Ben Yuk Fai Fong
Vincent Tin Sing Law
Albert Lee *Editors*

Primary Care Revisited

Interdisciplinary Perspectives for a New Era

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Foreword

I am very delighted to write this foreword because I have known Dr. Ben Y. F. Fong and Professor Albert Lee for decades. The editors have successfully pooled an array of interdisciplinary experts together in producing this timely and practical book on primary care from a non-clinical perspective. I deeply appraise the educational value of this book which is an indispensable reference for readers on primary care and public health.

Primary care is the critical portal of health systems. However, primary care is facing various challenges which include ageing population, prevalence of chronic diseases, escalating medical costs, and unequal distribution of healthcare resources. The Declaration of Alma-Ata at the International Conference on Primary Health Care of the World Health Organization (WHO) in 1978 sparked worldwide discussion on "health for all" and the role of primary care. After four decades, it is timely to renew primary care, resharpen its focus on people, as well as offer a community-based approach, so as to respond to the ever-changing world.

The editors and authors of this book constitute an excellent mix of experts in clinical practices, management, educators, and so on. Dr. Ben Y. F. Fong, a Family Doctor and a Specialist in Community Medicine who holds Honorary Clinical Associate Professorship at the two local medical schools in Hong Kong, is a veteran in hospital administration and private medical practice. With his recent experience in nurturing medical and health-related undergraduates, Ben sheds light on promoting primary care and community health. Dr. Vincent Law, Senior Lecturer of the School of Professional Education and Executive Development of The Hong Kong Polytechnic University, contributes through his assorted background in business administration, public policy, and consultancy. His contribution reinforces research on primary care based on interdisciplinary and stakeholder perspectives. Professor Albert Lee is a renowned academic on family medicine and public health. He is a Member of the National Academy of Medicine (NAM), USA; Honorary Fellow of the Faculty of Public Health, UK; and Vice President of UNESCO-HK Association. Albert has been serving as WHO Advisor/Consultant since 2003 on health development and has contributed models of care for school health and healthy city, applicable internationally. I deeply believe that potential readers will benefit from Albert's contribution in primary care policy, health system, healthy city, and public health as a whole.

This book helps readers to grasp multiple facets of primary care from a non-clinical and practical outlook. I witness a systematic portrait of in-depth knowledge on four facets of primary care in this book, namely, principles of primary care and systems, care models and practices, social context, as well as future development and education. The editors and authors present compelling evidences that promote primary care needs, and concerted and sustained effort of various components of the health system. I sincerely hope this book will become a primer for health professionals, educators, policymakers, students, and other intimate stakeholders of healthcare.

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Preface

The initiative to develop this book was inspired by the development of primary care and growing strength of interdisciplinary approach in recent years. In 1978, the Declaration of Alma-Ata by the World Health Organization urged all governments, health and development workers, and the world community to protect and promote the health of all people of the world. The declaration reiterates the importance of primary care for all and devotes genuine implementation measures. Improvement on primary care requires the symphony and synergy of various facets of primary care such as health promotion, disease prevention, long-term care, health education, monitoring of chronic diseases, and so on. An interdisciplinary approach allows experts in different disciplines to contribute various perspectives and case studies of primary care to depict a comprehensive and forward-looking vision on primary care for the betterment of the community, health professionals, the health sector, and the world at large.

Against such background, this book aims to research into primary care in the new era via an interdisciplinary approach. It aims at providing international readers with current knowledge and delivery models of healthcare in the community setting to health professionals and especially those who are working in primary care. This book attempts to serve as a useful reference for various stakeholders of primary care which cover general citizens, community health practitioners, health professionals, the health sector, educators, and policymakers.

This book is structured into four main parts: (1) Principles of Primary Care and Systems, (2) Care Models and Practices, (3) Social Context, and (4) Future Development and Education.

Part I provides the context of fundamental but pertinent issues on the principles of primary care and systems.

In Chap. 1, Ben Y. F. Fong and Vincent Law provide an up-to-date overview on primary healthcare, offer a systematic review of practices in the worldwide perspectives, illustrate the future role of primary care, as well as introduce community-based care and practices models of primary care. The chapter ends by linking various disciplines of primary care for its betterment.

Chapter 2 by Albert Lee provides insights on the philosophy of primary care is based on the rationalisation of resources and quality services which include essential features such as essential healthcare services, universally accessible to the general population, and services accepted by residents, affordable by the population, and participated in by many.

Chapter 3 by Sabrina C. Y. Luk discusses the fiscal sustainability challenge of primary care based on various models. Financial considerations in primary care and optimisation of health program sustainability are provided. The chapter ends with insights on formulating a practical and sustainable healthcare system.

In Chap. 4, Margaret Tung and Sukhpreet Kaur review the reforms of the health sectors which have strengthened service delivery and adopted a sustainable approach with an increase in funding. Learning from the systems and experiences of three countries and one city as well as insights on formulating a practical and sustainable healthcare system are provided.

Chapter 5 by Anthony Y. H. Fung and Alex H. Y. Lau reviews the emergence of social media that has made medical and health information more transparent. Roles of various stakeholders on health issues and how the media take a balance between the benefits and the consideration of moral dilemma via message transmission related to primary care are also discussed.

In Chap. 6, Katy N. W. Wong and Francesca Quattri examine the funding deficiencies in primary care in the public sector and explore the advantages of public-private partnership (PPP) in primary care. Appropriate PPP models, based on international experiences on improving the programme quality, are recommended as long-term solutions to address healthcare challenges and to improve public primary care.

Part II looks into a variety of care models and practices in relation to delivering and further strengthening primary care at the community and life levels.

In Chap. 7, Eva O. W. Chan views the care scope as no longer being confined to mental patients themselves. The needs of the carers, concern of the public, as well as the sustainability of government services have become themes for discussion. Various models of care and practices, such as the holistic model, the strength model, and the recovery model, have been developed, moving with the international service trend of mental healthcare in the primary care setting.

Chapter 8 by Vincent Law views health-promoting workplaces as essential elements of the contemporary world. The working environment is continuously interacting with the workers in physical, social, and psychological contexts. Policymakers, legislators, organisations, employers, employees, and community health practitioners can help promote health in workplaces via an interdisciplinary approach.

In Chap. 9, Percy W. T. Ho, Ronald M. Y. Wong, and W. H. Cheung note falls among elderly as a major public health threat worldwide. Fall prevention in the primary care service and prevention of recurrent falls by Fracture Liaison Services (FLS) in the community and hospitals are introduced. The chapter ends by describing the epidemiology of falls and subsequent fractures in the elderlies worldwide.

In Chap. 10, Thomas M. C. Dao and Liio W. K. Poon provide an overview of current scientific evidences of the practice of community rehabilitations and main components of community rehabilitation with reference to the WHO framework. Experience of a comprehensive multidisciplinary chronic obstructive pulmonary disease rehabilitation programme in a government-funded general outpatient clinic in Hong Kong will be shared.

Chapter 11 by Chor Ming Lum reviews primary care for older adults. The chapter discusses how a multidimensional biophysical-psychosocial or multi-morbidity model but not a disease-based model should be adopted in primary care for older adults. Such model should better be done at the community level and includes healthcare workers and social workers (health-social collaboration). The chapter ends by discussing the dynamic role delineation between primary and secondary/tertiary care along with a system to facilitate seamless flow in the best interests of older adults.

In Chap. 12, Connie Chu and Jimmy Tsui review palliative care and end-of-life issues in the context of primary care. The chapter examines the past and present of the palliative and hospice care movement in Hong Kong, the optimal model with respect to overseas practices, as well as the future of end-of-life care in the region. The chapter also explores a wider and interdisciplinary perspective, suggests an integrated care model, and explores the sources of impact to end-of-life patients.

Part III explores the social context of primary care ranging from equity, social responsibility, ethics, volunteering, social marketing, living environment, and disaster preparedness.

In Chap. 13, Tommy K. C. Ng, Ben Y. F. Fong, and Marcus H. T. Fung discuss the social, economic, political, demographic, and geographic perspectives related to healthcare inequality. The authors elaborate on how the principles are translated to practices in the provision of quality primary healthcare in the community setting. The chapter ends by advocating that the gatekeeping function is the key to successful primary healthcare in meeting the needs and expectations of the community.

In Chap. 14, Tiffany C. H. Leung and Jacky C. K. Ho introduce the concept of morality and ethics and provide a general overview of four major ethical theories and approaches. The chapter also illustrates corporate scandals and issue management, the global trends of sustainable reporting practices, and four major social aspects of the Global Reporting Initiative related to healthcare settings.

In Chap. 15, Fowie Ng, Graeme D. Smith, Chun Cheong Ma, and Leon W. Li introduce the concept of doctor shopping, which is a common treatment-seeking behaviour internationally, particularly among those who suffer from chronic conditions or major illnesses. The chapter also reviews the current literature of doctor shopping in the international context and addresses the possible impact on doctor shopping from the current trend of using digital health for consultation and prescription.

In Chap. 16, Kar Wai Tong examines the significant impacts of volunteers on primary healthcare in the world and their roles in non-government organisations

(NGOs) with a case study from Hong Kong. The chapter also examines healthcare volunteerism globally and briefs the development of healthcare volunteerism in NGOs in Hong Kong. The chapter ends with a review of inherent difficulties and challenges, examines volunteers' impacts on primary care, and forecasts future developments.

In Chap. 17, Edward Pinkney, Hoi Fung Wong, and Pui Fai Wong discuss the increasing opportunity for tailored, highly responsive campaigns in primary care in the age of digital communication. The chapter also introduces campaigns created with much more creativity, disseminating key messages for improving health-related knowledge, attitudes, beliefs, and behaviour at both the population and personal levels.

In Chap. 18, Joseph H. L. Chan and Chun Cheong Ma introduce the concepts of "adequate housing" and "sustainable buildings" that have emerged in recent years, yet health consideration may not be the prime concern in the construction and rehabilitation of buildings, with standards based on engineering knowledge and aesthetics of buildings. The relationship between health problems and undesirable built environment has long been recognised by a number of international studies. The chapter provides insights for possible improvement of housing, built environment, and health outcomes of building occupants in the community.

In Chap. 19, Noel T. S. Yim and K. K. Lam discuss the command, control, communication, coordination, triage, treatment, and transport disaster medical management at the scene. The vital role of primary care in disaster preparedness is also discussed. The chapter ends with the discussion of volunteer groups which provide cardiopulmonary resuscitation (CPR) training to the community.

Part IV provides future developmental insights on primary care based on lifelong education, application of mobile technology, and happy university initiative.

In Chap. 20, Vincent Law and Sean H. Y. Hui give an overview on lifelong education and continuous professional development (CPD) and apply the concepts to the health professionals, health service providers, and the community at large. The chapter also highlights the importance of lifelong learning for health professionals as the development of a new identity as member of a particular community of practice.

In Chap. 21, Adam K. L. Wong reviews mobile apps that help people maintain a good diet and mobile phones used for health promotion. The chapter also discusses the use of mobile phone apps in personal health management, helping patients to perform self-diagnostics and manage illnesses. The chapter ends with the application of IoT (Internet of Things) in providing important information about health for people.

In Chap. 22, Elsa K. Y. Chan and Ben Y. F. Fong explore the influence of the current education towards happiness among students of higher education, with mental issues and academic overload being the key determinants. A pilot study has found that happy life, health condition, academic work, and social relationships are significantly associated.

In the last chapter, Chap. 23, Albert Lee and Peter K. K. Poon illustrate the merits of district-based primary healthcare system in meeting eminent needs of the local population. Different tiers of prevention require different levels of expertise which signify a paradigm shift.

Kowloon, Hong Kong, China — Ben Yuk Fai Fong
Kowloon, Hong Kong, China — Vincent Tin Sing Law
New Territories, Hong Kong, China — Albert Lee

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Ben Y. F. Fong
Vincent Law
Albert Lee

About the Book

Primary care is fundamental and integral to all health systems, providing health equity and security to the community. Since the Declaration of Alma-Ata in 1978, primary care is considered cost-effective in health promotion, disease prevention, long-term care, health education, monitoring, and self-management of chronic conditions, compared to the more resources-intensive secondary and hospital-based care. This book adopts an interdisciplinary approach with a wide scope of perspectives and case studies and is intended for international readers. It consists of four parts which describe the principles, care models and practices, social context, as well as future development and education in primary healthcare. The chapters provide current knowledge and delivery models of healthcare in the community setting to practitioners and all those working in the discipline of primary healthcare. The contents serve as a useful reference, with case studies, to policymakers, researchers, community health practitioners, health executives, and higher education students in the practical, philosophical, and scholarly issues pertinent to the delivery, financing, planning, ethics, health politics, professional and technological development, manpower, and monitoring in primary healthcare. The book does not follow the common clinical practice or service-based approach found in most books on primary care. Contributors are academics and practitioners coming from diversified professional backgrounds of medical, dental, nursing, allied health, Chinese medicine, health economics, administration, accounting, laws, public policy, linguistics, housing management, information technology, and mass communication. A number of the contributors possess international educational background and experience.

This book is an essential tool for professionals in services, executive, policy, planning, and developmental positions and professionals in training in primary care.

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About the Editors

Ben Y. F. Fong is a Family Doctor and a Specialist in Community Medicine, holding Honorary Clinical Associate Professorship at the two local medical schools in Hong Kong. He has been Deputy Medical Superintendent of Prince Henry Hospital in Sydney, Director of University Health Service at The Chinese University of Hong Kong, and Senior Assistant Commissioner of the Auxiliary Medical Service of the Hong Kong SAR Government. He commissioned the Union Hospital and Ruttonjee Hospital in Hong Kong and is currently an Associate Division Head of Science, Engineering and Health Studies of the College of Professional and Continuing Education and the Director of Centre for Ageing and Healthcare Management Research (CAHMR) at the School of Professional Education and Executive Development (SPEED) of The Hong Kong Polytechnic University (PolyU).

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Part I

Principles of Primary Care and Systems

Chapter 1
Renewal of Primary Care

Ben Y. F. Fong and Vincent Law

Primary Health Care: Roles and Challenges

Primary health care (PHC) is the focus of the healthcare system (WHO 1985). PHC is regarded as the first and critical portal into the health system (Charif et al. 2017; Blackburn et al. 2018; McMurray and Clendon 2015; Starfield et al. 2005; Welzel et al. 2017). PHC involves a persistent and lifelong dedication to health (Doohan and DeVoe 2017), and it provides people-oriented and people-integrated care gradually (Martin-Misener et al. 2012). PHC is important in improving the management of people's health (Hutchison et al. 2011). Patients treasure better access to primary care services as one of the priorities (NHS England 2017), and such improvement is also one of the goals of healthcare system (Corscadden et al. 2018).

The definition of PHC varies with countries (Kronenberg et al. 2017). McMurray and Clendon (2015) defined PHC as a set of principles which escort healthcare professionals in helping people to achieve good health via fair and equitable means. Junod Perron et al. (2018) view PHC as the provision of integrated accessible healthcare services and the development of a sustained partnership between physicians and patients. PHC is intersectoral, and its planning should be in liaison with various sectors concerned with health aspects of the community (McMurray and Clendon 2015).

Primary health care serves multiple roles for the population. PHC is viewed as evolving to reduce health disparities while improving outcomes and quality (Kapadia 2018). Strong PHC is crucial to an efficient and effective health system and equitable healthcare delivery systems (Dullie et al. 2018; Leach et al. 2017).

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Strengthening of PHC is conducive to a more equitable and accessible care system which produces better health outcomes at lower cost (Wong et al. 2017). Countries with sufficient access to primary care enjoy health and economic benefits (Charif et al. 2017; Phillips and Starfield 2003; Ranstad et al. 2017).

PHC is also facing multiple challenges. First, the demand for PHC is expected to increase (Wen et al. 2018; Nathan et al. 2017) in view of the challenge of ageing population with more chronic diseases (Vestjens et al. 2018). Ageing population would induce higher utilisation of PHC services among the elderly and cast considerable consequences on healthcare resources (Welzel et al. 2017). Second, expansion on research on the primary care activities is needed (Adar et al. 2017). To promote widespread adoption, researches which address the feasibility, effectiveness and efficiency in the primary care context are needed (Klein et al. 2017). A renewal of PHC is timely in responding to the ever-changing world and puts people at the core of health again.

Health for All: Declaration of Alma-Ata

In 1978, the historical Declaration of Alma-Ata (the Declaration) at the International Conference on Primary Health Care of the World Health Organization (WHO) marked a shining moment in the human history of public health. The Declaration provides guidelines, principles and values for the world to develop and promote primary care, which is the key to "Health for All (HFA) by the Year 2000" (WHO 1978). Investing more in primary healthcare interventions may accelerate the achievement of Sustainable Development Goals (SDGs) of universal health coverage (Dullie et al. 2018). The need of a robust primary care system was echoed strongly three decades later in the WHO's World Health Report 2008, *Primary Health Care: Now More Than Ever* (Brown et al. 2016).

Primary health care was defined by the WHO's *Declaration of Alma-Ata* (1978) as follows:

> *Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination… It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process.*

Primary health care is based on the concepts of equity, access, empowerment, community self-determination and intersectoral collaboration. It involves various stakeholders and is associated with economic, social, political, environmental and cultural factors of health. Health promotion, disease prevention, health education, control over health and well-being by individuals and person-centred holistic care, as well as curative and rehabilitative services, are provided. PHC empowers individuals to present various health problems and to participate in making decisions on their own health and care (PHAA 2014).

The Declaration aims to protect and promote the health of all people as a fundamental human right and a universal social goal in view of health inequality in various countries. Comprehensive health for all is needed in the sustainable development of economic and social aspects and enhanced quality of life, in the spirit of self-reliance, social justice, equity and universal coverage. Primary health care is the first encounter of individuals with continuing and multidisciplinary health care which is proximal to workplace and residence, under the coordinated efforts of non-health sectors. All governments are urged to formulate policies and action plans for sustainable primary health care by allocating resources to achieve value for money (WHO 1978).

Development of Primary Care

History of Primary Health Care

Primary health care is considered as the latest expression of a philosophical acceptance that major diseases are linked not only to the best science available but also to social fairness and improved life quality for the poor. Dr. Halfdan Mahler, the charismatic Danish doctor, was elected Director General of WHO in 1973 and served three terms until 1988. He shifted WHO's focus and turned his "participatory and bottom-up" initiatives with the goal of "Health for All by the Year 2000" into the Primary Health Care movement, resulting in the Declaration of Alma-Ata and the subsequent radical changes to health systems (Cueto 2004; Unite For Sight 2018).

The subsequent years after the Declaration were not easy. There were some "counter-revolutionary" initiatives by donor nations in adopting "selective primary health care" and structural adjustment policies, selecting low-cost technical interventions, such as vaccination and privatising health services with business management methods in the 1980s by the World Bank. It was a detour from the holistic primary care philosophy. Political commitment was not forthcoming. In 2008, on the 30th anniversary of the Declaration, Dr. Mahler called a halt to seeing things through the medically tainted glasses by attending to the association between health and social, economic and environmental factors. He was responding to the resistance of the doctors who feared of losing privileges, prestige and power in the primary care movement. However, the situation has not changed much over the years in the medical profession worldwide. Primary care is still not considered the mainstream specialisation option for the upcoming young medical graduates. A step forward came in 1997 when a newly proposed target entitled "Health for All in the 21st Century" was put forward in the Pan American Health Organization document. The holistic primary care in the original 1978 proposal was still under planning 20 years later. Perhaps a way to boost the impact of primary care in health is the study of history (Cueto 2004; Brown et al. 2016; Unite For Sight 2018). Primary health care is revisited through the four selected cases from the developed and developing world, illustrated in the next section.

Ottawa Charter for Health Promotion in 1986

Health promotion entails health education interventions and the related organisational, political and economic supports for making behavioural and environmental changes to improve health. Health education, prevention and protection are the three core components, and lifestyle and social determinants are the major health risk factors. A landmark document entitled “A New Perspective on the Health of Canadians” was presented in 1974 by Marc Lalonde, the then Canadian Minister of Health. The document considered lifestyle, genetic and environmental causes of diseases, as well as social determinants in health (Lalonde 1974). This work was the forerunner to the Ottawa Charter for Health Promotion (the Charter), in which a new framework for health promotion was designed as the ways of achieving health for all, announced at the first International Conference on Health Promotion in Ottawa in 1986 (Tulchinsky and Varavikova 2010; Saskatchewan Health Authority 2018).

Moving from disease prevention to health promotion, the Charter was a continuation of the primary healthcare era, and primary health care was back in the world agenda again with the spotlight on population health. The Charter assisted public health professionals and policymakers to find different practices in working with other disciplines. The first health promotion setting project was the Healthy Cities movement in 1986, with the slogan “Think globally, act locally”, and the first Healthy Cities coordinating centre was set up in Liverpool. The objective of the project was to continually enhance the social and physical environments for health protection and sustainable development. The Healthy Cities network now consists of thousands of cities worldwide. Then the Healthy Schools movement follows, recognising schools as a living environment with resources to ensure healthy development of children supported by the family and the community. Similarly, universities may serve as the focal point for health and sustainability (Awofeso 2004; Kickbusch 2007; Potvin and Jones 2011*;* WHO 2018a).

An innovative Campus Health Ambassadors (CHA) programme, in conjunction with the University Health Service, was started at The Chinese University of Hong Kong in 2003. The programme aimed to inspire and train students who are enthusiastically devoted to promote physical and psychological health within the university and to advocate health messages to the community. Universities can provide a place for students to learn healthy living skills; to take on, synthesise and assess perception of healthy living; to discover components of healthy living; and to make responsible health choices for oneself. Furthermore, the Health Promoting Hospitals project began in 1988 promoted the total quality management of hospitals, with the aims of addressing the health of staff and linking the hospitals to the community (WHO 2018a; Fong 2007; Ng et al. 2018).

The Charter covered five key areas of public health actions, healthy public policies, supportive environments, personal skills, community action as well as reorientation of healthcare services, while three basic strategies of health promotion are advocate, enable and mediate. Health naturally exists in where people live, work and entertain. Thus health promotion has to incorporate the social determinants approach, aligning the "old" public health, and a devotion to individual and community empowerment into the new public health. Sir Doctor Michael Marmot has suggested the lack of human autonomy, empowerment and freedom, which are the core values, as the potent cause of ill health. Professor Lester Breslow has described health as a resource for living and defined the Ottawa Charter as constituting the third public health revolution in building health. According to Breslow (2004), the first revolution began in the early half of the nineteenth century to deal with communicable diseases, and the second one took place in the latter part of the twentieth century in combating non-communicable diseases (NCDs) such as heart conditions, diabetes and cancers (Kickbusch 2007; Potvin and Jones 2011*;* WHO 2018b).

In recognition of the role of health promotion in pursuing health of the population, there are university programmes, professional associations and journals in health promotion. Canada has even established the Ministry of Health Promotion. Moreover, research is a system approach to better understand the values, principles and processes and to assess the outcomes of better health. It will help formulate health-enhancing policies and build effective service capacity in health promotion. Integration of research and practice and innovative development is essential in avoiding implementation gaps, noted by the Seventh WHO Global Conference on Health Promotion in 2009 (Potvin and Jones 2011).

The New Public Health

Public health refers to activities which focus on the whole population or subpopulation groups within a larger population (Guzys et al. 2017). There was agreement within the public health sector by the early 1990s that health promotion, based on the Ottawa Charter, comprised the "new public health", as a consequence of advances in knowledge, concerns about human rights and appearance of new threats to health. The new public health (NPH) is a philosophy to broaden the older understanding of public health, with the emphasis on individual health, equal access to healthcare services, social and physical environment, political governance as well as social and economic development. Health should also be included in public policy. In fact, new public health is not a new term. It has appeared in publications 30 years ago to present the link of disease prevention with health promotion and social factors (Awofeso 2004; Tulchinsky and Varavikova 2010).

In the twentieth century, public health was given low priority because many countries placed more resources on the costly hospitals and tertiary care and other health needs, while primary care was underprovided. However, modern scientific advances kept emerging in early detection, prevention and management of chronic conditions and cancers. A wide range of evidence-based scientific, technological and management methodologies is applied in NPH to build up the scientific basis and practice of public health. Thus, the management and public health practitioners have to work with a common language as well as with cultural orientation, in the pursuit of better population health and to avoid policy conflicts over resource allocation in community care. NPH measures and knowledge can then be promulgated in the broad aspects and be implemented in a cost-efficient and cost-effective manner into public health practice for the benefits of the community (Tulchinsky and Varavikova 2010).

New public health also provides an organisational framework which adopts a population-based approach to reflect health as a fundamental human right, public health policies to recognise available technology and current "best practice" standards, and leadership accountability to remain primarily with the government. The question is to put into practice what is already known and to explore solutions to the unknown with optimism, professionalism, verdict and perseverance in a NPH perspective (Tulchinsky and Varavikova 2010). Furthermore, education and training in public health must take into consideration the "new" roles of public health professionals and workers in the rapidly changing environment. They should be equipped with the tools, values and knowledge needed for health improvements beyond the traditional public sector settings (Petersen and Weist 2014).

The Bangkok Charter for Health Promotion in a Globalized World (2005)

In 2005, the Bangkok Charter for Health Promotion in a Globalized World (the Bangkok Charter) was signed at the Sixth Global Conference on Health Promotion held in Bangkok, Thailand. The Bangkok Charter recognised the global expansion of the innovations underlying the Ottawa Charter and the role of health promotion in developing countries where there are increased inequalities. It identified major challenges, actions and commitments required for formulating policies to address the factors of health in a globalised world by approaching the empowered community. Issues of sustainability in health promotion, focusing on the resources required to meet the challenges of the world, such as consumer-led society, changing world environment and urbanisation, were also highlighted. The Bangkok Charter advocated social justice and equality in national and global development. There are four key commitments: a global development agenda with focus on health promotion, a key responsibility for all governments, a main focus of communities and civil society, and a need for good corporate practices. It refined the approach to behavioural, social and environmental factors of health, and the key is on implementation, with an emphasis on strong political action and leadership, broad participation and alliance and sustainable advocacy based on solidarity (De Leeuw et al. 2006; Catford 2009; Potvin and Jones 2011*;* Ontario Health Promotion E-Bulletin 2018).

The World Health Report 2008: Primary Health Care – Now More Than Ever

The HFA movement had little apparent progress after 30 years, and thus the renewal of PHC was suggested in the World Health Report 2008 – *Primary Health Care* (*Now More Than Ever*) (2008 Report). Recommendations include putting people at the centre of health and responding better and faster to the changing world and growing community expectations. Initiatives in reorientation and reform of the healthcare systems shall help reinforce government structures, professional organisations and civil society organisations with solidarity. All government policies should include health so as to respond to the needs of people. Furthermore, resources should be shifted from the costly curative services to PHC that alleviates disease burden through health promotion and early detection of diseases (WHO 2008a).

The 2008 Report described the lost opportunities since the paradigm shift in thinking about health in the Declaration of Alma-Ata. Most health systems still rely on specialised curative care with short-term results of fragmented services. There appears a laissez-faire approach to governance. Four sets of reforms were suggested: universal coverage reforms, service delivery reforms, public policy reforms and leadership reforms driven by shared values. Well-organised multidisciplinary teams increase patient satisfaction and reduce physician and staff burnout (Leach et al. 2017). There shall be multidisciplinary teams, collaboration with services of other sectors, coordinated inputs of hospitals, specialists and community organisations and improved capacity of health authorities to steer PHC reforms. Information technology helps strengthening the potential for enhancing health and health literacy in a well-educated and modernised world. PHC will then be stronger in direction and unity than the conventional delivery model in achieving health for all, particularly in affluent countries where financial means are available to expedite the change from tertiary care to primary care, to generate a healthier policy environment and to establish universal coverage system. Eventually global solidarity can be realised by international cooperation in the conversion of health systems in the world (WHO 2008a).

Shanghai Declaration on Promoting Health in the 2030 Agenda for Sustainable Development (2016)

The Shanghai Declaration was very concise and was the outcome of the Ninth Global Conference on Health Promotion held in Shanghai in November 2016. Health and wellness were recognised as being necessary to attain the United Nations Development Agenda 2030 and its Sustainable Development Goals (SDGs). There are other agenda items, including promoting health through works on all the SDGs and making daring political alternatives for health. Enlightened governance is very important for health. Cities and communities are vital settings for health, while health literacy allows and steers equity (WHO 2018c).

Health is recognised as a universal right, a necessary resource for daily living, a shared social goal and a primary political concern for all countries. The United Nations Sustainable Development Goals establish a responsibility to invest in health, to ascertain universal health coverage and to narrow health inequities among individuals of all ages. Health is also considered a political choice. Leaders from all sectors are urged to improve health and well-being in all the SDGs, as a shared responsibility. The Shanghai Declaration aims to hasten the enactment of the SDGs through added political commitment and financial input in health promotion (WHO 2018c).

Primary Health Care Revisited

The World Perspectives

“Health for All by the Year 2000”, a banner of the 1978 Declaration of Alma-Ata, intended to change the views of governments and people about how good health was attained and sustained. Governments were committed to take action to achieve the WHO definition of health as a “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” in a “new” global movement. However, the task has confronted some critical challenges to implementation, including defining PHC and putting PHC into practice, translating equity into action, encountering the limitations of community participation and finding finances to support health system reforms (Rifkin 2018).

Over the years, many government and non-governmental organisation (NGO) PHC programmes are still trying to balance the PHC vision and the reality of health service delivery success by studying health impacts and cost-effectiveness. Year 2018 was designated the year of universal health coverage, with a commitment to social justice and the associated coverage to equity and community participation through the support of community health workers (Rifkin 2018). In creating and sustaining comprehensive primary healthcare practices, a political context is required. There should also be co-partnership models and policy development by the government in conjunction with the communities. Community advocacy and engagement in decision-making should be supported. Deploying, empowering and building up social and human resources in developing as well as developed countries are essential in realising the promise of primary health care (Labonte et al. 2014).

Cases of Developed Countries

The Declaration and the Ottawa Charter for Health Promotion in 1986 only attained a limited and technical approach to certain diseases within nations. There are four movements jeopardising the attainment of HFA. First, managerialism – a goals and targets approach – has restricted the implementation of health promotion in Australia and some industrialised countries by not addressing the social and environmental imperatives and community action. Second, market-dominant economics has been fuelling health inequities in the world and within countries. Third, individualism, with focus on behaviour and lifestyle, has compromised a collective approach to PHC. Fourth, environmental degradation, an increasing global threat to public health, has been neglected in the implementation of HFA. There are suggestions to return to the original and more radical philosophy, reinforcing the approaches of PHC and health promotion with broader goals in order to achieve HFA (Baum and Sanders 1995).

In New Zealand, primary health care has made considerable changes since year 2000. Primary Health Care Strategy was launched to narrow inequalities in health, to involve communities as well as to enhance the prevention and management of chronic conditions by reducing the burden of diseases and the escalating costs of secondary care. Primary health organisations (PHOs) were subsidised on capitation funding by the government. The PHOs were in charge of the primary health care in a region or for a group or particular ethnic group and were founded across New Zealand, with over 90% of enrolment across the nation. They coordinate and reinforce the care providers with an emphasis on population health. Care providers are encouraged to be innovative and to customise their services to the community in keeping people well (WHO 2008b).

To improve access for Maori and other groups, New Zealand health officials have developed a novel, “evolutionary”, and yet effective way to treat the local Maori population. The Maori do not perceive hospitals and clinics as friendly environments and are unwilling to attend these institutions. A health facility was set up on the sacred meeting place and staffed by two culturally sensitive general practitioners. The practitioners became well trusted and respected in the Maori community, which then feel more at ease. The primary care service had become so well received that there was a need to extend the opening hours and relocate the clinic to bigger rooms in a new premise. From this experience, building healthcare facilities in venues where the local people feel comfortable has enhanced their utilisation of health care. However, healthcare needs vary tremendously among the groups. Hence, demands of different communities are met by addressing the inequalities in health among the different groups (WHO 2008b).

In France, there is another story of development of primary care, as illustrated by the works of country doctors, who might be called for emergency care in the middle of a meal in the 1950s. This happened around the clock and the doctors literally “belonged” to the patients. This centuries-old, 24-hour primary healthcare service is still carried on today in rural France, irrespective of the changes in modern time, progress in health care as well as cultural, economic and social impacts on life occurring in faraway communities. Country medical practitioners still provide individualised, one-to-one care with empathy, trust as well as an intimate knowledge of individuals. However, it has become harder to recruit young doctors to work in the rural areas, resulting in closing many practices in the last few decades in France. Apart from the perceived harder working conditions, general practitioners do not want to take more responsibility because there is danger of being challenged, with consequent legal implications (WHO 2008b).

Very much the same case in Asia, French people move from consulting their family doctor to using emergency services frequently. They seek for the best medical care and always wish to travel to Paris and larger French cities with bigger hospitals. Nonetheless, some country medical practitioners adjust to the changes and their diminishing role. They continue to provide personalised services. Doctor-patient relationship, with a strong bond of trust, is still a fundamental part of the treatment process. Furthermore, an arrangement of night and weekend on-call rotation duties of the local doctors has been proven to work well (WHO 2008b).

Cases of Developing Countries

China's barefoot doctor scheme has been well recognised worldwide as a significant reform of medical education. It had substantial influence on the Declaration of Alma-Ata. In 1951, the Chinese central government pronounced essential health care should be provided in villages. The barefoot doctors, together with health workers and epidemic prevention staff, provided primary health care and basic treatment that combined western and traditional medicines from the 1950s. The barefoot doctor scheme was a very practical and effective measure, particularly in the poor rural areas of the time, where medicine and doctors were in short supply. The doctors returned to the villages to continue farming and to practise medicine after a brief duration of training of 3 months to a year. During the Cultural Revolution, many doctors were deployed from urban hospitals to the villages to learn from the local workers and farmers as part of the Down to the Countryside Movement and to demonstrate professionalism (WHO 2008b).

Barefoot doctors in the village had the advantage of being neighbours to the patients. They knew the family situation, lifestyle and habits of the villagers, and thus they could follow up the cases very closely. In the early 1980s, as a movement of the economic liberalisation, barefoot doctors became qualified as village doctors after formal assessment, and those who failed would practise under the supervision of the village doctors. These rural health workers provide primary health care in health education, prevention, maternal and child health services and collect disease information. The access and quality of care have been improving with social and economic developments. However, the services deteriorated when the agricultural part was privatised at around the same time. Village doctors were deprived of their origin of income and many went to work in farming or industry. As a result, diseases that had been eliminated surfaced again in the countryside because of the lack of inoculations and primary healthcare services (WHO 2008b).

Originated in the most populated, predominantly rural nation on earth, the implication of barefoot doctors in rural health care is now widely recognised by researchers and policymakers in view of the difficulty to mobilise providers to the rural areas. Training local residents appears to be an option and helps to establish sustainability in rural primary health services as human resources and medicine are the key inputs. Chairman Mao Zedong, at the time, “rightly” advocated that 1-year short-term training was enough to train a doctor to cover the needs of primary care in the villages. In recent years the Chinese government introduced new health insurance schemes as a pledge to a primary health system that subscribes social equality and is affordable for all people. The New Rural Cooperative Medical Scheme that was introduced in 2003 is currently covering over 800 million residents in the rural areas, and at the same time public financing of the health system has escalated considerably (WHO 2008b).

Madagascar is an island country off the southeast coast of Africa with a population of 25 million. As the core of the national primary healthcare policy, a project was initiated in 1978 with high expectations of reaching the Alma-Ata goal of health for all by 2000. The local healthcare supply was inadequate. The healthcare provisions and staff situated in the cities were serving the elites. One thousand and five hundred young health aides were sent on foot, bicycles or primitive transport to primary healthcare centres in the rural districts. In the intervening 30 years, mixed results were noted, with progresses in some areas, while not meeting expectation in others. Generally, health outcomes have been improving in terms of life expectancy, infant mortality and combating infectious diseases like poliomyelitis, leprosy and malaria. Only 60–70% of the residents, mainly in areas linked by roads, have ready access to primary health care at basic health centres which were renamed in the mid-1990s and staffed by nurses. Many people still have to walk some 10 km to receive care, although mobile health centres have been set up in remote villages (WHO 2008b).

Many of the basic health centres were understaffed, ill-equipped with essential drugs and in poor state. The government launched *The Madagascar Action Plan 2007–2012*, comprising eight commitments, as the key policy of Malagasy. Commitment five of the action plan describes the national framework on health, family planning and HIV/AIDS with the aims to provide quality health services to all and promote hygienic practices. The Declaration of Alma-Ata continues to be the cornerstone of primary health care, and the responsibility to attain the HFA goal has been in the hands of individual communities since 2007 (WHO 2008b).

There are some major challenges arising from local cultural beliefs and psychological barriers in the primary care system. Villagers resist education programmes for better personal health and cleanliness, and some even reject the health workers from the lack of trust. Some people have no interest in primary care. They are not aware of the importance of modern practices and regard them as counter to traditional customs. Thus, assuring people of the gains of good health care needs sensitivity and adaptability, and educating rural people in Madagascar can be challenging. Primary health care is all about going back to the basics as far as the local communities and their tradition are concerned (WHO 2008b).

Priority Setting in Primary Health Care

Priority setting is about making choices and is necessary in all healthcare systems where needs and demands commonly exceed the available resources. It is a complicated interaction of different decisions at various levels within an organisation or government. Priority setting process should be transparent and follow ethical principles related to human dignity, community needs and cost-effectiveness (Arvidsson et al. 2012).

In Hong Kong, healthcare reform has been on the public agenda for over 30 years since the "Scott Report" (1985). The Health and Medical Development Advisory Committee in 2005 recommended the four new priorities in the "Building a Healthy Tomorrow – Discussion Paper on the Future Service Delivery Model for our Health Care System". They include acute and emergency care; services for low-income and underprivileged groups; conditions requiring significant cost, advanced technology and multidisciplinary professional teamwork; and training of healthcare professionals (HMDAC 2005). The report was welcomed by a group of academics in family medicine as "the first Government attempt over the last fifty years to address our health care system as a whole. The system thinking and comprehensive approach demonstrated in this paper are most commendable, … and offers hope for moving our health care delivery system forward" (FMU, HKU 2005).

Since 2005, 14 years have gone by and these priorities have not been "implemented" in the system, which is still "business as usual". In fact, the four priorities are neither new nor old. They have always been embedded in the public system all these years, as assured by the government that "no one is denied adequate medical treatment due to lack of means", *a very unique and dogmatic commitment not heard elsewhere in the world*. In priority setting, a number of factors are considered, including the burden of diseases, social determinants, knowledge set, investment and perceived effectiveness of the new choice, or in other words, the needs assessment, financial appraisal, outcome measures, community involvement and ethical consideration (Ng et al. 2019). There is also shared responsibility among the government, care providers, individuals and the entire society to achieve the fair and just choice and decision in the use of social resources.

In primary care, providers should work with the local community to set the priorities to decide health needs and funding of programmes. There are no generally accepted rules in setting priorities, which is a complex, value sensitive, moral and often contested process involving competing interests and political gains. An interdisciplinary and collaborative approach should be adopted with the inputs from health economists, professionals, community leaders, politicians and researchers, especially epidemiologists and policy analysts in building up evidence. A framework has been formulated to describe current knowledge about the services, socio-economic considerations and trade-offs agreed among the stakeholders. It is a useful tool for decision-making in setting priorities for the community systematically. Nonetheless, alignment with the priorities and targets of the government is a crucial deliberation and will help striking the strategic choices and their subsequent success of implementation. In the longer term, community health plans should be developed to steer priority setting, particularly in response to the changing social, economic, political and professional environment, both locally and internationally (McDonald and Ollerenshaw 2011; Arvidsson et al. 2012).

Evidence-Based Primary Care

Although medicine is often considered an art as well as a science, clinical practice should take into consideration the appropriate evidence in areas where unbiased scientific evidence is available – elements of clinical practice can be quantified. Evidence-based medicine (EBM) is the integration of clinical expertise, patient values and the best evidence into the decision-making process for patient care. Clinical expertise refers to the clinician's cumulated experience, education and clinical skills. The patient brings to the encounter his or her own personal and unique concerns, expectations and values. The best evidence is usually found in clinically relevant research that has been conducted using sound methodology with mathematical estimates of potential benefit and the risk of possible harm.

EBM aims to apply the best available evidence to unify and standardise treatment and clinical decision-making – *the gold standard*. EBM is not a panacea to the problems of all medical decision-making, but a way to the development of good clinical practice, especially in striking a balance between EBM and individualised patient care when evidence for best practice may not be equally applicable to all patients. Evidence quality can be assessed by meta-analysis, systematic reviews, clinical relevance, risk-benefits analysis, randomised controlled trials, peer reviews, etc. There are limitations of EBM, including cost of studies, time for experiments, generalisability, publication bias – accessibility and representativeness of evidence, ethics and safety issues – and patient concerns.

In primary care, EBM is a useful tool for improvement of the quality of care and in clinical decision-making. Providers are expected to be knowledgeable and comprehensive, while delivering evidence-based primary care effectively. Training in the skills of identifying and applying good evidence is essential. However reliable evidence is not always available, coupled with clinical uncertainty. These drawbacks can be partly solved by the providers' experience, professional expertise and good judgment. Moreover, primary care doctors are concerned that EBM derived from clinical studies is not often applicable to primary care; particularly new knowledge and practice appear all the time. Hence results of research and relevant information should be made easily available and accessible to providers to achieve a highly effective and sustainable primary care system. However, it is difficult to provide evidence-based primary care (EMPC) because of the complexity of information, and there are personal subjectivity and values, as well as emotions and preferences, of providers and patients (Edirne 2012**)**.

Clinical guidelines are usually very imprecise for the complex contexts of primary care, and clinical decisions need to consider family, psychosocial, ethnic, financial, policy and legislative issues (Edirne 2012). Clinical decisions should routinely be based on evidence that is unbiased and integrated with clinical skills and patient values. Quality of care counts on excellent communication skills and truly informed decision-making in choosing the most relevant rule. Learning from other non-health disciplines, like social sciences and humanities, will improve the application of EBPC. There is a clear need for studies to evaluate improvement in patient-oriented outcomes and high-quality research on common primary care problems in general (Ebell et al. 2017), with the objectives to increase primary care capacity for evidence implementation and to pursue primary care transformation (Shoemaker et al. 2018).

The Way Forward

Forty years have passed since the Declaration of Alma-Ata in 1978. The world is still exploring on how best and practical to pursue the supreme goal of health for all people on the earth. The roles of primary care in the achievement of health and wellness of people in all healthcare delivery systems are well recognised by all stakeholders in the community, including governments, health professionals, academics, politicians, community leaders and the public. Primary care is a complex, adaptive system and is influenced by various interrelated factors (Litchfield et al. 2017). One of the major changes in primary care is the redesign of the entire primary healthcare practice with the support of multidisciplinary teams (Hung et al. 2018). Policymakers should strengthen coordination of care and comprehensiveness in primary care via integration of health systems (Zhong et al. 2018). Based on a US study, Crocker et al. (2017) suggest that an integrative primary care approach can solve the problem of low public satisfaction with the health system. In this connection, an interdisciplinary approach in primary health care is preferred. More integrated interdisciplinary collaboration is needed to meet the future challenges of primary care (Matthys et al. 2017). A primary care-based inter-professional team provides patients with guidance and education to improve their health (Klein et al. 2017).

The authors wish to propose the concept of “interdisciplinary foundation blocks in primary care” that consists of essential components and building blocks to achieve healthy and happy life for all people in the world, irrespective of localities of living, ethnicity, classes, sexes, ages and backgrounds. The interdisciplinary foundation blocks include personal freedom, clean and safe water, adequate food and nutrition, clean air, safe environment, adequate living space, clothing, convenient toilet facilities, happy and harmonious community, banning of harmful substances (such as tobacco, alcohol, drugs, unhealthy food, pollutants, etc.), secured employment and healthy ageing. All responsible governments have the primary duty to ensure the adequate provision, as well as effective and equitable distribution, of the foundation blocks to every individual in the community.

In the real world, such ideal situation may not be attainable due to political, financial, cultural, social and local factors and characteristics. Successful implementation of multidisciplinary primary care is influenced by organisational factors, social factors and policy factors (Leach et al. 2017). In many developed communities, the concern of sustainability of healthcare system and issues of equity, financing health and long-term care are always on the public agenda. These items will affect care delivery and hence health of the future generations. Hence the establishment of an efficient and effective primary care system is fundamental and crucial to any community. Community-based care and practices models of primary care have been introduced to illustrate the important roles of primary care in healthcare systems.

The eight I's approach is adopted in this book to revisit primary care in the ways forward through the various chapters:

1. *Innovation* – Renewal of primary care, philosophy of primary health care, the happy university initiative, public health in the context of environment and housing
2. *Integration* – Public-private partnership in primary care, healthcare volunteers' significant impacts on primary care, district health systems and capacity building
3. *Infrastructure* – Preparedness for disasters in the community, development of care models in community mental health care, health-promoting workplaces, primary care for older adults, palliative care and end of life issues
4. *Integrity* – Equity, quality and gatekeeping, social responsibility and ethics in community health care, health-seeking behaviour doctor shopping
5. *Investment* – Sustainable healthcare systems, lifelong education for providers and community
6. *Implementation* – Prevention of falls and capturing fractures in the community, community rehabilitation, social marketing in health promotion and behaviours in lifestyle modification
7. *Insurance* – Fiscal sustainability challenge and the importance of primary health care
8. *Information* – Development and application of mobile technology and Internet of things to aid primary care

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References

Adar, T., Levkovich, I., Castel, O. C., & Karkabi, K. (2017). Patient's utilization of primary care: A profile of clinical and administrative reasons for visits in Israel. *Journal of Primary Care & Community Health, 8*(4), 221–227. https://doi.org/10.1177/2150131917734473.

Arvidsson, E., André, M., Borgquist, L., Andersson, D., & Carlsson, P. (2012). Setting priorities in primary health care – On whose conditions? A questionnaire study. *BMC Family Practice, 13*, 114.

Awofeso, N. (2004). What's new about the "New Public Health"? *American Journal of Public Health, 94*(5), 705–709.

Baum, F., & Sanders, D. (1995). Can health promotion and primary health care achieve Health for All without a return to their more radical agenda? *Health Promotion International, 10*(2), 149–160. https://doi.org/10.1093/heapro/10.2.149.

Blackburn, S., McLachlan, S., Jowett, S., Kinghorn, P., Gill, P., Higginbottom, A., Rhodes, C., Stevenson, F., & Jinks, C. (2018). The extent, quality and impact of patient and public involvement in primary care research: A mixed methods study. *Research Involvement and Engagement, 4*(16), 1–18. https://doi.org/10.1186/s40900-018-0100-8.

Breslow, L. (2004). The third revolution in health. *Annual Review of Public Health, 25*. https://doi.org/10.1146/annurev.pu.25.022604.100011. https://www.annualreviews.org/.

Brown, T. M., Fee, E., & Stepanova, V. (2016). Halfdan Mahler: Architect and defender of the World Health Organization "Health for All by 2000" declaration of 1978. *American Journal of Public Health, 106*(1), 38–39. https://doi.org/10.2105/AJPH.2015.302935.

Catford, J. (2009). Advancing the 'science of delivery' of health promotion: Not just the 'science of discovery'. *Health Promotion International, 24*(1), 1–5.

Charif, A., Zomahoun, H. T. V., LeBlanc, A., Langlois, L., Wolfenden, L., Yoong, S. L., Williams, C. M., Lépine, R., & Légaré, F. (2017). Effective strategies for scaling up evidence-based practices in primary care: A systematic review. *Implementation Science, 12*(139), 1–13. https://doi.org/10.1186/s13012-017-0672-y.

Corscadden, L., Levesque, J. F., Lewis, V., Strumpf, E., Breton, M., & Russell, G. (2018). Factors associated with multiple barriers to access to primary care: An international analysis. *International Journal for Equity in Health, 17*(28), 1–10. https://doi.org/10.1186/s12939-018-0740-1.

Crocker, R. L., Grizzle, A. J., Hurwitz, J. T., Rehfeld, R. A., Abraham, I., Horwitz, R., Weil, A., & Maizes, V. (2017). Integrative medicine primary care: Assessing the practice model through patients' experiences. *BMC Complementary and Alternative Medicine, 17*(490), 1–8. https://doi.org/10.1186/s12906-017-1996-5.

Cueto, M. (2004). The origins of primary health care and selective primary health care. *American Journal of Public Health, 94*(11), 1864–1874.

De Leeuw, E., Tang, K. C., & Beaglehole, R. (2006). Editorial – Ottawa to Bangkok — Health promotion's journey from principles to '*glocal*' implementation. *Health Promotion International, 21*(suppl 1), 1–4.

Doohan, N., & DeVoe, J. (2017). The chief primary care medical officer: Restoring continuity. *Annals of Family Medicine, 15*(4), 366–371. https://doi.org/10.1370/afm.2078.

Dullie, L., Meland, E., Hetlevik, Ø., Mildestvedt, T., & Gjesdal, S. (2018). Development and validation of a Malawian version of the primary care assessment tool. *BMC Family Practice, 19*(63), 1–11. https://doi.org/10.1186/s12875-018-0763-0.

Ebell, M. H., Sokol, R., Lee, A., Simons, C., & Early, J. (2017). How good is the evidence to support primary care practice? *Evidence-Based Medicine, 22*(3), 88–92. https://doi.org/10.1136/ebmed-2017-110704.

Edirne, T. (2012). Is evidence-based medicine appropriate in primary care? *Primary Health Care, 2*, e108. https://doi.org/10.4172/2167-1079.1000e108.

Family Medicine Unit, The University of Hong Kong (FMU, HKU). (2005). *Responses to discussion paper "Building a Healthy Tomorrow", HMDAC, HWFB 2005*. http://www.fmpc.hku.hk/doc/FMU_Health_D%20Paper_response_Oct_05.pdf

Fong, B. (2007). *Campus Health Ambassadors.* Paper presented at the meeting of the first Asia-Pacific conference on healthy universities. Hong Kong: The Chinese University of Hong Kong.

Guzys, D., Brown, R., Halcomb, E., & Whitehead, D. (2017). *An introduction to community and primary health care* (2nd ed.). Cambridge: Cambridge University Press.

Health and Medical Development Advisory Committee (HMDAC). (2005). *Report on "building a healthy tomorrow – Discussion paper on the future service delivery model for our health care system"*. Hong Kong: The Government of Hong Kong SAR.

Hung, D. Y., Harrison, M. I., Truong, Q., & Du, X. (2018). Experiences of primary care physicians and staff following lean workflow redesign. *BMC Health Services Research, 18*(274), 1–8. https://doi.org/10.1186/s12913-018-3062-5.

Hutchison, B., Levesque, J. F., Strumpf, E., & Coyle, N. (2011). Primary health care in Canada: Systems in motion. *Milbank Quarterly, 89*, 256–288.

Junod Perron, N., Audetat, M. C., Mazouri, S., Schindler, M., Haller, D. M., & Sommer, J. (2018). How well are Swiss French physicians prepared for future practice in primary care? *BMC Medical Education, 18*(1), 65. https://doi.org/10.1186/s12909-018-1168-4.

Kapadia, A. (2018). Meditation and mindfulness: A call to action in elevating primary care. *The Permanente Journal, 22*, 17–171. https://doi.org/10.7812/TPP/17-171.

Kickbusch, I. (2007). The move towards a new public health. *IUHPE – Promotion & Education. Supplement 2, 14*(33), 33–35.

Klein, D., Jeejeebhoy, K., Tremblay, A., Kallio, M., Rheaume, C., Humphries, S., Royall, D., Brauer, P., Heyland, D., Dhaliwal, R., & Mutch, D. M. (2017). The CHANGE program exercise intervention in primary care. *Canadian Family Physician, 63*(July), 546–552.

Kronenberg, C., Doran, T., Goddard, M., Kendrick, T., Gilbody, S., Dare, C. R., Aylott, L., & Jacobs, R. (2017). Identifying primary care quality indicators for people with serious mental illness: A systematic review. *British Journal of General Practice, 67*(661), e519–e530. https://doi.org/10.3399/bjgp17X691721.

Labonte, R., Sanders, D., Packer, C., & Schaay, N. (2014). Is the Alma Ata vision of comprehensive primary health care viable? Findings from an international project. *Global Health Action, 7*(1), 1–16. https://doi.org/10.3402/gha.v7.24997.

Lalonde, M. (1974). *A new perspective on the health of Canadians*. Ottawa: Minister of Supply and Services Canada. Retrieved from Public Health Agency of Canada website: http://www.phac-aspc.gc.ca/ph-sp/pdf/perspect-eng.pdf

Leach, B., Morgan, P., de Oliveira, S., Hull, S., Østbye, T., & Everett, C. (2017). Primary care multidisciplinary teams in practice: A qualitative study. *BMC Family Practice, 18*(115), 1–10. https://doi.org/10.1186/s12875-017-0701-6.

Litchfield, I. J., Bentham, L. M., Lilford, R. J., McManus, R. J., Hill, A., & Greenfield, S. (2017). Adaption, implementation and evaluation of collaborative service improvements in the testing and result communication process in primary care from patient and staff perspectives: A qualitative study. *BMC Health Services Research, 17*(615), 1–13. https://doi.org/10.1186/s12913-017-2566-8.

Martin-Misener, R., Valaitis, R., Wong, S., et al. (2012). A scoping literature review of collaboration between primary care and public health. *Primary Health Care Research and Development, 13*(4), 327–346.

Matthys, E., Remmen, R., & Van Bogaert, P. (2017). An overview of systematic reviews on the collaboration between physicians and nurses and the impact on patient outcomes: What can we learn in primary care? *BMC Family Practice, 18*(110), 1–22. https://doi.org/10.1186/s12875-017-0698-x.

McDonald, J., & Ollerenshaw, A. (2011). Priority setting in primary health care: A framework for local catchments. *Rural and Remote Health, 11*(2), 1714.

McMurray, A., & Clendon, J. (2015). *Community health and wellness: Primary health care in practice* (5th ed.). Chatswood: Churchill Livingstone/Elsevier.

Nathan, T. A., Cohen, A. D., & Vinker, S. (2017). A new marker of primary care utilization – Annual accumulated duration of time of visits. *Israel Journal of Health Policy Research, 6*(35), 1–10. https://doi.org/10.1186/s13584-017-0159-y.

Ng, A. W., Fong, B. Y. F., & Leung, T. C. H. (2018). Health and sustainability: Reinforcing public and private engagement through tertiary institutions. In U. M. Azeiteiro, M. Akerman, W. L. Filho, A. F. F. Setti, & L. L. Brandli (Eds.), *Lifelong learning and education in healthy and sustainable cities* (World sustainability series) (pp. 169–186). Cham: Springer.

Ng, T. K. C., Fong, B. Y. F., & Kwong, C. K. Y. (2019). Transition of hospital acute-centric to long term care in an ageing population in Hong Kong – Is it an issue of service gap? *Asia-Pacific Journal of Health Management, 14*(1), 11–15.

NHS England. (2017). *Next steps on the NHS five year forward view*. Available at https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THENHS-FIVE-YEAR-FORWARD-VIEW.pdf

Ontario Health Promotion E-Bulletin. (2018). *Reflections on the Bangkok charter for health promotion*. http://www.ohpe.ca/node/7662

Petersen, D. J., & Weist, E. M. (2014). Framing the future by mastering the new public health. *Journal of Public Health Management and Practice, 20*(4), 371–374. https://doi.org/10.1097/PHH.0000000000000106.

Phillips, R. L., & Starfield, B. (2003). Why does a U.S. primary care physician workforce crisis matter? *American Family Physician, 68*(8), 1494–1500.

Potvin, L., & Jones, C. M. (2011). Twenty-five years after the Ottawa Charter: The critical role of health promotion for public health. *Canadian Journal of Public Health, 102*(4), 244–248.

Public Health Association of Australia (PHAA). (2014). *Public Health Association of Australia: Policy-at-a-glance – Primary Health Care Policy*.

Ranstad, K., Midlov, P., & Halling, A. (2017). Socioeconomic status and geographical factors associated with active listing in primary care: A cross-sectional population study accounting for multimorbidity, age, sex and primary care. *BMJ Open, 7*, e014984. https://doi.org/10.1136/bmjopen-2016-014984.

Rifkin, S. (2018). Health for All and primary health care, 1978–2018: An overview. *Oxford Research Encyclopedia of Global Public Health*. https://doi.org/10.1093/acrefore/9780190632366.013.55.

Saskatchewan Health Authority. (2018). *History of primary health care.* http://www.rqhealth.ca/department/community-and-preventative-health/history-of-primary-health-care

Shoemaker, S. J., McNellis, R. J., & DeWalt, D. A. (2018). The capacity of primary care for improving evidence-based care: Early findings from AHRQ's EvidenceNOW. *Annals of Family Medicine, 16*(Suppl), S2–S4. https://doi.org/10.1370/afm.2227.

Starfield, B., Shi, L., & Macinko, J. (2005). Contribution of primary care to health systems and health. *Milbank Quarterly, 83*, 457–502.

Tulchinsky, T., & Varavikova, E. (2010). What is the "New Public Health"? *Public Health Reviews, 32*(1), 1–25. https://doi.org/10.1007/BF03391592.

Unite For Sight. (2018). *Primary Health Care – Shifts in conventional wisdom*. http://www.uniteforsight.org/global-health-history/module5

Vestjens, L., Cramm, J. M., & Nieboer, A. P. (2018). An integrated primary care approach for frail community-dwelling older persons: A step forward in improving the quality of care. *BMC Health Services Research, 18*(28), 1–13. https://doi.org/10.1186/s12913-017-2827-6.

WD Scott & Co. Pty. Ltd. (1985). *The delivery of medical services in hospitals: a report for the Hong Kong Government* (the Scott Report). Hong Kong: Government Printer.

Welzel, F. D., Stein, J., Hajek, A., König, H.-H., & Riedel-Heller, S. G. (2017). Frequent attenders in late life in primary care: A systematic review of European studies. *BMC Family Practice, 18*(104), 1–14. https://doi.org/10.1186/s12875-017-0700-7.

Wen, T., Zhang, Y., Wang, X., & Tang, G. (2018). Factors influencing turnover intention among primary care doctors: A cross-sectional study in Chongqing, China. *Human Resources for Health, 16*(10), 1–11. https://doi.org/10.1186/s12960-018-0274-z.

WHO. (1978). *Declaration of alma mater in 1978: Health For All in year 2000*. http://www.who.int/publications/almaata_declaration_en.pdf

WHO. (1985). *Target for Health for All. Targets in support of the European regional strategy for Health for All*. Copenhagen: WHO Regional Office for Europe Copenhagen; 1985. http://www.euro.who.int/__data/assets/pdf_file/0006/109779/WA_540_GA1_85TA.pdf

WHO. (2008a). *Primary health care: Now more than ever. World health report 2008*. http://www.who.int/whr/2008/en/

WHO. (2008b). *The Bulletin series: Primary health care 30 years on*. Bulletin of the World Health Organization. http://www.who.int/bulletin/primary_health_care_series/en/

WHO. (2018a). *Types of healthy settings*. http://www.who.int/healthy_settings/types/cities/en/

WHO. (2018b). *The Ottawa Charter for Health Promotion*. http://www.who.int/healthpromotion/conferences/previous/ottawa/en/

WHO. (2018c). *Shanghai Declaration on promoting health in the 2030 Agenda for Sustainable Development*. http://www.who.int/healthpromotion/conferences/9gchp/shanghai-declaration/en/

Wong, S. T., MacDonald, M., Martin-Misener, R., Meagher-Stewart, D., O'Mara, L., & Valaitis, R. K. (2017). What systemic factors contribute to collaboration between primary care and public health sectors? An interpretive descriptive study. *BMC Health Services Research, 17*(796), 1–10. https://doi.org/10.1186/s12913-017-2730-1.

Zhong, C. W., Kuang, L., Li, L., Liang, Y., Mei, J., & Li, L. (2018). Equity in patient experiences of primary care in community health centers using primary care assessment tool: A comparison of rural-to-urban migrants and urban locals in Guangdong, China. *International Journal for Equity in Health, 17*(51), 1–11. https://doi.org/10.1186/s12939-018-0758-4.

Chapter 2
Philosophy of Primary Health Care

Albert Lee

Philosophy of Primary Health Care Needs Urgent Revisitation

On 25 October 2018, countries around the world agreed to the Declaration of Astana to strengthen their primary health-care systems as an essential step towards achieving universal health coverage (WHO and UNICEF 2018). Although one would be joyful to the "Declaration of Astana" as strong symbol of global affirmation to commitment of primary care development after the 1978 "Declaration of Alma-Ata", we need to think more rationally that we should be celebrating and sharing the success of advancement of primary health care rather than another slogan. Let us not forget the Ottawa Charter for Health in 1986 that also called for reorientation of health services towards primary health care (WHO 1986).

In 2011, United Nations adopted "The Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases (NCD)" with key agenda of calling for action to reduce risk factors and create health-promoting environments through: "…the implementation of multi-sectoral, cost-effective, population-wide interventions in order to reduce the impact of the common non-communicable disease risk factors, namely tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol, through the implementation of relevant international agreements and strategies, and education, legislative, regulatory and fiscal measures" (UN 2011). However, the child and adolescent mortality is still high in high-income countries with poor diet, physical inactivities, smoking, alcohol and misuse of drugs still accounting for substantial

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morbidity and mortality, and child health (death) is highly interrelated with socio-economic, behavioural and biological characteristics (Sidebotham et al. 2014). Socio-economic inequalities in adolescent health were still observed from 2002 to 2010 among 34 European and North American countries (Elgar et al. 2015). Health disparity still exists in an economically well-developed society in Asia (Lee et al. 2015).

We have not moved forward with the intended outcomes of primary health-care development. For people who would live long enough for another four decades, they might not want to see another declaration. For people like myself who is unlikely to be on earth by 2058, it might be of fantasy to have "Declaration of Mars, Venice, Mercury…" from the outer space. Why still only a handful of countries in the world have laid down good infrastructure of primary health care, e.g. Australia, Canada, the United Kingdom and some European countries? Hong Kong with a very advanced in health-care development, again the system for health is still very much hospital dominated after decades of reform. The importance of primary health care is still not reaching the minds of key stakeholders including users and providers of health care. We are not even seeing primary health-care development catching up hospital services, needless to say reorientation to primary care-led services. Perhaps the philosophy of primary health care is not well presented by those big international papers. It is time to revisit the philosophy of primary health care from wider angles.

What Actually Contribute to Health Improvement?

Thomas McKeown raised the limited role of medicine in most historical improvements of health in the developed nations in the mid-twentieth century, arguing instead the importance of economic growth, rising living standards and improved nutrition as the primary sources of improvement (McKeown and Record 1962). This would explain the dramatic health improvement in well-developed societies in Asia such as Japan, Korea, Hong Kong, Taiwan and Singapore with improved life expectancy and rapid decline of infant mortality rate. However, with fast-growing economy in countries like China, India and Brazil, there is a new wave of epidemics of non-communicable diseases (NCDs) (Whelton et al. 2004). Szreter (2002) has suggested the importance of social organised intervention played by modern public health. Szreter (2002) has raised the importance of redistributive social philosophy and practical politics shaping the public health movement from nineteenth-century origin. Notwithstanding many global voices emphasising the importance of primary health care with many declarations from UN organisations and international conferences, the worldwide development of primary care is not proportionate to the voices generated. We need fundamental changes of philosophy in operating health-care system requiring political drive. Perhaps we should also take this approach to construct a new pathway for primary care development.

Failing to Meet the Challenges of Health-Care Provision

People are now living in a more risky society with easy exposure to health risk factors beyond their control such as air pollution; urbanisation depriving space for physical activity; processed food with high salt, calorie and fat density; and fragmentation of neighbourhood depriving emotional resources (Di Blasi et al. 2001). The context of health care has changed and the key determinants of health are beyond the health sector (Marmot et al. 2008). There is failure to recognise the important contribution of non-health sectors to population health and adopt the whole system approach integrating heath care, public health and social welfare shifting from hospital base to community mode of care. Another phenomenon is relying too heavily on few big players as only international organisations to solve the health issues but ignoring the local culture and social context. There is also a lack of involvement of community organisations in concrete action to address the underlying determinants and implement prevention and health promotion. This has led to double standards of care with rich resources in tertiary hospitals and poor resources in primary health care. This might explain why primary health care and community-based initiatives are not well developed in the less well-developed urban areas and hospital care would flourish (Lee et al. 2007).

Frieden (2015) describes the "health impact pyramid" with public health focusing on denominators asking what proportion of all people actually benefit and who can benefit from an intervention. Improvements at the base of the pyramid generally improve health for more people, at lower unit cost, than those at the top (Fig. 2.1).

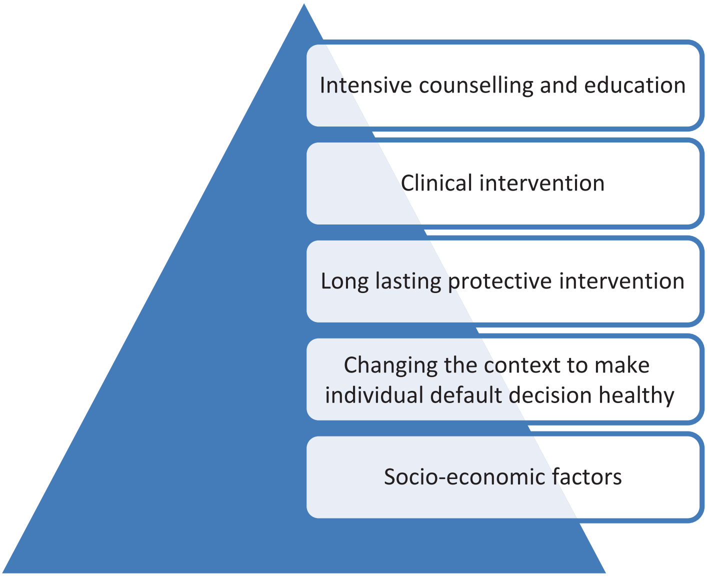

Fig. 2.1 Health impact pyramid. (Source: Frieden 2015)

Hospital-based health-care system cannot provide intervention at the base of the pyramid. The mode of health-care provision needs to be close with the context of daily living of people with long-term and continuing care to allow coordination of care to address socio-economic factors, enabling healthy decision-making and long-lasting protection. This should become the fundamental philosophy of effective primary health care.

Ecology of Health Care

Analysis of health care by Green et al. (2001) has revealed that hospital care is only tip of the iceberg covering much less than 10% of population including hospital outpatient clinics (Fig. 2.2). It is far behind the needs of the 80% of the population reporting symptoms. It is impossible to expand the hospital care to cover the health needs of the population in terms of manpower and financial resources. The most feasible solution is to tackle the bottom of health impact pyramid by effective public health and primary care interventions (Fig. 2.1). This can enable those people reporting symptoms to be resolved at early stage, and those cases requiring medical care would be managed in primary setting. Lesser proportion will require hospital care with well-developed primary care system, and hospital care is mainly for those with unstable conditions. Future ecology of health care should enable people with symptoms to be resolved by self-management and the default decision-making

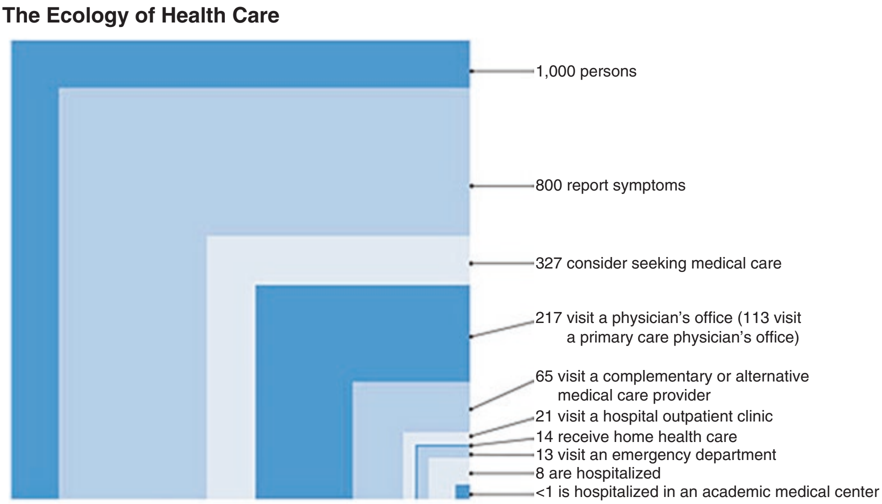

Fig. 2.2 Ecology of health care
Note: The group in each box is not necessarily a subset of the preceding box. Some persons may be counted in more than one box. (With kind permission from L. A. Green, Green et al. 2001)

being healthy. Those with symptoms would be managed in primary health-care setting. This would result in lesser proportion reporting symptoms and requiring hospital care.

Primary health care should *not* simply mean care in community. It implies continuation of quality care after discharging from the hospital. It should also identify persons at high risk for medical intervention for early intervention and also identification of appropriate service providers to meet the health needs of patients. It should enable patients to receive appropriate care at the right time and right place. The population should have access to personalised patient-centred care meeting their needs.

The advancement of medicine especially in the field of study of genome can now allow us to integrate and analyse genomic and other data. We can find common factors and causes of variation, resulting in the discovery of new pathways of disease, changing how diseases are thought of and treated (NHS-England 2016). Technology has allowed capturing of big data so that we can have more data about people, their habits and their health than we have ever had before with 90% of all recorded human data captured in the last 2 years (Science Museum 2016). Bringing together genomic, clinical and diagnostic data and lifestyle data, the integration and analysis of this information can advance the development of personalised medicine to improve how we treat disease. Would this become a more powerful way to provide patient-centred care than primary health care? The cost of single human genomic sequencing was around GBP 2 billion (Genomic England 2015). The new sequencing technology together with advancement of high-speed computing for analysis would bring a dramatic drop in the cost. However, would we consider this technology as part of routine health care particularly for low- and middle-income countries occupying large proportion of the world population? The technology would bring a breakthrough in managing certain groups of diseases for certain population groups such as cancer and rare diseases. For equitable use of health-care resources, it might not offer the best solution to routine health care.

An expert consultation meeting of adolescent health was organised by Johns Hopkins University School of Public Health in 2011. It highlighted the link between policies and programmes and the current understanding of science with new insights into strengthening current understanding of identifiable pathways, mapping how one factor or behaviour affects the others and environmental factors interacting with both genome and epigenome to control gene expression, affecting morbidity and mortality in adolescence and beyond (Blum and Dick 2013). A review of the current biological models for addiction has also highlighted the interactive influences of genetic and environmental contributions to addictive behaviours of adolescents and supportive evidence of preventive strategies targeting risk factors and enhancing protective factors at individual, familial and community levels (Potenza 2013). Wang et al. (2013) highlighted new opportunities for development of early prediction and prevention paradigms with greater understanding of the epigenetic mechanism in responding to both internal and external environmental stimuli. Application of the neurobiology of addiction to food addiction and obesity indicates the need for multilevel interventions going beyond simple behavioural approaches for tackling obesity in adolescence (Lee and Gibbs 2013). There was a discussion on how WHO prioritised its interventions, addressing the common social determinants of health risk behaviours for adolescents and the importance of balancing and influencing individual behaviours with targeting policy and regulatory environment (Bustreo and Chestnov 2013). Personalised medicine might not be the panacea for future health-care delivery. Primary health care needs to play its role to empower the citizens not only adopting healthy lifestyles but also helping them to respond to living environment to enhance health protection and minimise exposure to risk factors. Effective primary health care would also enhance community action to tackle the social determinants of health by addressing issues at the bottom of "health impact pyramid" (Fig. 2.1).

Management of Chronic Illnesses by Primary Health Care Versus Various Hospital Specialities

Many patients with chronic illnesses have multiple health problems. Many of them are under care of different specialties in secondary care. There is always a question from both patients and also different clinical specialties on how primary health care would handle patients with chronic illnesses better than inputs from multi-specialities. Multi-morbidity is complex requiring more than an *assess-and-advise* model of care. Comprehensive and holistic care with good coordination of care is essential to help patients navigate the complexity, which is at the heart of primary health care. Patients will need to have professional inputs from different disciplines at different stages of the clinical pathway according to their needs and clinical circumstances. Patient-centred care is needed to support patients in adopting behaviours across a wide range of lifestyle factors for management of their underlying conditions, but there is little guidance as to how to achieve these recommendations. Therefore, it is *not* the question of which specialists the patients need; it should be whether the patients can have a specialist team to assess their needs continuously and coordinate the best possible care for them. Effective primary health care addresses the diversity of health issues as described in Fig. 2.3 which can enable primary health care to assume the role in balancing contributions from several narrow specialties and provide advice on different management plans and help patients to make decisions meeting their needs.

Majority of primary care physicians in many parts of the world, including Hong Kong with a very advanced hospital system, are mainly operating as solo practitioners. Therefore, it lacks an infrastructure of quality primary health care to enable primary care physicians to provide comprehensive, whole person and continuing care for their patients.

There is still a gap between the quality of care provided for management of chronic illnesses and optimal care although the principles of chronic disease management are well known (Wagner et al. 1996). Chronic care model for patients

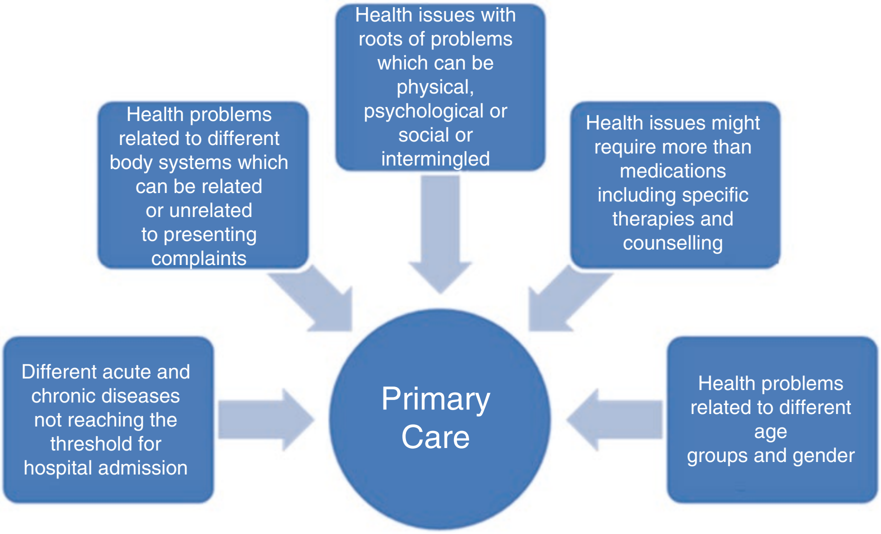

Fig. 2.3 Diversity of primary health care. (Source: Albert Lee)

with chronic conditions includes supporting patient self-management and patient care team (Norris et al. 2001). Although advice or education is frequently given in clinical practice for chronic illness such as diabetes mellitus; more extensive patient education programmes designed to develop self-management skills have been demonstrated to improve diabetes control as reflected by HbA1c and better blood pressure control (Lee et al. 2011; Norris et al. 2002). Diabetes self-management education and support should be patient-centred, respectful and responsive to individual patient preferences, needs and values and should help guide clinical decisions, and psychosocial care should be integrated with a collaborative, patient-centred approach and provided to all people with diabetes, with the goals of optimising health outcomes and health-related quality of life (American Diabetes Association 2017). Energy and effort should therefore be invested in patient self-management to support patients to live with best possible control of their chronic condition. An editorial by Lehman and Krumholz (2009) has argued that tighter glycaemic control in all patients with type 2 diabetes, regardless of the duration of diabetes and the drugs being used, would lead to wastage of resources and possible harms to patients.

Diabetes mellitus is a good example to illustrate the skills required for management of chronic disease of ageing as it affects more than 20% of people over 65 and co-morbidities are highly prevalent with nearly 60% having at least one co-morbid condition (Huang 2016). This may alter the relative importance, effectiveness and safety of treatments for diabetes. Huang (2016) has discussed that decision analysis, health economics and observational studies have helped to illustrate the importance of acknowledging life expectancy, hypoglycaemia and treatment burden when setting goals in diabetes. There should be guidelines recommending physicians to individualise the intensity of glucose control and treatments on the basis of the prognosis (based on co-morbidities and functional impairments) and preferences of individual patients. More research is needed to determine the risks and benefits of intensifying, maintaining or de-intensifying treatments in this population. This research effort should extend to the development and study of decision support tools as well as targeted care management. Primary health-care physicians can play an important role to target care management for patients with chronic illnesses such as diabetic care. It is important to reinforce self-management to avoid patients with chronic illnesses socialised into the medical model fostering dependence on professionals and also advocate for patients to appeal to health-care providers and health insurance to include patient self-management as part of formal health care.

Patient's inability to adhere to the treatment regime is grounded in psychological and motivational rather than education factors (Mint et al. 2010). Raising self-efficacy and self-construction of healthy behavioural model is feasible and acceptable in primary health-care setting and also in culture with dominance of doctor-centred care. Wilkinson et al. (2013) on personalised decision support in type 2 diabetes mellitus have captured the importance of self-management, patient-centred care and psychosocial needs for chronic care in primary health care (Fig. 2.4).

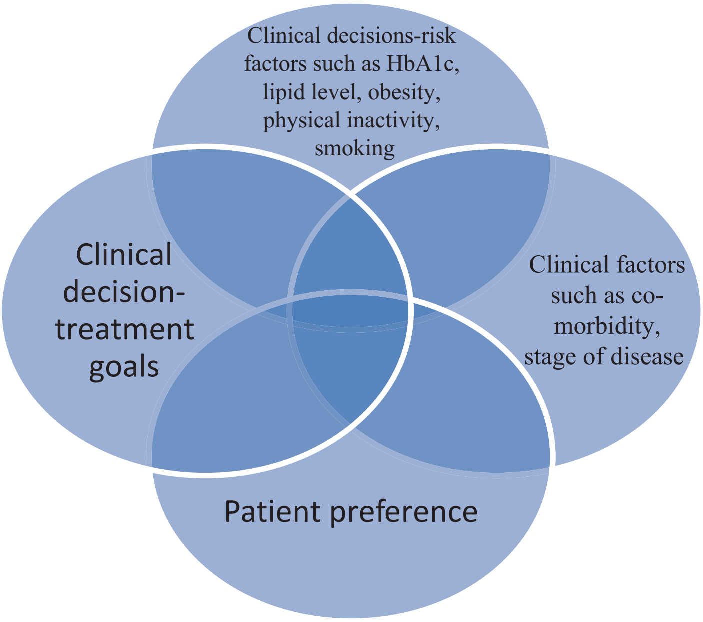

Fig. 2.4 Personalised decision support for type 2 diabetes mellitus. (Source: Wilkinson et al. 2013)

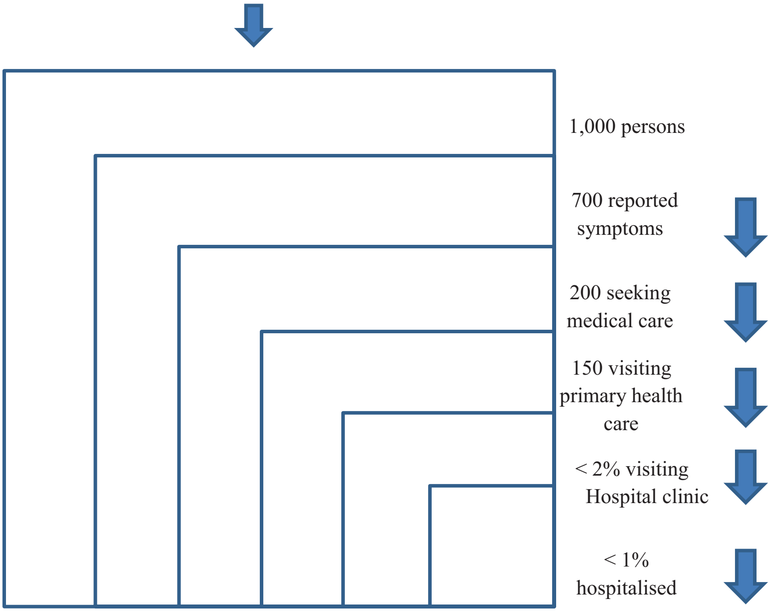

Fig. 2.5 Hypothesised changing ecology of health care with decreasing proportion of population reporting symptoms and seeking medical care with better primary health care

Clinical decision on treatment selection is only one part. It needs to take into account the underlying risk factors (clinical and lifestyle) of that particular case as well as the clinical factors such as co-morbidity and also patient preferences. One cannot underestimate the issue of compliance to health advice and medication for patients with chronic illnesses (Mint et al. 2010). This type of personalised decision support for disease management is more applicable in primary health-care setting than in acute hospital setting as cases attending hospital setting are more serious in unstable conditions. Acute management will be mainly based on clinical decisions. However, if cases can be well managed in primary health care, not only lesser proportion of cases will need to seek help from hospital setting, but also lesser proportion of population will report symptoms making workload in primary care more manageable and improving the ecology of health care to higher proportion of population in symptom-free status (Fig. 2.5).

Some Other Important Key Features of Primary Health Care

The unique features or specialisation of primary health care is the breadth of health problems that it would cover rather than the depth of health problems. We need to expose the health problems and health concerns at the bottom of the clinical iceberg

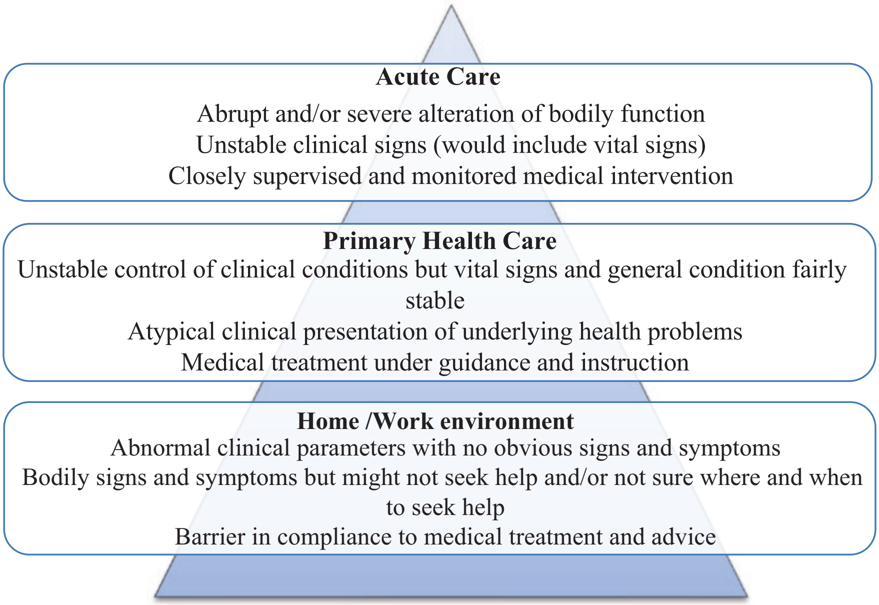

Fig. 2.6 Spectrum of illness in different settings

by understanding the health behaviours that have serious impact on health. Relatively few risk factors such as high cholesterol, high blood pressure, obesity, smoking and alcohol cause the majority of the chronic disease burden, and a change in dietary habits, physical activity and tobacco control have a major impact in reducing the rates of these chronic diseases. There is overwhelming evidence that prevention is possible when sustained actions are directed at both individuals and families, as well as the broader social, economic and cultural determinants of NCDs (Mant 2004; Marmot et al. 2008). Figure 2.6 illustrates the spectrum of illness in different settings. Provision of appropriate health advice and support in home and living environment at the bottom layer will have significant impact to improve health of population. Hospital care at the top of the pyramid is too remote in solving the health issues encountered by the majority of the population. It is providing minority health care with majority resources. Primary health care is a closer system to manage their health issues in their home and living environment to allow efficient use of health-care resources.

There are few important key points for primary health-care service providers in supporting their cases in the management of health conditions especially chronic conditions (Greene and Yerdida 2005):

- Offer them understandable explanations.
- Respect what patients say.

- Involve them in making a plan for care.
- Give them choices.
- Help them to solve problems occurring in caring their illness.
- Encourage them to learn about illness.
- Help them to make changes in lifestyles.
- Spend sufficient time during consultation.
- Be available during an urgent episode.
- Help them to feel able to take care of themselves.

Case Scenario Demonstration of the Key Features of Primary Care (Lee 2019)

Case 1

Mr. Lau, aged 62 years, is suffering from obsessive-compulsive disorder (OCD) and hypertension. He used to work as a legal clerk and detected his problem with obsession behaviour by repetitive checking of the documents, so he lost his job.

He was prescribed selective serotonin reuptake inhibitor (SSRI) by the psychiatrist. He is now under the care of the specialist clinic for Mrs Lau as he is more stable. As he is not working now, his OCD is not affecting his daily life.

He also suffers from hypertension and is on Adalat Retard 20 mg twice daily. He has hyperlipidaemia, and recent lipid profile is total cholesterol 5.5 mmol/L, HDL 1.1 mmol/L and LDL 4.0 mmol/L.

His blood pressure has been around 150/95 mmHg recently on several occasions and not so well controlled. He told the family doctor that he has been quite stress recently because of instability of his wife's conditions.

How would Mr. Lau be managed in primary care?

- Explore lifestyle such as diet, exercise, smoking, alcohol and weight control.
- Consider readjustment of antihypertensive therapy.
- Consider lipid-lowering drug if not resolved by lifestyle modification.
- In-depth analysis of his wife's conditions by detailed family history.

Mr. Lau mentioned that his wife used to be more stable when they lived in town as the house was close to the fitness club. Their children have subscribed membership for them so they would go regularly. Since moving to Sha Tin, it is too expensive to travel every day and also too tiring. Mrs. Lau mainly stays indoor with little physical activities.

He has noted that her mood becomes more depressed and worse with wide fluctuation of blood glucose from hyper- to hypoglycaemia easily. During one of the hypoglycaemic attacks, Mrs. Lau hit Mr. Lau by mistake without realising what she had done. Doctors at specialist family medicine clinic only glance through her self-monitoring. Mr. Lau is afraid of leaving his wife alone at home, so he becomes semi-housebound as well.

What is the impact of Mrs. Lau's chronic illness on Mr. Lau's chronic illness?

- Lack of physical activities
- Stress and anxiety
- Social isolation
- Not helping his physical conditions, hypertension
- Not helping his mental condition, OCD

Better control of Mrs. Lau's diabetes would help Mr. Lau's chronic conditions.

What can be done to improve the control of diabetes for Mrs. Lau?

- Physical inactivity.
- High-fat diet and diet rich in saturated fats increase the risks.
- Unrealistic to believe that any single drug could be first line for prevention.
- Increases in physical activity and moderate weight loss reduced the incidence of type 2 diabetes for cases with impaired glucose tolerance (IGT).

The feasibility of lifestyle interventions being used to treat prediabetes and enhance glycaemic control has been assessed by a systematic review (Kerrison et al. 2017). The outcome measures were to assess cumulative incidence of diabetes development, glycaemic control, physical exercise capacity and changes in weight/BMI. Overall, cumulative incidence of diabetes is drastically reduced in the intervention groups compared to control groups (standard care). Furthermore, glycaemic control was improved in the short term, with many participants reverting to normoglycaemia. In the long term, glycaemic control diminished, but glycaemic control was still superiorly better managed than baseline results and control groups. As a result of the findings from this review, lifestyle intervention should be provided as a treatment option for adult prediabetes patients to improve glycaemic control and reduce the prospect of their condition developing into type 2 diabetes mellitus.

The above case has illustrated the complexity of chronic illness lying with management of lifestyles, stabilisation of different health issues and illness of close family members. Therefore, the case requires a well-ordinated primary health-care team compromising different supporting services to manage different health risks and coping with family health. The following case scenario also reveals that care by different hospital specialities might not always help, and the breadth of primary health care would be more beneficial than depth of specialty care.

Case 2

Mr. Chan, a 55-year-old security guard, is complaining of breathlessness and increasing tiredness over last few months. He was admitted to the hospital and was found to have the following conditions:

- Coronary heart disease with heart failure
- Iron-deficiency anaemia due to imbalance diet
- Hypertension BP160/95
- Chronic obstructive pulmonary disease (COPD)
- Obstructive sleep apnoea
- Obesity BMI 30
- Hyperlipidaemia

Fasting lipids

Total cholesterol	6.4
HDL	1.2
LDL	5.1
Triglycerides	2.5
Fasting blood glucose	4.3

Mr. Chan is under multiple medications for hypertension, heart condition and hyperlipidaemia.

He was referred for further work up as to whether he might need invasive intervention. He is scheduled with appointment of the respiratory clinic to be considered for polysomnography in the sleep clinic. The waiting time is likely to be months.

He is advised smoking cessation, weight reduction by diet and exercise and low-fat diet.

Weight loss would help to improve sleep apnoea.

He had been referred to the dietitian for advice. However, he was very confused with a diet which would improve his iron status but also needs to be on diet for weight reduction. The dietitian was very busy and gave him some information sheets to read with no follow-up.

He would not do much exercise due to the knee pain. He was then referred to the orthopaedic clinic. He was diagnosed with osteoarthritis (OA) knee with degenerative change of the knee. He was prescribed NSAID, an inflammatory drug, but was warned of potential adverse outcomes with his underlying heart conditions. He was also referred to the physiotherapy clinic where he was taught quadriceps exercise to do at home.

Mr. Chan did not want to take NSAID. He wanted to lose weight but could not do so with the knee pain.

What Mr. Chan really wants?

- He has expressed his concerns with diet to balance the need for adequate nutrition for iron deficiency. He was then prescribed iron tablets. He worried with passing black stool and constipation.
- He felt quite frustrated and depressed with attending different clinics because he could not get advice on management that he would cope with.
- He is not keen on further cardiac intervention and worried that he might end up with knee replacement and heart surgery.
- His sleep apnoea is affecting his work, and he has received complaints that he fell asleep while on duty.
- He returned to his own family doctor. He wanted his family doctor to manage him as his medical benefits would cover some of his medical costs, investigations and physiotherapy.
- However, if he needs surgical interventions, this will far exceed his budget.

If Mr. Chan can be managed well in primary care by his family doctor with well-coordinated supporting services from different disciplines, this will not only minimise hospital and emergency admissions but also reduce the health-care expenditure.

Conclusion

NCD accounts for over half of the world's death and burden of disease and around half in Asia Pacific region and increasingly shifting towards younger age group. Behavioural, environmental, occupational and metabolic risks can explain half of the global mortality and more than one-third of the global DALYs providing many opportunities for prevention (GBD 2013 Risk Factors Collaborators 2015). Behavioural and social science research on interventions for these risks should be strengthened. Many prevention and primary care policy options are available to act on these risk factors. Experience from high-income countries has shown that many households with family members having chronic conditions still carry severe economic burden notwithstanding a well-developed health-care system with universal health coverage (UHC). UHC is not a panacea if the resources for boarder public health and preventive services are channelled towards covering clinical services at individual level (Schidt et al. 2015). Fee-for-service payments reward quantity over quality, drive up health costs and do nothing to promote the use of services such as prevention and patient education, which are high value and low cost (Calsyn and Lee 2012). One should invest in preventive medicine and develop a multidisciplinary integrated primary care model to enhance management of NCDs at different levels of prevention. If one considers health and equity, every citizen should be accessible to health care. Then the question is what type of health care and where they should seek help. Should quality primary health care be the answer? The challenge is enhancement of primary health care to the community by developing a distinct district health service model (Lee 2014), as illustrated in Chap. 23.

References

American Diabetes Association. (2017). Lifestyle management. *Diabetes Care, 40*(Supplement 1), S33–S43. https://doi.org/10.2337/dc17-S007. Access 25 June 2019.

Blum, R., & Dick, B. (2013). Strengthening global programs and policies for youth based on the emerging science. *Journal of Adolescent Health, 52*, S1–S3.

Bustreo, F., & Chestnov, O. (2013). Emerging issues in adolescent health and the positions and priorities of the World Health Organization. *Journal of Adolescent Health, 52*, S4.

Calsyn, M., & Lee, E. O. (2012). *Alternatives to fee-for-service payments in healthcare*. https://www.americanprogress.org/wp-content/uploads/2012/09/FeeforService-1.pdf. Access 26 June 2019.

Di Blasi, Z., Harkness, E., Ernst, E., et al. (2001). Influence of context effects on health outcomes: A systematic review. *The Lancet, 357*, 757–762.

Elgar, F. J., Pförtner, T. K., Moor, I., et al. (2015). Socioeconomic inequalities in adolescent health 2002-2010: A time-series analysis of 34 countries participating in the health behaviour in school-aged children study. *The Lancet, 385*(9982), 2088–2095. https://doi.org/10.1016/S0140-6736(14)61460-4.

Frieden, T. R. (2015). Future of public health. *New England Journal of Medicine, 373*, 1748–1754.

GBD 2013 Risk Factors Collaborators. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet, 386*(10010), 2287–2323. https://doi.org/10.1016/S0140-6736(15)00128-2.

Genomic England. (2015). *From one to one hundred thousand*. 25 June 2015, England. https://www.genomicsengland.co.uk/from-one-to-one-hundred-thousand. Access 23 June 2019.

Green, L. A., Fryer, G. E., Jr., Yawn, B. P., Lanier, D., & Dovey, S. (2001). The ecology of medical care revisited. *New England Journal of Medicine, 344*(26), 2021–2025.

Greene, J., & Yerdida, M. J. (2005). Provider behaviours contributing to patient self-management of chronic illness. *Journal of Health Care for the Poor and Underserved, 16*(4), 808–824.

Huang, E. S. (2016). Management of diabetes mellitus in older people with co-morbidities. *BMJ, 353*, i22.

Kerrison, G., Gillis, R. B., Jiwani, S. I., et al. (2017). The effectiveness of lifestyle adaptation for the prevention of prediabetes in adults: A systematic review. *Journal of Diabetes Research, 7*, 8493145.

Lee, A. (2014). Family medicine and community health care. In K. W. Tong & K. N. K. Fong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions* (pp. 37–51). Hong Kong: City University Press.

Lee, A. (2019). *Preventive medicine and health promotion in family practice enhancing community based care. Lecture for medical year 5*. Hong Kong: The Chinese University of Hong Kong.

Lee, A., & Gibbs, S. (2013). Neurobiology of food addiction and adolescent obesity prevention in low and middle income countries. *Journal of Adolescent Health, 52*(2 suppl), S39–S42.

Lee, A., Kiyu, A., Milman, H. M., et al. (2007). Health and building human capital through an effective primary care system. *Journal of Urban Health, 84*(3 suppl), i75–i83.

Lee, A., Siu, C. F., Leung, K. T., Chan, C., Lau, L., & Wong, K. K. (2011). General practice and social service partnership for better clinical outcomes, patient self efficacy and lifestyle behaviours of diabetic care: Randomised control trial of a chronic care model. *Postgraduate Medical Journal, 87*(1032), 688–693.

Lee, A., Chua, H. W., Chan, M., Leung, P., Wong, J. W. S., & Chuh, A. T. T. (2015). Health disparity still exists in an economically well-developed society in Asia. *PLoS One, 10*(6), e0130424.

Lehman, R., & Krumholz, H. M. (2009). Tight control of blood glucose in long standing type 2 diabetes. *BMJ, 338*, b800.

Mant, D. (2004). Principle of prevention. In R. Jones, N. Britten, L. Culpeper, et al. (Eds.), *Oxford textbook of primary medical care*. Oxford: Oxford University Press.

Marmot, M., Friel, S., Bell, R., et al. (2008). Closing the gap in a generation: Health equity through action on the social determinants of health. *The Lancet, 372*(9650), 1661–1669.

McKeown, T., & Record, R. G. (1962). Reasons for the decline of mortality in England and Wales during the nineteenth century. *Population Studies, 16*(2), 94–122.

Mint, L., Møller, S., Vach, W., Wagner, L., & Henriksen, J. E. (2010). Mediating the effect of self-care management intervention in type 2 diabetes: A meta-analysis of 47 randomised controlled trials. *Patient Education and Counselling, 80*(1), 29–41.

NHS England. (2016). *Improving outcomes through personalised medicine*. 7 September 2016, England. https://www.england.nhs.uk/wp-content/uploads/2016/09/improving-outcomes-personalised-medicine.pdf. Access 23 June 2019

Norris, S. L., Engelgau, M. M., & Narayan, K. M. (2001). Effectiveness of self-management training in type 2 diabetes: A systematic review of randomised controlled trials. *Diabetes Care, 24*(3), 561–587.

Norris, S. L., Nichols, P. J., Caspersen, C. J., et al. (2002). Increasing diabetes self-management education in community settings: A systematic review. *American Journal of Preventive Medicine, 22*(Suppl 4), 39–66.

Potenza, M. N. (2013). Biological contributions to addictions in adolescents and adults: Prevention, treatment, and policy implication. *Journal of Adolescent Health, 52*(2, Supplement 2), S22–S32.

Schidt, H., Gostin, L. O., & Emanuel, E. J. (2015). Public health, universal health coverage and sustainable development goals: Can they co-exist? *The Lancet, 386*(9996), 928–930.

Science Museum. (2016). *Science museum to explore invisible revolution of big data.* 28 April 2016, England. http://www.sciencemuseum.org.uk/about-us/press/april-2016/our-lives-in-data. Access 23 June 2019.

Sidebotham, P., Fraser, J., Covington, T., et al. (2014). Understanding why children die in high-income countries. *The Lancet, 384*(9946), 915–927.

Szreter, S. (2002). Rethinking McKeown: The relationship between public health and social change. *American Journal of Public Health, 92*(5), 722–725.

Wagner, E. H., Austin, B., & Von Korff, M. (1996). Organising care for patients with chronic illness. *Midbank Quarterly, 74*(4), 511–544.

Wang, G., Walker, S. O., Hong, X., Bartell, T. R., & Wang, X. (2013). Epigenetics and Early Origins of Chronic Non-communicable Diseases. *J Adol Health, 52*, S14–21.

Whelton, P. K., He, J., & Muntner, P. (2004). Prevalence, awareness, treatment and control of hypertension in North America, North Africa and Asia. *Journal of Human Hypertension, 18*(8), 545–551.

WHO. (1986). *Ottawa Charter for Health Promotion*. In First International Conference on *Health Promotion*, *Ottawa*, Canada, November 1986. https://www.who.int/healthpromotion/conferences/previous/ottawa/en/index4.html. Access 26 June 2019.

WHO and UNICEF. (2018). *Declaration of Astana*. In Global Conference on Primary Care. 25–26 October 2018, Astana, Kazakhstan. https://www.who.int/docs/default-source/primary-health/declaration/gcphc-declaration.pdf. Access 19 June 2019.

Wilkinson, M. J., Nathan, A. G., & Huang, E. S. (2013). Personalized decision support in type 2 diabetes mellitus: Current evidence and future directions. *Current Diabetes Reports, 13*(2), 205–212.

Chapter 3
Fiscal Sustainability Challenge and the Importance of Primary Healthcare

Sabrina Ching Yuen Luk

Introduction

Health systems in many countries face the fiscal sustainability challenge due to the rapid growth of health spending. Advances in medical technologies, rising incomes and population ageing are key drivers of health spending growth. These have compelled governments to find ways to extract greater value for money from health spending. Over the past few decades, overemphasis on developing tertiary care has led to poor value for money, inefficiency and health inequity. Primary healthcare (PHC) has remained underdeveloped and underfunded in many countries since the launch of the 1978 Declaration of Alma-Ata. In 2018, leaders around the world endorsed the Astana Declaration and renewed their political commitment to develop PHC. How to create a better balance between tertiary and primary care and achieve universal health coverage (UHC) with a stronger emphasis on PHC have become important tasks for governments worldwide.

Health Financing Models

"Health financing provides the resources and economic incentives for the operation of health systems" (Schieber et al. 2006, p. 225). The three key functions of health financing are revenue collection, pooling of funds and purchasing/provision of services (World Health Organization 2010, p. 72). In theory, there are five types of health financing models around the world: the Beveridge model, the Bismarck model, the mandatory savings model, the private health insurance model and the

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out-of-pocket model. In reality, most countries adopt a pluralistic approach to finance healthcare.

The Beveridge Model

Named after a highly regarded economist Sir William Beveridge, the Beveridge model refers to the National Health Service in the United Kingdom (UK). It provides universal healthcare and is financed by general taxation (Blank and Burau 2007, p. 12). Medical services are provided by publicly owned hospitals and most of them are free at the point of use. They include preventive services (e.g. screening, immunisation), emergency treatment, medical consultations, urgent and elective operations (Majeed 2018). "Primary care is delivered mainly through general practitioners (GPs), who act as "gatekeepers for secondary care" (Thorlby and Arora 2017, p. 50). The strengths of the Beveridge model are "scale economies in administration, risk management, and purchasing power" (Savedoff 2004, p. 2). But major weaknesses of this model are the risks of underfunding or unstable funding because of competing public expenditure (International Labour Organization 2019) and inefficiency emerged from lack of incentives and effective public supervision (International Labour Organization 2019). Countries or cities using this model or variations on it include the UK, Spain, Italy, the Nordic countries, New Zealand, Cuba and Hong Kong (Reid 2009a, b).

The Bismarck Model

Named after the Prussian Chancellor Otto von Bismarck, the Bismarck model refers to the social health insurance model that is built on the principle of solidarity. It requires joint contribution from employers and employees to non-profit sickness funds through compulsory payroll deduction (Chung 2017; Reid 2009a). In effect, the fund's revenue is redistributed from high-income people to low-income people, young people to old people and healthy people to sick people. All the insured are entitled to the same comprehensive benefits package (Saltman 2004, p. 7), regardless of their socioeconomic status or geographical location (Busse et al. 2017, p. 882). This model provides comprehensive coverage, including preventive services (e.g. basic immunisations, dental check-ups, check-ups for chronic illnesses, cancer screening), outpatient and inpatient services, prescription drugs, mental healthcare and physiotherapy (Blümel and Busse 2017, p. 70). Service providers are mostly private. Primary care is mainly provided by office-based, private for-profit GPs (Blümel and Busse 2017). But the government "plays a heavy role in cost control, and prices for services and pharmaceuticals are negotiated" (Goldberg 2016, p. 478). Countries or regions using this model include Germany, the Republic of Korea and Taiwan.

The Mandatory Savings Model

The mandatory savings model refers to mandatory contribution by employers and employees to medical savings accounts (MSAs). It is designed under the principles of self-reliance and self-accountability (Hsiao 1995, p. 261). Under this model, an individual saves and pays for his/her medical needs (Hsu 2010, p. 3). In 1984, Singapore was the first country implementing a compulsory medical savings scheme called Medisave. Both employers and employees are required to contribute a proportion of their monthly salary to the Central Provident Fund (CPF), which is a comprehensive social security system. Part of the contributions then goes into the employee's Medisave account to meet his/her "future personal or approved dependant's hospitalisation, day surgery and certain outpatient expenses" (Central Provident Fund Board 2019). Contributions are tax-free, can earn interest and be bequeathed (Wouters et al. 2016, p. 324). Medisave can be used for approved outpatient treatments (e.g. vaccinations, approved chronic diseases, health screening, MRI scans and CT scans for cancer patients), inpatient and day surgery at acute hospitals and long-term care (Ministry of Health 2018a). "Under Medisave, patients have free choice of providers but pay directly for the services they demand at the point of delivery" (Hsiao 1995, p. 262). Eighty percent of PHC is provided by clinics run by private GPs and the rest is provided by government polyclinics (Ministry of Health 2018b). Polyclinics provide immunisations, health screening, health education, diagnosis, treatment, pharmacy services and medical follow-ups after discharge from hospitals (Ministry of Health 2018b). In 1998, China implemented Urban Employee Basic Medical Insurance (UEBMI), which requires mandatory contributions from employers and employees. Part of the contributions goes into an individual MSA to cover personal general outpatient and emergency medical expenses and prescribed drug charges (Luk 2017, p. 49). The rest of the contributions go into the Social Pooling Fund (SPF) to cover inpatient charges. Primary care is provided by GPs in community hospitals and medical professionals in secondary and tertiary hospitals (Fang 2017, p. 32).

The Private Health Insurance Model

The private health insurance model refers to "insurance schemes that are financed through private health premiums, which are often (but not always) voluntary" (OECD Study on Private Health Insurance 2004, p. 9). Premiums tend to be risk rated or community rated (Sekhri and Savedoff 2004, p. 5). Risk-rated premiums "are related to individual risks and calculated from actuarial principles on the basis of expected medical claim" (OECD Study on Private Health Insurance 2004, p. 11). Under community rating, however, premiums for all beneficiaries in a specified geographical area are the same, regardless of their age or health status. An individual can "take up insurance individually, or the cover can come as part of a group, for example as an employment provision" (OECD Study on Private Health Insurance 2004, p. 10). Private health insurance provides subscribers with protection against unexpected health issues and more choices of healthcare services and doctors. In the United States (US), the Affordable Care Act enacted in 2010 requires all health insurance plans to cover ten categories of services. These include preventive services, outpatient and inpatient services, emergency services, prescription drugs, laboratory services, maternity and newborn care, paediatric services (e.g. vision and dental care), mental health services and rehabilitative services (Ashton and Wray 2013, p. 236). Tertiary care is mainly provided by the private sector (i.e. not-for-profit community hospitals and for-profit community hospitals). Primary care is provided by several physician specialties (i.e. family medicine, general internal medicine and general paediatrics), nurse practitioners and physician assistants (Robert Graham Center 2018, p. 5). The US mainly relies on employment-related group insurance to finance healthcare (Aaron and Bosworth 1994).

The Out-of-Pocket Model

The out-of-pocket model is the simplest method of health financing that "entails direct, non-reimbursable payment at the point of service" (Leung and Bacon-Shone 2006, p. 346). Money comes from an individual's personal resources, which include those he or she may have received or borrowed from another source (e.g. a friend, a relative or loan company) (Roemer 1976, p. 15). This model is used in poor countries that do not have any national health systems (Wallace 2013, p. 84). Disparities in wealth result in the rich getting medical care while the poor stay sick or die (Chung 2017; Reid 2009a, p. 19). Hence, out-of-pocket payment is "the most regressive and inequitable way to fund the health system" (World Health Organization 2018a, p. 41). Countries using this model include Cambodia, India, Egypt and rural regions of Africa (Reid 2009a, p. 19).

Major Challenges Facing the Current Healthcare Systems

Health systems in Organisation for Economic Co-operation and Development (OECD) countries "are more effective, provide higher quality care, and have given access to health care to a larger share of the population" (OECD 2010, p. 22). But their health systems face the fiscal sustainability challenge due to the rapid growth of health spending. Looking back over 1993–2008, the average annual growth rate of public health spending of 3.9% outpaced gross domestic product (GDP) growth of 2.6% in all OECD countries (OECD 2010, p. 25). In 2017, health spending accounted for about 9% of GDP on average in OECD countries and exceeded 10% in many countries (OECD 2017, p. 18). Advances in medical technologies, rising incomes and population ageing are key drivers of health spending growth (OECD 2015, pp. 31–32).

Overemphasis on financing acute care and investing in medical technologies leads to waste and inefficiency. Technological advances in diagnosis, drugs and surgical procedures extend and deepen the range of health interventions and provide better quality of medical service, but at the same time increasing the cost of medical treatment (OECD 2015). Rising incomes engender higher expectations on the scope and quality of care (OECD 2015, p. 19). People tend to devote more of their income to healthcare. Population ageing increases demand for and expenditure on health services because older people suffer from higher burden of chronic conditions that are more costly to treat (OECD 2015). The most recent OECD projections found that advances in medical technologies explained 46% of health spending growth, income explained 42% and demographic effects explained 12% for the period 1995 to 2009 (OECD 2015, p. 33). Meanwhile, a shrinking workforce due to ageing population leads to shortfalls in payroll taxes or premium contribution to finance healthcare.

For low- and middle-income countries, lack of financial assistance deters the sick from seeking needed healthcare and burdens household budgets (Mills 2014, p. 553). The sick have to face high out-of-pocket payments (World Health Organization 2017). On average, out-of-pocket payments have been around 40% of health spending in low- and lower middle-income countries and 30% in upper middle-income countries, as compared with 20% in high-income countries (World Health Organization 2017, pp. 24–25). Many low-income countries still rely heavily on external assistance for health (World Health Organization 2017, p. 19). While external funding for health counts for less than 0.3% of global spending, it counts for 30% of current health expenditure on average for low-income countries (World Health Organization 2017, p. 33). Nevertheless, external assistance in health spending has been highly volatile that negatively affects the ability of low-income countries to plan and thus use resources efficiently (World Health Organization 2017, p. 21). Additionally, steady growth in GDP and greater fiscal capacity have not translated into an increase in government health spending in low-income countries (World Health Organization 2017, p. 33, 2018a, p. 15). This is because the increased external funding appears to have a crowding effect that leads governments to reallocate domestic resources to fund other priorities (World Health Organization 2017).

The Economic Benefits of Primary Healthcare

Controlling the rapid growth of health spending is a perplexing and uneasy task because of two main reasons. First, "health care is perceived by citizens as a very high priority, with government policies in this area highly scrutinised" (OECD 2015, p. 80). Second, a great number of stakeholders such as Ministry of Health, insurers and healthcare providers would intervene between beneficiaries of healthcare (e.g. patients) and public resources that finance it (OECD 2015, p. 80). In recent decades, cost-containment policies have been implemented by governments in OECD countries to "change mainly provider or consumer behaviour and activities, or act through a combination of both" (OECD 2015, p. 80). Examples of cost-containment policies include payment systems based on diagnosis-related groups (DRGs), insurer competition and selective contracting, direct price control of pharmaceuticals and decentralisation of health system functions (OECD 2015, p. 131). However, implementing cost-containment policies does not guarantee cost savings. For example, while physician payment methods based on capitation have succeeded in containing overall costs in the UK, DRG-based payment has shown more mixed effects in several OECD countries (OECD 2015, pp. 130–131). DRGs that are mainly used for acute inpatient care help increase hospital efficiency and decrease costs per patient due to shortening the average length of stay (Cots et al. 2011, p. 83; Mathauer and Wittenbecher 2013, p. 746). But they also increase case volumes (Mathauer and Wittenbecher 2013), reduce service quality and have inappropriate early discharge that may jeopardise patients' health (Cots et al. 2011, p. 83). Another situation is that some cost-containment policies succeed in cost savings, but create new problems. For example, price-based competition among hospitals can lower overall costs in the US and the UK, but result in worsening health outcomes for inpatients (OECD 2015, pp. 130–132). Also, cost-containment policies that work in one country do not necessary work in another country. For example, the cost-containment impacts of insurer competition reforms are more successful in the US, but less successful in the Netherlands (OECD 2015, p. 131). The end result of cost-containment reforms appears to be context dependent (OECD 2015, p. 152).

Facing the fiscal sustainability challenge, governments in OECD countries have been finding ways to extract greater value for money from health spending (OECD 2015). Meanwhile, low- and middle-income countries that face the highest burden of disease but severe resource limitations have been looking for the most effective and cost-effective way to deliver healthcare services (Watson et al. 2018). An initial scoping review of literature recently conducted by World Health Organization (2018b) has shown that PHC can "produce a range of economic benefits through its potential to improve health outcomes, health system efficiency and health equity" (p. 2). Regarding health outcomes, the use of continuity of care, primary care physicians (PCPs) and community health workers can improve population health in terms of life expectancy; all-cause and cause-specific mortality (cancer, heart disease, stroke); maternal, neonatal and child mortality; as well as mental health outcomes (depression, anxiety and suicide) (World Health Organization 2018b, p. 14). Economic benefits of improved health outcomes include an increase in workforce participation, an increase in workforce productivity, GDP growth, a decrease in unemployment and impoverishment associated with ill-health (World Health Organization 2018b, p. 7). From a microeconomic perspective, PHC (i.e. continuity of care, case management programmes, transitional care programmes, PCPs) improves health system efficiency by reducing wasteful use of healthcare resources (World Health Organization 2018b, p. 14). These include "avoidable hospitalizations, readmissions to hospital and unnecessary use of emergency departments" (World Health Organization 2018b, p. 8). Total healthcare cost per capita (US$) is also reduced because PCPs use fewer resources (e.g. diagnostic tests, prescribing, procedures) than subspecialists (World Health Organization 2018b, p. 14). As regards to health equity, PHC can reduce inequities in access to healthcare services, inequities in health outcomes and inequity in self-rated health

(World Health Organization 2018b, p. 15). Economic benefits of improved health equity include a reduction in healthcare cost and social security costs, improved population health outcomes, societal wellness and caring externality (World Health Organization 2018b, p. 7). The scoping review helps develop the case for prioritising PHC as well as increasing investment in PHC in low-, middle- and high-income countries (World Health Organization 2018b, p. 18).

Creating a Better Balance Between Tertiary and Primary Care

Throughout much of the twentieth century, hospitals have played an important role in most health systems around the world (World Health Organization 2008, p. 11). The problem of hospital centrism, which refers to a disproportionate focus on specialist, tertiary care, is a major source of inefficiency (World Health Organization 2008, p. 11). Unnecessary medicalisation and iatrogenesis lead to poor value for money and jeopardise patients' health (World Health Organization 2008, p. 11). The problem of hospital centralism is also a real source of health inequity because "it presupposes that, in order to access care or health information, people should visit a healthcare institution" (Azétsop and Ochieng 2015, p. 1). Hence, it crowds out more efficient, effective and more equitable ways of organising healthcare and improving health (World Health Organization 2008, p. 11).

The reorientation of health systems towards PHC requires the willingness and commitment of political leaders to recognise PHC as actionable priority; design policies, strategies and plans that are in line with the goals and objectives of PHC; mobilise adequate funding, and reallocate appropriate resources to support PHC services (World Health Organization 2018c). The Declaration of Alma-Ata, which laid a foundation for PHC, has been implemented for more than four decades. But progress for PHC has been uneven (UNICEF 2018). PHC has remained underdeveloped and underfunded in many countries and faced the problem of recruiting and retaining staff (The Lancet 2018, p. 1369). The vision and values set forth in the Declaration of Alma-Ata have gone largely unfulfilled because of inadequate political leadership, political instability, economic crises, global epidemics, unregulated private healthcare and overinvestment in specialised curative care (Ghebreyesus et al. 2018, p. 1371). In October 2018, the Global Conference on Primary Health Care brought together 1200 leaders from United Nations Member States to endorse the Astana Declaration. They renewed political commitment to placing PHC at the heart of achieving UHC and the sustainable development goals (SDGs) (World Health Organization 2018d, p. 9). Renewing commitment to PHC is essential because the features of PHC allow health systems to adapt and respond to rapid demographic, economic, technological and environmental changes, all of which affect health and well-being (World Health Organization 2018c, p. 5). A wealth of evidence has shown that PHC can address the main causes of, and risk factors for, poor health, as well as emerging health challenges in a highly effective and efficient way through its people-centred and multisectoral approach, its emphasis on promotion and prevention, and addressing social, economic and environmental determinants of health (World Health Organization 2018c, pp. 4–5). Health screening for chronic diseases should be expanded so that chronic diseases can be identified and treated in an early stage to improve health and reduce the risk of serious complications (Ministry of Health Singapore 2019). Health promotion that addresses behavioural risk factors such as unhealthy diet, physical inactivity and alcohol and tobacco use should also be strengthened so that individuals can take greater ownership of their health. A recent study found that small cash incentives and interaction with a healthcare program coordinator could promote primary care visits (Bradley and Neumark 2017, p. 1383).

"Successful reorientation of health systems towards PHC depends on the recognition of the role of hospitals in the process" (World Health Organization 2018c, p. 9). The present dichotomy between hospitals (tertiary care) and primary care (first level care) should be eliminated (World Health Organization 2018e, p. 2). Hospitals can support and amplify the benefits of PHC (World Health Organization 2018e, p. 1) by "reorienting patients to primary care for follow-up or to avoid unnecessary admissions" (World Health Organization 2018c, p. 9). Alternatively, they can relocate hospital clinicians to primary care settings or attach specialists to primary care teams (Sibbald et al. 2007, pp. 112–113). The potential benefits of relocating hospital services are improved access for patients as well as greater equity in care provision, especially in underserved communities and remote rural areas (Sibbald et al. 2007, p. 113). Additionally, a collaborative inpatient care model can be implemented to incorporate the PCP into the hospitalist team as a consultant (Goroll and Hunt 2015, p. 309). The potential benefits of the collaborative inpatient care model include improving patients' care experience in a cost-effective way and enhancing professional satisfaction for both hospitalists and PCPs (Goroll and Hunt 2015, p. 309). At present, however, collaboration between hospitals and primary care is hampered by several systems-level factors, which include lack of financial incentives for collaboration, competing priorities (e.g. regulatory/accreditation requirements, financial strain, strained clinic capacity), mismatched expectations about the role and capacity of primary care and poor communication infrastructure (Nguyen et al. 2014, pp. 702–704). Collaboration can be facilitated by informal affiliations and partnerships formed through personal relationships and interpersonal networking, modifying payment models to align financial incentives across settings and implementing electronic health record (EHR) system to improve information transfer and communication (Nguyen et al. 2014, pp. 703–705).

Conclusion

To conclude, PHC can efficiently and effectively organise healthcare and improve health outcomes and health equity. Political leaders should prioritise PHC development, design policies that are in line with the objectives of PHC and mobilise adequate funding to support PHC services. Reorienting health systems towards PHC can help achieve fiscal sustainability of health systems, cope with greater demand for healthcare caused by ageing population and achieve UHC in the future.

References

Aaron, H. J., & Bosworth, B. P. (1994). *Economic issues in reform of health care financing*. Retrieved from https://www.brookings.edu/wp-content/uploads/1994/01/1994_bpeamicro_aaron.pdf

Ashton, C. M., & Wray, N. P. (2013). *Comparative effectiveness research: Evidence, medicine, and policy*. New York: Oxford University Press.

Azétsop, J., & Ochieng, M. (2015). The right to health, health systems development and public health policy challenges in Chad. *Philosophy, Ethics, and Humanities in Medicine, 10*, 1. https://doi.org/10.1186/s13010-015-0023-z.

Blank, R., & Burau, V. (2007). *Comparative health policy* (2nd ed.). Basingstoke/New York: Palgrave Macmillan.

Blümel, M., & Busse, R. (2017). The German health care system. In E. Mossialos, A. Djordjevic, R. Osborn, & D. Sarnak (Eds.), *International profiles of health care systems* (pp. 69–76). Washington: The Commonwealth Fund. Retrieve from https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2017_may_mossialos_intl_profiles_v5.pdf

Bradley, C. J., & Neumark, D. (2017). Small cash incentives can encourage primary care visits by low-income people with new health care coverage. *Health Affairs, 36*(8), 1376–1384.

Busse, R., Blümel, M., Knieps, F., & Bärnighausen, T. (2017). Statutory health insurance in Germany: A health system shaped by 135 years of solidarity, self-governance, and competition. *The Lancet, 390*, 882–897. https://doi.org/10.1016/S0140-6736(17)31280-1.

Central Provident Fund Board. (2019). *MediSave*. Retrieved from https://www.cpf.gov.sg/Members/Schemes/schemes/healthcare/medisave

Chung, M. (2017). *Heath care reform: Learning from other major health care systems*. Retrieved from https://pphr.princeton.edu/2017/12/02/unhealthy-health-care-a-cursory-overview-of-major-health-care-systems/

Cots, F., Chiarello, P., Salvador, X., Castells, X., & Quentin, W. (2011). DRG-based hospital payment: Intended and unintended consequences. In R. Busse, A. Geissler, W. Quentin, & M. Wiley (Eds.), *Diagnosis-related groups in Europe: Moving towards transparency, efficiency and quality in hospitals* (pp. 75–92). Maidenhead: Open University Press.

Fang, H. (2017). The Chinese health care system. In E. Mossialos, A. Djordjevic, R. Osborn, & D. Sarnak (Eds.), *International profiles of health care systems* (pp. 31–38). Washington: The Commonwealth Fund. Retrieved from https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2017_may_mossialos_intl_profiles_v5.pdf

Ghebreyesus, T. A., Fore, H., Birtanov, Y., & Jakab, Z. (2018). Primary health care for the 21st century, universal health coverage, and the Sustainable Development Goals. *The Lancet, 392*, 1371–1372. https://doi.org/10.1016/S0140-6736(18)32556-X.

Goldberg, A. E. (Ed.). (2016). *The SAGE encyclopedia of LGBTQ studies*. Thousand Oaks: SAGE. https://doi.org/10.4135/9781483371283.

Goroll, A. H., & Hunt, D. P. (2015). Bridging the hospitalist-primary care divide through collaborative care. *The New England Journal of Medicine, 372*(4), 308–309. https://doi.org/10.1056/NEJMp1411416.

Hsiao, W. C. (1995). Medical savings accounts: lessons from Singapore. *Health Affairs, 14*(2), 260–266. https://doi.org/10.1377/hlthaff.14.2.260.

Hsu, J. (2010). *Medical savings accounts: What is at risk?* Retrieved from https://www.who.int/healthsystems/topics/financing/healthreport/MSAsNo17FINAL.pdf

International Labour Organization. (2019). *Pros and cons of key financing mechanisms for social health protection*. Retrieved from https://www.social-protection.org/gimi/gess/ShowTheme.action;jsessionid=I__V3uIBZo7MU4g1gnyH7vO5p5fXHE8E_HgQzjWGacYUwVARsXxV!-1751551395?id=3108&lang=EN

Leung, G. M., & Bacon-Shone, J. (2006). *Hong Kong's health system: Reflections, perspectives and visions*. Hong Kong: Hong Kong University Press.

Luk, S. C. Y. (2017). *Financing healthcare in China: Towards universal health insurance*. Abingdon/New York: Routledge.

Majeed, A. (2018). *Universal health coverage in the United Kingdom: Past, present and future*. Retrieved from https://wwwf.imperial.ac.uk/blog/imperial-medicine/2018/04/06/universal-health-coverage-in-the-united-kingdom-past-present-and-future/

Mathauer, I., & Wittenbecher, F. (2013). Hospital payment systems based on diagnosis-related groups: Experiences in low- and middle-income countries. *Bulletin of the World Health Organization, 91*, 746–756A. https://doi.org/10.2471/BLT.12.115931.

Mills, A. (2014). Health care systems in low- and middle- income countries. *The New England Journal of Medicine, 70*, 552–557. https://doi.org/10.1056/NEJMra1110897.

Ministry of Health. (2018a). *Medisave*. Retrieved from https://www.moh.gov.sg/cost-financing/healthcare-schemes-subsidies/medisave

Ministry of Health. (2018b). *Primary healthcare services*. Retrieved from https://www.moh.gov.sg/our-healthcare-system/healthcare-services-and-facilities/primary-healthcare-services

Ministry of Health Singapore. (2019). *The ABCs of health screening*. Retrieved from https://www.healthhub.sg/live-healthy/403/abcs_of_health_screening

Nguyen, O. K., Kruger, J., Greysen, S. R., Lyndon, A., & Goldman, L. E. (2014). Understanding how to improve collaboration between hospitals and primary care in postdischarge care transitions: A qualitative study of primary care leaders' perspectives. *Journal of Hospital Medicine, 9*(11), 700–706. https://doi.org/10.1002/jhm.2257.

OECD. (2010). *Value for money in health spending*. Paris: OECD Publishing.

OECD. (2015). *Fiscal sustainability of health systems: Bridging health and finance perspectives*. Paris: OECD Publishing.

OECD. (2017). *Health at a glance 2017: OECD indicators*. Paris: OECD Publishing.

OECD Study on Private Health Insurance. (2004). *Proposal for a taxonomy of health insurance*. Retrieved from http://www.oecd.org/health/health-systems/31916207.pdf

Reid, T. R. (2009a). *The healing of America: A global quest for better, cheaper, and fairer health care*. New York: Penguin Press.

Reid, T. R. (2009b). *Four basic models of health care*. Retrieved from https://changeagent.nelrc.org/wp-content/uploads/2018/05/Four-Basic-Models-of-Health-Care.pdf

Robert Graham Center. (2018). *The state of primary care in the United States: A chartbook of facts and statistics*. Retrieved from https://www.graham-center.org/content/dam/rgc/documents/publications-reports/reports/PrimaryCareChartbook.pdf

Roemer, M. I. (1976). *Health care systems in world perspective*. Ann Arbor: Health Administration Press.

Saltman, R. B. (2004). Social health insurance in perspective: the challenge of sustaining stability. In R. B. Saltman, R. Busse, & J. Figueras (Eds.), *Social health insurance systems in western Europe* (pp. 3–20). Maidenhead: Open University Press. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/107609/E84968.pdf?sequence=1&isAllowed=y.

Savedoff, W. (2004). *Tax-based financing for health systems: Options and experiences*. Retrieved from https://www.who.int/health_financing/taxed_based_financing_dp_04_4.pdf

Schieber, G., Baeza, C., Kress, D., & Maier, M. (2006). Financing health systems in the 21st century. In D. T. Jamison, J. G. Breman, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans,

P. Jha, A. Mills, & P. Musgrove (Eds.), *Disease control priorities in developing countries* (2nd ed., pp. 225–242). Washington, DC: World Bank and Oxford University Press. License: CC BY 3.0 IGO. Retrieved from https://openknowledge.worldbank.org/handle/10986/7242

Sekhri, N, & Savedoff, W. (2004) *Private health insurance: implications for developing countries*. Retrieved from https://www.who.int/health_financing/documents/dp_e_04_3-private_h_insurance.pdf

Sibbald, B., McDonald, R., & Roland, M. (2007). Shifting care from hospitals to the community: a review of the evidence on quality and efficiency. *Journal of Health Services Research & Policy, 12*(2), 110–117. https://doi.org/10.1258/135581907780279611.

The Lancet. (2018). The Astana Declaration: The future of primary health care? *The Lancet, 392*, 1369. https://doi.org/10.1016/S0140-6736(18)32478-4.

Thorlby, R., & Arora, S. (2017). The English health care system. In E. Mossialos, A. Djordjevic, R. Osborn, & D. Sarnak (Eds.), *International profiles of health care systems* (pp. 49–58). Washington: The Commonwealth Fund. Retrieved from https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2017_may_mossialos_intl_profiles_v5.pdf

UNICEF. (2018). *New global commitment to primary health care for all at Astana Conference*. Retrieved from https://www.unicef.org/laos/press-releases/new-global-commitment-primary-health-care-all-astana-conference

Wallace, L. S. (2013). A view of health care around the world. *Annals of Family Medicine, 11*(1), 84. https://doi.org/10.1370/afm.1484.

Watson, S. I., Sahota, H., Taylor, C. A., Chen, Y., & Lilford, R. J. (2018). Cost-effectiveness of health care service delivery interventions in low and middle income countries: A systematic review. *Global Health Research and Policy, 3*, 17. https://doi.org/10.1186/s41256-018-0073-z.

World Health Organization. (2008). *The world health report 2008 – Primary health care (now more than ever)*. Retrieved from https://www.who.int/whr/2008/en/

World Health Organization. (2010). *Monitoring the building blocks of health systems: A handbook of indicators and their measurement strategies*. Retrieved from https://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf

World Health Organization. (2017). *New perspectives on global health spending for universal health coverage*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/259632/WHO-HIS-HGF-HFWorkingPaper-17.10-eng.pdf

World Health Organization. (2018a). *Public spending on health: A closer look at global trends*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/276728/WHO-HIS-HGF-HF-WorkingPaper-18.3-eng.pdf?ua=1

World Health Organization. (2018b). *Building the economic case for primary health care: A scoping review*. Retrieved from https://www.who.int/docs/default-source/primary-health-care-conference/phc%2D%2D-economic-case.pdf?sfvrsn=8d0105b8_2

World Health Organization. (2018c). *A vision for primary health care in the 21st century*. Retrieved from https://www.who.int/docs/default-source/primary-health/vision.pdf

World Health Organization. (2018d). *From Alma-Ata to Astana: Primary health care – Reflecting on the past, transforming for the future. Interim report from the WHO European region*. Retrieved from https://www.who.int/docs/default-source/primary-health-care-conference/phc-regional-report-europe.pdf?sfvrsn=cf2badeb_2

World Health Organization. (2018e). *The transformative role of hospitals in the future of primary health care*. Retrieved from https://www.who.int/docs/default-source/primary-health-care-conference/hospitals.pdf?sfvrsn=5d7e8137_2

Wouters, O. J., Cylus, J., Yang, W., Thomson, S., & Mckee, M. (2016). Medical savings accounts: Assessing their impact on efficiency, equity and financial protection in health care. *Health Economics, Policy and Law, 11*, 321–335. https://doi.org/10.1017/S1744133116000025.

Chapter 4
Sustainable Healthcare Systems

Margaret Tung and Sukhpreet Kaur

Introduction

Healthcare is not only an essential need but, more importantly, is a basic human right. While almost every country today adopts some form of healthcare system, many still view it as "an important political issue", often making changes, such as the development of new medical science advances and addressing the continuing increase in service demand, difficult to implement (Prowle and Harradine 2015). According to Crisp (2017), sustainability depends on seven factors that are, at the same time, interdependent and interconnected with a particular emphasis on cross-sectoral partnerships. The factors, including *efficiency and effectiveness on health and care provision*, *availability of well-trained health and care workers*, *costs and economic benefits*, *health and resilience of the population*, *contribution of carers and informal networks of care*, *integration of policy and practice* and *public and political acceptability and support*, may not be new to the health and care systems, but the timing is appropriate to integrate them into the system. This chapter will examine the existing healthcare systems of some developed economies, namely, Australia, the United Kingdom, Canada and Hong Kong, find out their strengths and weaknesses and explore other possible options with the aim to find out the most appropriate way of formulating a practical and sustainable healthcare system.

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Healthcare in Australia

Medicare

The healthcare in Australia incorporates universal healthcare, dispensed by the public sector and private providers (Duckett and Willcox 2015). Most of its population opt for public hospitals and primary healthcare as opposed to services by the private sector because Australian citizens are subsidised under the universal health insurance scheme named Medicare.

Medicare, a financing system introduced in 1984 by the then prime minister, Bob Hawke, is operated by the Department of Human Services and funds primary healthcare for all Australian residents. It allows them to seek a rebate after receiving treatment from medical practitioners and allied health professionals (Eckermann and Sheridan 2016). It also entitles Australian residents to reciprocal rights as per the Reciprocal Health Care Agreements (RHCA) in countries including the United Kingdom, the Netherlands, Sweden, Slovenia, Malta, Italy, Republic of Ireland, Belgium, Finland, New Zealand and Norway while residing in one of these places (Barraclough 1991). Presently, it is funded by the *Medicare levy*, an income tax surcharge that is about 2% of an individual's taxable income (Sowa et al. 2018). Low-income earners are exempted from the levy, while different thresholds are applied to others such as singles, families, seniors and pensioners. It was introduced as part of an effort to minimise demand pressure on the medical system by encouraging citizens to utilise the private hospital system.

There are often debates concerning Medicare, emphasising on the two-tier system as well as the actual role of private health insurance (Wong et al. 2017). It is reported that people with health insurances are still accessing "the taxpayer-funded public system" instead of relying on personal insurances. This may be due to the fact that quite a number of incentives are offered to those who take up private health insurance (Sowa et al. 2018). The private health insurance rebate, supplementary to the public health plan since 1999, is funded by the government to a varying percentage when eligible individuals for Medicare consider check-up in the private sector. It was previously capped at 30% but now ranges between 0 and 35% and takes into account the income and age of the applicant. The number of Australians with private health insurance was declining but has again picked up with the launch of Lifetime Health Cover and tax incentives to encourage private cover. With this, those who apply for private hospital insurance later in life have to pay a higher premium compared to those covered since childhood.

Overview of the Australian Healthcare System

Primary Healthcare

Primary healthcare is the initial point of call for most illnesses and can be delivered in a variety of settings, including at community health centres, at general practices and at home (Willis et al. 2016). It is provided by doctors, along with nurses and registered persons including dentists, pharmacists and other allied health professionals. Additionally, the government has set up free after-hours general practice helpline after business hours (Swerissen and Duckett 2018). A registered nurse will analyse the caller's health condition based on the symptoms and, if needed, have a general practitioner to contact back depending on the urgency.

Access to Health Facilities and Services

In Australia, rural and remote areas are equipped with health facilities and services as the country understands that everyone is entitled to proper healthcare (Reeve et al. 2015). As per the Australian Health Ministers Advisory Council Rural Health Standing Committee, "people in the rural and remote Australia are as healthy as other Australians", owing to attention and guidance of the government on such areas. However, in comparison to those in major cities, the life expectancy of those from rural or remote areas is up to 7 years lower. In addition, the ageing population, tripled over the years, would contribute to an increased need for health services in the near future (McPake and Mahal 2017). Hence, equity access to health facilities and services has become mandatory now than ever.

Tax-Funded Public Insurance and Lifetime Health Cover

Medicare in Australia, a tax-funded public insurance programme and financed by the federal government, covers outpatient services and a fraction of the cost of prescriptions. The states and territories hold responsibility for public hospital care (Eckermann and Sheridan 2016). Medicare adopts the bulk-billing system, and it is directly billed for the amount payable for use of health service. Provision of services and quality of medicine are determined by hospitals and doctors. Australian doctors are paid on a fee-for-service basis, and general practitioners "act as gatekeepers" to specialised care. On the other hand, Lifetime Health Cover encourages young Australians to opt for private health insurance early in their lives for a lifetime (McDonald and Duckett 2017). This is because if one does not go for an eligible hospital policy before the age of 31, policies applied later in life will slightly be costly. In the case of private healthcare, one always can choose between private and public hospitals and facilities, allowing for service flexibility and choice.

Shortage of Manpower

Despite the growth in the health workforce over the years, Australia, as in many countries, has been experiencing a shortage of health professionals. Nurses and midwives are reported to be the largest group in the health workforce with almost 370,000 registered and more than 315,000 employed as per the data collected in 2016. Many of them are overseas-trained registered health professionals that play a substantial part in Australia. For instance, almost 35% of medical practitioners employed in Australia in 2016 received their primary qualifications overseas. This gives them the option to work among the registered countries. Furthermore, many employed in the health sector are not officially registered by the Australian Health Practitioner Regulation Agency (AHPRA), thus corrupting the statistics of the actual health professionals in Australia.

Healthcare in the United Kingdom

Healthcare in the United Kingdom is predominantly a publicly funded system with a modest scale of the private sector and voluntary provision (Ferlie and Shortell 2001). Its key developments include major social reforms targeting a universal healthcare system following the Second World War. It is viewed as one of the best healthcare systems in the world in terms of *quality of care*, *access to care*, *efficiency* and *equity*, despite the fact that it is still fragmented. Primary care, as part of the overall healthcare system, entitles all residents to comprehensive medical care from the National Health Service (NHS). Ideally, primary care includes "initial assessment, diagnosis, and management; long-term continuous comprehensive care of people and their families; health promotion for a defined local population; and coordination of specialists' and community services" (Starfield 1992).

In the United Kingdom, through government policies, the industry began subsidising the expense of the staff since the 1960s which is structured to conduct outreach and community-oriented primary care (Fry 1969). As an example, home visitors assist the frail elderly living independently in the community, and various education and health-promotional group clinics are conducted by practice nurses, promoting interdisciplinary teamwork as a result. Most people register with local general practitioners who provide continuing services on a 24-hour basis (Fry 1993). It follows a strict referral system between levels of care by setting a single portal of entry to the NHS. General practitioners in the NHS system provide primary healthcare in addition to making referrals to supplementary services as and when necessary (Davis et al. 2014). For the more specialised services, including care for psychiatric illnesses, patients are directed to the hospitals and accident and emergency (A&E) departments.

Role of NHS

The NHS is the provider of most healthcare in England, including inpatient care, long-term healthcare, primary care and dentistry. In England, as per the Spring Budget 2017, the NHS adds up to £122.5 billion of the Department of Health's budget, or 7.4% of gross domestic product (GDP). The clinical commissioning groups (CCGs), overseen by NHS England, are in charge of the hospitals and local services for which they are responsible. These groups decide the kinds of services as well as ensure the provision of such services. As a result, NHS has a high level of public support within the country and ranks 14th in Europe in the Euro Health Consumer Index (Cylus et al. 2016).

In Scotland, healthcare is provided by NHS Scotland and covers all local residents. Generally, it has one of the healthiest populations in the world with life expectancy at 79.0 years (Scottish government 2017). This is because primary and secondary care is integrated in Scotland and spends an estimated 40% of the total budget of the Scottish government. However, access to some healthcare services in remote rural areas is challenging; particularly as the older population grows in those areas. Scotland does not have NHS trusts as in England (Steele and Cylus 2012). Instead, a total of 14 regional health boards, further subdivided into Health and Social Care Partnerships, are in charge of the provision of healthcare services. To ensure high quality, Healthcare Improvement Scotland is responsible for assessing NHS hospitals and services, including independent healthcare services and making recommendations for improvement. In Wales, the Welsh public health service, NHS Wales, likewise dominates the healthcare provision.

Health and social care in Northern Ireland, the publicly funded service providing public health and other social services, plays the major part in Northern Ireland. Northern Ireland differs from England and Scotland because it offers social care in addition to healthcare (Bevan and Hood 2006). With the Health and Social Care Reform Act in 2009, the Health and Social Care Board and five related trusts were established to monitor the delivery of primary, secondary and community healthcare. The five local commissioning groups created under the Act work concurrently with the social and health trusts. There are currently about 350 general practitioner practices in the regions for primary care. Primary care services in the community have been upgraded by incorporating pharmacies, surgery suites, scanning facilities, out-of-hours consultations and community healthcare partnerships. It mainly accommodates older people (Elder 2018). However, the performance of the system in Northern Ireland is comparatively unsatisfactory because it fails to meet the waiting list target of 52 weeks, and there has been several government reports demanding prevention instead of hospital-based care (Belfast Telegraph 2015).

Overview of the UK Healthcare System

Primary Healthcare

The importance of primary care is well recognised in the NHS, with general practitioners and the primary care team playing a vital role. It is a government-administered single-payer system, providing universal coverage and reflecting organisation and planning in the system as a whole. There are strict distinctions between generalists and specialists, a sense of responsibility for "population-based healthcare" and the interdisciplinary teamwork. While the role of specialists is to work mostly in hospitals, general practitioners act as "gatekeepers" to specialist care. Hence, primary care has been considered effective since the introduction of the National Health Service (NHS) in 1948 (Andrews 2016). Primary care continues to develop in settling primary care standard and quality accreditation schemes. For instance, a remarkable improvement in the aspect of quality and safety has been observed. When pay for performance (P4P) was introduced in 1990, an increase in performance and reduction in socio-economic inequalities were found. In 1998, guidelines and frameworks were implemented, and there had been improvements in hospital activities. Moreover, efforts have been made to manage the rising burden of non-communicable diseases since 2004 (Gov.uk 2014). The partnerships between the NHS and several companies with relevant expertise have managed to develop and deliver primary care services and have become the fundamentals and foundation to the NHS specifically in long-term conditions.

UK Healthcare System Challenges

The UK healthcare system faces similar challenges as in many healthcare systems around the world, such as increase in life expectancy and chronic diseases, lifestyle change and mental health problems (Grosios et al. 2010). Life expectancy is steadily increasing and so is the risk of chronic diseases. The most common are cancers and neurological disorders. Furthermore, changes to lifestyle have somewhat led to obesity and associated conditions such as cardiovascular diseases and diabetes. There are also changes to healthcare services. The shifting of focus and practice in recent years requires additional attention and supervision in order to offer better treatment and palliative or supportive care to the community.

The establishment of preventive medicine within the UK healthcare system is solid. However, there is a tendency to seek other approaches. The UK healthcare system is exploring predictive, preventive and personalised medicine (PPPM) in the NHS (Grosios et al. 2012). For this, the medical system needs to adopt a scientific understanding of health and disease and technological advancement (Grosios et al. 2010). Unfortunately, this is not the case at this stage. The system has a long way to fully understand and embrace new technologies, plus it needs to implement comprehensive strategies for the NHS to achieve the desired healthcare outcomes. More importantly, knowledge and understanding of professionals, patients and the public are equally essential to prepare for the new initiatives.

Healthcare in Canada

Under the Canada Health Act of 1984, healthcare in Canada is carried out via the designated provincial and territorial systems. The decision of Lester Pearson, a Canadian scholar and Nobel laureate, to expand healthcare through Medicare is praiseworthy knowing that it serves to provide near-universal coverage to all Canadians in accordance to "their need for such services and irrespective of their ability to pay" (Marchildon 2009). Together with the government's effort to ensure the quality of care through federal standards, the Medicare system has become cost-effective. Although Canada has a publicly funded Medicare system, most services are provided by the private sector through substantial government finance at the provincial level (Canadian Institute for Health Information 2018). The provincial Ministry of Health issues health cards to individuals for services in the province to allow everyone to receive the same level of care. It regards preventive care and early detection crucial, hence annual check-ups are recommended to all residents. However, Canada is one of the few countries that does not include coverage of prescription medication, except in the province of Quebec. The Council of the Federation is now considering collaborating with chosen provinces to limit pharmaceutical drug costs.

Strengths of the Canadian System

Access to Healthcare

The healthcare system of Canada is based on the taxes and premiums collected annually in order to provide all residents with access to universal healthcare regardless of income, status, age, employment or health conditions, with the aim to improve the overall health of the citizens (Marchildon 2004). Treatment is free, and drugs are set at reasonable prices. There is also a free choice of doctors and hospitals.

Primary Care in Canada

Primary care is known for its excellence in Canada, owing to the key reform initiatives, including the support for interpersonal primary healthcare teams, group practices and networks, financial incentives, development of primary healthcare governance mechanisms and other related changes (Hutchison et al. 2011). Basically, the system puts great attention to enhancing medical resources for chronic illnesses and technological advancements (Montague et al. 2018). Canadians have the right to choose their respective family physicians (Hutchison et al. 2011). It is found that chronic illnesses are the number one causes of death rates in Canada. Patients suffering from cardiovascular diseases or other forms of diseases would prefer to get treatment in Canada as they are handled better. Healthcare professionals in many Canadian provinces give information to the community on health and illness prevention.

Drawbacks of the Canadian System

Preference for Private Service

Canada has a mixed public-private system (Makarenko 2010). The private sector delivers healthcare services and the public sector finances those services. In 2017, Canada spent about 12% of its gross domestic product (GDP) in healthcare. Majority of the Canadians either have private health insurance, often through their employers, or are covered by Medicare, and the demand for services in private sector is greater in Canada. Although the Canadian Medical Association aims to serve with the highest standards of healthcare (CMA n.d.), there are internal disputes and criticisms on the system. It is reported that a number of medical associations permit greater private role, leading to unequal funding and expenditures. It would require greater investment in the near future if the system extends its coverage, especially for Canadian seniors.

Waiting Time

Follow-up services for non-urgent patients take an extremely long time to make an appointment with the doctors. In 2015, the think tank Fraser Institute claimed that the median waiting time for referrals from general practitioners to a specialist was estimated to be 19 weeks, more than 4 months (Barua et al. 2015). This was further described by a study by the Commonwealth Fund, which found that the wait time in Canada for all kinds of services ranked “either at the bottom or second to the bottom” in comparison to the group of surveyed countries. Canada has the longest waiting time on emergency services as well, with patients having to wait more than 4 h in the emergency department. There have been calls for increasing both the federal and provincial funding for Medicare so as to provide a solution to the unreasonable waiting time.

Canada Health Act

The Canada Health Act legislation specifies the criteria and terms of health insurance programmes and manages the financing system. Provincial or territorial health insurance plans must comply with the set conditions to be granted full payments from the federal government for insured services. The principles of the Canada Health Act include *universality*, *comprehensiveness*, *public administration*, *accessibility and portability* (Health Canada 2002). Canadian health insurance plans must be thoroughly administered; cover all insured health services provided by medical practitioners, hospitals or dentists; have uniform terms and conditions on all plans for all insured persons; have continuation of services regardless of the province of residence; and provide reasonable access to services, either direct or indirect. Private clinics that do not conform to such arrangements are often warned of not being entitled to privately funded healthcare as a result. Due to these reasons, some residents opt to seek treatment across the border in the United States, where healthcare is more available given that it is a multi-payer and heavily private system (Squires and Anderson 2015).

Elderly Care in Canada

Canada has roughly 6 million seniors, and there are very few well-rounded healthcare plans for the seniors. Old Age Security, one of the healthcare plans, is for citizens residing in Canada for at least 10 years. Another is the Canada Pension Plan, in which those in the workforce put aside money until they reach the age 65 years. Basically, it is a social insurance plan for individuals bracing for retirement. Other than these plans, the elderly have to endure long waiting hours and insufficient savings to support longer-term treatments. According to a report by the Canadian Institute for Health Information, almost 35% of the Canadian seniors are "dissatisfied" with the overall health services provided (Zafar 2018). The major challenges faced by the seniors are getting their appointments and receiving different information from service providers. Furthermore, the system is designed to tackle acute problems, and hence it fails to address chronic diseases which are common as people are now living longer. Nonetheless, the Canadian healthcare system ranks above average among the Group of Eight (G8) highly industrialised nations despite its performance for availability and access to resources being below the set standard by the Organisation for Economic Co-operation and Development (OECD) (Barua et al. 2016). This is because seniors in Canada are living longer and have better access to primary care and better health as opposed to seniors in other countries (Zafar 2018), and primary care doctors are aware of patients' medical history, make medical decisions and spend sufficient time with patients for treatment.

Healthcare in Hong Kong

Hong Kong enjoys a high standard of medical service that is aligned with the policy "that no one should be denied adequate health care through lack of means" (Chiu 2011) and is in general commended for its efficiency and cost-effectiveness (Griffiths and Lee 2012). With a dual track of public and private services in healthcare system, the investment of about 5.7% GDP is very low considering the fact that

Hong Kong is a developed society (Ng et al. 2019). Nonetheless, the city has achieved the longest life expectancy in the world as well as low infant and maternity mortality rates (Centre of Health Protection 2017). As a result, the proportion of the population over the age of 65 years will increase to 33% in 2064 and those aged 80 or above to 15.9%. It will inevitably pose threats and challenges to the existing health service model.

Hong Kong has an imbalance between the supply and demand, often reflected in the long waiting time in public hospitals (Tsui and Fong 2018). The growth of the ageing population will further escalate the problems in the healthcare system. This is mainly because the traditional model lacks sustainability provided that the financial and delivery of care aspects are highly considered while other aspects are undermined (Ng et al. 2019).

Key Initiatives

A government reform paper released in 2005, *Building a Healthy Tomorrow*, focused on five areas, namely, developing a basic model for primary care services, establishing a system for family doctor registration, providing subsidies, improving public primary care and strengthening health functions (Food and Health Bureau 2005). The initiatives have enabled professionals from both the private and public sectors to set standards for primary care by evaluating potential health risks, frequent monitoring of patients and encouraging healthy concepts. A list of doctors in the registration system has become available, and subsidies for service users are offered. Another government consultation document in 2008, *Your Health, Your Life*, has recommended the public of disease prevention and the reasonably affordable health services under primary care (Food and Health Bureau 2008). A more recent document published in 2010, *Primary Care Development in Hong Kong: Strategy Document*, put forth initiatives for self-care, professional development and quality improvement, shaping the overall system as integrative and multidisciplinary (Department of Health 2012).

Public-Private Partnership

The primary healthcare system in Hong Kong has progressed over time. High-quality services are assured by public-private partnership (PPP), resulting in more healthcare choices for individuals and better resource allocation between the public and private sectors (Ho and Fong 2017) by addressing the imbalance of services as well as making use of capacity available in both sectors (Wong et al. 2015). In a report by Hospital Authority in 2016, the programmes have "achieved the planned objectives and are running smoothly". Public-private partnership has also explored and introduced programmes for more health choices for individuals, and better resource allocation and utilisation between the public and private sectors increased efficiency and enhanced balance between the two subsystems (Ho and Fong 2017).

Primary Care Office

The developments and collaboration among government departments and other professionals have led to more benefits to the users through initiatives, such as the Primary Care Directory, Elderly Health Care Voucher Scheme, Electronic Health Record Sharing System, etc.

The Primary Care Office, under the Department of Health, and community health centres co-operate to train staff for primary care to tackle the ever-increasing community demands for services and the heavy burden arising from chronic illnesses of the ageing population (Chan 2015). It is also promoted via various channels, for instance, television, radio programme, advertisements, announcements and internet online, to draw the attention of the public, so as to provide clear guidelines of the services to the public. Information on enrolled primary care providers such as doctors in the community, together with their qualifications, clinic address and opening hours, etc., are available in the Primary Care Directory on the internet. The publicity has enabled the government to attract more service users, especially during the promotion of Elderly Health Care Vouchers and Elderly Health Assessment Pilot Programme (Food and Health Bureau 2015).

Delivery of Quality Service

High-quality primary care is delivered, predominantly by the private sector, to the community with reasonable affordability, great access and free choices (Kong et al. 2015). The delivery model, together with client satisfaction and treatment compliance to a certain extent, helps achieve better health in the population, which has enjoyed long life expectancy on top of the world. Preventive care is mostly covered in the public sector by the Department of Health and the Hospital Authority. Community health centres (CHC) or CHC networks, such as general outpatient clinic services of the Hospital Authority, elderly health centres, maternal and child health centres and student health services of the Department of Health, provide comprehensive primary care to the general public.

Electronic Health Record

The Food and Health Bureau has created an Electronic Health Record (eHR) Sharing System, managed by the Electronic Health Record Office, to provide an information infrastructure for healthcare providers in both the public and private sectors for them to get access to patients' medical records. The system also enhances the General Outpatient Clinic Public-Private Partnership Programme and allows a patient portal to facilitate management of health conditions and health education.

Major Concerns

Public Services Are Hospital-Oriented

Public healthcare services are predominantly hospital-oriented. Over 80% of the government's annual budget goes to the Hospital Authority, which manages 90% of all the hospital beds. Thus, public medical services in Hong Kong are heavily subsidised. It has been accused of red tape and has allegedly "increased the burden on overworked medical staff" (Cheung 2019). Public hospital staff, including doctors and nurses, have to deal with heavy administration work despite long working hours. Such work practice obviously raises questions on the efficiency, effectiveness and efficacy of publicly funded health services in resources utilisation. This is more so because the public has limited knowledge about primary care and therefore relied heavily on public hospitals, particularly the accident and emergency services.

Home care and community-based care services under the principle of "prevention is better than the cure" have always been ignored. There is a need to promote more community engagement, better coordination of the medical and social sectors and effective district-level primary healthcare services. The government has pledged to look into these issues and ultimately to have less demand for hospitalisation (Policy Address 2017). The Kwai Tsing District Health Centre is the initial step towards primary care network in Hong Kong, and similar centres will be established throughout all the 18 administrative districts (Cheung 2018). This new move aims to ease the burden on public hospitals and attend to the needs of the community, through teamwork and healthcare collaborators like the local private general practitioners, family doctors and Chinese medicine practitioners.

Challenges

Despite the fact that Hong Kong has been successful in the delivery of high-standard services and excellent outcomes such as long life expectancy, low infant and maternal mortality rates, effective disease control, etc., the system faces some burning issues. Excessive workload, manpower shortage, limited capacity and long waiting hours, particularly in the public hospital services, are challenges to the authority and healthcare professionals. The public hospitals are unbelievably overcrowded during the influenza season. While the international standard of the nurse-to-patient ratio is 1–6, Hong Kong public hospitals stand at 1–11. This will potentially lower the quantity and quality of care as more pressure is added onto the already burdened staff.

Practical and Sustainable Healthcare Systems

As a country develops and the healthcare system advances, new challenges will emerge. When the healthcare system has the intention to provide universal or free health coverage to each and every citizen, it probably has never imagined that patients or the public will 1 day be relying heavily on the system for health services. The challenges of long waiting time, shortage of manpower and overreliance on the public services are mere reflection of the intrinsic feature of the healthcare system, particularly the tax-based financing model in the United Kingdom and Hong Kong. There is the need to ensure sustainability as the systems advance for continuous improvement in the three key attributes in the system – affordability, acceptability and adaptability (Fineberg 2012).

Sustainable development in healthcare system will tackle problems it faces as well as seek continuous improvement (Law 2019). It is important to ensure that the change is in harmony and enhances both current and future potential to meet human needs and aspiration (Braithwaite et al. 2017). Patients must find the services affordable for the sake of timely treatments by health professionals (Fineberg 2012). More importantly, a health system must adapt to the changing demographics and new and emerging disease patterns so as to remain viable. Existing, useful and sound practices can be derived to create an ideal structure, paying attention to the internal and external factors to optimise the healthcare system (Capolongo et al. 2015). A commendable practice of contemporary system is the establishment of primary care. With primary care, a systematic medical approach – or better described as continuity – gives patients access to a wide variety of health services, care for chronic conditions, preventive care and screenings and acute care for minor sickness with primary care. Health issues can be detected early and be treated timely and early (Olsen 1998). Primary care also acts as initial step to combat the growing ageing population and the alarming burden of chronic illnesses and long-term care. Like Australia, a mandatory universal health insurance scheme can be introduced in a healthcare system so that citizens enjoy essential and primary medical services with little charge, as specialist treatments can be very costly despite government subsidy.

The sustainability in this context merely discusses solutions to general problems faced in many healthcare systems. The challenge to having a sustainable system is overcoming problems faced by all stakeholders, consumers and service providers, so that the key attributes are met and services are optimised in the utilisation of existing human, professional and social resources (Gruen et al. 2008).

References

Andrews, G. J. (2016). *Primary health care: People, practice, place*. London: Routledge.

Barraclough, S. (1991). Reciprocal health care agreements and Australian health policy. *Australian Health Review: A Publication of the Australian Hospital Association, 14*(4), 413–421.

Barua, B., Rovere, M., & Skinner, B. J. (2015). *Waiting your turn*. Vancouver: Fraser Institute.

Barua, B., Timmermans, I., Nason, I., & Esmail, N. (2016). *Comparing performance of universal health care countries*. Vancouver: Fraser Institute.

Bevan, G., & Hood, C. (2006). Have targets improved performance in the English NHS? *BMJ, 332*(7538), 419–422.

Braithwaite, J., Testa, L., Lamprell, G., Herkes, J., Ludlow, K., McPherson, E., Campbell, M., & Holt, J. (2017). Built to last? The sustainability of health system improvements, interventions and change strategies: A study protocol for a systematic review. *BMJ Open, 7*(11), e018568.

Canadian Institute for Health Information. (2018). *Improving the health of Canadians. Summary report [electronic resource]*. Ottawa: Canadian Institute for Health Information.

Capolongo, S., Bottero, M., Buffoli, M., & Lettieri, E. (2015). *Improving sustainability during hospital design and operation*. Cham: Springer, Green Energy and Technology.

Centre of Health Protection. (2017). *Major health indicators in 2015 and 2016*. Retrieved October 14, from http://www.chp.gov.hk/en/data/4/10/27/110.html

Chan, S. (2015). *Primary care development in Hong Kong*. Retrieved February 04, from http://www3.ha.org.hk/haconvention/hac2015/proceedings/downloads/MC10.2.pdf

Cheung, E. (2018, July 11). *Kwai Tsing residents to benefit from subsidised health care plan*. Retrieved from www.scmp.com/news/hong-kong/health-environment/article/2154703/new-plan-give-hong-kongs-vulnerable-subsidised

Cheung, E. (2019, March 01). *Review red tape issues, health chief urges hospital authority*. Retrieved from www.scmp.com/news/hong-kong/health-environment/article/2188285/review-system-and-cut-through-red-tape-hong-kong

Chiu, A. P. (2011). *An overview of primary care development in Hong Kong (Rep.)*. Department of Health. Retrieved from https://www.cuhk.edu.hk/hkiaps/conference/event/PPT/CHIU%20Amy_0303.pdf

CMA. (n.d.). Retrieved from https://www.cma.ca/en/Pages/cma_default.aspx

Crisp, N. (2017). What would a sustainable health and care system look like? *BMJ, 358*, j3895.

Cylus, J., Nolte, E., Figueras, J., & McKee, M. (2016). What, if anything, does the EuroHealth consumer index actually tell us?. *BMJ Blogs*.

Davis, K., Stremikis, K., Schoen, C., & Squires, D. (2014). Mirror, mirror on the wall, 2014 update: How the US health care system compares internationally. *The Commonwealth Fund, 16*, 1–31.

Department of Health. (2012). *Welcome to the primary care directory!*. Retrieved from http://www.pcdirectory.gov.hk/english/welcome/welcome.html

Duckett, S., & Willcox, S. (2015). *The Australian health care system* (5th ed.). Oxford: Oxford University Press.

Eckermann, S., & Sheridan, L. (2016). Supporting medicare health, equity and efficiency in Australia: Policies undermining bulk billing need to be scrapped. *Applied Health Economics and Health Policy, 14*(5), 511–514.

Elder, D. (2018, May 09). *£8m health village plan 'well advanced'*. Retrieved from https://www.midulstermail.co.uk/news/health/8m-health-village-plan-well-advanced-1-8491210

Ferlie, E. B., & Shortell, S. M. (2001). Improving the quality of health care in the United Kingdom and the United States: A framework for change. *The Milbank Quarterly, 79*(2), 281–315.

Fineberg, H. V. (2012). A successful and sustainable health system—How to get there from here. *New England Journal of Medicine, 366*(11), 1020–1027.

Food and Health Bureau. (2005). *Building a healthy tomorrow discussion paper on the future service delivery model for our health care system*. Retrieved from http://www.info.gov.hk/archive/consult/2005/hmdac_paper_e.pdf

Food and Health Bureau. (2008). *Your health your life: Healthcare reform consultation document*. Retrieved from http://www.fhb.gov.hk/beStrong/files/consultation/exsummary_eng.pdf

Food and Health Bureau. (2015). *Primary care development in Hong Kong*. In HA Convention 2015. Retrieved from Government of the HKSAR, from http://www3.ha.org.hk/haconvention/hac2015/proceedings/downloads/MC10.2.pdf

Fry, J. (1969). *Medicine in three societies*. Lancaster: Medical and Technical Publishing.

Fry, J. (1993). *General practice: The facts*. Oxford: Radcliffe Medical Press.

Griffiths, S. M., & Lee, J. P. (2012). Developing primary care in Hong Kong: Evidence into practice and the development of reference frameworks. *Hong Kong Medical Journal, 18*(5), 429–434.

Grosios, K., Gahan, P. B., & Burbidge, J. (2010). Overview of healthcare in the UK. *EPMA Journal, 1*(4), 529–534.

Grosios, K., Gahan, P. B., & Burbidge, J. (2012). Healthcare in the UK–predictive, preventive and personalised medicine perspective at the beginning of the twenty-first century. In *Healthcare overview* (pp. 31–44). Dordrecht: Springer.

Gruen, R. L., Elliott, J. H., Nolan, M. L., Lawton, P. D., Parkhill, A., McLaren, C. J., & Lavis, J. N. (2008). Sustainability science: An integrated approach for health-programme planning. *The Lancet, 372*(9649), 1579–1589.

Health Canada (2002, November 25). "*Canada Health Act overview, 2002*. About Health Canada. Canada

Health of Scotland's Population – Life Expectancy. (2017). *Scottish Government*. Retrieved from www.gov.scot

Ho, W. T., & Fong, B. Y. F. (2017). Public private partnership in health and long-term care: The Hong Kong experience. In B. Y. F. Fong, A. Ng, & P. Yuen (Eds.), *Sustainable health and long-term care solutions for an aging population* (pp. 103–124). Hershey: IGI Global.

Hong Kong Special Administrative Region Government. (2017). *Policy address 2017*. Retrieved from https://www.policyaddress.gov.hk/2017/eng/policy_ch05.html

Hutchison, B., Levesque, J. F., Strumpf, E., & Coyle, N. (2011). Primary health care in Canada: Systems in motion. *The Milbank Quarterly, 89*(2), 256–288.

Kong, X., Yang, Y., Gao, J., Guan, J., Liu, Y., Wang, R., Xing, B., Li, Y., & Ma, W. (2015). Overview of the health care system in Hong Kong and its referential significance to mainland China. *Journal of the Chinese Medical Association, 78*(10), 569–573.

Law, V. T. (2019). Intergenerational and sustainable development. In F. W. Leal (Ed.), *Encyclopedia of sustainability in higher education*. Cham: Springer.

Makarenko, J. (2010). *Canada's health care system: An overview of public and private participation*. Maple Leaf Web.

Marchildon, G. P. (2004). The public/private debate in the funding, administration and delivery of healthcare in Canada. *HealthcarePapers, 4*(4), 61–68.

Marchildon, G. P. (2009). The policy history of Canadian medicare. *Canadian Bulletin of Medical History, 26*(2), 247–260.

Mark Regan. (2015, August 17). *There's huge health inequality between Northern Ireland and England*. Retrieved May 29, from https://www.belfasttelegraph.co.uk/opinion/news-analysis/mark-regan-theres-huge-health-inequality-between-northern-ireland-and-england-31454876.html

McDonald, F., & Duckett, S. (2017). Regulation, private health insurance, and the Australian health system. *McGill Journal of Law and Health, 11*(1), S31–S60.

McPake, B., & Mahal, A. (2017). Addressing the needs of an aging population in the health system: The Australian case. *Health Systems & Reform, 3*(3), 236–247.

Montague, T., Cochrane, B., Gogovor, A., Aylen, J., Martin, L., & Nemis-White, J. (2018). Healthcare in Canada: Choices going forward. *Healthcare Quarterly (Toronto, Ont.), 21*(1), 13–18.

Ng, T. K., Fong, B. Y., & Kwong, C. K. (2019). Transition of hospital acute-centric to long term care in an ageing population in Hong Kong-is it an issue of service gap? *Asia-Pacific Journal of Health Management, 14*(1), 11–11.

Olsen, I. T. (1998). Sustainability of health care: A framework for analysis. *Health Policy and Planning, 13*(3), 287–295.

Primary Care: Partnerships in Action. (2014, May 21). Retrieved from https://www.gov.uk/government/publications/primary-care-working-in-partnership/primary-care-partnerships-in-action

Prowle, M., & Harradine, D. (2015). *Sustainable healthcare systems: An international study* (pp. 1–24, Rep.). London: The Association of Chartered Certified Accountants.

Reeve, C., Humphreys, J., Wakerman, J., Carter, M., Carroll, V., & Reeve, D. (2015). Strengthening primary health care: Achieving health gains in a remote region of Australia. *Medical Journal of Australia, 202*(9), 483–487.

Sowa, P. M., Kault, S., Byrnes, J., Ng, S. K., Comans, T., & Scuffham, P. A. (2018). Private health insurance incentives in Australia: In search of cost-effective adjustments. *Applied Health Economics and Health Policy, 16*(1), 31–41.

Spring Budget 2017. London: HM Treasury. 8 March 2017. The £122.5bn budget consists of £116.4bn Departmental Expenditure Limit (operating budget) and £6.1bn capital budget.

Squires, D., & Anderson, C. (2015). US health care from a global perspective: Spending, use of services, prices, and health in 13 countries. *The Commonwealth Fund, 15*, 1–16.

Starfield, B. (1992). *Primary care: Concept, evaluation, and policy*. New York: Oxford University Press.

Steele, D., & Cylus, J. (2012). United Kingdom (Scotland): Health system review. *Health Systems in Transition, 14*(9), 1–150.

Swerissen, H., & Duckett, S. (2018). *Mapping primary care in Australia*. Melbourne: Grattan Institute.

Tsui, Y. M., & Fong, B. Y. F. (2018). Waiting time in public hospitals: Case study of total joint replacement in Hong Kong. *Public Administration and Policy: An Asia-Pacific Journal, 21*(2), 120–133. https://doi.org/10.1108/PAP-10-2018-009.

Willis, E., Reynolds, L., & Keleher, H. (Eds.). (2016). *Understanding the Australian health care system*. London: Elsevier Health Sciences.

Wong, E. L., Yeoh, E. K., Chau, P. Y., Yam, C. H., Cheung, A. W., & Fung, H. (2015). How shall we examine and learn about public-private partnerships (PPPs) in the health sector? Realist evaluation of PPPs in Hong Kong. *Social Science & Medicine, 147*, 261–269.

Wong, C. Y., Greene, J., Dolja-Gore, X., & van Gool, K. (2017). The rise and fall in out-of-pocket costs in Australia: An analysis of the strengthening medicare reforms. *Health Economics, 26*(8), 962–979.

Zafar, A. (2018, February 08). *Canadian seniors 'less satisfied with the healthcare system' than in other countries, report suggests|CBC News*. Retrieved from https://www.cbc.ca/news/health/seniors-satisfaction-cihi-1.4525303

Chapter 5
The Role of the Mass Media in Health Care

Anthony Y. H. Fung and Alex H. Y. Lau

Introduction

Since the beginning of the twenty-first century, information technology evolution such as Internet and smartphone popularisation has been changing the daily life of people and its quality in the world. During the past decade, the traditional print media have been replaced by the more participative electronic form of the Internet and social media. More and more people in the community prefer the "new" media. Governments are using social media for promotion of policies and issues. As an institution of the modern society, the use of media, or new media, for enhancing the health-care system, particularly in an ageing population, is not yet the mainstream practice. A controversy of whether the mass media is appropriate to bear the responsibility to transfer the right approaches and ideas of medical information precisely has always been the hot topic of debate in the public.

Development of Mass Media

Mass media is the communication used to reach the vast majority of the general public in a short interval through written, spoken or broadcast communication (Coleman n.d.). Mass media can be divided into different forms, including broadcast

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media like films, radio or television, digital media such as Internet comprising social media and websites, mobile mass communication, outdoor media of billboards and the print media of newspapers, magazines, leaflets and so on. Organisations that control media technologies like television stations or publishing companies are known as the mass media. Event and public speaking are also considered as a form of mass media. Following the explosion of digital communication technology in the late twentieth and early twenty-first centuries, lots of different types of media are launched, such as cell phones, video games, etc. In recent years, a new concept called "key opinion leaders" (KOLs) has become more popular in the communication world. KOL can be a person or organisation that has a strong social network that can have influence in a respective field (Kontiokari 2017). KOLs are active in the social media. By posting videos or articles, they easily earn more trust and followers. Most of the companies believe that the more the number of followers, the higher the amount of financial gain (WARC 2016). Eventually, they are willing to cooperate with KOLs in order to promote a product or brand. In 2016, the luxury fashion brand Givenchy partnered with a KOL in China to promote the sale of the limited handbags that were sold out in a short time (Cosmetics China 2017). Obviously the power of media can alter the world with great impact to a variety of different fields via different platforms.

Characteristics of Mass Media

In general, there are lots of characteristics of mass media. According to John Thompson of the Cambridge University, the characteristics of mass communication have been identified as "information distribution", which means a single person or organisation delivers and disseminates mass-produced products to a great number of audience, in the concept of "reaching out to those far removed in time and space" (Thompson 2013). At the end of the twentieth century, the tradition had been subverted by the development of the Internet. Any information can be received by anyone or spread out to the world instantly anywhere and anytime as long as people can connect to the Internet. Internet has not only broken the geographic and time limitations in people's daily life, but it has also spurred the development of the multimedia. By using animations and movies, news announcements become more lively and dynamic. This new characteristic connects the news publishers and readers much more closely and more interactively. Today, no matter who you are and where you are, the Internet has become a large part of daily life for everyone. Internet has also caused the convergence of the online community. Features and applications of the Internet have attracted more people to disseminate information and to exchange views, including overseeing the operations of the government and mobilising the masses to protest.

The mass media are not only reporting the news but also bearing a role of providing the link between government and the people in information transmission, especially in relations to the delivery of health-care services (CliffsNotes n.d.).

Health-care information refers to all issues concerning the services, education, medical problems and the medical institutions. The information can be defined as a different form like a standard communication of the organisation (Centers for Disease Control and Prevention 2011). It is necessary to manage and deliver the information effectively.

Influences of the Mass Media on Primary Care

Positive Influences: Examples

Positive Influence of Media in Promoting Organ Donation

Hong Kong citizens are paying more attention to organ donation in recent years. Whether living or deceased organ donations, the ratio of the participation number in organ transplantation is lower than those in other countries (International Registry in Organ Donation and Transplantation 2018). To attract more citizens' attention in organ donation, media channels like television advertisement, print media and social media have been used by the Hong Kong government and NGOs. In the past, studies have investigated in how to present the donation message via the media (Feeley and Vincent 2007). A study to explore the relationships between the social media and organ donation news had been conducted by the Hong Kong Shue Yan University in 2017 (Radio Television Hong Kong 2017). The research pointed out that more than half of the respondents in Hong Kong had acquired information through social media (Levy 2017). It also indicated that Facebook was the most popular platform for people to receive news among all media in Hong Kong.

Two organ transplantation cases were reported enthusiastically by the local media in 2016 and 2017. Ma Cheuk-long's case had 81 reports and Tang Kwai-sze's case had 39 reports. The media, whether print media or online, often post all relevant news from the time waiting for organ transplant to the follow-up after the transplantation operation. The concept of framing theory has been used by researchers for data analysis. In essence, the framing theory is about how something is presented to the audience (Tian 2010). In terms of the media frame, texts with photos or pictures were used as the main report format in these transplantation cases. Most of the reports were said to be impartial. Positive reports were slightly higher than negative news. The contents of all the neutral and positive reports focused on personal experiences of the organ donors or patients, as well as the follow-up reports about the health status of the patients and donors after the operations. By using Facebook as an example and within 120 reports, nearly all users commented with positive messages.

The above analysis outlines that the news related to organ donation presented by the media are most likely to be neutral and positive. The media reported the patients' conditions and health policies in organ donation, respectively. With the positive messages from majority of the Facebook users, it is beneficial to reinforce the public awareness of organ donation.

Positive Influence of Media in Promoting Healthy Lifestyles

The media do not only affect the prevalence of organ donation in the community but also evoke more people to focus on how to achieve a healthy lifestyle. Leisure time sharing with others via social media is a common activity, especially in dining and physical activities. A research conducted in the USA has found the majority of self-reported episodes are associated with sports-related contexts or eating (Oh et al. 2014). Eating behaviour is strongly affected by the media. Computer use has been associated with increased sedentary behaviour and snack consumption among youngsters, leading to obesity. Some studies have shown that the youth prefers food intake guidelines on the Internet rather than those in the real world (Bevelander et al. 2013). In Bevelander's study, teenagers were found to conform to the amount of palatable food eaten by peers through social media interaction. Thus, media influences on eating are powerful and pervasive.

Obviously media promotion casts impacts on changing lifestyles. According to the research by Guenther et al. (2006), more than half of the Americans consumed less than the recommended amounts of fruits and vegetables, despite the health benefits from fruits or vegetable. Hanks et al. (2016) investigated in the impact of the media on children's vegetable selection in the school canteen of ten schools. Vinyl banner and short television segments with health education and vegetable pictures were used in the study. It was found that the combination of branded media exposure, consisting of banners and television segments, had significantly increased the number of students who chose vegetables. It demonstrated the potential of using the media to encourage healthier choices among school children.

When considering the current trend of health promotion by media, Hong Kong compares favourably with many places elsewhere. The Department of Health launched the "EatSmart@restaurant.hk" campaign since April 2008. The public can find restaurants that provide different kinds of healthy dishes when people are eating out (Department of Health 2019). The campaign has been optimised with the Internet platform. Citizens can access the campaign more easily by using the social networks, including mobile applications.

Negative Influences

Negative Influence of Media in Increasing Pressure of Frontline Staff

With the pursuance on patient rights in health care, the mass media play an important role in delivering information and raising patient awareness in diagnosis, medication regimen, service quality and so on. The social media are not only communication platforms between health practitioners and patients but also a means to engage and to shape public perceptions in health-care issues (Bekkum and Hilton 2013). In fact, the media have been criticised for presenting unfounded information, controversial health issues as well as health risks. The media are also accused of providing inaccurate statistics and evidence with little scientific basis (Wilkins and Patterson 1987). For instance, the study by Begg et al. (1998) reported that the percentage of MMR (measles, mumps and rubella) vaccine coverage had fallen. The media had succeeded in denting parents' confidence in childhood vaccination and had affected the primary care system in disease prevention, but subsequent evidence found no direct relation between the MMR vaccine and Crohn's disease.

A telephone interview conducted by Bekkum and Hilton (2013) suggested that media coverage can cause anxieties of patients about particular health issues and related risks without any evidence provided by the health authorities. The respondents who were nurses also revealed that patients will seek further consultation about particular topical health issues frequently. Thus unfounded information offered by the media may not only have impact on people's judgement about health-care practices but also impinge on the nurses' workloads as they need to spend extra time in explaining to patients, particularly when facing with controversies.

Stakeholders of Media in Health Care

The health-care system is a complex structure linked with different stakeholders. Each stakeholder across the health-care continuum holds a unique position and forms an enormous network which interacts with each other and maintains normal operations in the whole system (Bishwajit 2016).

Government

Government is the governing authority of a political unit and geographic entity. It should not be a supremacy without constrains or restrictions. In fact, governments are serving their people as civil servants who are responsible to the citizens with due considerations for their welfare and safety. However, this is easier said than done. In 2003, the SARS outbreak was widespread around the world, particularly in China and Hong Kong. At the outset, all the information and reports were highly sensational, sensitive and important during the outbreak. Information at that time was not transparent, and there was "no mechanism" for the health authorities from China to pass the information to Hong Kong. Eventually, the SARS hit Hong Kong in late February 2003 and inflicted serious damage to the people of Hong Kong. 1755 people were diagnosed of SARS and 299 of them died during the 3-month outbreak of the emerging infectious condition (World Health Organization 2015). The Mainland Chinese and local governments were criticised that they had prompted the media "hyped" the outbreak news and exaggerated its effects (Loh et al. 2004). Had the government be more transparent in delivering the messages, the epidemic could have been controlled in a faster manner. The role of the government in influencing population health is not limited to the health sector but also to various sectors outside the health system.

Citizens

It is well recognised that the media play an enormously influential role in public responses to health issues. However, the ability of critical thinking in citizens is indispensable. In early 2019, local media reported the outbreak of measles among people working at the Hong Kong International Airport. At that time, there were many citizens showing their worry, and they began to doubt the efficacy of MMR vaccine programme received during childhood. Owing to the wide spread of improper information with exaggerated reports by the media, the public panic in the community led to the insufficient supply of measles vaccine. In fact, the mortality rate of measles is so insignificant and is lower than 0.3% generally (Gindler et al. 2004). Nearly all of the citizens born in Hong Kong are fully covered with MMR vaccination, and this means that they are immune to measles (Hong Kong Special Administrative Region 2018). Therefore, the panic and fears regarding the outbreak of measles are unwarranted. Moreover, Internet is highly accessible in searching information and in receiving online message easily. To achieve accurate information without being misled by media, it seems that Internet intelligence is the essential tool for citizens who wish to be smart when online.

The Media Industry

The code of ethics in the mass media is to find and deliver the truth to the public effectively. It is the core value for all media practitioners. Unfortunately, in recent years, there have been many conflicts between the media and medicine. On the one hand, the media prefer to use terms like “medical blunder” or “medical error” to describe incidents which are related to medical and health-care services. On the other hand, medical professionals claim that the media have played to the gallery by using overstated words to draw public attention. On 14 May 2017, Princess Margaret Hospital (PMH) made the announcement regarding a serious medical complication arising from a mistake of catheter insertion guided by ultrasound (Hong Kong Special Administrative Region 2017). The media were criticised of using “hyperbole” to deliver the news by the authority. The authority also blamed the media for obscuring the definitions between “medical incidents” and “procedures with risk”. In the case, the attending surgeon has informed the patient and her family about the risks of catheter insertion that may lead to a stroke. In fact, all medical procedures and treatments may have certain risks like side effects or complications. There is no medical treatment without any absolute potential danger in the world. The media have the responsibility to convey the right concept in medical operations rather than making exaggeration. In addition, a doctor has claimed that misleading news titles have been adopted by several media (Lee 2017). The news has presented that catheter insertion via ultrasound may increase the probability of making a mistake. Actually, a piece of evidence from a study in the UK in 2003 had proven that ultrasound localisation was a standard practice in central venous access and was recommended by health-care authorities such as the National Institute for Clinical Excellence with high efficiency and more safety (Bodenham 2003). In general, "stand for neutral" is the aim for any journalists to comply. They should report the news impartiality to the public without a standpoint. Each of the media may have their position and presentation style when they report news as usual, but it is better to maintain their views with neutrality so as to uphold a moral standard of the media practitioners.

Health-Care Professionals

Health-care professionals are persons associated with either a speciality in clinical practice or a general discipline in preventive and curative measures to maintain people's health. Apart from doctors and nurses, other allied health professionals such as pharmacists, dietician and ambulance staff, who have direct contact with patients, are health-care professionals. Health-care professionals have been denounced that they often conceal unconfirmed news to the public deliberately. In the late 1990s, the Hospital Authority (HA) had delivered information about Creutzfeldt-Jakob disease (CJD). The NHS in the UK knew that the onset probability of CJD in clients who had received vaccine injection was very low, and they did not release any information to the public to reduce anxiety. In contrast, the HA decided to announce the news to the public and the vulnerable patients (Radio Television Hong Kong 1999). It is questionable whether the HA should abandon professional judgement and risk prediction and should report everything to the public. To avoid misleading the public, medical and health institutions should respond to the media with responsibility and sincerity, as well as increasing transparency and maintaining their professional credibility. They should also try to preserve the cooperative partnerships with the media and to provide medical information. If the institution knows that the release of certain information may influence the public interest, it may wish to inform the media that the interpretation of the information may cause unnecessary panic. Authorities should also alert the media to stop issuing or to pay more attention when handling sensational information.

Mass Media in Healthy Ageing

This chapter connects mass media with the ageing population. Admittedly, doctors and health professionals want to deliver the key message of healthy ageing to the public, and nowadays numerous studies have shown that maintaining a social network via different media could create a better life for the ageing population.

Older Adults and Social Media

Up to the present, youth is not the only group that has derived any benefits from the innovation of technologies. The number of older users embracing the new technologies has grown dramatically, especially in the use of social networks and media. The survey conducted in America in 2010 reported that nearly half of Internet users aged 50–64 years and around 1 out of 4 users aged 65 or above preferred social network platform like Facebook and LinkedIn (Madden 2010). The report pointed out that social network had gained the participation of older Americans. The growth rate of these groups had multiplied more than three times compared with 1 year before. Furthermore, although email was still the primary way for older users, they started to adopt social networks for communication.

Importance of Social Media to Elder Adults

All human beings will get old, but how to achieve a better quality of life is up to individual's choice. In fact, the seniors often experience the loss of spouses and friends, while facing a decline of health (Philips Lifeline 2015). Fortunately technological advancement has provided the seniors a beneficial social network platform via social media.

To Relieve Cognitive Decline

As the world's population age, the number of people who suffer from cognitive decline has been rising continuously. Cognitive decline is a major risk factor for dementia, and Alzheimer's disease will develop eventually. Some research has suggested that cognitive decline begins in individuals aged between 45 and 60 years (Singh-Manoux et al. 2012). Therefore, early prevention is important for the older adults.

A study from the UK points out that more than half of older adults aged between 65 and 74 years have Internet access (Ofcom 2013). This phenomenon and achievement is often known as digital literacy, which means the ability to use digital tools for handling daily life tasks (Bawden 2008). Studies have proven that older adults who use the Internet have a lower risk of having a diagnosis of dementia (Almeida et al. 2012). To evaluate whether digital literacy might be associated with relieving cognitive decline in older adulthood, a study conducted in the UK had collected data from more than 5000 participants aged between 50 and 89 years from year 2002 to 2011. This study showed that participants who were current users of the Internet presented in good cognitive performance when compared with those who were not users of the Internet (Xavier et al. 2014). In order to control the computer, it is necessary for users to keep their brain in processing and input the command correctly. As a result, their brain could be trained well, and this would be beneficial in delaying the progression of cognitive decline.

To Maintain Elder's Social Circle as to Remain Body Health

Social relationship is an important factor contributing to mental health, physical conditions and behaviour because humans are social creatures by nature. Previous research has demonstrated that the risk of death among men or women who lack social and community connections is more than twice as high as those with social ties (Berkman and Syme 1979). It is commonly known that older adults often face with the loss of their loved ones and with the dysfunction of body conditions, resulting in the feelings of isolation. For example, an older adult suffering from chronic back pain will have weaker body strength and mobility, making the person homebound eventually. The social sphere of the person can be shrunk by the restriction of social mobility and communication, leading to the feelings of isolation and loneliness.

Research found that both isolation and loneliness are related to increase in mortality (Steptoe et al. 2013). In addition, the negative effects of isolation and decreased socialisation have also been associated with specific health conditions. People who are socially inactive in general are less likely to share medical conern with peers or receive health information (Steptoe et al. 2013). Low quality of social relations is also related to the development of high blood pressure, progression of cardiovascular disease and even cancer (Ertel et al. 2009).

By using social media, the seniors have the opportunity to better connect with their families and friends and broaden their social circle. This can relieve stress and help improve their mental health status. Social media not only bridge social connection gap but also become a tool for information achievement. Communication lets lonely adults overcome the feelings of loneliness (Leist 2013). Through Internet searching, older adults can access social platforms and forums like Facebook that can offer valuable health information and resources on disease prevention, diagnosis, risk of medical operations, help-seeking pathways and so on (Philips Lifeline 2015). Social network also allows users to exchange ideas with others.

Applications of New Media in Healthy Ageing

Background and Definitions

Clinical and technological advancement in modern medicine and increased awareness in public health have contributed to improvement in life expectancy in the world. It has resulted in an increasing number of people living with one or more chronic diseases as a consequence of ageing. Anderson (2004) estimated the number of people with chronic diseases to reach 133 million in 2004 and would grow to almost 157 million by 2020. To relieve these problems and health concerns, health-related technologies are being developed to solve problems arising from ageing population.

Innovations in the information and communication technology are constantly shaping the new ecology of global communication, and the general terms of "Web 2.0" has been established to explain the technological evolution. Web 2.0 defines websites and Internet tools which allow users to interact through information, ideas and thought sharing (Vozikis and Mytilinaki 2014). As part of Web 2.0, social media change the traditional communication pathway, spread information into society and advocate worldwide participation. The wider Web 2.0 movement has allowed worldwide communication without any restrictions, and the subset of health-care technologies is called "Health 2.0".

Application of Health 2.0 in Hong Kong

Health 2.0 refers to the use of diversified technologies, including electronic medical records, mobile health and telemedicine, and the use of the Internet by patients through blogs, electronic forums, online communities, patient to doctor communication systems and other advanced systems using modern cloud and mobile-based technologies. A key concept is that patients should have greater insight and control on information generated about them.

According to the Hong Kong government, the general population increased from no more than six million from 1988 to more than seven million in 2019. Over the 30 years, the size of the seniors aged 65 years or above rose dramatically from less than half million or lower than 10% to nearly 1.3 million or approximately 18%, respectively. Conversely, the proportion of children dropped from higher than a quarter to around 15%. The median age has increased from 30 to 45 years (Wong and Yeung 2019). With a rapid ageing population, promotion and maintenance of well-being among the elderly have become an urgent task that should be tackled by everyone in the community.

The healthy ageing project initiated by the Hong Kong Science and Technology Parks Corporation (HKSTP) is a typical example of Health 2.0. The project involves cross-disciplinary technologies like biomedicine, robotics as well as big data analysis to supplement the limited manpower for service provision, to improve care services and quality of life for the elderly as the ultimate goal (HKSTP 2019). In 2018, the Gerontech and Innovation Expo cum Summit hosted by the Hong Kong government and co-organised with HKSTP showcased the latest innovative products and ideas of technology application such as the variety of monitoring and caring systems and equipment that can be linked with different media usage (Hong Kong Special Administrative Region n.d.). Meanwhile, the media are beneficial for seniors.

Concluding Remarks

To sum up, the mass media play an important role as a health-care information delivery system in the community. With “Web 2.0” and “Health 2.0”, social media is the driving agent of social network. Apart from technological enhancements and whatever the traditional media or social media, there are pros and cons in the dissemination of health information. Stakeholders who are in the pool of “health message delivery” play their unique roles. While practitioners of the media must obey their professional integrity and put aside their individual standpoint, the government, health-care experts and ordinary people should be open-minded and fair when dealing with the health issues. If everyone receives health information accurately, then it is conducive to the concepts of primary care for human well-being and the community with merits.

References

Almeida, O. P., Yeap, B. B., Alfonso, H., Hankey, G. J., Flicker, L., & Norman, P. E. (2012). Older men who use computers have lower risk of dementia. *PLoS One, 7*(8), e44239. https://doi.org/10.1371/journal.pone.0044239.

Anderson, G. (2004). *Chronic conditions: Making the case for ongoing care*. Baltimore, MD: Johns Hopkins University.

Bawden, D. (2008). Origins and concepts of digital literacy. In C. Lankshear & M. Knobel (Eds.), *Digital literacies: Concepts, policies and practices* (2nd ed., pp. 17–32). New York: Peter Lang Publishing.

Begg, N., Ramsay, M., White, J., & Bozoky, Z. (1998). Media dents confidence in MMR vaccine. *BMJ, 316*(7130), 561–561. https://doi.org/10.1136/bmj.316.7130.561.

Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology, 109*(2), 186–204. https://doi.org/10.1017/cbo9780511759048.005.

Bekkum, J. E., & Hilton, S. (2013). Primary care nurses’ experiences of how the mass media influence frontline healthcare in the UK. *BMC Family Practice, 14*(178). https://doi.org/10.1186/1471-2296-14-178.

Bevelander, K. E., Anschütz, D. J., Creemers, D. H., Kleinjan, M., & Engels, R. C. (2013). The role of explicit and implicit self-esteem in peer modeling of palatable food intake: A study on social media interaction among youngsters. *PLoS One, 8*(8), e72481. https://doi.org/10.1371/journal.pone.0072481.

Bishwajit, G. (2016). Role of health journalism in promoting communication among stakeholders in healthcare sector. *Journal of Healthcare Communications, 1*(3),. 16th ser). https://doi.org/10.4172/2472-1654.100016.

Bodenham, A. R. (2003). Ultrasound guided central venous access. *BMJ, 326*(7391), 712. https://doi.org/10.1136/bmj.326.7391.712.

Centers for Disease Control and Prevention. (2011, May 10). *What is Health Communications?* Retrieved from https://www.cdc.gov/healthcommunication/healthbasics/WhatIsHC.html

CliffNotes. (n.d.). *The functions of the mass media.* Retrieved from https://www.cliffsnotes.com/study-guides/american-government/the-mass-media/the-functions-of-the-mass-media

Coleman, S. (n.d.). *What is mass media? – Definition, types, influence & examples*. Retrieved from https://study.com/academy/lesson/what-is-mass-media-definition-types-influence-examples.html

Cosmetics China. (2017, September 04). *3 Foreign brands who master Chinese marketing*. Retrieved from http://cosmeticschinaagency.com/3-foreign-brands-master-chinese-marketing/

Department of Health. (2019, May 01). *DH ESR Campaign – Background*. Retrieved 2019, from https://restaurant.eatsmart.gov.hk/eng/content.aspx?content_id=4

Ertel, K. A., Glymour, M. M., & Berkman, L. F. (2009). Social networks and health: A life course perspective integrating observational and experimental evidence. *Journal of Social and Personal Relationships, 26*(1), 73–92. https://doi.org/10.1177/0265407509105523.

Feeley, T. H., & Vincent, D. (2007). How organ donation is represented in newspaper articles in the United States. *Health Communication, 21*(2), 125–131. https://doi.org/10.1080/10410230701307022.

Gindler, J., Tinker, S., Markowitz, L., Atkinson, W., & Dales, L. (2004). Acute measles mortality in the United States, 1987–2002. *The Journal of Infectious Diseases, 189*(Supplement_1), 69–77. https://doi.org/10.1086/378565.

Guenther, P. M., Dodd, K. W., Reedy, J., & Krebs-Smith, S. M. (2006). Most Americans eat much less than recommended amounts of fruits and vegetables. *Journal of the American Dietetic Association, 106*(9), 1371–1379. https://doi.org/10.1016/j.jada.2006.06.002.

Hanks, A. S., Just, D. R., & Brumberg, A. (2016). Marketing vegetables in elementary school cafeterias to increase uptake. *Pediatrics, 138*(2), e20151720. https://doi.org/10.1542/peds.2015-1720.

Hong Kong Science and Technology Parks Corporation. (2019, March 31). *Healthy ageing platform*. Retrieved from https://www.hkstp.org/en/our-stories/technology-and-innovation/healthy-ageing-platform/

Hong Kong Special Administrative Region. (2017, May 14). *Press releases: Princess Margaret Hospital announced a serious medical complication case*. Retrieved February from https://www.info.gov.hk/gia/general/201705/14/P2017051400746.htm?fontSize=1

Hong Kong Special Administrative Region. (2018, June 06). *Press releases: Immunisation for children*. Retrieved from https://www.info.gov.hk/gia/general/201806/06/P2018060600702.htm?fontSize=1

Hong Kong Special Administrative Region. (n.d.). *Gerontech and Innovation Expo cum Summit 2018*. Retrieved from https://gies.hk/

International Registry in Organ Donation and Transplantation. (2018, December). *IRODaT Newsletter 2017*. Retrieved from http://www.irodat.org/img/database/pdf/ IRODaT Newsletter 2017.pdf.

Kontiokari, V. (2017, May 04). *Key opinion leaders: Who are they and why do they matter?* Retrieved from https://www.lianatech.com/blog/key-opinion-leaders-who-are-they-and-why-do-they-matter.html

Lee, W. (2017, May 22). *Missleading the public, and the patient will be the loser*. Retrieved March 14, 2019, from https://www.hk01.com/01博評-政經社/92578/醫療事故-來稿-誤導公眾-損失的將會是病人.

Leist, A. K. (2013). Social media use of older adults: A mini-review. *Gerontology, 59*(4), 378–384. https://doi.org/10.1159/000346818.

Levy, D. A. (2017, June 22). Reuters Institute for the Study of Journalism: Digital news report 2017. *Digital journalism*. Retrieved from https://reutersinstitute.politics.ox.ac.uk/risj-review/2017-digital-news-report-now-available.

Loh, C., Galbraith, V., & Chin, W. (2004). The media and SARS. In *At the Epicentre: Hong Kong and the SARS Outbreak* (pp. 195–214). Hong Kong: Hong Kong University Press.

Madden, M. (2010, August 27). *Older adults and social media*. Retrieved from http://www.pewinternet.org/2010/08/27/older-adults-and-social-media/

Ofcom. (2013, August 06). Internet and web based content in: Ofcom's tenth annual Communications Market Report. *The Communications Market 2013*. Retrieved from https://www.ofcom.org.uk/research-and-data/multi-sector-research/cmr/cmr13

Oh, A., Erinosho, T., Dunton, G., Perna, F. M., & Berrigan, D. (2014). Cross-sectional examination of physical and social contexts of episodes of eating and drinking in a national sample of US adults. *Public Health Nutrition, 17*(12), 2721–2729. https://doi.org/10.1017/s1368980013003315.

Philips Lifeline. (2015, December 22). *The benefits of social media for healthy aging*. Retrieved from https://www.lifeline.philips.com/resources/blog/2015/12/the-benefitsof-social-media-for-healthy-aging.html

Radio Television Hong Kong. (1999, July 15). *Ethics of medical information and its communication*. Retrieved from http://app3.rthk.hk/mediadigest/content.php?aid=1793

Radio Television Hong Kong. (2017, December 15). *Investigation in the relationship between news of organ transplant and social media*. Retrieved from http://app3.rthk.hk/mediadigest/content.php?aid=2132

Singh-Manoux, A., Kivimaki, M., Glymour, M. M., Elbaz, A., Berr, C., Ebmeier, K. P., et al. (2012). Timing of onset of cognitive decline: Results from Whitehall II prospective cohort study. *British Medical Journal, 344*(Jan04 4). https://doi.org/10.1136/bmj.d7622.

Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences, 110*(15), 5797–5801. https://doi.org/10.1073/pnas.1219686110.

Tian, Y. (2010). Organ donation on web 2.0: Content and audience analysis of organ donation videos on YouTube. *Health Communication, 25*(3), 238–246. https://doi.org/10.1080/10410231003698911.

Thompson, J. B. (2013). *Media and modernity: A social theory of the media*. Oxford: Wiley.

Vozikis, A., & Mytilinaki, D. (2014). Web 2.0 and its impact on health care quality improvement: The case of Amalia Kalyvinou. *Health Science Journal, 8*(2), 289–293.

WARC. (2016, September). *Building an influencer strategy in China: Behind the USD8 billion industry*. Retrieved from https://www.warc.com/Content/cef776db-e1af-441c-bc58-6fff27c53a1b

Wilkins, L., & Patterson, P. (1987). Risk analysis and the construction of news. *Journal of Communication, 37*(3), 80–92. https://doi.org/10.1111/j.1460-2466.1987.tb00996.x.

Wong, K., & Yeung, M. (2019, January). *Population ageing trend of Hong Kong*. Retrieved from https://www.hkeconomy.gov.hk/en/research/letters/2019.htm

World Health Organization. (2015, July 24). *Summary of probable SARS cases with onset of illness from 1 November 2002 to 31 July 2003*. Retrieved from https://www.who.int/csr/sars/country/table2004_04_21/en/

Xavier, A. J., Dorsi, E., Oliveira, C. M., Orrell, M., Demakakos, P., Biddulph, J. P., & Marmot, M. G. (2014). English longitudinal study of aging: Can internet/E-mail use reduce cognitive decline? *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 69*(9), 1117–1121. https://doi.org/10.1093/gerona/glu105.

Chapter 6
Public-Private Partnership in Primary Care

Katy N. W. Wong and Francesca Quattri

Funding Deficiencies in Primary Care in Public Sector

The Alma-Ata Declaration in 1978 recommended a change in strategy from managing illness to creating healthy communities. Global population growth, ageing, rising occurrence in chronic diseases and rising demand for primary care make preventive action more imperative. However, the Alma-Ata vision remains unrealised (Allen et al. 2018).

According to research, higher investment in primary care may generate lower expenses, higher patient satisfaction, fewer hospitalisations and emergency department visits and lower mortality (Barker et al. 2017). A 2018 report by the World Health Organization (WHO) stated that only 8 of the 30 developing countries with available data spend at least US$40 per person on primary health care per year (Primary Health Care Performance Initiative 2018; WHO and UNICEF 2018). Challenges to primary care implementation stem from the allocation of funding to disease-specific projects (termed "vertical programmes") on endemics in developing countries, such as HIV infection, tuberculosis and malaria, which pulled resources away from comprehensive care (Secci 2016).

It is not only low- and middle-income countries that lack insights on primary health-care spending, high-income countries likewise do not have a consistent pattern (Secci 2016). The latest research conducted by the Organisation for Economic Co-operation and Development (OECD) pointed out that investment in primary care is not going on quick enough to cope with the increasing burden of chronic diseases (OECD 2017). This phenomenon has a lot to do with respective

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government policy and its understanding of the priority and importance of primary health care. In most countries, policy direction and public funding allocation favour hospital-based clinical services, rather than primary care activities such as health promotion, prevention and rehabilitation.

According to a study in *Journal of the American Medical Association* (JAMA), the United States of America (USA) health-care spending allocated to primary care ranges only between 5.8% and 7.7% of the total health expenditure, while leading researchers suggest that doubling its financing to 10–12% would be optimal for improved outcomes and overall reduced expenditures (Phillips Jr. and Bazemore 2010). In an updated report in 2013, authors reported a possible decrease in the number of patients served by community centres, if continued federal funding is not provided – from 25.6 million in 2014 to 18.8 million by 2020 (Ku et al. 2013).

In Europe, primary care expenditure varies strongly among countries, from 4.7% in the Czech Republic to 25.6% in Switzerland (Kringos et al. 2015). Japan, Korea, Portugal and Turkey also lack strong primary care to strengthen prevention and treatment and reduce the demand for secondary care. Notwithstanding their efforts to reduce the reliance on hospital care through policy reform, the progress is still lagging behind a lot of other developed countries (OECD 2017).

The most critical thing is to assure sufficient funding for the primary care sector. Even in countries where primary care is well established, such as the United Kingdom (UK), funding for primary care (a share of the NHS budget) decreased every year from 8.3% in 2010 to 7.9% in 2014 (Allen et al. 2018; Baird et al. 2016). Even with the increase in funding to £1.8 billion for primary care proposed by the National Health Service (NHS) England by 2021, the analysis shows that there would still be a shortfall of approximately £580 million to fund the workforce of primary care (UK Parliament 2016).

Impact of Funding Deficiency

Despite knowing the importance of primary care, countries face different challenges in their implementation in the public sector. In the context of global ageing, rising occurrence of chronic disease and rising costs, most public sectors have stretched to reach the ceiling, making it very difficult for resources to be diverted from the existing services to enhance primary care and community medicine. It has been an apparent phenomenon in Hong Kong. Numerous patients without urgent medical needs have been going to public accident and emergency units when public outpatient clinic services are unavailable. The primary public care services have been overstretched to meet its growing demand (Legislative Council 2015). In Hong Kong, due to limited capacity provided by the public sector, primary care is basically offered by the private sector, in the form of solo or group practice (FHB 2008). This compartmentalisation of the public and private sectors brings problems such as private-public imbalance, limited patient choices, shortage of workforce and restricted collaboration between the two sectors. It is considered cost-ineffective, and it affects the continuity of overall medical services (Ho and Fong 2019).

In response, countries are trying to reach the right balance between public and private sectors in the provision of health care and its financing to achieve efficiency and cost-effectiveness (Hsu 2010).

Development of Public-Private Partnerships

In recent years, both developed and developing countries have encouraged greater private sector involvement in health service provision and financing. Countries have a growing understanding that the role of government should distance itself from the provider role in health care. With greater private sector involvement in health-care provision, it is believed that system efficiency can be improved (Lim 2005).

While the public sector has been heavily burdened, the private sector is seen to be providing excellent primary care services and more personalised choices, which are more readily accessible. In private sector provision, patients are given more choices and more responsive care according to the individual's needs and requests (Yeoh 2002). Many private doctors have built up continuing relationships with their patients, a fundamental aspect of patient-centred approach to care that is beneficial for the long-term continuity of the same (FHB 2008). As a large number of Hong Kong patients seeking advice from the private also receive care from the public sector, greater collaboration and interface between the public and private sectors are essential to enhance the comprehensiveness of the provision of care as a whole and improve long-term care and consistency in services (FHB 2008).

Indeed, one of the recommendations for health-care reform is to promote public-private collaboration. The World Health Organization (WHO) defines partnership (Kickbusch and Quick 1998) as "bringing together a set of actors for the common goal of improving the health of populations based on mutually agreed roles and principles" (Wong et al. 2015). In the international perspective, different modes of public-private partnerships include collaborations like contracting public services, funding by the private sector, assigning of building construction and design to one sector and funding corporate social responsibility projects with co-regulatory mechanisms (Buse and Waxman 2001).

Public-private partnerships (PPPs) allow the public and private sectors to join hand in hand in a contractual relationship to deliver high-quality public services (Abuzaineh et al. 2018). By involving the private sector, the existing system and management within the government and public infrastructure can be strengthened. Additional resources could also be mobilised from the private sector to the public sector (Kwak et al. 2009). Such collaboration is expected to provide better and more efficient services than the public service alone. PPP can fill the service gap and leverage primary care for effective disease management, better health outcomes and prevention (Quality Healthcare Medical Services Limited 2016). It also creates a triple-win solution for different stakeholders in the community, such as the patients, the government and the private medical practitioners.

International Experience

Advantages of Public-Private Partnership

The following case studies are meant to show some of the main advantages of current PPPs on primary care. All case studies share common features and show the enormous potential of primary care in improving population health.

Accessibility and Affordability of Health-Care Services

PPP must meet the public's needs effectively and efficiently. Through PPP, patient choices for primary care could be expanded from the existing public outpatient services to the private service. They ensure the accessibility of health care and affordability of medical expenses. Long-term care can also be achieved when patients are followed up by the same doctor (FHB 2008).

The Hospital Authority (HA) in Hong Kong launched the General Outpatient Clinic Public-Private Partnership Programme (GOPC PPP) in 2014 to decrease the waiting time for public general outpatient clinics, to increase the provision of primary care and to promote the concept of preventive care in primary care. Under the programme, HA purchases primary care services from private clinicians for patients who have chronic diseases requiring long-term care such as hypertension or diabetes mellitus and are in stable conditions. Each participant is entitled ten subsidised consultations per year by private clinicians at a price equivalent to the public general outpatient clinics, i.e. HKD$45 per consultation inclusive of drugs (Legislative Council 2015). Patients' responses have been positive as they have a choice over service providers and can be followed up by the same doctor to receive continuity of health care (Ho and Fong 2019); E-Health Record Office 2016).

Alleviating Burden and Sharing Risk for the Public Sector

By shifting the patient load to the private sector, public hospitals are allowed to concentrate on their priority services such as acute and emergency care, as well as the second and third tier care. It greatly relieves the demands on hospital service and allows the government to share the responsibility of health providers with the private sector (FHB 2008). In some cases, the government and the private sector share design, financing, political and demand risks of delivering a service and allocate the risks to the party who has the best capacity to manage it (FHB 2008; Ministry of Finance Singapore 2016).

The Lesotho Health Network in Africa, a public-private partnership in primary care, is another example of risk alleviation and prioritisation of primary care. A small country in Southern Africa, Lesotho has been experiencing a health crisis since the 1990s. Tuberculosis in Lesotho scores the highest incidence worldwide, and more than 74% of the population is HIV positive. GPs' presence and monitoring are crucial to the patients. In 2005, through the government efforts and with the overwhelming help of the private sector and the International Finance Corporation of the World Bank Group, three primary care clinics were created to provide essential public health services in the greater Maseru area.

The Lesotho Hospital PPP is a pioneering model for integrated primary healthcare delivery, the first in Africa. The private operator designs and builds the structure. It then manages the full operations of the hospital and associated clinics, including the three clinics (World Bank International Finance Corporation 2011). The clinics help in freeing up and alleviating burden of the hospital capacity by treating less severe cases in this mini-health-care network. Five years since its inception, the clinics have managed to improve the overall health-care outcomes and have adopted more advanced medical technologies. Overall, the clinics offer faster services, for example, laboratory results within 1 h, clean and safe environment and better and adequate medical equipment (World Health Organization 2016).

Achieving Savings and Enhancing Cost-Effectiveness

PPP allows governments to obtain the best value for money and enhance and improve the cost-effectiveness of the public services (Ministry of Finance Singapore 2016), by buying of services at a lower price through bulk contracts from the private sector. It also enables the community to make fuller use of available human resources to achieve optimal utilisation (FHB 2008).

The Alzira model (de Rosa Torner 2012), implemented at the Hospital De La Ribera in Valencia of Spain, is a pioneer model of PPP in primary care and a good example of enhancement of cost-effectiveness. The model currently provides free primary care diagnostic tools previously unavailable or of low quality, and it assumingly helps saving investments for the construction of another public hospital in the region (United Nations Economic Commission for Europe, World Health Organization, & Asian Development Bank 2012).

Mutual Expertise and Experience and Healthy Competition and Collaboration

PPP collects experts' opinions and experiences from both the public and private sectors (Ho and Fong 2019). PPP enables the introduction of technology and innovative solutions to improve operational efficiency (World Bank 2016). The more balanced spread of caseload creates healthy competition to enhance service quality and standard (FHB 2008). The unity of responsibilities to strive for a common goal for service delivery is also encouraged.

In Singapore, the collaboration between the two sectors has advanced public-private partnership in health-care financing and provision. In the 1980s, the government decided to subsidise health care to an affordable level, and citizens would share the expenses of the services they consumed. This led to the introduction of the 3 M system, which successfully mobilised private financial resources. Meanwhile, Medisave, the government-led medical savings accounts (mandatory for the labour force), amounts to S$30 billion, which was enough to pay for the total population's health-care costs for the following 5 years. The government succeeded in one of its most laborious tasks of shifting the financial burden from the government to the private sector (Lim 2005).

Business Opportunities for the Private Sector

The design of the PPP business model offers new business opportunities to the private sector. The private sector can be invited to participate in different parts of service delivery, from design, construction, operations to maintenance, which are generally undertaken by public organisations. PPP also provides opportunities for the private sector to offer innovative solutions for public services. The valuable experience gained in conducting the PPP projects may also enhance the competitiveness of the companies to win overseas contracts (Ministry of Finance Singapore 2016).

The private sector can and should come to the support of governments when needed. This is what happened in the case of the Alzira model mentioned earlier. The hospital became operational in 1999, but the private partner withdrew from the contract due to heavy losses after 4 years. This required the intervention of the Spanish Health Administration, which injected money while also allowing the private partner Adeslas SA to purchase assets and receive compensation for the loss. The model was re-launched with a 15-year contract and had been running since (Expert Panel on Effective Ways of Investing in Health 2014). The Valencia hospital currently receives funding from the government, including coverage for the personnel and operating expenses and investments in infrastructure and machinery, while offering visits from primary care hospital doctors and specialist consultants. Propositions have been made to improve primary care at the institution further, engaging more specialists in combined consultations.

Since 2009, the Chinese government has been initiating reforms to restructure its primary care system in response to the increasing public concerns over difficulties in accessing quality health care and affording expensive medical fees. Since the development of primary care is still in its infancy in China, the private sector including foreign investors has been encouraged to invest in primary care to bring in the best practices and expertise in policy planning to facilitate the implementation of innovative primary care models. The programme comprises a PPP model with elderly care facilities built by the government and operated by private companies. Over the years, many leading primary care and elderly care companies have founded their businesses in the Guangdong province. It is anticipated that the primary care service market in China will grow from £42.6 billion in 2014 to £98.51 billion by 2020, creating a tremendous commercial opportunity for the private sector (KPMG 2016).

In other countries contracting has been proved to be an effective way for the private sector to actively participate in preventive health care while paving the way to improved quality services (Farahbakhsh et al. 2012). Like other developing countries, Azerbaijan has experienced a rise in population with an increase in fertility rates in women aged 19–25 over recent years (OECD data). According to the Institute for Health Metrics and Evaluation (IHME), although the mortality rates under aged 1 and 5 have steadily decreased since the 1990s, the leading causes of most premature deaths are communicable, maternal, neonatal and nutritional diseases, which also cause most problems of disability later in life. In Azerbaijan, the government is in charge of preventative health services but guarantees very little welfare, so the rest of the population opts for out-of-pocket payments when possible (Institute for Health Metrics and Evaluation 2019). To tackle the need for better primary care and more intervention from the private sector, cooperative health centres (CHCs) have been created, where each CHC delivers preventive health services to a population between 9000 and 17,000. The government provides an initial subsidy, and then contracts are signed between the CHCs and the provincial health departments. Each CHC shall have at least seven practitioners, besides nurses and environmental health specialists. Researchers have found that CHCs are better than public hospitals in providing primary care to the elderly, women and preschool children. They follow up patients more efficiently than the public counterparts in screening and health programmes. The staff are happier than in public hospitals, and customers scored a higher satisfaction rate as well (Farahbakhsh et al. 2012).

Real or Potential Demerits

There exist some common areas of weakness in PPP models. These can become real or potential demerits of the models. These weaknesses are unrelated to the overall wealth and GDP of the country. Three main overlapping shortcomings among the models are identified.

Scepticism and Partisanship

The Valencia and Lesotho experiences show that changes in political philosophies can significantly affect outstanding projects, leading to the halting or withdrawing existing funds. Political changes represent one major challenge for PPPs and shall be counteracted by the long-term commitment of the partners and by leaving aside political feelings (PricewaterhouseCoopers 2018). Despite occasional turmoil, Bhutan, Mozambique, Sri Lanka and Peru have set an example in founding PPPs in primary care that work well, proving the sceptics wrong. Scepticism used to loom large upon the relationship between the private and the public sectors, which for a long time are characterised by antagonism, suspicion of profit and confrontation. Nowadays, there seems to exist more and overall understanding about the need of the two sectors to cooperate. This is now a fact that shall leverage more fruitful exchanges.

Lack of Funds

Mobilisation of resources is often the first step towards PPPs. The dearth of public funds for primary health-care services, especially in rural areas, represents a chronic problem in health-care management. In a 2014 report, Oxfam denounced that the three Lesotho clinics were profusely paying their partners while decimating funds for rural areas. Moreover, health spending in Lesotho was initially not directed towards primary care but urban-based tertiary care (Webster 2015). In a 2006 scandal of primary care clinics handed over to NGOs in India, the public accused the government of neglecting the clinics and not injecting enough public money, leading to unrenewed contracts and the loss of valuable primary services for the rural population. These services were needed to tackle diarrhoea, tuberculosis, malaria, hepatitis, chikungunya and other acute conditions (Tanwar et al. 2016).

Abuse of Power and Mismanagement

The collaboration between private and public does not solely include savvy management skills but also transparency and observance of an ethical compass. Abuse of power, vested interests and corruption can easily sweep away the efforts made by many over time and silence the expectations of the public towards a better, safer and timely health care. In the Indian state government of Bihar, one of the first in the country to introduce the concept of PPP and primary care clinics, the partners have managed to provide pathology, diagnostic and ambulance services but failed miserably to meet their duties. The ambulance contract has got suspended; the pathology laboratory started contracting out work (Tanwar et al. 2016).

Concrete Tasks, Concrete Expectations and a Fair Division of Labour

The European Union (EU) Executive Agency for Health and Consumers (EAHC) recently acknowledged, at the end of a thorough investigation on PPPs and PFI (accommodation-only partnerships) in primary care, the lack of “convincing methodology for reviewing, at national or European level, the economic and clinical impacts of PFI and PPPs.[…]", the reasons being the presence of "too many co-founders", small programmes and "diverse statistical data". Lack of methodology and sound management has also been behind inadequate primary care facilities in Lesotho, with insufficient numbers of specialists, equipment and supplies. The lack of coordinated action at the facilities has hindered the attempt to refer patients to primary, secondary or tertiary care adequately. Roughly 70% of all cases treated in the Lesotho PPP have assumingly bypassed primary care (World Health Organization 2016). If strategic planning was put in place, the primary health-care system would have been scrutinised and possibly renewed, followed by the construction of the clinics.

Researchers in London raised another important issue about the establishment of sound PPPs, namely, that all stakeholders have realistic expectations about their share of responsibilities and gains and that they all commit to the cause (Mudyarabikwa et al. 2017). Micromanagement instead of large projects could be a solution to achieve such a goal, and the Azerbaijan's CHCs represent a case of small yet effective and flexible PPPs.

Towards A Model of Successful PPP in Primary Care

Primary Care at the Core for Efficiency and Effectiveness

For a reference model of PPP in primary care to be developed, PPP shall be in "an agreement between two or more partners" and "with a common interest in positive outcomes of the partnership". The partners have a common understanding of what to expect from each other, and they share the belief (alias trust) that each partner will behave by the established agreements (Mitchell 2008).

Functioning primary care services are the pillars of every healthy health-care system. Systems mostly leveraging on primary care and general practice achieve better results in population health outcomes, equity, access and continuity of care, low costs and high-quality care (World Health Organization Europe 2004) – all the goals that PPPs should strive. Advantages and real and potential demerits of PPP in primary care worldwide have been presented in this chapter, and the cases have demonstrated PPP's potential of increasing efficiency and effectiveness in health care, while maximising costs and minimising waste. Nonetheless, they require experienced and sufficient medical human resources, vision, commitment, flexibility and shared values between stakeholders and the involved third parties. Based on these experiences, a reference model of PPP in primary care is proposed that shall serve as a guideline towards the creation of high-quality preventive services, while tackling future health-care challenges that the model may encounter and potential solutions, without idealism aims.

Efficiency and Effectiveness

For a PPP to be effective and efficient, both private and public sectors shall acknowledge their respective strengths and interdependencies and work together towards common goals of better, faster and personalised primary health-care services and products. Lack of funding and financial constraints will be endemic in the process, thus requiring savvy management from the government and top level. In this situation, the public sector may work with private organisations using regulations, guidelines, monitoring and control, safety issues and quality check. Conversely, the private sector may help with the creation and management of networks, medical machinery, training and the deployment of services and products, including serving the remote areas. According to recent estimates, 57% of the total budget for the deployment of a new PPP shall cover operating expenses only (World Bank International Finance Corporation 2011).

A successful PPP brings both financial and non-financial advantages to its partners, the public and the third parties involved. Partners shall, therefore, report mutual gains, i.e. cost containment and reduction of waste and redundancy while observing rules and responsibilities. They shall also guarantee a constant transfer of R&D, technology and innovation. In doing so, they would both gain prestige and public influence. Successful PPP for the public will entail good accessible primary health-care services and products, taking advantage of the skills and expertise from both the public and the private sector and getting better through state-of-the-art technologies. Timely, better and personalised services, contained costs and universal welfare and health-care coverage shall be guaranteed.

Third parties, including pharmaceutical producers, directly or indirectly involved in the success of PPP, will also gain in prestige and augmented social influence for the company with high ethical etiquette. Stakeholders must coordinate resources, ensure transparency and implement a shared set of operating principles. Sound governance, management and monitoring of the PPP are significant assets. Cooperation at the governance and managerial levels must be guaranteed. Medical personnel in primary care must be trained and well nurtured. Rural areas and remote areas shall get access to good-quality primary care. Governments and the private sector shall commit long-term commitments to inject adequate capitals into the projects.

Many of these concepts and values (Fig. 6.1) have been pinned by the Norwegian government, while planning the development of two national existing partnership models of primary care in Norway, including the Community Care Network (CCN) (Bakke and Vege 2012). The Norwegian health-care system is well-known for providing comprehensive care from the cradle to the grave and for being one of the best health-care systems in the world.

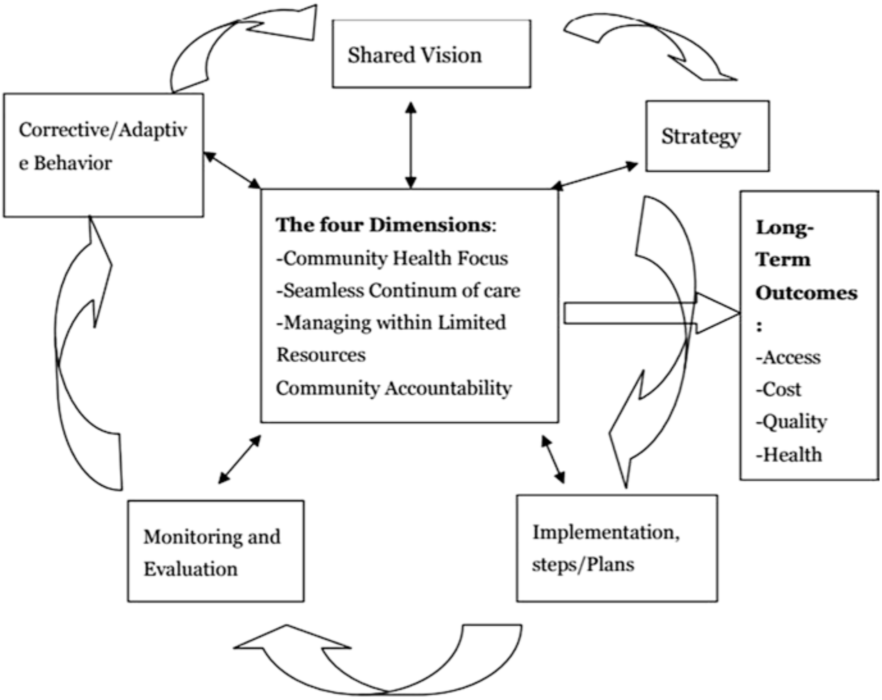

Fig. 6.1 CCN operational model of action. (Source Shortell et al. (2002). Evaluating partnerships. *Journal of Health Politics, Policy, and Law, 27*(1), 49–52; in Bakke and Vege 2012)

Long-Term and Successful PPP Models

A long-term, successful model of PPP shall strive for:

1. Effectiveness, leading to equity
2. Efficiency, leading to the wise use of resources
3. Technological improvements, leading to (1) and (2) and better-provided quality of health care

Nonetheless, these objectives are potential challenges for the model to thrive. They each contain potential harms and risks. Equity and effectiveness are not easy tasks to achieve (Ho and Fong 2018). All PPPs are vulnerable to increased costs, lower quality, corruption and oligopoly, which in turn can threaten welfare and lead to limited medical services and products. A possible solution to this dooming scenario would be risk sharing between the public and the private sectors as well as strict monitoring and regulation by the public sector over the private one.

Efficiency shall result in more gains and fewer losses for all involved parties. This is a hard task to achieve. Health-care costs are already skyrocketing due to external and uncontrollable variables in any health-care system, including demographic changes, like an ageing population and slow demographic growth, and the upsurge of chronic and acute diseases worldwide. Complex, new and high-quality health-care services and products are considerably costly. The risk of striving to too much efficiency in the implementation of a PPP may cause a reduction in quality and may result in reduced welfare, oligopoly or even higher expenditure for the provision of health care. These clearly are unbearable risks for the health-care systems and will lead to the brink of collapse, making care unaffordable even for the middle classes. A possible solution would be shared risk management and strategic planning. The public sector has already strong incentives in defining the structure of the work to lead resources' allocation.

While technology, R&D and innovation help to improve and guarantee the quality of care, the risks that come with them include recyclable services and products, fake care and redundant and outdated services. The possible solution would be the promotion of accountability, implying the division of roles and responsibilities between the sectors. There shall also be improved and favourable normative contexts, which allow newcomers and old-timers to compete on the market for the best possible health care fairly. Respected, already broadly accepted medical standards and guidelines shall also be adopted as the contractual playground for further development, so to guarantee quality and safety and protect patients and consumers. Sound PPP in preventive care also requires the collaboration between health-care providers, courthouses, police, policymakers and legislative bodies.

Concluding Remarks

PPP is a collaboration between the public and private sectors that enables fulfilment of certain common goals by drawing expertise from both sectors (Quality Healthcare Medical Services Limited 2016). As illustrated, a successful PPP model can enhance accessibility and affordability of health-care services, particularly in the primary care, alleviate burdens and share risk, achieve savings and enhance cost-effectiveness, foster mutual expertise and collaboration as well as provide business opportunities. Notwithstanding the many advantages, weaknesses of some PPP models include scepticism and partisanship, shortage of funds, abuse of power and mismanagement and the lack of concrete tasks and a fair division of labour. As a way forward, PPP is one option for governments to build a stronger primary health care. In order to establish a well-designed model that achieves greater effectiveness and efficiency, careful risk sharing between the private and the public sector is pivotal, accompanied by strict monitoring and regulation, strategic planning and the promotion of accountability.

References

Abuzaineh, N., Brashers, E., Foong, S., Feachem, R., & Da Rita, P. (2018). *PPPs in healthcare: Models, lessons and trends for the future. Healthcare public-private partnership series*, No. 4. San Francisco: The Global Health Group, Institute for Global Health Sciences, University of California, San Francisco and PwC. Produced in the United States of America. First Edition, January 2018.

Allen, L. N., Barkley, S., De Maeseneer, J., van Weel, C., Kluge, H., de Wit, N., & Greenhalgh, T. (2018). Unfulfilled potential of primary care in Europe. *BMJ, 363*, k4469.

Baird, B., Charles, A., Honeyman, M., Maguire, D., & Das, P. (2016). *Understanding pressures in general practice*. London: King's Fund.

Bakke, T., & Vege, A. (2012). *The use of public-private partnerships in quality improvement in the primary care services. A description of two models*. Norway: Norwegian Institute of Public Health.

Barker, I., Steventon, A., & Deeny, S. R. (2017). Association between continuity of care in general practice and hospital admissions for ambulatory care sensitive conditions: Cross sectional study of routinely collected, person level data. *BMJ, 356*, j84.

Buse, K., & Waxman, A. (2001). Public-private health partnerships: A strategy for WHO. *Bulletin of the World Health Organization, 79*, 748–754.

de Rosa Torner, A. (2012). *The King's Fund International Integrated Care Summit. Lessons from Spain: The Alzira Model*. Retrieved from https://www.kingsfund.org.uk/sites/default/files/alberto-roso-torner-integrated-care-spain-alzira-model-kings-fund-may12.pdf.

E-Health Record Office. (2016). *GOPC PPP in Focus*. Retrieved from https://www.ehealth.gov.hk/en/publicity_promotion/ehealth_news_07/news1_gopc/index.html.

Expert Panel on Effective Ways of Investing in Health. (2014). Definition of a frame of reference in relation to primary care with a special emphasis on financing systems and referral systems. European Commission.

Farahbakhsh, M., Sadeghi-Bazargani, H., Nikniaz, A., Sadegh Tabrizi, J., Zakeri, A., & Azami, S. (2012). Iran's experience of health cooperatives as a public-private partnership model in primary health care: A comparative study in East Azerbaijan. *Health Promotion Perspective, 2*(2). https://doi.org/10.5681/hpp.2012.034.

Food and Health Bureau (FHB). (2008). *Your Health Your Life - Healthcare Reform Consultation Document*. Retrieved from https://www.fhb.gov.hk/beStrong/files/consultation/HCR_Report_eng.pdf.

Ho, W. T., & Fong, B. Y. F. (2018). Public-private partnership in health and long-term care: The Hong Kong experience. In B. Y. F. Fong, A. Ng, & P. Yuen (Eds.), *Sustainable health and long-term care solutions for an aging population*. IGI Global: Hong Kong.

Ho, W. T., & Fong, B. Y. F. (2019). Public-private partnership in health and long-term care: The Hong Kong experience. In *Healthcare policy and reform: Concepts, methodologies, tools, and applications* (pp. 276–297). IGI Global, Hershey.

Institute for Health Metrics and Evaluation. (2019). *Azerbaijan – Facts and data about the Country* Retrieved from http://www.healthdata.org/azerbaijan.

Kickbusch, I., & Quick, J. D. (1998). *Partnerships for health in the 21st century*.

KPMG. (2016). *Commercial Opportunities in the Primary Care Market in China*. Retrieved from https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2016/10/commercial-opportunities-in-the-primary-care-market-in-china.pdf.

Kringos, D. S., Boerma, W. G., Hutchinson, A., & Saltman, R. B. (2015). *Building primary care in a changing Europe*. Geneva: WHO Regional Office for Europe.

Ku, L. C., Zur, J., Jones, E., Shin, P., & Rosenbaum, S. J. (2013). *How Medicaid expansions and future community health center funding will shape capacity to meet the nation's primary care needs*.

Kwak, Y. H., Chih, Y., & Ibbs, C. W. (2009). Towards a comprehensive understanding of public private partnerships for infrastructure development. *California Management Review, 51*(2), 51–78.

Legislative Council. (2015). *General Outpatient Clinic Public-Private Partnership Programme and Tin Shui Wai General Outpatient Clinic Public-Private Partnership Programme*. Retrieved from https://www.legco.gov.hk/yr14-15/english/panels/hs/papers/hs20150316cb2-993-6-e.pdf.

Lim, M.-K. (2005). Transforming Singapore health care: Public-private partnership. *Annals Academy of Medicine Singapore, 34*(7), 461.

Ministry of Finance, Singapore. (2016). *Public Private Partnership Handbook Version*, 2. Retrieved from https://www.mof.gov.sg/Portals/0/Policies/ProcurementProcess/PPPHandbook2012.pdf.

Mitchell, M. (2008). *An overview of public private partnerships in health*. International Health Systems Program Publication. Harvard School of Public Health.

Mudyarabikwa, O., Tobi, P., & Regmi, K. (2017). Public-private partnerships to improve primary healthcare surgeries: Clarifying assumptions about the role of private provider activities. *Primary Health Care Research & Development, 18*, 366–375. https://doi.org/10.1017/S1463423617000147.

OECD. (2017). Caring for quality in health: Lessons learnt from 15 reviews of health care quality. *OECD Reviews of Health Care Quality. Retrieved from*. https://doi.org/10.1787/9789264267787-en.

Phillips, R. L., Jr., & Bazemore, A. W. (2010). Primary care and why it matters for US health system reform. *Health Affairs, 29*(5), 806–810.

Pricewaterhouse Coopers. (2018). PPPs in healthcare. Models, lessons and trends for the future. In *Institute for Global Health Sciences*. Global Health Group.

Primary Health Care Performance Initiative. (2018). *Primary health care expenditure per capita ($USD)*. Retrieved from https://phcperformanceinitiative.org/indicator/capita-current-primary-health-care-expenditure-usd.

Quality Healthcare Medical Services Limited. (2016). *The Power of Public-Private Partnerships - Steering Hong Kong towards comprehensive primary care*. Retrieved from http://www.qhms.com/docs/Quality HealthCare_The Power of PPP_Report_vF.pdf.

Secci, F. (2016). *PHCPI Data Insight: Primary Health Care Spending*. Retrieved from https://improvingphc.org/blog/2016/04/04/phcpi-data-insight-primary-health-care-spending.

Tanwar, R., Ojha, R., Agarwal, M., Singh, A., & Joshi, H. S. (2016). Role of public-private partnerships in delivering health Care Services in India. *International Journal of Advanced and Integrated Medical Sciences, 1*(3), 116–118.

UK Parliament. (2016). *Investing in Primary Care*. Retrieved from https://publications.parliament.uk/pa/cm201516/cmselect/cmhealth/408/40807.htm.

United Nations Economic Commission for Europe, World Health Organization, & Asian Development Bank. (2012). *Discussion paper: A preliminary reflection on the best practice in PPP in healthcare sector: A review of different PPP case studies and experiences*. Retrieved from https://www.unece.org/fileadmin/DAM/ceci/images/ICoE/PPPHealthcareSector_DiscPaper.pdf.

Webster, P. C. (2015). Lesotho's controversial public-private partnership project. *The Lancet, 386*(10007), 1929–1931. Retrieved from https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00959-9/fulltext. https://doi.org/10.1016/S0140-6736(15)00959-9.

Wong, E. L., Yeoh, E.-K., Chau, P. Y., Yam, C. H., Cheung, A. W., & Fung, H. (2015). How shall we examine and learn about public-private partnerships (PPPs) in the health sector? Realist evaluation of PPPs in Hong Kong. *Social Science & Medicine, 147*, 261–269.

World Bank. (2016). *Government objectives: Benefits and risks of PPPs*. Retrieved from https://ppp.worldbank.org/public-private-partnership/overview/ppp-objectives

World Bank International Finance Corporation. (2011). *Handshake. IFC's quarterly journal on public-private partnerships [Press release]*. Retrieved from file:///C:/Users/dell/Downloads/Handshake_Issue_3.pdf.

World Health Organization. (2016). *Lesotho health network Public Private Partnership (PPP)*. Retrieved from http://www.worldbank.org/en/country/lesotho/brief/lesotho-health-network-ppp

World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). (2018). *A vision for primary health care in the 21st century: towards universal health coverage and the Sustainable Development Goals*. (WHO/HIS/SDS/2018.X). Licence: CC BY-NC-SA 3.0 IGO.

World Health Organization Europe. (2004). *What are the advantages and the disadvantages of restructuring a health care system to be more focused on primary care services?* Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0004/74704/E82997.pdf

Yeoh, E. (2002). *Motion on improving the imbalance between public and private medical services*. Retrieved from https://www.info.gov.hk/gia/general/200206/20/0620258.htm

Part II
Care Models and Practices

Chapter 7

Development of Care Models in Community Mental Health Care

Eva Oi Wah Chan

Introduction

Mental illness was treated as a taboo in the old days. Patients, their family members as well as the general public knew little about the signs and symptoms of this kind of “strange” illnesses. Patients hardly received the appropriate treatment and care. It was even worse that their human right and dignity could not be maintained most of the time, even after their death. To start this chapter, a training visit with colleagues to Yale University years ago is shared. Other than having lectures at classroom, a field visit at Connecticut Valley Hospital (CVH) was arranged, plus various briefing sessions on different services at different units.

Graves Without Names at Hospital Cemetery

Connecticut Valley Hospital was located at Middletown of Connecticut. It was the site granted for the establishment of an asylum to address the need of accommodation for Connecticut’s mentally ill. The hospital was formally opened in 1868. It was previously known as Connecticut General Hospital for the Insane. It is still functioning as a psychiatric care facility, under the operation of the Department of Mental Health and Addiction Services of the United States.

CVH is a 100 acre historic district that was listed on the National Register of Historic Places. It is well equipped with its own church, bank, library as well as other facilities. The facility appears to be a general normal community with self-contained resources. However, it was purposely built for the mentally ill. By all

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means, this site reflects the caring history and treatment of patients with mental illness in Connecticut.

Its cemetery is a site that attracts people's attention. The historic cemetery was founded in 1878 at the Silvermine Road in Middletown. It is separated from the former campus of the Connecticut Valley Hospital. It is roughly 3 acres in size, serving as the burying ground for patients of the Connecticut General Hospital for the Insane until 1957.

Graves are placed in lines parallel to the road, with markers of cast cement, and only identified by numbers. A set of four granite plaques near the road was used to memorialise the site and provided an index for the buried individuals. A total of 1681 burials were recorded at the closure of cemetery in 1957. It is believed that CVH was the only state medical facility with an associated cemetery. Its design and layout display the institutional cemetery practices of the earlier period, with uniform numbered grave markers in a modestly landscaped setting.

Mental patients died without their names on their graves. Was it a discriminated practice? It was sad that someone had suffered from mental illness. Both patients and their family members would be upset when patients were so ill that they required hospitalisation. It was worse that patients would even lose their name when they died at psychiatric hospital and buried at hospital cemetery. This arrangement did not only happen at CVH but also at mental institutions in other states. This was likely a common practice during that period of time.

Was it a way to protect the mental patients? Outsiders would not know that they were suffering from a stigmatised illness. Was mental illness so terrified that no one wanted to disclose it to others even when the patients were no longer living in the real world? Would it bring negative image to survivors of mental illness or their family members? Would they feel the shame to have a family member suffering from mental illness? Was the society really not accepting this kind of illness and people having it?

It would not be easy to find perfect answers to these questions. Yet, this gave good illustration of how mental patients and their family members were being treated in the old days. Definitely they would face a traumatic experience once mental illness had occurred in a family.

The Old Beliefs About the Causes of Mental Illness

Mental illnesses are special and specific. Its onset may occur all in a sudden. Some patients would appear normal in their daily living all along. However, they may manifest strange signs and symptoms, totally not matching with their background or usual personality, and without any warning. A lot of their behaviours appear unexplainable and irrational. Thus, most of the time, people would blame that as an attack from evil, devil or witch. They may even believe that it is the result of family sin. In fact, from 900 to 600 BC, all kinds of disorders, both biological and mental disorders, were considered as having originated from the work of the devil in the great Persian Empire (Barlow and Durand 2015).

The description in ancient Mesopotamia was much more symbolic. It conceptualised that all mental illnesses were "hands" of certain deities because hands indicated certain control over a person (Black and Green 1992). Therefore, some of the general public would seek intervention from supernatural agents or sorcery rather than formal medical treatment. Popular treatments in the old days included the use of herbs, ointments, prayers, witchcraft, etc.

Walking with the History of Care for Mentally Ill

Mental illnesses were often stereotypically with aimless wandering and violence. These "insane and disturbed people" would be admitted into workhouses, poor houses, jails or new private madhouse in the sixteenth to eighteenth centuries (Wright 1997). Restraints and forcible confinement would be applied to those patients if they were assessed having potential risk of violence towards themselves, others or property (Laffey 2003).

Mental patients were once viewed as insensitive wild animals by the end of the seventeenth century. Harsh treatment and even restraint in chains would be used as therapeutic tools to clamp down the animal passions. Some owners of madhouses would boast their authority with the whip. Most of the treatments at public asylums were so barbaric, likely secondary to prisons. The most notorious record in the history was found in Bethlem Royal Hospital, a psychiatric hospital in London. The word "bedlam", meaning uproar and confusion, is the nickname of this hospital. Now the hospital remains a service provider for modern psychiatric services. However, historically it had demonstrated the dark side of asylums in the era of lunacy reform. It had been noted that at one time spectators could pay a penny to watch the inmates as a form of entertainment in the old days (Walsh 1907, Young 2013).

Moral treatment movement developed towards the end of the eighteenth century. More humane, psychosocial and personalised care approaches were implemented for mental patients. With the increase of population growth and development of industrialisation, insane asylums were expanded massively in size and number in the nineteenth century. Western countries named this as a process of "the great confinement" or the "asylum era".

A "mental hygiene" movement at the United States was put forward from nineteenth to twentieth century. Prevention of disease of insanity through public health methods and clinics was highlighted. In addition, the movement of antipsychiatry and deinstitutionalisation came to the fore in the 1960s. Many psychiatric hospitals were closed down. Community mental health services became the favoured treatment choice. Furthermore, more psychiatric medications with better therapeutic effects were marketed gradually. Mental patients were able to gain better control of their long-lasting signs and symptoms with regular oral prescriptions and depot injections. Thus, more and more mental patients previously treated at hospital were discharged. They were encouraged to live in the community settings with a better quality of care.

The Emerging Community Mental Health Care

The gradual evolution of treatment procedures at Eastern State Hospital (ESH) in Washington is a very typical illustration for the development of community mental health care.

Eastern State Hospital is a psychiatric hospital established in 1891 in Medical Lake of Washington. Over the years, the hospital has a number of infamies regarding the patient treatment and the quality of care. It has undergone numerous transitions in the past century. Nowadays, it still operates as a treatment setting, in line with the modern understanding, to provide care for patients with different kinds of mental illnesses. The approaches to psychiatric care at this hospital have been changed over time since its establishment. Four phases can be roughly identified, namely, custodial care, the "patient is problem", chemotherapy and the current "community mental health movement".

Phase One: Custodial Care

The custodial care dominated at the hospital operations for the first five decades. Both medical professionals and the general public considered the mental patients being dangerous. Mental illness was heavily ostracised and stigmatised in the history of medical care. In general, it was expected that patients with mental illness might do harm to themselves and people around them. Thus, the safe intervention was to isolate them from others. Mental hospital became an "asylum" for the patients. Moreover, treatment options were neither scientific nor effective at that time. Religious actions, such as praying by priests, forced religious study and physical restraint, or other ways of punishments would be included. In addition, the hospital was severely overcrowding and understaffed in that period. The patient population peaked at 2274 in 1954. The staff and patient ratio was far from appropriate. One attendant was being responsible for looking after 40–50 patients. Each shift of duty lasted for 12 h. It was a dark time for mental patients being hospitalised there.

A noteworthy change in therapy came in the 1930s. A female patient who did not recognise her close family members, even husband or daughter, was given an insulin injection with very positive effect. She was back to the reality, and then the same treatment was repeated again. New interventions of convulsive therapies or "shock therapies" were later applied to different patients. The overuse was recorded in hospital documents: "During a two-year period in the early 1950s, over 1,100 patients received one of the convulsive therapies; altogether, about 15,000 treatments were administered".

Interestingly, "work therapy" for those not staying in locked wards was adopted too. It was estimated that about 80% of the total patient population were "prescribed" to carry out a variety of tasks between 2 and 8 h a day. Their tasks involved various skills, such as baking, farming, sewing, gardening, cobbling, landscaping, housekeeping, cooking and many others. Moreover, patients received either group or individual counselling after a day's work. Although special "medical and social treatments" were employed, mental condition of most patients was not improved. Some of them stayed in hospitals for many years, while some never left the place. The total number of patients at hospital rose steadily. The effectiveness of in-hospital treatment became in doubt.

Phase Two: "Patient Is Problem"

Freudian theory as the cause of mental illness was incorporated into the patient treatment from 1941 to 1954. Treatment approach shifted to focus on the thought processes, formative experiences and genetic factors of individual case. Short-term crisis therapy was developed for soldiers who returned from World War II because a lot of them suffered from mental trauma during the war. Group therapies were found to be effective too. Psychological intervention was added in the medical model to deal with patients' problems.

Phase Three: Chemotherapy

New development of effective psychotropic drugs generated change of treatment policies in the mid-1950s. The drugs had controlled patients' psychotic features well and enabled them of having higher possibility of being reintegrated back to the community. Furthermore, a volunteer programme involved 2400 visitors coming to hospital, was used to lessen the "asylum" stigma and helped patients to be integrated into the hospital with the public. The patient population in hospitals then fell dramatically. By 1970, there were only around 500 cases continuing treatment at the hospital, about a quarter of its peak of 1950s. Treatment delivered to discharged mental patients was gradually shifted to the staff of community mental health centres.

Phase Four: Community Mental Health Movement

The previous mental hospitals carried a negative image of being cruel and inhumane to mentally ill people. The new antipsychotic medications offered hope for more effective treatment, starting a period of "deinstitutionalisation". Deinstitutionalisation was the policy of purposively discharging severely mentally ill people from large state hospitals. The burden of care was therefore changed from an inpatient setting to the community setting. However, community care was not ready by that time. A lot of mentally ill did not receive proper care after discharge from hospitals. Some of them might be placed in nursing homes without personal choice, and those who were unable to find a place for settlement might become homeless in the streets. Most unfortunately, some even ended up in jails.

The Mental Health Study Act was passed with this background in the United States in 1955. The Joint Commission on Mental Illness and Health was established to review the mental health services. Numerous studies were conducted and recommendations for various reforms were proposed. This community mental health movement was put further forward with the Community Mental Health Act in 1963. Federal grants were arranged to set up community mental health centres to provide outpatient care. Totally $260 million was granted for community mental health centres from 1965 to 1969 (Kemp 2007).

The process of “deinstitutionalisation” and movement of community mental health care did not happen just in the United States. It was also developed as an international trend of care delivery. Right sizing of hospitals was found in different parts of the world. Although deinstitutionalisation varies from country to country, the increasing demand of different community service elements would be the same. The National Institute of Mental Health (NIMH) initiated a Community Support Program (CSP) in 1977. Ten elements of a community support system were established as shown below (Turner and TenHoor 1978):

1. Responsible team
2. Residential care
3. Emergency care
4. Medicare care
5. Halfway house
6. Supervised (supported) apartments
7. Outpatient therapy
8. Vocational training and opportunities
9. Social and recreational opportunities
10. Family and network attention

It is obvious that mentally ill people would have a lot of needs when they are being discharged from hospital into the community in order to achieve independence and high quality of living. The concept of case management was raised, and various models of care were generated to match the complex needs of mentally ill in the community.

Models of Care in Community Mental Health

From Biomedical Model to Biopsychosocial Model

Biomedical model is the dominant treatment paradigm in traditional mental health practice. Doctors play a key role in this traditional care of mentally ill all along.

What are the reasons behind this? First of all, mental illness is a brain disease. It is well evidenced with the advanced scientific development in brain investigation. For instance, brain imaging techniques allow doctors to view more activities or problems inside the human brains without invasive neurosurgery. These techniques help them to identify the lesions. Moreover, chemotherapy is effective in the treatment of brain diseases, especially during the acute stage of mental illness. Doctors are the key professionals to carry out investigations, to make medical diagnosis as well as to offer related prescriptions.

Doctors are the team leaders to decide the treatment and service elements for the mentally ill. It is particularly important when new psychiatric drugs are put into the market. However, mental illnesses are caused by multiple individual factors, including personality trait, interpersonal relationship, family issue, social stress, etc. These factors can never be removed or solved solely by medications. More consideration on the psychosocial perspectives is therefore needed in the provision of holistic care to the mentally ill in the community.

Dr. George Engel, an American psychiatrist, has identified some shortcomings of the classical medical model and proposed a modified option, the biopsychosocial model:

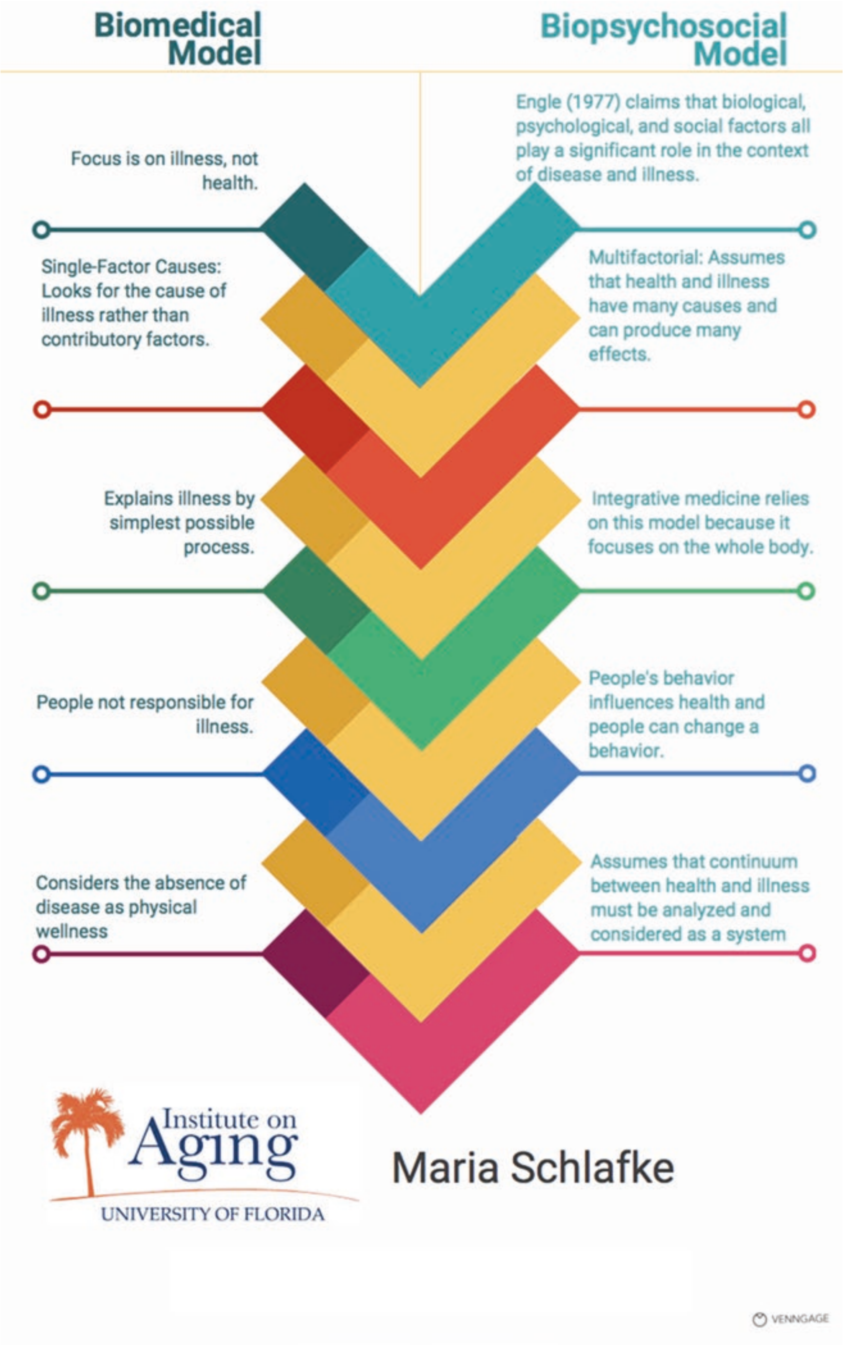
> The existing medical model does not suffice. To provide a basis for understanding the determinants of disease and arriving at rational treatments and patterns of health care, a medical model must also take into account the patient, the social context in which he lives, and the complementary system devised by society to deal with the disruptive effects of illness, that is, the physician role and the health care system. This requires a biopsychosocial model. (Engel 1997)

The medical model emphasises the absence of disease which refers to physical wellness. It is effective to treat the biological cause of mental illness. The biopsychosocial model extends this traditional idea and puts health and illness on a continuum. Intervention of illness would involve consideration of the biological, psychological and social factors as an integrated system. This is explicitly valid in caring mentally ill with complex and diversity of needs in the community. Figure 7.1 further elaborates Dr. Engel's concepts of biopsychosocial model. Furthermore, it gives a good comparison between the two models, medical and biopsychosocial models, in the following aspects:

A. Focus of the model
B. Cause and process of illness
C. Response and intervention for the illness

Case Management Models with a Wide Range of Care

The deinstitutionalisation movement in 1950s and 1960s had brought marked change on the locus of treatment for mentally ill from the hospital to the community. However, the set-up of community mental health centres was unable to meet the



Biomedical Model

Focus is on illness, not health.

Single-Factor Causes: Looks for the cause of illness rather than contributory factors.

Explains illness by simplest possible process.

People not responsible for illness.

Considers the absence of disease as physical wellness

Biopsychosocial Model

Engle (1977) claims that biological, psychological, and social factors all play a significant role in the context of disease and illness.

Multifactorial: Assumes that health and illness have many causes and can produce many effects.

Integrative medicine relies on this model because it focuses on the whole body.

People's behavior influences health and people can change a behavior.

Assumes that continuum between health and illness must be analyzed and considered as a system

Fig. 7.1 Biomedical model and biopsychosocial model rapid growing needs for persons with psychiatric illness. Some cases with severe mental illness failed to access related services or reintegrate into the community after discharge from mental hospitals. Case management model of care delivery was therefore developed to enhance the service coordination for those in needs at the community.

The case management model assigns a designated case manager or a team of professionals to support a person with mental illness in the community. The concept of case management largely stresses on service coordination at the beginning. It is defined as an ongoing process that includes assessment of wants and needs of target clients, planning, locating and securing supports and services as well as regular monitoring and follow-up for them (Kanter 2010). The ultimate goal is to ensure provision of quality care to clients and effective use of community resources. Rose and Moore (1995) have described the key functions in case management as follows:

(a). Outreach or identification of clients
(b). Assessment of individual needs
(c). Service or care planning
(d). Plan implementation
(e). Progress monitoring
(f). Regular review and termination

Clinical professionals working closely with academic leaders have developed a variety of different models of case management over the past decades. Service elements would be adjusted depending on the specific conditions of clients and the programme resources of different system of mental health care. The models have generated a lot of discussion in academic literature:

1. Broker model
2. Clinical case management model
3. Assertive community treatment model
4. Strengths model

From Minimal Support to Intensive Care

Broker Model

As the name of this model implies, case manager plays a specific role as a broker. His or her primary duty is to connect the client to the services as well as to coordinate between different service providers. Case managers are responsible for the specific functions of (a) assessment, (b) planning, (c) linking to services, (c) monitoring and (d) advocacy (Intagliata 1982).

This model is commonly used by social workers in the field of social welfare or security services. It is suitable for a system with a huge number of clients under a limited number of case managers. Field workers or case managers may not be able to offer direct care to their client group individually. They would offer minimal support by linking clients to a series of service providers based on their needs. It is good that it enables clients to reach the related services for their best welfare. In addition, continuous monitoring by case managers would ensure the quality of care.

The limitation of this model is that clinical skills are not placed as the first priority in performing effective case management, whereas coordination would be the core for service provision. Besides, it may not always be possible to identify a provider for individual care.

Clinical Case Management Model

A lot of clients with mental illnesses actually require day to day practical support in the community after discharge from psychiatric hospitals. They are usually in strong need for specific individual clinical care. A model in which case managers integrated their roles as clinician and service coordinator was therefore developed.

Five principles are advocated in this clinical case management model (Kanter 2010):

(a). Continuity of care
(b). Use of the case management relationship
(c). Titrating support and structure in response to client need
(d). Flexibility of intervention strategies (frequency, duration and location of contact)
(e). Facilitating client resourcefulness or strengths

They demand more clinical competencies from the case managers, who are expected to use their clinical skills to offer the clients personal training on independent living, intermittent individual psychotherapy, patient psychoeducation, etc. Broader intervention, such as building alliance with families and caregivers and maintaining and expanding their social networks, is also included. To a certain extent, this model addresses some of the limitations of the broker model and has added alternative strategies in care delivery for the mentally ill in the community.

Assertive Community Treatment Model

In the 1970s, Stein and Test (1980) initiated the Programme for Assertive Community Treatment (PACT) in the United Kingdom. It was a specialised care package for the chronic psychotic cases who were higher service users with more severe psychiatric impairments. Services of the assertive community treatment (ACT) model are delivered by a multidisciplinary team, usually consists of a psychiatrist, a nurse and at least two case managers. The core elements of the ACT model include (Stein and Test 1980, 1985; Test 1992):

(a). Low patient to staff ratios (e.g. 10:1, rather than 30:1 or higher).
(b). Most services are provided in the community (e.g. patients' homes, restaurants), rather than in the office.
(c). Caseloads shared across clinicians, rather than individual caseloads.
(d). 24-h coverage.
(e). Most services are provided directly by the ACT team and not brokered out.
(f). Time-unlimited service.

It emphasises on treating clients at their natural context and the preference for providing direct services to clients rather than making referrals to service providers elsewhere. Priority is placed in giving practical support to clients' daily living, such as guiding them to shop at the markets, arranging laundry services and taking transportation in the community. These measures enable them to run their living in a more independent way. Such holistic coverage demonstrates a comprehensive approach with intensive level of care for the specific target cases.

Many positive data and evidences of this model are founded in academic researches. On the other hand, not all programmes with the ACT model are the same. Professionals in different parts of the world that adopt the ACT model might adjust their service elements slightly, based on the settings. Variations and unsuccessful results have been noted for this kind of intensive care. Some have indicated that input of additional resources in this way might not be able to ensure shorter length of hospital stay or better quality of care to the clients.

Strengths Model: As the Future Direction for Recovery

All the three above-mentioned models tend to overemphasise the problem and impairment of persons with mental illness. The strengths model has made a breakthrough and became popular with the evolving concepts on recovery. Recovery previously refers to getting rid of signs and symptoms of a disease. Nevertheless, advanced medical technology and pharmacological development can save life but would not be able to remove all impairment of disability after the illness. Therefore, a lot of recovered persons have to run their living with the dysfunction associated with their illness. The same applies to mentally ill people. It is especially true to those with chronic severe mental illness.

The strengths model was developed to address this practical issue at the real life of people with mental illness. There are six strengths principles (Rapp and Goscha 2011):

(a). People have the capacity to recover, reclaim and transform their lives.
(b). The focus is on the individual's strengths rather than deficits.
(c). The community is viewed as an oasis of resources.
(d). The consumer is the director of the helping process.
(e). The worker-client relationship is primary and essential.
(f). The preferred setting for recovery work is the community.

The strengths model of case management emphasises the engagement and rapport between the case manager and client. They work together to identify client's capacities and make recovery plan based on the client's goal and choice. It empowers the clients and enables them to have more independent living in the community. In addition, they would have personal growth through the learning process or even to offer contribution to others. This model sounds too optimistic and may be considered as not realistic to apply to clients with severe chronic mental illness. Some comments state that it is putting the options with high standards on the top of the tree but difficult to be down on the earth.

However, the wisdom actually lies with how case managers make goal setting with their clients. Experienced case managers are expected to understand the clients' needs and risk well. They should make full use of the available network and resources to guide clients to be a driver to ride on their own recovery journey safely. Good examples and successful stories of recovered people with mental illness have been reported in a lot of researches. This strengths model would remain as the contemporary direction in the ongoing services of psychiatric rehabilitation and recovery.

Comparison of the Models

Mental illnesses were highly stigmatised in history. Mentally ill persons were being discriminated. A lot of them were not properly treated at hospitals or other clinical settings and even lost their personal dignity as ordinary people in the community. Traditional biological and medical model looks into the physical condition of psychiatric patients. Its key objective is to treat their signs and symptoms with chemotherapy. The biopsychosocial model works on multiple factors that affect the persons with mental illness.

The broker model of case management can identify the needs of clients and link them to related service providers. Clinical case management model focuses direct care towards mentally ill. Case managers play the role as clinicians as well as service coordinators. Yet, the combination of the broker model and clinical case management model is still inadequate to meet all the complex needs of psychiatric clients.

The assertive community treatment model is a type of intensive care aiming to engage people with severe mental illness and high service user in the community. It switches the focus of treatment setting from the hospital to the community. Clients are supported to recover at their natural living environment. These programmes have successfully reduced patients' length of stay at psychiatric hospitals though some studies have stated weak impact on psychosocial functioning (Stein and Test 1980; Surles et al. 1992).

The strengths model provides a new direction in patient recovery. Professionals act as facilitators to support patients to walk through their recovery journey. Patients' strengths would be explored. The cases themselves would be in charge of their own choice of treatment plans and ways to recovery. It also further promotes the peer support movement. More and more clients are willing to share their live experience on recovery to others with similar problems. It induces hope to other clients and their carers. Furthermore, it added new energy into the health-care system. Clients with mental illness would not solely depend on professionals in their process of care and recovery.

The Way Forward in Community Mental Health Care

Time has passed with various medical, technical and social development in place. Remarkable improvement in the treatment to psychiatric clients is noted. Public awareness about mental illness and the needs of care to mentally ill has been raised. However, mental illness is a specific disease that would affect multiple aspects of a person. People with mental illness would face many changes in their living and step on a long recovery journey. They still require ongoing understanding and sustainable supports.

Each model has its own particular features. Their unique strengths and limitations enable them to be adopted in different context. People with mental illness at various stages of the illness may require different level of care. The models of care delivery for mentally ill need to be modified continuously to match the changing needs in the community. Moreover, the environmental factors or resource issues of health-care system are influential to the actual practice. For instance, the needs of clients in urban areas will be different from those in the rural communities. The availability of competent case workers may also affect the design of the care delivery model. It would be too narrow-minded for professionals to stick with only one of the models. Perhaps some hybrid models would be the thumb of choice. Professionals have to pay persistent effort to keep fresh their wisdom in the caring processes. It is imperative to adjust the service elements of various models from time to time in order to provide the best guidance to clients on the recovery journey.

Furthermore, the concepts and models of care in community mental health care are extending and becoming significant in the primary care settings. It is increasingly recognised that both physical and mental problems will attack individuals at the same time. Evidence has stated that the rate of depression and anxiety of people suffering from hypertension, HIV/AIDS, etc. is doubled of those of the general public (Oni et al. 2014). On the other hand, people with severe mental illness and on second generation of antipsychotics may be more prone to have diabetes or cardiovascular diseases. These co-morbidities are commonly found and require treatment and prevention in the primary health-care settings. Management of mental illness is moving forwards to be placed under the same category of management of other chronic conditions.

An integrated model of chronic disease prevention and management has been initiated in the United States and is named “chronic care model”. It is adopted by the World Health Organization in its Innovative Care for Chronic Conditions

Framework (ICCCF) (WHO 2002). Specific support to clients with chronic conditions, including mental illness, on self-care management is advocated. There is also improvement in clinical decision-making guidelines, clinical information system and collaboration with community groups. The integrated care approach has called for formal and informal involvement from multiple dimensions. The service users, community partners, clinicians as well as the policymakers of health-care system all play a role. The effectiveness of this approach should be empirically tested in the future (Thornicroft et al. 2016).

Professionals and their clients in the community will move beyond one or two models of mental health care into a wider integrative intervention in the coming years. Positive and feasible service elements of different case management models will become the foundation of care delivery. New vertical and horizontal linking with innovative care concepts in the primary care settings, such as schools, workplaces, elderly homes, community centres, etc., will definitely generate a lot of health-care challenges ahead. All parties, clients with mental illnesses, their families, professionals in related fields, stakeholders of health-care organisations and communities, need to join hands to embrace the coming stimulating development in community mental health care.

References

Barlow, D. H., & Durand, V. M. (2015). *Abnormal psychology: An integrative approach* (7th ed.). Boston: Cengage Learning.

Black, J., & Green, A. (1992). *Gods, demons and symbols of ancient Mesopotamia: An illustrated dictionary*. Austin: The British Museum Press for the Trustees of the British Museum.

Engel, G. (1997). The need for a new medical model: A challenge for biomedicine. *Science, 196*(4286), 129–136.

Intagliata, J. (1982). Improving the quality of community care for the chronically mentally disabled: The role of case management. *Schizophrenia Bulletin, 8*(4), 655–674.

Kanter, J. (2010). Chapter 20: Clinical case management. In J. Brandell (Ed.), *Theory and practice of clinical social work*. New York: Columbia University Press.

Kemp, D. R. (2007). *Mental health in America: A reference handbook (contemporary world issues)* (1st ed.). Santa Barbara: ABC-CLIO.

Laffey, P. (2003). Psychiatric therapy in Georgian Britain. *Psychological Medicine, 33*(7), 1285–1297. https://doi.org/10.1017/S0033291703008109.

Oni, T., McGrath, N., BeLue, R., et al. (2014). Chronic diseases and multi-morbidity – A conceptual modification to the WHO ICCC model for countries in health transition. *BMC Public Health, 14*, 575.

Rapp, C. A., & Goscha, R. J. (2011). *The strengths model: A recovery-oriented approach to mental health services*. Oxford: Oxford University Press.

Rose, S. M., & Moore, V. L. (1995). Case Management. In R. L. Edwards (Ed.-in-Chief), *Encyclopedia of social work* (pp. 335–340, 19th ed.). Washington, DC: NASW Press.

Stein, L. I., & Test, M. A. (1980). Alternative to mental hospital treatment: 1 conceptual model, treatment program, and clinical evaluation. *Archives of General Psychiatry, 37*, 392–397.

Stein, L. I., & Test, M. A. (1985). *The training in community living model: A decade inexperience*. San Francisco: Jossey Bass.

Surles, R. C., Blanch, A. K., Shern, D. L., & Donahue, S. A. (1992). Case management as a strategy for systems change. *Health Affairs, 11*, 151–163.

Test, M. A. (1992). Training in community living. In R. P. Liberman (Ed.), *Handbook of psychiatric rehabilitation* (pp. 153–170). New York: Macmillan Publishing.

Thornicroft, G., Deb, T., & Henderson, C. (2016). Community mental health care worldwide: Current status and further developments. *World Psychiatry, 15*, 276–286.

Turner, J., & TenHoor, W. (1978). The NIMH Community support program: Pilot approach to needed social reform. *Schizophrenia Bulletin, 4*(3), 319–349.

Walsh, J. J. (1907). Bedlam. In *Catholic encyclopedia*. New York: Robert Appleton Company.

World Health Organization. (2002). *Innovative care for chronic conditions: Building blocks for action*. Retrieved from https://www.who.int/chp/knowledge/publications/icccreport/en/

Wright, D. (1997). Getting out of the asylum: Understanding the confinement of the insane in the nineteenth century. *Social History of Medicine, 10*(1), 137–155. https://doi.org/10.1093/shm/10.1.137.

Young, G. (2013). Bedlam hospital, Beckenham, England, United Kingdom. *Encyclopaedia Britannica*. Retrieved from https://www.britannica.com/topic/Bedlam

Chapter 8
Health-Promoting Workplaces

Vincent Law

Definitions

Health

The World Health Organization (WHO) defined health as a state of complete physical, mental, and social well-being (WHO 1946a). The WHO views health status of people as being affected by various social factors such as education, occupation, income, gender, race/ethnicity, and others.

Health in Workplaces

Workplace is the place where people perform their job and spend most of their waking time in life. The health of workers is created and influenced by an extremely broad and complex network of interacting forces (WHO 2016). Occupational health is a multidisciplinary action that prevents and controls occupational diseases and accidents by eliminating hazardous occupational factors at work (WHO 2001, p. 13), including rehabilitation, particularly after accidents and injuries. Healthy workplace has been defined differently over the past decades. The WHO (2010b, p. 6) views a healthy workplace as a process which continuously improves the protection and promotion of health, safety, and well-being of workers. The workplace must be inducive to safe, hazard-free, and environmentally friendly to attain the objective of sustainability for the owners, operators, and workers.

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Primary Care at Workplaces

Governments and the agencies create the systems and infrastructure of primary health care to provide basic occupational health services (WHO 2010b, p. 26). Health promotion has been provided by key health-care professionals such as physicians and nurses, occupational hygienists, and related staff members such as safety officers, health educators, and primary health-care workers (WHO 2001). Some organisations establish occupational worksite clinics to provide comprehensive primary care and pharmacy services and thus help address certain problems in the health-care system (Shahly et al. 2014).

Introduction

The Alma-Ata Declaration (WHO 1978) promotes primary health care as its central means towards good and fair global health. The declaration focuses on a health system model that acts on an array of underlying political, economic, and social causes of poor health. Primary care is an indispensable health care for employees and their families in the community (Albuquerque et al. 2014). As stated in Article 2 of its constitution, the WHO strikes to improve working conditions and environmental hygiene at the workplaces (WHO 1946b). Occupational health focuses on health of employees, extendable to their community, and is directly linked with primary care. Occupational health and environmental health are often closely linked and deserve intense attention of the concerned stakeholders.

Work influences both physical safety and health of individuals (WHO 2010b, pp. 82–89). Work-related health problems affect individual work performance and organisational performance. Employees who are suffering from health problems may have increased absenteeism and accidents, higher turnover, decreased productivity, as well as economic loss to both the workers, their families, and the company (Tompa et al. 2013). Employees' health and well-being are linked with employee satisfaction and performance (Martin et al. 2018). From the organisational perspectives, corporations have been paying more attention to the health, well-being, and safety of their workers (Roche et al. 2019). The workplace setting has developed to be a promising platform for improving access to health protection services (Blake et al. 2018). Some organisations have even elevated occupational health to the strategic level of business strategy (Burke 2014, p. 4).

From the employees' perspectives, healthy workers are the keys for productivity, and organisations are responsible for improving workers' health in the humanitarian value of employees (WHO 2001). Employees value the investment of their organisations in the health and well-being of the workforce (Blake et al. 2014). As compared with jobless individuals, working individuals have better physical and mental health and exhibit higher proactivity (Kim et al. 2013). Job engagement results in positive organisational outcomes and better individual health and well-being (Bailey et al. 2017).

In view of the joint development of occupational health and health promotion, the World Health Assembly endorsed the Global Plan of Action on Workers' Health (GPA) which aims at putting strategy to action to promote occupational health of workers (WHO 2007). The WHO (2010b, p. 6) hopes workplaces can meet four categories of needs of the workers: the first category of needs is related to health and safety concerns in the physical work environment; the second category addresses concerns in the psychosocial work environment which include organisation of work and organisational culture; the third category is related to personal health resources in the workplace; the fourth category concerns about approaches to community engagement to improve the health of workers, their families, and other community members. A healthy workplace should provide an open, accessible, and accepting environment for people with differing backgrounds, demographics, skills, and abilities (WHO 2010b, p. 15). With a holistic view, the American National Institute for Occupational Safety and Health (NIOSH) adopted a Total Worker Health (TWH) approach. TWH emphasises policies, programmes, and practices that integrate protection from work-related safety and health hazards (NIOSH 2019). However, staff of primary care units found it difficult to reach workers in the community which render some of workers being ignored by occupational health and safety (ILO 2009, p. 5). The community, through its primary health workers, is also responsible for health education (WHO 2001).

Risk Factors at Workplaces

Health and lives of workers are at risk due to various health hazards and occupational diseases (WHO 2001). In general, health in workplaces is affected by various risk factors which can be classified as organisational, job-related, or individual factors.

Organisational Risk Factors

Organisational Changes

Internal and external changes of organisations affect well-being of workers (Umans et al. 2018). Within work, organisational changes have great effects on workers' well-being and affect their productivity and organisational commitment (Bushra et al. 2011). Outside work, organisational changes may also influence individuals' life when they are off duty (Bushra et al. 2011).

Organisational Stress

Stress affects individual health and industrial performance (Drakopoulos et al. 2012). Occupational stress makes individuals more vulnerable to diseases. Occupational stress may be caused by economic cycles and crises which impair well-being of employees (Frasquilho et al. 2016). From the clinical perspective, occupational stress can increase cardiovascular risk and affect the immune systems (Backé et al. 2012). Occupational stress also negatively affects managers' perceived health and performance efficacy (Schieman and Glavin 2016). In turn, behaviours of stressed-out managers may become a stressor for their subordinates (Huang et al. 2016).

Managerial Demand

Health in workplaces is directly affected by managerial demand. Line managers have to face pressure from both top management and subordinates. Top management demands the line managers for efficiency and effectiveness, while subordinates demand for personal health (Ladegaard et al. 2017). Managers themselves may be poorly prepared in managing subordinates having physical or mental health problems. While burnout is related to various undesirable outcomes (Salyers et al. 2015), managers may deplete personal resources of their subordinates and lead to the latter's burnout (Huang et al. 2016). As a result, both the managers and subordinates may suffer from poor satisfaction and burnout.

Job-Related Risk Factors

Suboptimal Working Conditions

Health of employees is directly affected by the working conditions and environment. Inadequate work conditions, together with factors such as high job demands, excessive workloads, negative organisational climate, or poor leadership, may deteriorate health (Hagqvist et al. 2018). Work-related musculoskeletal disorders, in particular the neck, among computer users, are common (Baydur et al. 2016). Unsafe environment with poorly planned workstations and space, unfit furniture, poor ventilation, excessive noise, inadequate lighting, outdated or lack of fire safety measures for emergencies, and insufficient supply of personal protective equipment can result in adverse effects on the productivity and employees health (Edem et al. 2017).

Job Insecurity

Industrial and organisational change may arouse feeling of job insecurity among employees (Bidwell 2013). Some workers view job insecurity as an enduring stressor at the workplace (Charkhabi 2018), as exemplified by workers in the United States (Hamad et al. 2015) and Europe (László et al. 2010) who experienced job insecurity and suffered harmful outcomes.

Job insecurity brings both short-term and long-term negative health outcomes. In the short term, employees may experience psychological outcomes such as anxiety and tension (Adekiya 2015), physiological outcomes such as increased blood pressure, or behavioural outcomes such as absenteeism (Adekiya 2015). Employees who worry about loss of job facets (such as salary and position) report more psychological or behavioural tensions (Charkhabi 2018). If no proper intervention is in place, accumulation of short-term outcomes may lead to poor physical and mental health (De Witte et al. 2016) which are even more difficult to tackle with.

Sedentary Behaviour

The WHO (2010a) estimated that 41 per cent of men and 48 per cent of women living in developed countries fail to participate in enough moderate exercise. Barriers to exercise include a lack of time and access to facilities at work. This has been fuelled by the phenomenon that modern jobs are largely sedentary office-based ones. Prolonged sitting per day leads to minimal physical activity among many modern workers (Close et al. 2018) and is an independent cardiometabolic risk factor (Owen et al. 2014). Besides, majority of sedentary adults found it difficult to maintain physical activity throughout health intervention. Helping staff to be physically active at work has many benefits to both the employees and employers. Gymnasiums and leisure facilities are set up in large organisations and office buildings. Such in-house or on-site facilities are run either by the companies directly or by third-party providers.

Individual Risk Factors

Alcohol and Other Drug (AOD) Use

Reliance of substance use may be contributed by the culture, policies, and physical environment of a workplace (Roche et al. 2017). Among various kinds of reliance on substance, smoking and alcohol and other drug (AOD) use are growing concerns of the workplaces. AOD use among workers increases the risk of physical and mental health problems (WHO 2018a) and may lead to absenteeism, injuries, and decreased productivity (De Graff et al. 2012).

Work Overcommitment (WOC)

Work overcommitment (WOC) denotes a group of attitudes, behaviours, and emotions that endeavour to excessive achievement (Siegrist 2017). WOC is a risk factor of health leading to sleep disturbances and is higher among managers as compared with other employees (Åkerstedt et al. 2012).

From the primary care perspective, many health-care employees are committed to their work and provide double-duty care. They have to take care of clients at work and care about their own family members when off duty (De Pasquale et al. 2016). Health-care professionals experience competing work-related stressors and how to meet challenging 24/7 care coverage requirements (Kossek et al. 2017); their occupational health is affected in the first instance before they can help solve occupational health problems of their serving groups.

Depression and Mental Illness

The WHO (2015) recognises depression as one of the key causes of disability. Workplace depression is widespread, disruptive, and expensive (Greden et al. 2019). It is related to mental illness of workers and leads to various consequences. Put into occupational perspective, depression has great effect on individual productivity and is related to poor performance, absenteeism, and increased turnover (De Frank 2012). Absenteeism and presenteeism in turn diminish productivity and incur economic costs (Graaf et al. 2012).

Mental illness has become one of the top global health concerns (World Federation of Mental Health 2012). Mental illness may cause high unemployment rate, high absence due to sickness, as well as weakened work execution (Organisation for Economic Co-Operation and Development 2012). In the workplaces, mental illness incurs high economic costs (Szeto and Dobson 2013). From the individual perspective, mental illness may be a stigma that involves workplace discrimination (Reavley et al. 2016). However, psychological interventions have mostly centred on helping the workers to cope better instead of targeting the workplace situation (Finnes et al. 2019).

When handling mental ill-health subordinates, managers need support on maintaining their own personal mental health and well-being (Martin et al. 2018). Among various types of workers, eldercare employees report better mental well-being and in turn provide better quality of care and show lower turnover rate (Nordin et al. 2018). As compared with their private counterparts, public sector employees have been facing less favourable conditions in terms of the balance between healthy and unhealthy factors, which increase mental stress (Danielsson et al. 2012). It is imperative for organisations to develop policies and strategies to effectively handle employees' mental health issues (Martin et al. 2018).

Healthy Workplace Framework

Occupational health is a top priority for various parties including the government, academics, organisations, employers, and employees. The WHO (2008) regards the workplace as a feasible setting to promote the benefits of physical activity. Health-promoting workplaces use protective measures to prevent work-related injury and illness while promoting the well-being of the organisation and wellness of the staff.

The WHO realises the imperative to develop a global framework for healthy workplaces since some governments and enterprises lack the knowledge, skills, or tools to make improvements (WHO 2010b, p. 7). Based on identified needs, the WHO suggests that enterprises should consider addressing the content of healthy workplaces in four avenues of influence (WHO 2010b, p. 77). The four avenues are approaches that employers can collaborate with their employees and the community to influence health status in terms of physical work environment, psychosocial work environment, personal health resources, and community involvement of the enterprises. The WHO also advises enterprises to strike for continuous improvement via various internal processes.

Health-Promoting Workplaces

Healthy Workplace Interventions in Primary Care Perspectives

There are various interventions adopted by employers, employees, and government to protect and promote workplace health and safety in the primary care perspectives and principles, so as to steer organisations to become health-promoting workplaces. Interventions shall be designed in ways geared to the specific organisational context (Shann et al. 2019). Among professionals, the health sector can pilot the development of occupational health policy and programmes (CSDH 2008, p. 82). Based on the four avenues of influence of the WHO's global framework on healthy workplaces (WHO 2010b, p. 7), the following sections discuss contemporary approaches to promote workplace health from a primary care perspective.

Personal Health Resources in the Workplace

Provision of Personal Resources

The WHO urges top management of organisations to dedicate necessary resources and time for successful health promotion programmes (WHO 2001). Managers should be provided with adequate resources and support systems to tackle psychological health issues in the workplace (Martin et al. 2018). Work engagement of employees is shaped by positive feeling of personal strengths and personal resources (Bailey et al. 2017). Provision of personal resources promotes employees' health and reduces burnout and depression (Da Silva et al. 2014). Character strengths, which are positive personality traits, become another salient element for employee health (Pang and Ruch 2019). Employees with specific character strengths may help shape workplace well-being (Pang and Ruch 2019). Workplace resources may include standing desks, brief activity breaks, workplace-sponsored activity classes (e.g. yoga), extended lunch breaks, as well as flexible work hours (AuYoung et al. 2016).

Physical Work Environment

Promotion of Workplace Exercise

General workplace health promotion programmes are common (McCleary et al. 2017). Exploration of job-related health issues and associated risk-factors helps design ergonomic work environment (Sain and Meena 2016). Workplace exercises and ergonomic interventions can improve work productivity (Jain et al. 2018).

Workplace exercise programmes can improve exercise participation and fitness in the short-term (Hunter et al. 2018). Such promotional programmes which are designed to increase physical activities and can possibly mitigate the negative consequences of poor physical and mental health (Pedersen et al. 2019). In the long run, organisations shall refine workplace exercise programmes to encourage participation (Hunter et al. 2018). Targeted exercise programmes may improve the overall productivity by lowering presenteeism and absenteeism (Losina et al. 2017).

In addition, walking is safe (Krein et al. 2016) and promises a few health-related effects with minimal adverse effects (Hornbuckle et al. 2016). Pedometers, which measure steps of walking, are effective in enhancing physical activity of inactive adults (Kong et al. 2019). They can be introduced in workplace intervention programmes to encourage employees to walk more.

Organisational health interventions aim at improving individual productivity and organisational performance and can indicate the organisation's concern and ownership for employees' health (Karanika-Murray et al. 2018). Health interventions can change task characteristics, work conditions, and social aspects within organisations. Workplace physical activity interventions can modestly improve the levels of physical activity and weight (Malik et al. 2014). Interventions in workplace physical activity can improve employee health and health-related outcomes. Regular exercise improves cardiorespiratory and muscular fitness, as well as reduces mortality risk (Barry et al. 2013). On-site fitness centres are convenient to employees and thus help promote exercise engagement (Brown et al. 2014). Employees can use frequent self-weighing diaries (Madigan et al. 2015) and physical activity log book (Richelsen et al. 2008) to sustain health programmes at health-promoting workplaces.

Policy on Chemical Substance

Envisaging the rising popularity of e-cigarettes, smoking e-cigarettes at workplaces should also be restricted under the same policy as traditional cigarettes (Phillips 2014). Employers should have a well-defined policy on chemical use and impairment (Phillips et al. 2015). For safety-sensitive jobs, the occupational health providers need to work closely with the management to assess the risks of using chemical substances (Phillips et al. 2015), including tobacco, alcohol, and other drugs.

Psychosocial Work Environment

Organisational Culture/Climate

Organisational culture reflects the work environments which interact with the well-being of the employees (Umans et al. 2016). Psychosocial Safety Climate (PSC) can mitigate unfavourable influence of workplace conditions on worker well-being (Dollard et al. 2012). A supportive health-care climate provides small to moderate positive effects on mental and physical health (Ng et al. 2012). When employees perceive a good organisational climate, they would enjoy positive outcomes for mental health (Bronkhorst et al. 2015), which is in turn good for the organisations, the employees' families, and the community.

Mindfulness Programmes

There are growing interest in applying mindfulness to foster health and well-being of workers at workplaces (Wolever et al. 2012). Various positive effects for mindfulness have been recorded such as stress reduction (Aikens et al. 2014), increased job satisfaction (Hülsheger et al. 2013), improved job performance (Reb et al. 2014), as well as enhanced social relationships (Glomb et al. 2011). Mindfulness can also promote better task performance across diverse job roles and work environments (Good et al. 2016). Preliminary data showed that mindfulness-based strengths practice (MBSP) has the potential to improve well-being (Pang and Ruch 2019) and help workers manage stress and recognise the character strengths of co-workers (Niemiec and Lissing 2016). Overall speaking, it is important to implement mindfulness interventions within a health-promoting workplace at both individual level and organisational level (Jamieson and Tuckey 2017).

Raising Mental Health Literacy

Mental health literacy is the knowledge and beliefs about mental disorders which help their recognition, management, or prevention (Jorm 2012). Mental health literacy is one of the key capabilities that can mitigate the impact of mental illness in the workplace (Lamontagne et al. 2014). Improving mental health literacy at work can facilitate the employees to seek appropriate support (Bovopoulos et al. 2018) since individuals are more likely to reveal their mental health problem if they feel supported (Reavley et al. 2017). Designated mental health first aid officers (MHFAOs) can improve workplace mental health in an integrated manner (Bovopoulos et al. 2018).

Enterprise Community Involvement

Community and the society at large are intimate stakeholders of the enterprises. The health of workers is affected intensively by the community and vice versa (WHO 2010b, p. 95). Enterprises should treasure the protection of workers' health since better worker health contributes to high productivity and organisational success, which in turn leads to economic prosperity of the society as a whole.

Workplace Primary Care Service

Offering primary care services for employees and their families at a convenient location can improve access to health-care services. On-site primary care clinics are common in large private enterprises such as the airlines and bus companies. They offer convenience to the staff and tackle job-related health conditions and issues by in-house health professionals, who are experienced in the selected occupational field. Primary care physicians (PCPs) highly encourage patients to use physical activity resources provided at the workplace (AuYoung et al. 2016). In this regard, in-house community health practitioners (CHPs) or commonly called community health workers (CHWs) play a crucial role in promoting health in the workplaces.

Community Health Practitioners

The WHO (2018b, p. 22) defined CHPs as health workers based in the communities. They conduct outreach beyond primary health-care facilities or based at peripheral health posts that are not manned by doctors or nurses. According to the International Labour Organization (ILO n.d., p. 46), CHPs assist the communities, families, and individuals with preventive health measures. The World Health Organization Alma-Ata Declaration (1978) envisioned universally accessible health care for all, whereas CHPs form the key basis in achieving that goal. As exemplified by Alaska's tribal health system, CHPs are important first points of contact for health care (Golnick et al. 2012) and possess the deepest roots in the community (Minnesota Community Health Worker Alliance 2018). CHPs help educate the public about health risks, promote healthy behaviours, or link the public with service providers at health-care facilities (Pallas et al. 2013). CHPs link the mass and health-care providers

(Centers for Disease Control and Prevention 2015). In Nigeria, CHPs are primary health-care professionals who had finished standard training programme and passed the examinations set by the national regulatory body (Ibama and Dennis 2016). In South Korea, the government trains CHPs, who are nurses with 6 months of special training, to deliver primary health care for remote or isolated communities (Ko et al. 2009). Hence CHPs can play an important supporting role in promoting health at the workplaces.

Legal Protection

Health in workplaces should be protected by law. Governments are responsible for establishing and maintaining safe working conditions and assuring provision of occupational health services through legislation (WHO 2001). In Hong Kong, health and safety of workers are legally protected by the Occupational Safety and Health Ordinance (CAP 509) and related subsidiary regulations (Occupational Safety and Health Council 2019). According to the ordinance, safety and health at work of all economic activities are regulated. Employers have the general duty of care to fulfil in accident prevention, working environment, workplace hygiene, first aid, as well as manual handling operation and use of display screen equipment.

Supportive Leadership

Leadership style of supervisors plays a pivotal role in both organisational productivity and enhancing well-being of employees. Visible and strong support from the organisational leaders is essential for successful organisational health interventions (e.g. Havermans et al. 2016). Although leadership evolves and changes during the journey of organisational health interventions (Ipsen et al. 2018), leadership support has to be apparent and endorsed rather than symbolic (Karanika-Murray et al. 2018).

Leadership styles affect employees' affective health and well-being (Vignoli et al. 2018) by affecting perceived stress and self-rated health. Relation-oriented leadership, a leadership style which trusts subordinates, is positively related to mental health of employees (Vignoli et al. 2018), well-being, and psychological function (Montano et al. 2016). Transformational leaders can promote willingness of employees to act proactively in health interventions (Frykman et al. 2018) and thus uphold well-being and psychological function of the employees (Montano et al. 2016). However, leaders who show self-centred leadership style would result in poor mental health, low energy, and high stress of the employees (Nyberg et al. 2011).

Supervisor support is vital in promoting health and well-being of subordinates. Overall speaking, supervisors need training in their awareness in mental health issues which would result in reduced compensation claims from workers (Dimoff et al. 2016).

Workplace Health Promotion

The NIOSH provides a guide titled *Essential Elements of Effective Workplace Programs and Policies for Improving Worker Health and Wellbeing* to establish effective workplace programmes (2008). The guide emphasises building of relationship between employers and employees on how to maintain and improve workers' health. Among the initiatives proposed, the NIOSH promotes the design, implementation, and evaluation processes of workplace health promotion (WHP). The WHP is the collective effort of the employers, the employees, and the society to enhance health and well-being of workers (Auvinen et al. 2012). WHP activities or programmes help create a healthy workplace, improve overall health (Hutchinson and Wilson 2012), increase physical activity, decrease absenteeism due to sickness, as well as increase work productivity (Cancelliere et al. 2011). In the long run, WHP programmes would continue to influence employability via their positive effects on health, work productivity, and reduction of absenteeism (Rongen et al. 2013). All organisations and employers should aim to adopt the principles and practices of primary care and to establish health-promoting workplaces.

Conclusions

The Alma-Ata Declaration (WHO 1978) promotes primary health care as its central means towards good and fair global health. Primary care is indispensable for both employers and employees, as exemplified in occupational health. Work influences health and physical safety, while work-related health problems affect performance at both individual and organisational levels. At the individual level, employees suffering from health problems may have increased absenteeism, higher turnover, and decreased productivity. At the organisational level, corporations have to maintain and promote employees' health and safety. A healthy workplace is open, accessible, and accepting for people with diversified backgrounds, abilities, and skills.

Health in workplaces is affected by various risk factors which can be classified as environmental, organisational, job-related, and individual ones. Among them, organisational changes, organisational stress, managerial demand, inadequate working conditions, job insecurity, sedentary behaviour, alcohol and other drug use, depression, work overcommitment, as well as mental illness are the leading risk factors for workers. To cultivate a health-promoting workplace, organisations may adopt the four avenues (approaches) of influence under the WHO's global framework (2010b) to tackle health at workplaces by focusing at the physical work environment, psychosocial work environment, personal health resources in the workplace, as well as enterprise community involvement. Although they are not doctors or nurses, community health practitioners who are grounded in the community play an important role in promoting health for both the community and the workplaces.

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References

Adekiya, A. (2015). Perceived job insecurity: Its individual, organizational and societal effects. *European Scientific Journal, 1*(1), 100–118.

Aikens, K. A., Astin, J., Pelletier, K. R., Levanovich, K., Baase, C. M., Park, Y. Y., & Bodnar, C. M. (2014). Mindfulness goes to work: Impact of an online workplace intervention. *Journal of Occupational and Environmental Medicine, 56*, 721–731. https://doi.org/10.1097/JOM.0000000000000209.

Åkerstedt, T., Nordin, M., Alfredsson, L., Westerholm, P., & Kecklund, G. (2012). Predicting changes in sleep complaints from baseline values and changes in work demands, work control, and work preoccupation – The WOLF-project. *Sleep Medicine, 13*, 73–80.

Albuquerque, I. F., Cunha, R. C., Martins, L. D., & Sá, A. B. (2014). Primary health care services: Workplace spirituality and organizational performance. *Journal of Organizational Change Management, 27*(1), 59–82. https://doi.org/10.1108/JOCM-11-2012-0186.

Auvinen, A.-M., Kohtamäki, K., & Ilvesmäki, A. (2012). Workplace health promotion and stakeholder positions: A Finnish case study. *Archives of Environmental & Occupational Health, 67*(3), 177–184. https://doi.org/10.1080/19338244.2011.598892.

AuYoung, M., Linke, S. E., Pagoto, S., Buman, M. P., Craft, L. L., Richardson, C. R., Hutber, A., Marcus, B. H., Estabrooks, P., & Gorin, S. S. (2016). Integrating physical activity in primary care practice. *The American Journal of Medicine, 129*(10), 1022–1029. https://doi.org/10.1016/j.amjmed.2016.02.008.

Backé, E. M., Seidler, A., Latza, U., Rossnagel, K., & Schumann, B. (2012). The role of psychosocial stress at work for the development of cardiovascular diseases: A systematic review. *International Archives of Occupational and Environmental Health, 85*(1), 67–79. https://doi.org/10.1007/s00420-011-0643-6.

Bailey, C., Madden, A., Alfes, K., & Fletcher, L. (2017). The meaning, antecedents and outcomes of employee engagement: A narrative synthesis. *International Journal of Management Reviews, 19*(1), 31–53.

Barry, V. W., Baruth, M., Beets, M. W., Durstine, J. L., Liu, J., & Blair, S. N. (2013). Fitness vs. fatness on all-cause mortality: A meta-analysis. *Progress in Cardiovascular Diseases, 56*(4), 382–390.

Baydur, H., Ergör, A., Demiral, Y., & Akalin, E. (2016). Effects of participatory ergonomic intervention on the development of upper extremity musculoskeletal disorders and disability in office employees using a computer. *Journal of Occupational Health, 58*, 297–309. https://doi.org/10.1539/joh.16-0003-OA.

Bidwell, M. J. (2013). What happened to long-term employment? The role of worker power and environmental turbulence in explaining declines in worker tenure. *Organization Science, 24*(4), 1061–1082. https://doi.org/10.1287/orsc.1120.0816.

Blake, H., Bennett, E., & Batt, M. E. (2014). Evaluation of occupational health checks for hospital employees. *International Journal of Workplace Health Management, 7*(4), 247–266.

Blake, H., Hussain, B., Hand, J., Rowlands, S., Juma, A., & Evans, C. (2018). Employee perceptions of a workplace HIV testing intervention. *International Journal of Workplace Health Management, 11*(5), 333–348. https://doi.org/10.1108/IJWHM-03-2018-0030.

Bovopoulos, N., LaMontagne, A. D., Martin, A., & Jorm, A. (2018). Exploring the role of mental health first aid officers in workplaces: A qualitative study using case study methodology. *International Journal of Workplace Health Management, 11*(6), 366–381. https://doi.org/10.1108/IJWHM-06-2018-0082.

Bronkhorst, B., Tummers, L., Steijn, B., & Vijverberg, D. (2015). Organizational climate and employee mental health outcomes: A systematic review of studies in health care organizations. *Health Care Management Review, 40*(3), 254–271. https://doi.org/10.1097/HMR.0000000000000026.

Brown, T. C., Volberding, J., Baghurst, T., & Sellers, J. (2014). Faculty/staff perceptions of a free campus fitness facility. *International Journal of Workplace Health Management, 7*(3), 156–170.

Burke, R. J. (2014). Corporate wellness programs: An overview. In R. J. Burke & A. M. Richardsen (Eds.), *Corporate wellness programs: Linking employee and organizational health* (pp. 3–27). Cheltenham: Edward Elgar.

Bushra, F., Ahmad, U., & Naveed, A. (2011). Effect of transformational leadership on employees' job satisfaction and organizational commitment in banking sector of Lahore (Pakistan). *International Journal of Business and Social Science, 2*(18), 261–267.

Cancelliere, C., Cassidy, J. D., Ammendolia, C., & Cote, P. (2011). Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. *BMC Public Health, 11*, 395.

Centers for Disease Control and Prevention. (2015). *Implementation guide for public health practitioners*. Retrieved from https://www.cdc.gov/dhdsp/docs/implementation-guide-practitioners-st-johnsbury.pdf

Charkhabi, M. (2018). Do cognitive appraisals moderate the link between qualitative job insecurity and psychological-behavioral well-being? *International Journal of Workplace Health Management, 11*(6), 424–441. https://doi.org/10.1108/IJWHM-01-2018-0008.

Close, M. A., Lytle, L. A., Viera, A. J., Chen, D. G., Linnan, L. A., & Valle, C. G. (2018). Identifying and describing segments of office workers by activity patterns: Associations with demographic characteristics and objectively measured physical activity. *International Journal of Workplace Health Management, 11*(1), 16–30. https://doi.org/10.1108/IJWHM-07-2017-0053.

CSDH. (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health. Final report of the commission on social determinants of health*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/43943/9789241563703_eng.pdf;jsessionid=498486507C244D9ACCD11F695629ED1D?sequence=1.

Da Silva, R. M., Goulart, C. T., Lopes, L. F. D., Serrano, P. M., Costa, A. L. S., & de Azevedo Guido, L. (2014). Hardy personality and burnout syndrome among nursing students in three Brazilian universities – An analytic study. *BMC Nursing, 13*(1), 9.

Danielsson, M., Heimerson, I., Lundberg, U., Perski, A., Stefansson, C. G., & Åkerstedt, T. (2012). Chapter 6: Psychosocial stress and health problems: health in Sweden: the national public health report 2012. Scandinavian Journal of Public Health*,* 40(9), 121–134.

De Frank, R. S. (2012). Teaching a comprehensive course on stress and work. *Journal of Management Education, 36*(2), 143–165.

De Graff, R., Tuithof, M., van Dorsselaer, S., & ten Have, M. (2012). Comparing the effects on work performance of mental and physical disorders. *Social Psychiatry and Psychiatric Epidemiology, 47*(11), 1873–1883.

De Pasquale, N., Davis, K. D., Zarit, S. H., Moen, P., Hammer, L. B., & Almeida, D. M. (2016). Combining formal and informal caregiving roles: The psychosocial implications of double- and triple-duty care. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 71*, 201–211. https://doi.org/10.1093/geronb/gbu139.

De Witte, H., Pienaar, J., & De Cuyper, N. (2016). Review of 30 years of longitudinal studies on the association between job insecurity and health and well-being: Is there causal evidence? *Australian Psychologist, 51*(1), 18–31. https://doi.org/10.1111/ap.12176.

Dimoff, J. K., Kelloway, E. K., & Burnstein, M. D. (2016). Mental health awareness training (MHAT): The development and evaluation of an intervention for workplace leaders. *International Journal of Stress Management, 23*, 167–189. https://doi.org/10.1037/a0039479.

Dollard, M. F., Tuckey, M. R., & Dormann, C. (2012). Psychological safety climate moderates the demand-resource interaction in predicting workgroup distress. *Accident Analysis and Prevention, 45*(1), 694–704.

Drakopoulos, S., Economou, A., & Grimani, K. (2012). A survey of safety and health at work in Greece. *International Journal of Workplace Health Management, 5*(1), 56–70.

Edem, M. J., Akpan, E. U., & Pepple, N. M. (2017). Impact of workplace environment on health workers. *Occup Med Health Affairs, 5*(2), 261. https://doi.org/10.4172/2329-6879.1000261.

Finnes, A., Ghaderi, A., Dahl, J., Nager, A., & Enebrink, P. (2019). Randomized controlled trial of acceptance and commitment therapy and a workplace intervention for sickness absence due to mental disorders. *Journal of Occupational Health Psychology, 24*(1), 198–212. https://doi.org/10.1037/ocp0000097.

Frasquilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-de-Almeida, J. M. (2016). Mental health outcomes in times of economic recession: A systematic literature review. *BMC Public Health, 1*(16), 1–40.

Frykman, M., Lundmark, R., von Thiele Schwarz, U., Villaume, K., & Hasson, H. (2018). Line managers' influence on employee usage of a web-based system for occupational health management. *International Journal of Workplace Health Management, 11*(4), 193–209. https://doi.org/10.1108/IJWHM-12-2017-0104.

Glomb, T. M., Duffy, M. K., Bono, J. E., & Yang, T. (2011). Mindfulness at work. In J. Aparna, H. Liao, & J. J. Martocchio (Eds.), *Research in personnel and human resources management* (Vol. 30, pp. 115–157). Bradford: Emerald Group Publishing Limited. https://doi.org/10.1108/S0742-7301(2011)0000030005.

Golnick, C., Asay, E., Provost, E., Van Liere, D., Bosshart, C., Rounds-Riley, J., Cueva, K., & Hennessy, T. W. (2012). Innovative primary care delivery in rural Alaska: A review of patient encounters seen by community health aides. *International Journal of Circumpolar Health, 71*(1), 1–10. https://doi.org/10.3402/ijch.v71i0.18543.

Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., Baer, R. A., Brewer, J. A., & Lazar, S. W. (2016). Contemplating mindfulness at work: An integrative review. *Journal of Management, 42*(*1*), 114–142. https://doi.org/10.1177/0149206315617003.

Graaf, R. D., Tuithof, M., Dorsselaer, S. V., & Have, M. T. (2012). Comparing the effects on work performance of mental and physical disorders. *Social Psychiatry and Psychiatric Epidemiology, 47*(11), 1873–1883.

Greden, J. F., Garcia-Tosi, R., & Harrington, A. W. (2019). Healthy minds at work: Challenges and strategies for businesses. In M. B. Riba, S. V. Parikh, & J. F. Greden (Eds.), *Mental health in the workplace: Strategies and tools to optimize outcomes* (pp. 1–16). Cham: Springer.

Hagqvist, E., Vinberg, S., Landstad, B. J., & Nordenmark, M. (2018). Is the gap between experienced working conditions and the perceived importance of these conditions related to subjective health? *International Journal of Workplace Health Management, 11*(1), 2–15. https://doi.org/10.1108/IJWHM-08-2017-0067.

Hamad, R., Modrek, S., & Cullen, M. R. (2015). The effects of job insecurity on health care utilization: Findings from a panel of US workers. *Health Services Research, 51*(3), 1052–1073. https://doi.org/10.1111/1475-6773.12393.

Havermans, B. M., Schlevis, R. M., Boot, C. R., Brouwers, E. P., Anema, J., & van der Beek, A. J. (2016). Process variables in organizational stress management intervention evaluation research: A systematic review. *Scandinavian Journal of Work, Environment & Health, 42*(5), 371. https://doi.org/10.5271/sjweh.3570.

Hornbuckle, L. M., Kingsley, J. D., Kushnick, M. R., Moffatt, R. J., Haymes, E. M., Miles, R., & Panton, L. B. (2016). Effects of a 12-month pedometer-based walking intervention in women of low socioeconomic status. *Clinical Medicine Insights, Women's Health, 9s1*(Suppl 1), 75–84. https://doi.org/10.4137/CMWH.S39636.

Huang, J., Wang, Y., Wu, G., & You, X. (2016). Crossover of burnout from leaders to followers: A longitudinal study. *European Journal of Work and Organizational Psychology, 25*(6), 849–861.

Hülsheger, U. R., Alberts, H. J., Feinholdt, A., & Lang, J. W. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology, 98*, 310–325. https://doi.org/10.1037/a0031313.

Hunter, J. R., Gordon, B. A., Bird, S. R., & Benson, A. C. (2018). Perceived barriers and facilitators to workplace exercise participation. *International Journal of Workplace Health Management, 11*(5), 349–363. https://doi.org/10.1108/IJWHM-04-2018-0055.

Hutchinson, A. D., & Wilson, C. (2012). Improving nutrition and physical activity in the workplace: A meta-analysis of intervention studies. *Health Promotion International, 27*(2), 238–249.

Ibama, A. S., & Dennis, P. (2016). Role of community health practitioners in National Development: The Nigeria situation. *International Journal of Clinical Medicine, 7*, 511–518. https://doi.org/10.4236/ijcm.2016.77056.

International Labour Organization. (2009). *Promoting occupational health services for workers in the informal economy through primary care units*. (ILO Asia-Pacific Working Paper Series). Retrieved from https://www.ilo.org/wcmsp5/groups/public/%2D%2D-asia/%2D%2D-ro-bangkok/%2D%2D-sro-bangkok/documents/publication/wcms_114237.pdf

International Labour Organization. (n.d.). *Updating the International Standard Classification of Occupations (ISCO) draft ISCO-08 group definitions: Occupations in health*. Retrieved from http://www.ilo.org/public/english/bureau/stat/isco/docs/health.pdf

Ipsen, C., Karanika-Murray, M., & Hasson, H. (2018). Intervention leadership: A dynamic role that evolves in tandem with the intervention. *International Journal of Workplace Health Management, 11*(4), 190–192. https://doi.org/10.1108/IJWHM-08-2018-114.

Jain, R., Meena, M. L., Dangayach, G. S., & Bhardwaj, A. K. (2018). Association of risk-factors with musculoskeletal disorders in manual working farmers. *Archives of Environmental & Occupational Health, 73*(1), 19–28.

Jamieson, S. D., & Tuckey, M. R. (2017). Mindfulness interventions in the workplace: A critique of the current state of the literature. *Journal of Occupational Health Psychology, 22*(2), 180–193. https://doi.org/10.1037/ocp0000048.

Jorm, A. F. (2012). Mental health literacy: Empowering the community to take action for better mental health. *American Psychologist, 67*(3), 231–243.

Karanika-Murray, M., Gkiontsi, D., & Baguley, T. (2018). Engaging leaders at two hierarchical levels in organizational health interventions: Insights from the intervention team. *International Journal of Workplace Health Management, 11*(4), 210–227. https://doi.org/10.1108/IJWHM-07-2018-0086.

Kim, W., Kolb, J. A., & Kim, T. (2013). The relationship between work engagement and performance: A review of empirical literature and a proposed research agenda. *Human Resource Development Review, 12*(3), 248–276.

Ko, I. S., Lee, T. W., & Lee, I. S. (2009). Community health practitioner's practice guideline for a changing health care: Korean contribution. *Journal of Clinical Nursing, 18*(8), 1190–1198.

Kong, J. P., Bau, R. A., Jok, L., & Ayub, A. B. (2019). Primary care worksite weight management program: Are primary care employees achieving 10,000 steps a day? *Nutrition & Food Science, 49*(1), 85–98. https://doi.org/10.1108/NFS-05-2018-0124.

Kossek, E. E., Wipfli, B., Thompson, R., & Brockwood, K. (2017). The work, family and health network intervention: Core elements and customization for diverse occupational health contexts. In F. Leon, D. Eggerth, D. Chang, M. Flynn, K. Ford, & R. Martinez (Eds.), *Occupational health disparities among racial and ethnic minorities: Formulating research needs and directions* (pp. 181–215). Washington, DC: American Psychological Association.

Krein, S. L., Abdul-Wahab, Y., Kadri, R., & Richardson, C. R. (2016). Adverse events experienced by participants in a back pain walking intervention: A descriptive study. *Chronic Illness, 12*(1), 71–80.

Ladegaard, Y., Skakon, J., Elrond, A. F., & Netterstrøm, B. (2017). How do line managers experience and handle the return to work of employees on sick leave due to work-related stress? A one-year follow up study. *Disability and Rehabilitation, 41*, 44. https://doi.org/10.1080/09638288.2017.1370733.

Lamontagne, A. D., Martin, A., Page, K., Reavley, N. J., Noblet, A. J., Milner, A., Keegel, T., & Smith, P. M. (2014). Workplace mental health: Developing an integrated intervention approach. *BMC Psychiatry, 14*(1), 131–142.

László, K. D., Pikhart, H., Kopp, M. S., Bobak, M., Pajak, A., Malyutina, S., Salavecz, G., & Marmot, M. (2010). Job insecurity and health: A study of 16 European countries. *Social Science & Medicine, 70*(6), 867–874. https://doi.org/10.1016/j.socscimed.2009.11.022.

Losina, E., Yang, H. Y., Deshpande, B. R., Katz, J. N., & Collins, J. E. (2017). Physical activity and unplanned illness-related work absenteeism: Data from an employee wellness program. *PLoS One, 12*(5), e0176872.

Madigan, C. D., Daley, A. J., Lewis, A. L., Aveyard, P., & Jolly, K. (2015). Is self-weighing an effective tool for weight loss: A systematic literature review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity, 21*(12), 104.

Malik, S. H., Blake, H., & Suggs, L. S. (2014). A systematic review of workplace health promotion interventions for increasing physical activity. *British Journal of Health Psychology, 19*(1), 149–180.

Martin, A., Woods, M., & Dawkins, S. (2018). How managers experience situations involving employee mental ill-health. *International Journal of Workplace Health Management, 11*(6), 442–463. https://doi.org/10.1108/IJWHM-09-2017-0069.

McCleary, K., Goetzel, R. Z., Roemer, E. C., Berko, J., Kent, K., & Torre, H. D. L. (2017). Employer and employee opinions about workplace health promotion (wellness) programs: Results of the 2015 Harris Poll Nielsen survey. *Journal of Occupational and Environmental Medicine, 59*(3), 256–263.

Minnesota Community Health Worker Alliance. (2018). *Definition*. Retrieved from http://mnchwalliance.org/who-are-chws/definition/

Montano, D., Reeske, A., Franke, F., & Hüffmeier, J. (2016). Leadership, followers' mental health and job performance in organizations: A comprehensive meta-analysis from an occupational health perspective: Leadership and followers' mental health. *Journal of Organizational Behavior, 38*(3), 327–350. https://doi.org/10.1002/job.2124.

Ng, J. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science, 7*, 325–340. https://doi.org/10.1177/1745691612447309.

Niemiec, R. M., & Lissing, J. (2016). Mindfulness-based strengths practice (MBSP) for enhancing well-being, managing problems, and boosting positive relationships. In I. Ivtzan & T. Lomas (Eds.), *Mindfulness in positive psychology: The science of meditation and wellbeing* (pp. 15–36). London: Routledge.

Nordin, M., Romeo, M., Yepes-Baldó, M., & Westerberg, K. (2018). Spanish and Swedish eldercare managers' influence on employees. *International Journal of Workplace Health Management, 11*(5), 294–304. https://doi.org/10.1108/IJWHM-02-2018-0014.

Nyberg, A., Holmberg, I., Bernin, P., Alderling, M., Akerblom, S., Widerszal-Bazyl, M., & Theorell, T. (2011). Destructive managerial leadership and psychological well-being among employees in Swedish, polish, and Italian hotels. *Work: A Journal of Prevention and Assessment Rehabilitation, 39*(3), 267–281. https://doi.org/10.3233/WOR-2011-1175.

Occupational Safety and Health Council. (2019). *OSH Information*. Retrieved from http://www.oshc.org.hk/eng/main/osh_info/

Organisation for Economic Co-Operation and Development. (2012). *Sick on the job?: Myths and realities about mental health and work*. Paris: OECD Publishing.

Owen, N., Salmon, J., Koohsari, M. J., Turrell, G., & Giles-Corti, B. (2014). Sedentary behaviour and health: Mapping environmental and social contexts to underpin chronic disease prevention. *British Journal of Sports Medicine, 48*(3), 174–177.

Pallas, S. W., Minhas, D., Pérez-Escamilla, R., Taylor, L., Curry, L., & Bradley, E. H. (2013). Community Health Workers in Low- and Middle-Income Countries: What Do We Know About Scaling Up and Sustainability? *American Journal of Public Health, 103*, e74–e82. https://doi.org/10.2105/AJPH.2012.301102.

Pang, D., & Ruch, W. (2019). Fusing character strengths and mindfulness interventions: Benefits for job satisfaction and performance. *Journal of Occupational Health Psychology, 24*(1), 150–162. https://doi.org/10.1037/ocp0000144.

Pedersen, C., Halvari, H., & Olafsen, A. H. (2019). Worksite physical activity intervention and somatic symptoms burden: The role of Coworker support for basic psychological needs and autonomous motivation. *Journal of Occupational Health Psychology, 24*(1), 55–65. https://doi.org/10.1037/ocp0000131.

Phillips, J. A. (2014). Electronic cigarettes: Health risks and workplace policy. *Workplace Health Safety, 62*(9), 396.

Phillips, J. A., Holland, M. G., Baldwin, D. D., Meuleveld, L. G., Mueller, K. L., Perkison, B., Upfal, M., & Dreger, M. M. (2015). Marijuana in the workplace: Guidance for occupational health professionals and employers: Joint guidance statement of the American Association of Occupational Health Nurses and the American College of Occupational and Environmental Medicine. *Workplace Health & Safety, 63*(4), 139–164. https://doi.org/10.1177/2165079915581983\.

Reavley, N. J., Jorm, A. F., & Morgan, A. J. (2016). Discrimination and positive treatment toward people with mental health problems in workplace and education settings: Findings from an Australian national survey. *Stigma and Health, 2*(4), 254–265.

Reavley, N. J., Morgan, A. J., & Jorm, A. F. (2017). Disclosure of mental health problems: Findings from an Australian national survey. *Epidemiology and Psychiatric Sciences, 27*(4), 346–356.

Reb, J., Narayanan, J., & Chaturvedi, S. (2014). Leading mindfully: Two studies on the influence of supervisor trait mindfulness on employee well-being and performance. *Mindfulness, 5*, 36–45. https://doi.org/10.1007/s12671-012-0144-z.

Roche, A., Kostadinov, V., & Fischer, J. A. (2017). Stress and addiction. In C. L. Cooper & J. C. Quick (Eds.), *The handbook of stress and health: A guide to research and practice* (pp. 252–282). Chichester: John Wiley & Sons.

Roche, A., Kostadinov, V., McEntee, A., Allan, J., Meumann, N., & McLaughlin, L. (2019). Evaluation of a workshop to address drugs and alcohol in the workplace. *International Journal of Workplace Health Management, 12*(1), 2–14. https://doi.org/10.1108/JIWHM-05-2018-0064.

Rongen, A., Robroek, S. J. W., van Lenthe, F. J., & Burdorf, A. (2013). Workplace health promotion a meta-analysis of effectiveness. *American Journal of Preventive Medicine, 4*(4), 406–415. https://doi.org/10.1016/j.amepre.2012.12.007.

Sain, M. K., & Meena, M. L. (2016). Occupational health and ergonomic intervention in Indian small scale industries: A review. *International Journal of Recent Advances in Mechanical Engineering, 5*(1), 13–24.

Salyers, M. P., Fukui, S., Rollins, A. L., Firmin, R., Gearhart, T., Noll, J. P., William, S., & Davis, C. J. (2015). Burnout and self-reported quality of care in community mental health. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(1), 61–69. https://doi.org/10.1007/s10488-014-0544-6.

Schieman, S., & Glavin, P. (2016). The pressure-status nexus and blurred work-family boundaries. *Work and Occupations, 43*(1), 3–37. https://doi.org/10.1177/0730888415596051.

Shahly, V., Kessler, R. C., & Duncan, I. (2014). Worksite primary care clinics: A systematic review. *Population Health Management, 17*(5), 306–315. https://doi.org/10.1089/pop.2013.0095.

Shann, C., Martin, A., Chester, A., & Ruddock, S. (2019). Effectiveness and application of an online leadership intervention to promote mental health and reduce depression-related stigma in organizations. *Journal of Occupational Health Psychology, 24*(1), 20–35. https://doi.org/10.1037/ocp0000110.

Siegrist, J. (2017). The effort-reward imbalance model. In C. L. Cooper & J. C. Quick (Eds.), *The handbook of stress and health: A guide to research and practice* (pp. 24–35). Chichester: Wiley.

Szeto, A. C. H., & Dobson, K. S. (2013). Mental disorders and their association with perceived work stress: An investigation of the 2010 Canadian community health survey. *Journal of Occupational Health Psychology, 18*(2), 191–197.

The American National Institute for Occupational Safety & Health (NIOSH). (2008) *Essential elements of effective workplace programs and policies for improving worker health and wellbeing.* Retrieved from https://www.cdc.gov/niosh/twh/essentials.html

The American National Institute for Occupational Safety & Health (NIOSH). (2019). *What is total worker health?* Retrieved from https://www.cdc.gov/niosh/TWH/

Tompa, E., Dolinschi, R., & Natale, J. (2013). Economic evaluation of a participatory ergonomics intervention in a textile plant. *Applied Ergonomics, 44*(3), 480–487.

Umans, T., Broberg, P., Schmidt, M., Nilsson, S., & Olsson, E. (2016). Feeling well by being together: Study of Swedish auditors. *Work, 54*(1), 79–86.

Umans, T., Kockum, M., Nilsson, E., & Lindberg, S. (2018). Digitalisation in the banking industry and workers subjective well-being: Contingency perspective. *International Journal of Workplace Health Management, 11*(6), 411–423. https://doi.org/10.1108/IJWHM-05-2018-0069.

Vignoli, M., Depolo, M., Cifuentes, M., & Punnett, L. (2018). Disagreements on leadership styles between supervisors and employees are related to employees' well-being and work team outcomes. *International Journal of Workplace Health Management, 11*(5), 274–293. https://doi.org/10.1108/IJWHM-11-2016-0084.

Wolever, R. Q., Bobinet, K. J., McCabe, K., Mackenzie, E. R., Fekete, E., Kusnick, C. A., & Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology, 17*, 246–258. https://doi.org/10.1037/a0027278.

World Federation of Mental Health. (2012). *Depression: A global crisis*. Retrieved from www.who.int/mental_health/management/depression/wfmh_paper_depression_wmhd_2012.pdf

World Health Organization. (1946a). *Preamble to the Constitution of WHO as adopted by the International Health Conference, New York, 19 June – 22 July 1946; signed on 22 July 1946 by the representatives of 61 States*. Retrieved from https://www.who.int/about/who-we-are/frequently-asked-questions

World Health Organization. (1946b). *Constitution of the Wold Health Organization*. Geneva: WHO Press. Retrieved from https://www.who.int/governance/eb/who_constitution_en.pdf.

World Health Organization. (1978). *Declaration of Alma-Ata*. Geneva: WHO Press. Retrieved from https://www.who.int/publications/almaata_declaration_en.pdf?ua=1.

World Health Organization. (2001). *Occupational health: A manual for primary health care workers*. Geneva: WHO Press. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/200733/dsa191.pdf?ua=1.

World Health Organization. (2007). *Workers' health: Global plan of action. Sixtieth World Health Assembly*. Geneva: WHO Press. Retrieved from http://www.who.int/occupational_health/en/.

World Health Organization. (2008). *Preventing noncommunicable diseases in the workplace through diet and physical activity: WHO/world economic forum report of a joint event*. Geneva: WHO Press.

World Health Organization. (2010a). *Prevalence of insufficient physical activity*. Geneva: WHO Press. Retrieved from www.who.int/gho/ncd/risk_factors/physical_activity_text/en/#.

World Health Organization. (2010b). *WHO healthy workplace framework and model: background and supporting literature and practices*. Geneva: WHO Press. Retrieved from https://www.who.int/occupational_health/healthy_workplace_framework.pdf.

World Health Organization. (2015). *Depression: A global public health concern*. Geneva: WHO Press. Retrieved from www.who.int/mental_health/management/depression/who_paper_depression_wfmh_2012.pdf.

World Health Organization. (2016). *Employment conditions and health inequalities. Employment Conditions Knowledge Network, Final Report to WHO Commission on Social Determinants of Health* (chaired by Benach, J., Muntaner, C, & Santana V.). Geneva: WHO Press. Retrieved from https://www.who.int/social_determinants/resources/emconet_scoping_paper.pdf

World Health Organization. (2018a). *Global status report on alcohol and health*. Geneva: WHO Press. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/274603/9789241565639-eng.pdf?ua=1.

World Health Organization. (2018b). *WHO guideline on health policy and system support to optimize community health worker programmes*. Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.

Chapter 9
Prevention of Falls and Capturing Fractures in the Community

W. T. Ho, Ronald M. Y. Wong, and W. H. Cheung

Falls and Subsequent Fractures

According to the World Health Organization (WHO 2019a, b, c), a fall is defined as an event resulting in a person coming to rest accidentally on the ground. There are an estimated 646,000 fatal falls every year, making it the second leading cause of accidental injury and death. Falls among elderly are a major public health threat worldwide due to the frequency and adverse consequences in terms of quality of life, morbidity and mortality (Peel 2011). The highest incidence occurs in people aged 65 or above. Nearly 33% of the community dwellers over the age of 65 and 50% of the older people in elderly home or aged over 80 years are susceptible to falls each year (Tiedemann et al. 2014; Berry et al. 2010). Globally, there are around 37.3 million falls requiring medical attention each year, and such falls are responsible for more than 17 million disability-adjusted life years (DALYs) lost (WHO 2019a, b, c). Among these fall patients, one third of them require restriction of activities, 10–15% result in fracture, while 5% result in more serious soft tissue injury. Falls and fractures are strongly related to functional decline, psychological distress, social withdrawal as well as increased use of medical services (Berry and Miller 2008). This public health burden together with our ageing population poses a huge impact on the health-care system in terms of high direct and indirect costs and manpower insufficiency.

Falls can be devastating as it is the leading cause of nonfatal injuries including fractures and fatal injuries among older adults (Centers for Disease Control and Prevention 2015), especially vertebral injury among persons aged over 60. Fractures in women aged 65 or above bear an overwhelming share (89%) of total costs

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(Burge et al. 2007). Women have a higher rate of fall and are easier to suffer from a serious fracture compared to men due to their disparities, including lower level of physical activity, lower-body strength and higher rate of osteoporosis. However, men are likely to have a higher rate of fatal falls (Peel 2011). It is well-known that lifetime fracture risk in osteoporosis patients can reach 40%. The most common fracture regions are spine, followed by hip and distal radius (Rachner et al. 2011). Importantly, a recent fracture is also the most predictive risk factor for a secondary fracture. Current risk of a secondary fracture in the United States is 10% and 18% at 1 and 2 years, respectively (Balasubramanian et al. 2019). This has led to increased hospital admissions and additional costs to the health-care system.

Lack of physiotherapy training for postural balance, occupational therapy interventions, low drug prescription rates and poor patient drug compliance due to insufficient health education among citizens are key pitfalls leading to falls and fall-related injuries. With comprehensive and multifaceted fall prevention strategies, an effective fall prevention programme not only reduces the number and chance of people falls but can also lower the rate of falls and severity of fall injuries (World Health Organization 2019b). Additionally, providing Fracture Liaison Services (FLS) for fracture patients can prevent them from recurrent falls and secondary fractures and increase compliance to anti-osteoporotic drugs as well as reduce mortality. Fall prevention in the primary care service and promotion of preventing secondary fractures by FLS in the community and hospitals are therefore crucial in raising public awareness and decreasing further morbidity and mortality.

Rationale for Fall Prevention

Experiencing functional difficulties and mental health issues in older age increases risk of falling (Ambrose et al. 2013; Gale et al. 2016). Elderlies who receive community aged care services were found to have an even higher risk of falling due to decreases in balance and strength, continuous pain and injury as well as bouts of illness (Burton et al. 2018). This may be due to a lack of fall prevention programmes in the communities, leading to the insufficient exercise and medical knowledge within community dwellers. In Australia, the prevalence of fall among older adults who received community care services was 45% in 2017, which was found to be 50% higher than that of the general community dwellers population (30%) (Gillespie et al. 2009). Recent studies have suggested that most patients lack understanding of fracture risks. The majority of them perceive their own fall and fracture risk as being low and believe that fractures are solely related to accidents, environmental hazard or unsafe behaviour, but not the underlying susceptible osteoporosis. They see fall prevention and long-term drug taking as unnecessary (Roux and Briot 2017). Factors associated with the likelihood of falls among older people include history of previous falls, balance problems, frailty, female gender, mobility and gait issues (Burton et al. 2018). The average cost to the health system for one fall injury episode in elderlies aged 65 or older in Finland and Australia is US$ 3611 and US$ 1049, respectively (World Health Organization 2019a). Implementing fall prevention intervention not only helps to decrease fall-related morbidity and mortality but can also save medical care costs in the community and health-care system.

Fall Prevention as a Health Promotion Strategy

Health promotion is defined by the WHO as "a process of enabling people to increase control over health and to reach a state of complete physical, mental and social well-being". Fall prevention in the community is a kind of health promotion, a primary prevention which is proactive and preventive and helps keep healthy people healthy using a broad population approach. In the Ottawa Charter for Health Promotion, an international resolution by the WHO, five actions for health promotion were identified: (1) building healthy public policy (e.g. plan and set up strategies that support healthy ageing to prevent falls), (2) creating supportive environments (e.g. support fall prevention and promote fall-related injuries among community dwellers), (3) strengthening community action (e.g. support community by developing capacities to address fall-related injury challenges, and support and work closely with communities to consider their strength and assets for community-based fall prevention intervention programme), (4) developing personal skills (e.g. raise public awareness on the prevention of fall and subsequent injuries, or explore and support online self-management resources to empower elderlies to develop personal skills in preventing falls) and (5) reorienting health-care services towards prevention of illness and promotion of health (e.g. support health-care providers to obtain relevant training and access to fall prevention resources that are specific to elderlies that are supported by professionals) (World Health Organization 2019c). These actions are suggested to work out with three main strategies, including advocate, enable and mediate.

Health promotion emphasises on achieving equity in health. Fall prevention should aim at improving current health status (e.g. balance ability and mobility) and make sure equal opportunities and resources are available to all target population to achieve their fullest health potential. This must be applied equally to men and women (World Health Organization 2019c). Moreover, public services for health promotion mainly target women, and health promotion professional staff are also composed largely by women (Borges 2008). It is reported that men often do not recognise their needs in engaging in the health education campaign and thus generally maintain less knowledge in falls (Pagliosa and Renosto 2014). Nonetheless, fatal falls among men exceed those of women in all age groups although men have fewer occurrences of falls (Peel 2011). In view of this, fall prevention for active ageing is suggested in the community through raising awareness by education, assessing by capacity building and intervention by training for both genders (World Health Organization 2019b). Furthermore, performing impact evaluation of fall prevention at the end of the programme can help to assess the effects on participants. To evaluate the impact of a fall prevention programme, investigators can look into (1) the level of programme adoption, (2) the number of intended population it has reached, (3) the rate of falls reduced and the level of positive changes in physical performance and (4) the sustainability of the programme, e.g. the continuing use by the stakeholders as observed at a 6-month post-intervention time point (Li et al. 2016). It is well established that patients with previous fractures have increased risk of falls. Numerous studies have stated that among elderlies, fall prevention is as important as treating osteoporosis (Jarvinen et al. 2008), and it is estimated that prevention of falls reduces the number of fractures by over 50%. Fall prevention is therefore crucial in preventing further morbidity and mortality.

Fall Prevention in Community Settings

In the recent decades, many studies have focused on identifying the major modifiable factors of fall risks and effective fall prevention interventions (Stevens et al. 2010a; Tinetti et al. 1993) as it is postulated that falls are not a normal part of ageing (Stevens et al. 2010b). Several interventions investigated in randomised controlled trials (RCTs) have shown to be effective and were translated and implemented into community-based programmes (Ory et al. 2014). Community educational programme to reduce fall risks is proven to improve elderlies' health outcomes and help them avoid serious consequences from falls. Falls are the major factor contributed to hip fractures and are the common cause of traumatic brain injuries (Kulinski et al. 2017). As reported by CDC, people died from a fall every 10 s (Harrison 2017). Regardless of multifactorial fall risk factors, knowledge deficit is a major factor contributing to falls and fear of falls (Harrison 2017). Researches from meta-analysis and systematic reviews have established effective approaches for fall reduction among elderlies (Vieira et al. 2016). Such approaches include specific interventions, exercises (e.g. strength training, balance and gait training), medication modification, vitamin D supplementation, education, multifactorial interventions (e.g. muscle strength, history of falls, evaluation of visual acuity), etc. A review of fall prevention interventions among community older adults has shown that multiple-component group exercises and home-based exercises effectively reduced risk and rate of falls (Gillespie et al. 2009). Reduction of falls is thus seen to be a global priority.

Community Fall Prevention in Hong Kong

The Chinese University of Hong Kong (CUHK) Fall Prevention Campaign, established by the Department of Orthopaedics and Traumatology in 2000, is one of the successful examples of fall prevention programmes in Hong Kong. The campaign aims to provide health education and rehabilitation interventions to the elderlies to prevent them from falls, osteoporosis, sarcopenia and subsequent fractures in the community. The focused expert team with orthopaedics surgeons, academics and researchers have been working in fall prevention and fragility fracture management, investigating on products to prevent falls (e.g. fall prevention shoes) and using low-magnitude high-frequency vibration (LMHFV) as a rehabilitation intervention (http://www.no-fall.hk) for many years. There are also seminars, workshops, lectures and community health promotion (The Chinese University of Hong Kong 2018). During 2009–2012, 710 community elderlies were recruited in a cluster RCT to investigate the effects of 18-month LMHFV on falls rate and fracture risks. 18.6% of the vibration group reported falls compared with 28.7% in the control group (adjusted HR = 0.56, p = 0.001). The study showed the efficacy of LMHFV on reducing fall incidence and fracture risks (Leung et al. 2014). In another CUHK study, LMHFV was further shown to improve the balancing ability (Cheung et al. 2007) and enhance lower limb muscle strength. There was a retention effect of functional gains in the vibration group 1 year after cessation of the LMHFV treatment (Cheung et al. 2016). With these optimal results, LMHFV was then promoted in the community. Together with workshops, seminars, exercise training courses and health education talks (Figs. 9.1, 9.2, 9.3 and 9.4), the CUHK team has collaborated with community centres in promoting LMHFV to prevent falls among community elderlies (The Chinese University of Hong Kong 2018).

Fig. 9.1 Fall prevention education workshop

Fig. 9.2 Exercise training course

Fig. 9.3 Elderly tried the LMHFV machine in the fall prevention booth

Fig. 9.4 Fall prevention talk in the community

Overseas Community Fall Preventions

One of the valuable reference programmes is Stepping On, which is a fall prevention programme developed in Australia. This programme is also adapted to be used by the Wisconsin Institute for Healthy Ageing in the United States (Mahoney 2014; Wisconsin Institute for Healthy Aging 2012). The programme is then launched by the Centers for Disease Control and Prevention (CDC) in the selected communities in Oregon, Colorado and New York under a 5-year funded project by the US Department of Health. Stepping On is a programme implemented in a group and is proven to effectively reduce falls and build confidence to avoid recurrent falls among elderlies who experience a history of falls, hence reducing their anxiety of recurrent falls. Falls and fall-related injuries are reduced by engaging the healthcare organisations, fall prevention coalitions, as well as other stakeholders in hospital and community settings to implement the evidence-based fall prevention programmes, targeting at community dwellers with fall records or fear of falls. The programme has successfully reduced the risk of falls of the intervention subjects to a level approximately 30% lower than the control group (Clemson et al. 2004; Ory et al. 2014).

Key Pitfalls Leading to Falls and Fall-Related Fractures

There are many studies on the severity and consequences of falls in elderlies. However, there is a lack of health education regarding falls globally, especially in Hong Kong. CDC has proven that community-based fall prevention interventions are effective (Centers for Disease Control and Prevention 2015). Maintaining community elderlies in an active ageing situation in primary care is crucial in reducing the costs in secondary and tertiary preventions, institutionalisation, treatment and rehabilitation (Borges 2008). Since extrinsic risk factors of falls such as poor medication adherence, gait deficit, balance deficit and environmental home hazards are largely modifiable, preventive measures have a good potential to decrease the falls rate and subsequent costs (McClure et al. 2010). It is important to target high-risk subgroups for measures to prevent recurrent falls. Furthermore, interventions targeting wise healthy older people are also essential as they also have high incidence of falls and related injuries (Australian Government 2004; Hill et al. 1999; McClure et al. 2010; Speechley and Tinetti 1991). Community health education to a larger population can help to spot key pitfalls that lead to falls and subsequent fractures, including poor patient drug compliance, low drug prescription rate as well as lack of physiotherapy training for postural balance and occupational therapy intervention.

Poor Patient Drug Compliance

Many risks factors contribute to falls among community elderlies including dementia, Parkinson's disease, stroke, osteoarthritis, fall history, visual and balance impairments as well as psychiatric problems. Some of the drugs or interventions, including psychotropic medications or therapies and polypharmacy, used to treat these diseases have been found to be associated with an increased risk of falls (Berry et al. 2010). In contrast, some drugs help to reduce bone loss and fracture by preventing elderlies from suffering from osteoporosis such as calcium, vitamin D, bisphosphonates and anti-osteoporotic drugs (Bergman et al. 2018; Nowson 2010). Poor medication adherence occurs in half of the community-dwelling elderlies (Berry et al. 2010; Vik et al. 2006). Previous studies have shown an association between poor medical adherence and early functional and cognitive decline (Edelberg et al. 2000; Edelberg et al. 1999). These include antipsychotics, lipid-lowering agents, antiepileptic medications and bronchodilators (Ascher-Svanum et al. 2006; Ettinger et al. 2009; Ho et al. 2006; Williams et al. 2004). These drugs often lead to balancing impairment, which is associated with increased hospitalisation among older people due to falls and other associated illnesses. Individuals with poor medication adherence may be frailer, have limited physiological reserve and are less cautious to avoid situations with high fall risk (Berry et al. 2010; Patton et al. 1997). Health educational strategies with health-care providers, patients and their family have been proven to improve the medication adherence rate among elderlies (Patton et al. 1997).

Low Drug Prescription Rate in Osteoporosis

Fewer osteoporosis individuals are receiving drug treatment to avoid osteoporotic fracture. There is mounting evidence showing that this treatment gap is common in a number of countries, and it has become a growing global public health concern (Bauer 2018). A retrospective observational cohort found that among the hip fracture cases in a sample of US patients, only a minority (21%) received effective treatment after the initial fracture (Solomon et al. 2014). Similar low rates of therapy occur in Korea (39%), Spain (25%) (Kim et al. 2015) and Hong Kong (23%) (Leung et al. 2017). The use of medication for osteoporosis after initial fractures did not increase over time, while the medication adherence of osteoporosis in these countries is also suboptimal (Kim et al. 2015). A randomised controlled trial (RCT) has shown that prescription of oral and parenteral bisphosphonate therapy following vertebral and non-vertebral fractures significantly reduces recurrent fractures, functional decline and disabilities. This recurrent fracture trial has also demonstrated that prescription of intravenous zoledronic acid for several years would reduce subsequent clinical fracture risk by 35% and mortality by 28% (Lyles et al. 2007).

It is well-known that patients with initial hip fractures are at high risk of imminent osteoporotic fractures. Medications such as alendronate, ibandronate, risedronate, etidronate, calcitonin, denosumab and parathyroid hormone are useful in reducing recurrent osteoporotic fractures and mortality (Black et al. 1996; Bondo et al. 2013; Ensrud et al. 1997; Lyles et al. 2007). Under-treatment of fracture patients is a crucial age-related health disparity, and this is important to be addressed by the primary health-care systems and clinicians. Active screening of patients with osteoporosis, identifying patients with initial fracture using health informatics technology, providing counselling on effective drug therapy, monitoring postfracture rate and, most importantly, prescribing accurate amount of medications are crucial in lowering both fractures and the imminent fracture risks in the community (Bauer 2018).

Lack of Physiotherapy Training for Postural Balance and Occupational Therapy Intervention

Effective interventions for postural control in elderly are recommended to improve their performance in daily living activities (Elliott and Leland 2018). Physiotherapy training and occupational therapy intervention such as exercises involving gait, coordination, balance, functional tasks, multisensory exercises, strength training and stretching can enhance balance, strength and mobility in elderly and therefore help to reduce the risk of falls (Alfieri et al. 2012). A RCT has demonstrated that exercise intervention of a moderate to high dose of balance regularly could reduce falls rate in elderlies by 40% (Tiedemann et al. 2014). Occupational therapy helps to prevent falls in elderly through a variety of evidence-based interventions.

Nonetheless, although high-quality evidence-based researches support the efficacy and effectiveness of exercise-based fall prevention programme (Gillespie et al. 2012; Sherrington et al. 2008), the impact remains questionable because of low adherence rate and low levels of uptake (Robinson et al. 2014). Drop-out and non-adherence are frequently reported in the studies, and more than 50% of refusal rate is commonly documented in the literature (Campbell et al. 1997; Robertson et al. 2001). Only approximately 10% of the study participants take up exercise-based fall prevention intervention in the community (Day et al. 2002; Fabacher et al. 1994). These findings conclude that elderlies are reluctant to take part in or experience difficulties in committing on long-term exercise-based fall prevention programmes (Robinson et al. 2014).

Avoidance of adherence to the exercise-based intervention is commonly found in people with experience of falls. This has been shown to link with fear of falls and to the duration of intervention (Ganda et al. 2013). Fear of falling is a common problem in elderlies, with a prevalence rate ranging from 20% to 85% (Zijlstra et al. 2007). High prevalence is especially reported among people with the initial first falls and who are living in the institutional settings (Kempen et al. 2008), while the associated avoidance of activities is between 15% and 55% (Zijlstra et al. 2007). Fear of falls is known to be a major factor in the non-adherence of physiotherapy training and occupational therapy intervention (Robinson et al. 2014). People with high fall risk or with fear of falls are usually reluctant to participate in or do not comply with regular physical activities training (Gusi et al. 2012). For the duration of intervention, analysis has suggested that low level of adherence is noted in both long and short durations. Elderlies undergoing a long duration (i.e. more than 20 weeks) may feel bored and overwhelmed, leading to lack of motivation to the exercise intervention for fall prevention. In contrast, an intervention with a short duration (i.e. two or fewer sessions per weeks) makes participants doubtful about the effectiveness of the programme. This concept can be illustrated by the Health Belief Model, i.e. "the participants' perceived efficacy of the intervention affects their perceived benefits of and compliance with the intervention" (McPhate et al. 2013). Hence, designing an exercise-based intervention with appropriate duration will provide a great incentive to increase patients' motivation in adhering to the programme, resulting in the increase in compliance rate.

Secondary Fractures

A history of a recent fall increases the risk of osteoporotic fractures to a large extent, showing that falls are a major contributor for fractures compared to low bone mineral density (Geusens et al. 2002). Fragility fractures are well-known to increase the risk of a further fracture (Hansen et al. 2015; Johansson et al. 2017; Johnell et al. 2004), while secondary fractures are most common in the first 2 years following a fragility fracture. Johansson et al. (2017) have demonstrated that risk of fracture is initially high and declines afterwards. Imminent risk has been emphasised and defined as a markedly increased risk of fracture within 12 to 24 months following an initial fracture (Banefelt et al. 2019). Age is an independent risk factor of future fractures (Ahmed et al. 2013; Johansson et al. 2017). The risk of a subsequent fracture is 2.7-fold higher at year 1 and decreases to 1.4-fold at 10 years (Haczynski and Jakimiuk 2001). A majority of patients have been found not receiving treatment for osteoporosis after a fragility fracture regardless of the evidence that sustaining initial fracture would increase risk of a subsequent fracture (Feldstein et al. 2003; Hernlund et al. 2013; Siris et al. 2014). According to the data from the Hospital Authority of Hong Kong, imminent fracture rate is around 5%, leading to an increased hospital admissions and costs to the health-care system. The concept of imminent fracture provides chance for planning intervention to reduce future fracture risks and is a key to provide appropriate treatment to those with the highest risk of fractures.

Treatment Gap in Fractures and Osteoporosis

The treatment gap in the care of initial fracture is significant. This large care gap costs the health-care system millions of dollars of burden and puts many elderly fracture patients on needless pain and suffering. Although FLS has been developed in parts of the United States, Canada and some other countries, FLS is not adopted universally worldwide such as British Columbia, leading to a large gap in osteoporosis care (Napoleone 2015). Yet, some alternative models have been implemented for the care of fracture patients, e.g. referring patients to endocrinologists or primary care physicians. However, only a minority (20%) of fragility fracture patients receive therapies within a year following the initial fracture despite the advanced treatments, in particular the diagnosis of osteoporosis, interventions on reducing risk of fractures, clinical guidelines and assessment of future fracture risks (Choonhakarn and Seramethakun 1998; Freedman et al. 2000). There are only approximately 10% of older fragility fracture female patients receiving anti-osteoporosis therapy (Freedman et al. 2000). Moreover, the focus is on diagnosis and treatment rather than providing secondary preventive measures, which have been found to be less effective than FLS. The system also leads to suboptimal result in the imminent fracture rate and low prescription rates of bisphosphonates (Elliott and Leland 2018). The current treatment rate following initial fracture has been found to be even lower than those who reside in long-term care. Thus, one of the methods in decreasing this treatment gap and tackling this global concern of secondary fracture risk will be the international development of FLS (Giangregorio et al. 2006; Kanis et al. 2014).

Fracture Liaison Services Model

FLS is a multidisciplinary core involving physiotherapists, orthopaedic surgeons, occupational therapists as well as physicians and patients. FLS models have been grouped into four types referring as types A to D in a systematic review in 2013 (Ganda et al. 2013). Type A is a service that identifies, initiates and investigates treatment. Type B serves to identify, investigate and refer patients to the general practitioners for initiating treatment. Type C services will not initiate assessment or treatment but will identify patients at risk and then inform them and their primary care physician. Type D is defined as a service that identifies susceptible patients and provides health education to them. This service will not communicate with the other stakeholders of patient's care. With these four model types, FLS is further guided by the 5IQ model published by the National Osteoporosis Society (NOS) (Elliott and Leland 2018). The 5IQ model is adopted as the clinical standards for FLS, which included (i) identification, (ii) investigation, (iii) information, (iv) intervention, (v) integration and (vi) quality (Royal Osteoporosis Society 2014).

Fall and fracture prevention should be a national priority. One of the Sustainable Development Goals (SDGs) in the 2030 Agenda for Sustainable Development adopted by all United Nations member states in 2015 is Good Health and Well-Being. SDGs are "an urgent call for action by all countries in a global partnership to improve health and education, foster economic growth and reduce inequalities" (Nations 2019). Setting up FLS helps fracture patients to maintain good bone health, henceforth avoiding subsequent negative health conditions, such as recurrent falls, poor drug compliance, etc. FLS have been shown to be successful. They are proven to reduce recurrent fractures although the significance depends on the design of FLS (Nakayama et al. 2016; Walters et al. 2017). They also help to build relationship and provide a bridge for patients to communicate with orthopaedic experts. Moreover, FLS also facilitate a smooth journey for patients between medical and surgical care at the time of admission and follow up or initiate treatment within the community. Using dual energy X-ray absorptiometry (DXA) to see the bone mineral density of a patient expedites diagnosis of osteoporosis. Vertebral fracture assessment (VFA) also helps detect whether primary prevention model is widely initiated (Lewiecki and Laster 2006; Shipman et al. 2017). In addition, FLS is also shown to be cost-effective and cost-saving.

Economic Analysis of Fracture Liaison Services

The economic impact of falls is essential to family, community and society. Similarly, health-care impacts and costs of falls in elderlies have been increased significantly and gradually all over the world in terms of direct and indirect costs. Direct costs refer to the health-care costs like medications and clinical services such as consultations, treatment and rehabilitation, while indirect costs encompass societal productivity losses of activities and income when individuals sustain fall-related injuries or when caregivers are involved. Costs for running FLS are assessed on the programme management, operations of clinic, specialists, DXA scans, and clinical and supporting staff. It costs around £98 for each patient, while the cost for assessments in usual care of fragility fractures during hospitalisation costs £119 per patient (McLellan et al. 2011). Comparing with the usual care cohort, the FLS cohort has resulted in 22 quality-adjusted life years (QALY) gained, 3 life years gained, and 266 hospital bed days saved. There is an estimated £312,000 cost saving from the fractures avoided (International Osteoporosis Foundation 2019).

FLS are cost-effective compared with usual care for further fracture prevention in patients who suffered from the initial fracture (Cheung et al. 2018). The increment cost-effectiveness ratio is well below the threshold of £20,000 per QALY implemented by NICE in the United Kingdom which remains below £6000 per QALY in all analyses (McLellan et al. 2011). Therefore, FLS has been shown not only to reduce subsequent fracture rate and improve adherence to treatment, but it also benefits in cost-effectiveness and cost savings (Bonanni et al. 2017).

Fracture Liaison Services Worldwide

FLS was found in the United Kingdom in the late 1990s. It was set up to address the growing problem of osteoporosis and risk of fragility fractures, as well as the insufficient follow-up and management of these patients at that time (McLellan et al. 2003). The goal of FLS at that time was to ensure patients with high prevalence to receive appropriate treatment and evaluate and assess their needs for further interventions (McLellan et al. 2011). Later, the first movement tackling fragility fracture was begun by the International Osteoporosis Foundation, known as Capture the Fracture, in the early 2000s. This movement served to endorse, standardise and implement FLS and fragility fracture management and deal with the problem of fragility fractures and the growing problem on world's ageing population (Akesson et al. 2013).

Besides the United Kingdom and Hong Kong, many other countries or regions such as the United States and Taiwan used FLS models to help their citizens prevent fractures. In the United States, risk groups were identified and were distributed to numerous fragility fracture programme using FLS models. For instance, the Kaiser Permanente, a Southern California health-maintenance organisation, runs the Healthy Bones Programme which results in a decrease of 37.2% non-vertebral fractures with a cost saving of $30.8 million; The Own the Bone programme by the American Orthopaedic Association aims to provide a tool kit for FLS which provides ways to manage fracture patients and more importantly to educate the public on fracture prevention and osteoporosis in primary care; And the Project Healthy Bones by the California-based programme which aims to lower the incidence rate of non-vertebral fractures and to help improve bone strength and reduce prevalence of osteoporosis in the community (Bonanni et al. 2017).

In Taiwan, the first FLS programme was started in 2014. It was developed by the National Taiwan University Hospital. This programme serves as a primary framework for the later fracture services. In 2016, a series of workshops was started by the Taiwanese Osteoporosis Association to further promote FLS expansion using the first FLS programme as an example. Most of the 11 International Osteoporosis Foundation-accredited programmes in Taiwan are established at teaching hospitals and university medical centres, including the National Taiwan University Hospital, Taitung Christian Hospital, etc. These programmes are usually supported under research project grants and are led by well-trained FLS coordinators who are dedicated to provide the best services to patients with osteoporosis concerning falls (Chang et al. 2018).

The Hong Kong Experience

FLS in Hong Kong are coordinator-based, postfracture systems of care with an objective to help fracture patients in preventing from secondary fractures (Fig. 9.5). They are interdisciplinary services involving primary care, orthopaedics surgery, ancillary services, such as dieticians and physical therapy, and osteoporosis experts like rheumatologists, endocrinologists and gerontologists. The services aim to ensure that patients with initial fragility fracture will receive fracture risk

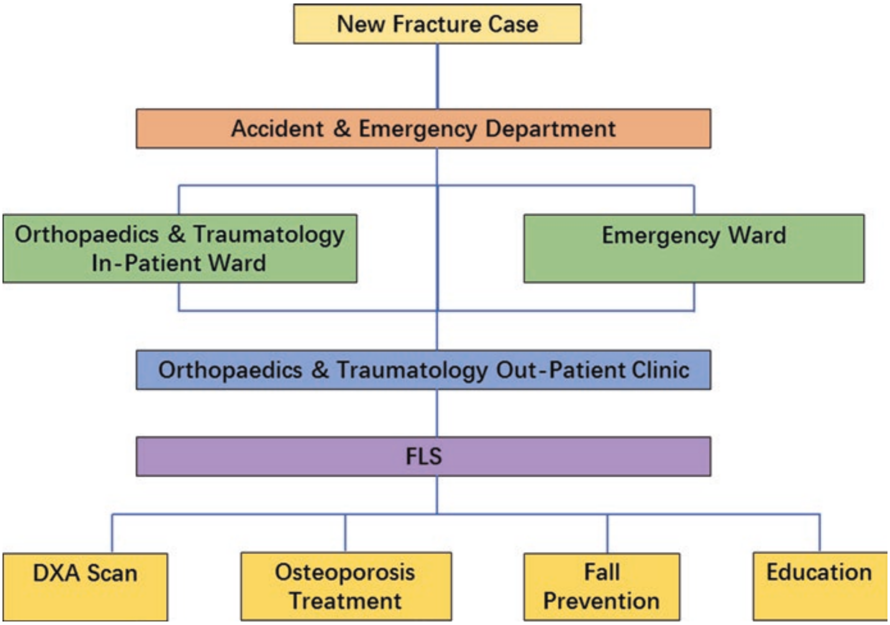

Fig. 9.5 Flow chart of FLS in Hong Kong

assessments and osteoporosis treatment immediately, normally through a dedicated coordinator. Recently, three hospitals, including Prince of Wales Hospital, United Christian Hospital and Queen Elizabeth Hospital, have set up FLS or similar services. These FLS aim to transfer fall prevention knowledge to the community through professional training, assessments and screening, as well as individual follow-up services to fracture patients. Cheung et al. (2018) have shown that programmes similar to FLS are cost-effective. They can reduce falls and fractures with less cost. Apart from primary care prevention, FLS also stress on the need of secondary fracture prevention for patients who have suffered from an initial fracture (Knowledge Transfer Initiatives 2019). In addition to the clinical tasks, two of the components of FLS are fall prevention and education. FLS have gradually been promoted into the community. The community liaison support aims to disseminate fall prevention knowledge to the community dwellers and their caregivers, who are educated with knowledge on reasons of falls, health conditions, nutrition and environmental factors related to falls, injuries, etc. Pamphlets have been distributed for public education, and the feedback from the community has been very positive.

Concluding Remarks

A fall in the elderly is a sentinel event, leading to a high risk of recurrent falls, fractures, imminent fractures and subsequent illnesses. Fall prevention intervention in primary care is crucial to encourage physical activities, strengthen muscles and improve balance ability so as to avoid further falling and fractures. Fracture Liaison Services have been shown to be effective in lowering the incidence of recurrent falls and fall-related imminent fractures through health education, health promotion in the prevention of sarcopenia and early diagnosis and treatment of osteoporosis. Further studies should focus on the efficacy of fall prevention programmes and FLS in terms of cost-effectiveness, changes in prevalence rate and improving the sustainability of the models.

References

Ahmed, L. A., Center, J. R., Bjornerem, A., Bluic, D., Joakimsen, R. M., Jorgensen, L., et al. (2013). Progressively increasing fracture risk with advancing age after initial incident fragility fracture: the Tromso study. *Journal of Bone and Mineral Research, 28*(10), 2214–2221. https://doi.org/10.1002/jbmr.1952.

Akesson, K., Marsh, D., Mitchell, P. J., McLellan, A. R., Stenmark, J., Pierroz, D. D., et al. (2013). Capture the Fracture: a Best Practice Framework and global campaign to break the fragility fracture cycle. *Osteoporosis International, 24*(8), 2135–2152. https://doi.org/10.1007/s00198-013-2348-z.

Alfieri, F. M., Riberto, M., Abril-Carreres, A., Boldo-Alcaine, M., Rusca-Castellet, E., Garreta-Figuera, R., & Battistella, L. R. (2012). Effectiveness of an exercise program on postural control in frail older adults. *Clinical Interventions in Aging, 7*, 593–598. https://doi.org/10.2147/CIA.S36027.

Ambrose, A. F., Paul, G., & Hausdorff, J. M. (2013). Risk factors for falls among older adults: a review of the literature. *Maturitas, 75*(1), 51–61. https://doi.org/10.1016/j.maturitas.2013.02.009.

Ascher-Svanum, H., Faries, D. E., Zhu, B., Ernst, F. R., Swartz, M. S., & Swanson, J. W. (2006). Medication adherence and long-term functional outcomes in the treatment of schizophrenia in usual care. *Joirnal of Clinical Psychiatry, 67*(3), 453–460.

Australian Government. (2004). *An analysis of research on preventing falls and falls injury in older people: Community, residential care and hospital settings*. Retrieved from https://www.health.gov.au/internet/main/publishing.nsf/Content/14D0B87F9C15C1E8CA257BF0001DC537/$File/falls_community.pdf

Balasubramanian, A., Zhang, J., Chen, L., Wenkert, D., Daigle, S. G., Grauer, A., & Curtis, J. R. (2019). Risk of subsequent fracture after prior fracture among older women. *Osteoporosis International, 30*(1), 79–92. https://doi.org/10.1007/s00198-018-4732-1.

Banefelt, J., Akesson, K. E., Spangeus, A., Ljunggren, O., Karlsson, L., Strom, O., et al. (2019). Risk of imminent fracture following a previous fracture in a Swedish database study. *Osteoporosis International, 30*(3), 601–609. https://doi.org/10.1007/s00198-019-04852-8.

Bauer, D. C. (2018). Osteoporosis Treatment After Hip Fracture: Bad News and Getting Worse. *JAMA Network Open, 1*(3), e180844. https://doi.org/10.1001/jamanetworkopen.2018.0844.

Bergman, J., Nordstrom, A., & Nordstrom, P. (2018). Bisphosphonate use after clinical fracture and risk of new fracture. *Osteoporosis International, 29*(4), 937–945. https://doi.org/10.1007/s00198-017-4367-7.

Berry, S. D., & Miller, R. R. (2008). Falls: epidemiology, pathophysiology, and relationship to fracture. *Current Osteoporosis Reports, 6*(4), 149–154.

Berry, S. D., Quach, L., Procter-Gray, E., Kiel, D. P., Li, W., Samelson, E. J., et al. (2010). Poor adherence to medications may be associated with falls. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences, 65*(5), 553–558. https://doi.org/10.1093/gerona/glq027.

Black, D. M., Cummings, S. R., Karpf, D. B., Cauley, J. A., Thompson, D. E., Nevitt, M. C., et al. (1996). Randomised trial of effect of alendronate on risk of fracture in women with existing vertebral fractures. Fracture Intervention Trial Research Group. *The Lancet, 348*(9041), 1535–1541.

Bonanni, S., Sorensen, A. A., Dubin, J., & Drees, B. (2017). The Role of the Fracture Liaison Service in Osteoporosis Care. *Missouri Medicine, 114*(4), 295–298.

Bondo, L., Eiken, P., & Abrahamsen, B. (2013). Analysis of the association between bisphosphonate treatment survival in Danish hip fracture patients-a nationwide register-based open cohort study. *Osteoporosis International, 24*(1), 245–252. https://doi.org/10.1007/s00198-012-2024-8.

Borges, P. L. d. C. e. B., Rose Procópio; AZEVEDO, Silvana Fernandes de and BARBOSA, Juliana Magalhães Machado. (2008). Perfil dos idosos freqüentadores de grupos de convivência em Belo Horizonte. *Cad. Saúde Pública 24*(12), 2798–2808.

Burge, R., Dawson-Hughes, B., Solomon, D. H., Wong, J. B., King, A., & Tosteson, A. (2007). Incidence and economic burden of osteoporosis-related fractures in the United States, 2005–2025. *Journal of Bone and Mineral Research, 22*(3), 465–475. https://doi.org/10.1359/jbmr.061113.

Burton, E., Lewin, G., O'Connell, H., & Hill, K. D. (2018). Falls prevention in community care: 10 years on. *Clinical Interventions in Aging, 13*, 261–269. https://doi.org/10.2147/CIA.S153687.

Campbell, A. J., Robertson, M. C., Gardner, M. M., Norton, R. N., Tilyard, M. W., & Buchner, D. M. (1997). Randomised controlled trial of a general practice programme of home based exercise to prevent falls in elderly women. *BMJ, 315*(7115), 1065–1069.

Centers for Disease Control and Prevention. (2015). *Preventing falls: A guide to implementing effective community-based fall prevention programs*. Retrieved from https://www.cdc.gov/homeandrecreationalsafety/pdf/falls/fallpreventionguide-2015-a.pdf

Chang, L. Y., Tsai, K. S., Peng, J. K., Chen, C. H., Lin, G. T., Lin, C. H., et al. (2018). The development of Taiwan Fracture Liaison Service network. *Osteoporos Sarcopenia, 4*(2), 47–52. https://doi.org/10.1016/j.afos.2018.06.001.

Cheung, W. H., Mok, H. W., Qin, L., Sze, P. C., Lee, K. M., & Leung, K. S. (2007). High-frequency whole-body vibration improves balancing ability in elderly women. *Archives of Physical Medicine and Rehabilitation, 88*(7), 852–857. https://doi.org/10.1016/j.apmr.2007.03.028.

Cheung, W. H., Li, C. Y., Zhu, T. Y., & Leung, K. S. (2016). Improvement in muscle performance after one-year cessation of low-magnitude high-frequency vibration in community elderly. *Journal of Musculoskeletal and Neuronal Interactions, 16*(1), 4–11.

Cheung, W. H., Shen, W. Y., Dai, D. L., Lee, K. B., Zhu, T. Y., Wong, R. M., & Leung, K. S. (2018). Evaluation of a multidisciplinary rehabilitation programme for elderly patients with hip fracture: A prospective cohort study. *Journal of Rehabilitation Medicine, 50*(3), 285–291. https://doi.org/10.2340/16501977-2310.

Choonhakarn, C., & Seramethakun, P. (1998). Erythema annulare centrifugum associated with pregnancy. *Acta Dermato-Venereologica, 78*(3), 237–238.

Clemson, L., Cumming, R. G., Kendig, H., Swann, M., Heard, R., & Taylor, K. (2004). The effectiveness of a community-based program for reducing the incidence of falls in the elderly: a randomized trial. *Journal of the American Geriatrics Society, 52*(9), 1487–1494. https://doi.org/10.1111/j.1532-5415.2004.52411.x.

Day, L., Fildes, B., Gordon, I., Fitzharris, M., Flamer, H., & Lord, S. (2002). Randomised factorial trial of falls prevention among older people living in their own homes. *BMJ, 325*(7356), 128.

Edelberg, H. K., Shallenberger, E., & Wei, J. Y. (1999). Medication management capacity in highly functioning community-living older adults: detection of early deficits. *Journal of the American Geriatrics Society, 47*(5), 592–596.

Edelberg, H. K., Shallenberger, E., Hausdorff, J. M., & Wei, J. Y. (2000). One-year follow-up of medication management capacity in highly functioning older adults. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences, 55*(10), M550–M553.

Elliott, S., & Leland, N. E. (2018). Occupational Therapy Fall Prevention Interventions for Community-Dwelling Older Adults: A Systematic Review. *The American Journal of Occupational Therapy, 72*(4), 7204190040p1–7204190040p11. https://doi.org/10.5014/ajot.2018.030494.

Ensrud, K. E., Black, D. M., Palermo, L., Bauer, D. C., Barrett-Connor, E., Quandt, S. A., et al. (1997). Treatment with alendronate prevents fractures in women at highest risk: results from the Fracture Intervention Trial. *Archives of Internal Medicine, 157*(22), 2617–2624.

Ettinger, A. B., Manjunath, R., Candrilli, S. D., & Davis, K. L. (2009). Prevalence and cost of nonadherence to antiepileptic drugs in elderly patients with epilepsy. *Epilepsy & Behavior, 14*(2), 324–329. https://doi.org/10.1016/j.yebeh.2008.10.021.

Fabacher, D., Josephson, K., Pietruszka, F., Linderborn, K., Morley, J. E., & Rubenstein, L. Z. (1994). An in-home preventive assessment program for independent older adults: A randomized controlled trial. *Journal of the American Geriatrics Society, 42*(6), 630–638.

Feldstein, A., Elmer, P. J., Orwoll, E., Herson, M., & Hillier, T. (2003). Bone mineral density measurement and treatment for osteoporosis in older individuals with fractures: A gap in evidence-based practice guideline implementation. *Archives of Internal Medicine, 163*(18), 2165–2172. https://doi.org/10.1001/archinte.163.18.2165.

Freedman, K. B., Kaplan, F. S., Bilker, W. B., Strom, B. L., & Lowe, R. A. (2000). Treatment of osteoporosis: Are physicians missing an opportunity? *The Journal of Bone and Joint Surgery. American Volume, 82-A*(8), 1063–1070.

Gale, C. R., Cooper, C., & Aihie Sayer, A. (2016). Prevalence and risk factors for falls in older men and women: The English Longitudinal Study of Ageing. *Age and Ageing, 45*(6), 789–794. https://doi.org/10.1093/ageing/afw129.

Ganda, K., Puech, M., Chen, J. S., Speerin, R., Bleasel, J., Center, J. R., et al. (2013). Models of care for the secondary prevention of osteoporotic fractures: a systematic review and meta-analysis. *Osteoporosis International, 24*(2), 393–406. https://doi.org/10.1007/s00198-012-2090-y.

Geusens, P., Autier, P., Boonen, S., Vanhoof, J., Declerck, K., & Raus, J. (2002). The relationship among history of falls, osteoporosis, and fractures in postmenopausal women. *Archives of Physical Medicine and Rehabilitation, 83*(7), 903–906.

Giangregorio, L., Papaioannou, A., Cranney, A., Zytaruk, N., & Adachi, J. D. (2006). Fragility fractures and the osteoporosis care gap: an international phenomenon. *Seminars in Arthritis and Rheumatism, 35*(5), 293–305. https://doi.org/10.1016/j.semarthrit.2005.11.001.

Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Lamb, S. E., Gates, S., Cumming, R. G., & Rowe, B. H. (2009). Interventions for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews, 2*, CD007146. https://doi.org/10.1002/14651858.CD007146.pub2.

Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L. M., & Lamb, S. E. (2012). Interventions for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews, 9*, ARTN CD007146. https://doi.org/10.1002/14651858.CD007146.pub3.

Gusi, N., Carmelo Adsuar, J., Corzo, H., Del Pozo-Cruz, B., Olivares, P. R., & Parraca, J. A. (2012). Balance training reduces fear of falling and improves dynamic balance and isometric strength in institutionalised older people: a randomised trial. *Journal of Physiotherapy, 58*(2), 97–104. https://doi.org/10.1016/S1836-9553(12)70089-9.

Haczynski, J., & Jakimiuk, A. (2001). Vertebral fractures: A hidden problem of osteoporosis. *Medical Science Monitor, 7*(5), 1108–1117.

Hansen, L., Petersen, K. D., Eriksen, S. A., Langdahl, B. L., Eiken, P. A., Brixen, K., et al. (2015). Subsequent fracture rates in a nationwide population-based cohort study with a 10-year perspective. *Osteoporosis International, 26*(2), 513–519. https://doi.org/10.1007/s00198-014-2875-2.

Harrison, B. E. (2017). Fall prevention program in thecommunity: A Nurse practitioner's contribution. *The Journal for Nurse Practitioners, 13*(8), e395–e397.

Hernlund, E., Svedbom, A., Ivergard, M., Compston, J., Cooper, C., Stenmark, J., et al. (2013). Osteoporosis in the European Union: medical management, epidemiology and economic burden. A report prepared in collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA). *Archives of Osteoporosis, 8*, 136. https://doi.org/10.1007/s11657-013-0136-1.

Hill, K., Schwarz, J., Flicker, L., & Carroll, S. (1999). Falls among healthy, community-dwelling, older women: A prospective study of frequency, circumstances, consequences and prediction accuracy. *Australian and New Zealand Journal of Public Health, 23*(1), 41–48.

Ho, P. M., Rumsfeld, J. S., Masoudi, F. A., McClure, D. L., Plomondon, M. E., Steiner, J. F., & Magid, D. J. (2006). Effect of medication nonadherence on hospitalization and mortality among patients with diabetes mellitus. *Archives of Internal Medicine, 166*(17), 1836–1841. https://doi.org/10.1001/archinte.166.17.1836.

International Osteoporosis Foundation. (2019). *Osteoporotic fractures are very common and extremely expensive*. Retrieved from https://www.capturethefracture.org/health-economics

Jarvinen, T. L., Sievanen, H., Khan, K. M., Heinonen, A., & Kannus, P. (2008). Shifting the focus in fracture prevention from osteoporosis to falls. *BMJ, 336*(7636), 124–126. https://doi.org/10.1136/bmj.39428.470752.AD.

Johansson, H., Siggeirsdottir, K., Harvey, N. C., Oden, A., Gudnason, V., McCloskey, E., et al. (2017). Imminent risk of fracture after fracture. *Osteoporosis International, 28*(3), 775–780. https://doi.org/10.1007/s00198-016-3868-0.

Johnell, O., Kanis, J. A., Oden, A., Sernbo, I., Redlund-Johnell, I., Petterson, C., et al. (2004). Fracture risk following an osteoporotic fracture. *Osteoporosis International, 15*(3), 175–179. https://doi.org/10.1007/s00198-003-1514-0.

Kanis, J. A., Svedbom, A., Harvey, N., & McCloskey, E. V. (2014). The osteoporosis treatment gap. *Journal of Bone and Mineral Research, 29*(9), 1926–1928. https://doi.org/10.1002/jbmr.2301.

Kempen, G. I., Yardley, L., van Haastregt, J. C., Zijlstra, G. A., Beyer, N., Hauer, K., & Todd, C. (2008). The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling. *Age and Ageing, 37*(1), 45–50. https://doi.org/10.1093/ageing/afm157.

Kim, S. C., Kim, M. S., Sanfelix-Gimeno, G., Song, H. J., Liu, J., Hurtado, I., et al. (2015). Use of osteoporosis medications after hospitalization for hip fracture: a cross-national study. *American Journal of Medicine, 128*(5), 519–526. e511. https://doi.org/10.1016/j.amjmed.2015.01.014.

Knowledge Transfer Initiatives. (2019). *Establishment of fracture liaison services to prevent secondary fractures and enhance post-fracture rehabilitation in community*. Retrieved from https://www.orkts.cuhk.edu.hk/knowledge-transfer-initiatives/project-highlights/1967-establishment-of-fracture-liaison-services-to-prevent-secondary-fractures-and-enhance-post-fracture-rehabilitation-in-community-kpf16icf202

Kulinski, K., DiCocco, C., Skowronski, S., & Sprowls, P. (2017). Advancing Community-Based Falls Prevention Programs for Older Adults-The Work of the Administration for Community Living/Administration on Aging. *Frontiers in Public Health, 5*, 4. https://doi.org/10.3389/fpubh.2017.00004.

Leung, K. S., Li, C. Y., Tse, Y. K., Choy, T. K., Leung, P. C., Hung, V. W., et al. (2014). Effects of 18-month low-magnitude high-frequency vibration on fall rate and fracture risks in 710 community elderly–a cluster-randomized controlled trial. *Osteoporosis International, 25*(6), 1785–1795. https://doi.org/10.1007/s00198-014-2693-6.

Leung, K. S., Yuen, W. F., Ngai, W. K., Lam, C. Y., Lau, T. W., Lee, K. B., et al. (2017). How well are we managing fragility hip fractures? A narrative report on the review with the attempt to setup a Fragility Fracture Registry in Hong Kong. *Hong Kong Medical Journal, 23*(3), 264–271. https://doi.org/10.12809/hkmj166124.

Lewiecki, E. M., & Laster, A. J. (2006). Clinical review: Clinical applications of vertebral fracture assessment by dual-energy x-ray absorptiometry. *Journal of Clinical Endocrinology and Metabolism, 91*(11), 4215–4222. https://doi.org/10.1210/jc.2006-1178.

Li, F., Harmer, P., & Fitzgerald, K. (2016). Implementing an Evidence-Based Fall Prevention Intervention in Community Senior Centers. *American Journal of Public Health, 106*(11), 2026–2031. https://doi.org/10.2105/AJPH.2016.303386.

Lyles, K. W., Colón-Emeric, C. S., Magaziner, J. S., Adachi, J. D., Pieper, C. F., Mautalen, C., Hyldstrup, L., Recknor, C., Nordsletten, L., Moore, K. A., Lavecchia, C., & Zhang, J. (2007). Zoledronic Acid and Clinical Fractures and Mortality after Hip Fracture. *The New England Journal of Medicine, 357*, 1799–1809.

Mahoney, J. E. (2014). "Stepping on": stepping over the chasm from research to practice. *Frontiers in Public Health, 2*, 148. https://doi.org/10.3389/fpubh.2014.00148.

McClure, R. J., Hughes, K., Ren, C., McKenzie, K., Dietrich, U., Vardon, P., et al. (2010). The population approach to falls injury prevention in older people: findings of a two community trial. *BMC Public Health, 10*, 79. https://doi.org/10.1186/1471-2458-10-79.

McLellan, A. R., Gallacher, S. J., Fraser, M., & McQuillian, C. (2003). The fracture liaison service: success of a program for the evaluation and management of patients with osteoporotic fracture. *Osteoporosis International, 14*(12), 1028–1034. https://doi.org/10.1007/s00198-003-1507-z.

McLellan, A. R., Wolowacz, S. E., Zimovetz, E. A., Beard, S. M., Lock, S., McCrink, L., et al. (2011). Fracture liaison services for the evaluation and management of patients with osteoporotic fracture: a cost-effectiveness evaluation based on data collected over 8 years of service provision. *Osteoporosis International, 22*(7), 2083–2098. https://doi.org/10.1007/s00198-011-1534-0.

McPhate, L., Simek, E. M., & Haines, T. P. (2013). Program-related factors are associated with adherence to group exercise interventions for the prevention of falls: a systematic review. *Journal of Physiotherapy, 59*(2), 81–92. https://doi.org/10.1016/S1836-9553(13)70160-7.

Nakayama, A., Major, G., Holliday, E., Attia, J., & Bogduk, N. (2016). Evidence of effectiveness of a fracture liaison service to reduce the re-fracture rate. *Osteoporosis International, 27*(3), 873–879. https://doi.org/10.1007/s00198-015-3443-0.

Napoleone, G. (2015). Addressing the Osteoporosis Health Care Gap in British Columbia with Fracture Liaison Services. *UBC Medical Journal, 7*(1), 33–35.

Nations, U. (2019). *Sustainable development goals*. Retrieved from https://sustainabledevelopment.un.org/?menu=1300

Nowson, C. A. (2010). Prevention of fractures in older people with calcium and vitamin D. *Nutrients, 2*(9), 975–984. https://doi.org/10.3390/nu2090975.

Ory, M. G., Smith, M. L., Jiang, L., Lee, R., Chen, S., Wilson, A. D., et al. (2014). Fall prevention in community settings: results from implementing stepping on in three States. *Frontiers in Public Health, 2*, 232. https://doi.org/10.3389/fpubh.2014.00232.

Pagliosa, L. C., & Renosto, A. (2014). Effects of a health promotion and fall prevention program in elderly individuals participating in interaction groups. *Fisioterapia em Movimento, 27*(1), 9.

Patton, K., Meyers, J., & Lewis, B. E. (1997). Enhancement of compliance among patients with hypertension. *American Journal of Managed Care, 3*(11), 1693–1698.

Peel, N. M. (2011). Epidemiology of falls in older age. *Canadian Journal of Aging, 30*(1), 7–19. https://doi.org/10.1017/S071498081000070X.

Rachner, T. D., Khosla, S., & Hofbauer, L. C. (2011). Osteoporosis: now and the future. *The Lancet, 377*(9773), 1276–1287. https://doi.org/10.1016/S0140-6736(10)62349-5.

Robertson, M. C., Devlin, N., Gardner, M. M., & Campbell, A. J. (2001). Effectiveness and economic evaluation of a nurse delivered home exercise programme to prevent falls. 1: Randomised controlled trial. *BMJ, 322*(7288), 697–701.

Robinson, L., Newton, J. L., Jones, D., & Dawson, P. (2014). Self-management and adherence with exercise-based falls prevention programmes: a qualitative study to explore the views and experiences of older people and physiotherapists. *Disability and Rehabilitation, 36*(5), 379–386. https://doi.org/10.3109/09638288.2013.797507.

Roux, C., & Briot, K. (2017). Imminent fracture risk. *Osteoporosis International, 28*(6), 1765–1769. https://doi.org/10.1007/s00198-017-3976-5.

Royal Osteoporosis Society. (2014). *Effective secondary prevention of fragility fractures: Clinical standards for fracture liaison services*. Retrieved from https://theros.org.uk/media/1776/clinical-standards-report.pdf

Sherrington, C., Whitney, J. C., Lord, S. R., Herbert, R. D., Cumming, R. G., & Close, J. C. (2008). Effective exercise for the prevention of falls: a systematic review and meta-analysis. *Journal of the American Geriatrics Society, 56*(12), 2234–2243. https://doi.org/10.1111/j.1532-5415.2008.02014.x.

Shipman, K. E., Doyle, A., Arden, H., Jones, T., & Gittoes, N. J. (2017). Development of fracture liaison services: What have we learned? *Injury, 48*(*Suppl 7*), S4–S9. https://doi.org/10.1016/j.injury.2017.08.030.

Siris, E. S., Adler, R., Bilezikian, J., Bolognese, M., Dawson-Hughes, B., Favus, M. J., et al. (2014). The clinical diagnosis of osteoporosis: a position statement from the National Bone Health Alliance Working Group. *Osteoporosis International, 25*(5), 1439–1443. https://doi.org/10.1007/s00198-014-2655-z.

Solomon, D. H., Johnston, S. S., Boytsov, N. N., McMorrow, D., Lane, J. M., & Krohn, K. D. (2014). Osteoporosis medication use after hip fracture in U.S. patients between 2002 and 2011. *Journal of Bone and Mineral Research, 29*(9), 1929–1937. https://doi.org/10.1002/jbmr.2202.

Speechley, M., & Tinetti, M. (1991). Falls and injuries in frail and vigorous community elderly persons. *Journal of the American Geriatrics Society, 39*(1), 46–52.

Stevens, J. A., Baldwin, G. T., Ballesteros, M. F., Noonan, R. K., & Sleet, D. A. (2010a). An older adult falls research agenda from a public health perspective. *Clinics in Geriatric Medicine, 26*(4), 767–779. https://doi.org/10.1016/j.cger.2010.06.006.

Stevens, J. A., Noonan, R. K., & Rubenstein, L. Z. (2010b). Older adult fall prevention: perceptions, beliefs, and behaviors. *American Journal of Lifestyle Medicine, 4*(1), 16–20.

The Chinese University of Hong Kong. (2018). *Fall prevention campaign*. Retrieved from http://www.no-fall.hk/t/index.html

Tiedemann, A., Hill, A.-M., Sturnieks, D. L., Lovitt, L., Clemson, L., Lord, S. R., Harvey, L., & Sherrington, C. (2014). Does a fall prevention educational programme improve knowledge and change exercise prescribing behaviour in health and exercise professionals? A study protocol for a randomised controlled trial. *BMJ, 4*(11), e007032.

Tinetti, M. E., Baker, D. I., Garrett, P. A., Gottschalk, M., Koch, M. L., & Horwitz, R. I. (1993). Yale FICSIT: risk factor abatement strategy for fall prevention. *Journal of the American Geriatrics Society, 41*(3), 315–320.

Vieira, E. R., Palmer, R. C., & Chaves, P. H. (2016). Prevention of falls in older people living in the community. *BMJ, 353*, i1419. https://doi.org/10.1136/bmj.i1419.

Vik, S. A., Hogan, D. B., Patten, S. B., Johnson, J. A., Romonko-Slack, L., & Maxwell, C. J. (2006). Medication nonadherence and subsequent risk of hospitalisation and mortality among older adults. *Drugs & Aging, 23*(4), 345–356. https://doi.org/10.2165/00002512-200623040-00007.

Walters, S., Khan, T., Ong, T., & Sahota, O. (2017). Fracture liaison services: improving outcomes for patients with osteoporosis. *Clinical Interventions in Aging, 12*, 117–127. https://doi.org/10.2147/CIA.S85551.

Williams, L. K., Pladevall, M., Xi, H., Peterson, E. L., Joseph, C., Lafata, J. E., et al. (2004). Relationship between adherence to inhaled corticosteroids and poor outcomes among adults with asthma. *Journal of Allergy and Clinical Immunology, 114*(6), 1288–1293. https://doi.org/10.1016/j.jaci.2004.09.028.

Wisconsin Institute for Healthy Aging. (2012). *Stepping on an Implementation Guide: How to Prepare for, Implement, and Evaluate Stepping on in Community*. Settings. Retrieved from https://wihealthyaging.org/_data/files/SO_materials/Stepping-On-Manual_10-17-2013.pdf

World Health Organization. (2019a). *Falls*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/falls

World Health Organization. (2019b). *Falls prevention in older age*. Retrieved from https://www.who.int/ageing/projects/falls_prevention_older_age/en/

World Health Organization. (2019c). *The Ottawa charter for health promotion*. Retrieved from https://www.who.int/healthpromotion/conferences/previous/ottawa/en/

Zijlstra, G. A., van Haastregt, J. C., van Eijk, J. T., van Rossum, E., Stalenhoef, P. A., & Kempen, G. I. (2007). Prevalence and correlates of fear of falling, and associated avoidance of activity in the general population of community-living older people. *Age and Ageing, 36*(3), 304–309. https://doi.org/10.1093/ageing/afm021.

Chapter 10
Community Rehabilitation

Thomas Man Chi Dao and Liio Wai Kit Poon

Introduction

It is far predicted that there has been 10% of population in the world who lives with a disability. The World Health Organization (WHO) defines rehabilitation as "a set of measures that help individuals who revel in, or are in all likelihood to revel in, disability to obtain and maintain premier functioning in interaction with their environments". In Hong Kong, the demand for rehabilitation services is expected to grow with the increasing ageing population. In "Hong Kong Population Projections for 2017 to 2066" published by the Hong Kong Census and Statistics Department (2017), the ageing of population will be most rapid in the coming 10 years. The percentage of elderly aged 65 or above is projected to grow from 17% in 2016 to 31% in 2036 and progress up to 37% in 2066. The healthcare burden of non-communicable diseases and their sequelae will also increase.

To address the pressing need for rehabilitation services, community health practitioners should equip themselves with the knowledge and skills in providing community rehabilitation to the patients. Community rehabilitation refers to the delivery of rehabilitation services in the community setting. In line with the WHO community-based rehabilitation guideline (2010), it consists of five important components: specifically health, education, livelihood, social, and empowerment; and each of them is composed of five elements. It provides comprehensive and practical suggestions at the development of a community-based rehabilitation programme, which will be discussed further in this chapter.

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Current Scientific Evidences and Practice of Community Rehabilitation in Primary Care Setting

The WHO has described community-based rehabilitation (CBR) as measures taken at the community level based on the community's resources, such as the impaired, disabled, and handicapped persons themselves, their families, and their network as a whole (WHO 1981). CBR is constructed in line with the community with well-planned programmes. It additionally serves the elderly (Paudel et al. 2017). The scope of CBR shall be broad enough to cover social, educational, and vocational rehabilitation, intensive individualised rehabilitation, sports activity rehabilitation, and so forth (Hoeman 1992). In order to achieve the objectives, the CBR programmes shall include providing educational support, referral services, social support, financial assistance, employment facilitation, etc. (Shrivastava et al. 2015).

As resources are becoming available and the stakeholders increasing, it becomes more important to provide evidences on the accountability and relevance of CBR such as to ensure correct decision-making and appropriate policy with rationality and transparency of management decisions (Velema et al. 2010). The evidences include quantitative and qualitative data representing the situation in the environment, the performance, the rehabilitation process, and the effects of interventions. The evidence of change of data is assessed by comparing the data collected at different points in time (Velema et al. 2010). Also, it is suggested that accurate evidence is important in evaluating the concerned programmes (Chung 2019).

However, in the Western and Eastern countries, the evidence base for CBR is insufficient. There are a few studies that have elicited methods for the evaluation of the CBR programmes, leading to diverse evidence bases (Chung et al. 2011). There is also a phenomenon of enough data but insufficient evidence in studying CBR (Kuipers and Hartley 2006). Both of the implementation mechanism and information to address stakeholders' concerns are presented in good shape, but the articles on participation and making use of the local resources are in a small scale. Moreover, there is a lack of focus of studying CBR, and the evidence base is not integrated or coherent (Finkenflugel et al. 2005). Some articles state that there is low CBR coverage. The assessments of evidence are incomprehensive to find out the effectiveness of CBR. In addition, the establishment of effectiveness of CBR supported with evidence is difficult. There is also a phenomenon that individual programmes are designed to explore special areas which are in need. Different focus, client types, etc. are included (Iemmi et al. 2013). Therefore, it is a challenge to design suitable studies that are widely applicable to different circumstances.

Given the tremendous data, the effectiveness of CBR is being evaluated in multiple dimensions and is too broad to be documented concisely. In practice, it is needed to specify an intervention of CBR to a specific target group and discuss its effectiveness within this group, which is, for instance, age, sex, and severity of disability. The result will reflect the goals such as increased mobility by providing aids and appliances, or increased income through income-generating activity (Velema et al. 2008).

The Reviews of Scope and Efficiency of CBR

Interventions

There are different types of interventions in various CBR programmes (Velema et al. 2008), such as the following:

1. Community volunteers to teach the disabled with skills applied in daily activities, enhancing mobility and autonomy, and other functions in society
2. Stakeholders to assist schooling and financial support to disabled children and also educate school staff to provide help
3. Stakeholders to provide socioeconomic support with physical rehabilitation
4. Other programmes that shall raise public awareness of disability and encourage formation of disabled persons' self-help groups or organisations

Efficiency of CBR

The efficiency of various CBR programmes has been reported in some studies as follows:

1. Home-based training – Some studies reported that by delivering home-based training programmes to disabled and caregiver, there are high percentage of improvement in their ability in performing various functions.
2. Schooling – Some reports showed that CBR workers helped many children overcome the boundary to attend school.
3. Socioeconomic rehabilitation – The results of reports are diverse.

Some disables have found jobs with the help of the CBR programmes. It is also suggested that the disabled got helps to go through the job-selection process, trade-choosing, and vocational training and some obtained microcredit to become self-employed with material improvement in well-being and can even start self-support.

Quality of Life

A quality of life score shows that those who use the rehabilitation services have enjoyed a better quality of life than those who do not and that the difference is even larger for those who use a combination of services (Velema et al. 2008).

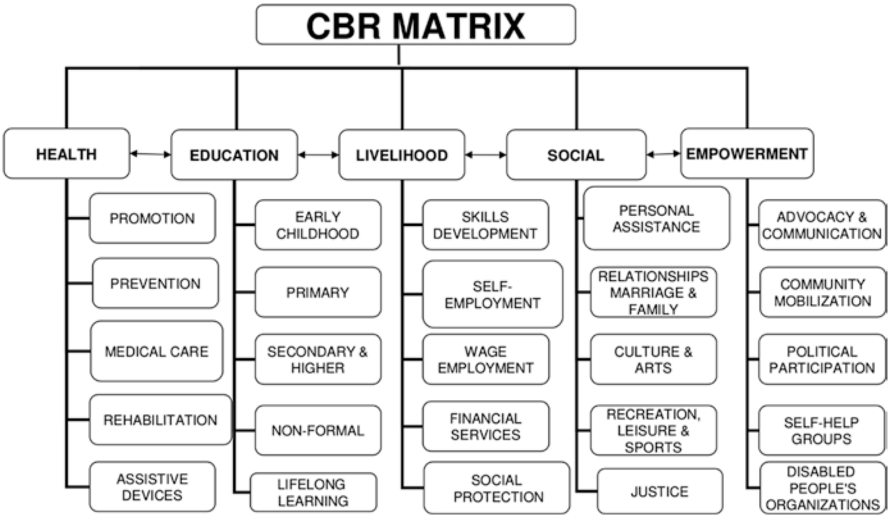

Fig. 10.1 Community-based rehabilitation (CBR) matrix of WHO

Components of Community-Based Rehabilitation

The components of community-based rehabilitation can be expressed as community-based rehabilitation matrix according to the WHO guideline. It is composed by five components as "CBR Matrix" (Fig. 10.1): health, education, livelihood, social, and empowerment. It is the basic structure to develop new CBR programmes (WHO 2010a).

I: Health Component

There are five elements in health component: health promotion, prevention, medical care, rehabilitation, and assistive devices (WHO 2010b).

Health Promotion

The aim of health promotion is to raise the control of health and its determinants. The role is to find out health promotion activities as well as cooperate with stakeholders to ensure services are delivered to disabled people and their families and to ensure that disabled people understand the essence of good health maintenance. Health promotion actions consist of five areas to help in developing and implementing health promoting strategies:

(i) Health services reorientation
(ii) Supportive environments for health
(iii) Community strengthening
(iv) Personal skills development
(v) Healthy public policy

Prevention

In CBR, prevention mainly focuses on primary prevention, i.e. to ensure activities of prevention for all people. Thus, CBR programmes provide services for disabled people and their families in health prevention. Prevention does not only facilitate the access to existing prevention programmes to ensure disabled people and their families understand the types of available prevention activities but also promote healthy behaviours and lifestyles. Hence, this element encourages immunisation such as cooperate with primary healthcare services to support disabled people and their families to join vaccination programmes, as well as proper nutrition for disabled children to support them with appropriate food.

Prevention element facilitates access to maternal and child healthcares by providing additional supports to women with disabilities. Besides, it promotes clean water and sanitation and helps to get rid of injuries such as finding out their major causes and the groups that are at risk. Furthermore, it helps to prevent secondary conditions by means of educating disabled people and their family members to understand the secondary conditions which are commonly associated with their disabilities.

Medical Care

Medical care focuses on disabled people to access services for identification, correction, and prevention of the health problems. CBR programmes can gather information about services by identifying medical services in all localities and all levels. Medical care assists to achieve early identification by screening activities for preliminary discovery of communicable or non-communicable diseases.

The element ensures the access of early treatment by prompt check with healthcare providers to ensure disabled people are under continuous medical care. Medical care also facilitates the access to surgical care to find out available surgical choices. Also, disabled people can be motivated to achieve self-management of chronic conditions.

Rehabilitation

Rehabilitation is to enhance disabled people to optimise their daily activities in the community. CBR not only promotes rehabilitation activities but also helps disabled people to gain specialised rehabilitation services when they are in need.

The activities include assessing their needs, helping to go through referral, and follow-up processes. Early intervention for child development is also provided.

This part of CBR encourages functional independence to improve individual's daily activities with minimum help from others. Environmental modifications in school, public buildings, or work places are also useful. Other aspects include connecting with self-help groups to share ideas and to develop and distribute resource materials and providing training to CBR providers so that appropriate services at community level can be delivered.

Assistive Devices

CBR shall cooperate with disabled people and their families to assess their needs for assistive devices. Also, access and maintenance of the assistive devices should be ensured.

To work out this element, CBR personnel shall be well-trained to provide accurate information, referral, and other educational means. It is also essential to build the capacity of individuals and families to understand the choices of assistive devices so that independence is achieved.

II: Education Component

There are five stages in education: early childhood care, primary education, secondary and higher education, non-formal education, and lifelong learning (WHO 2010c).

Early Childhood Care

This stage includes education from birth to the beginning of formal primary education. It emphasises on child life maintenance, learnings, and development such as nutrition and hygiene. CBR identifies and interacts with the families with disabled children to ensure good child development in all aspects.

CBR activities include:

(a) Identify the needs of early childhood and programmes that support disabled children and their families and work to facilitate early impairments identification.
(b) Support early home learning activities such as support education and training to the families with disabled child to ensure they can not only take care of the child but also explore learning opportunities for them.

(c) Help to develop inclusive preschools by linking up the education sectors to enhance adjustable child learning environment. CBR also assists training teaching staffs to build up effective learning environments.
(d) Connect adults and children with disabilities by encouraging them to get involved in care and education activities and enhance the functions as trainers and decision-makers.
(e) Address poverty to emphasise on activities about daily family activities so that the children become an integral part of family life.

Primary Education

CBR programmes are designed not only to cooperate with primary education systems to support families and disabled children for primary education but also to build network between home and community.

There are several activities that can achieve this propose, for instance, to mobilise the community to align disabled people's or parents' organisations to discuss about the barriers in keeping disabled children from schooling and exploring ways to support them; to motivate the schools to become a welcome and accessible premise with suitable learning environment; to provide training and support for teachers to develop training and resources for different impairments; to initiate the change in curricula and teaching methods to make curricula flexible; to encourage flexibility in examinations and assessment; to use locally available resources in creating an effective learning environment for children; and also to assist special schools to be included.

Secondary and Higher Education

CBR in secondary and higher education is to enhance inclusion by increasing participation and achievement for disabled students and to cooperate with school authorities to allow for flexibility in the curriculum. Activities include encouraging the community and school authorities to organise appropriate transportation means and to raise funding for fees, uniforms, assistive devices, and other additional supports. The family assists to create an inclusive learning environment to encourage disabled students to find important solution. In the aspect of curriculum and teaching methods, CBR programmes help to develop relevant and accessible curricula with appropriate formats and communication systems. Flexible examination and assessment can be designed for the student's needs.

Information and communications technology can be improved by exploring the possibility of grants or funding to provide computers and Internet support for disabled students. Social support to enhance the policy developments to eliminate discrimination should be considered.

Non-formal Education

These strategies will facilitate disabled people to explore educational opportunities. This element drives the acceptance of existing non-formal education programmes to become inclusive and sustain specific learning groups, CBR providers, to link up disabled students with disabled people's associations to facilitate their learning. It is also practical to construct linkage with formal schooling by requesting leaders from different education sectors to get into the CBR programme and to encourage formal schools to train parents and teachers in making schools inclusive and maintain strong home–school bonds.

Lifelong Learning

This element is to initiate educational plans such as home-based learning and government and community official organised plans. CBR programmes facilitate disabled people to find out learning opportunities so as to avoid community exclusion.

CBR can facilitate support for transitions such as further skills training and increased independence, can enhance opportunities for adult literacy and adult education by encouraging educational inclusion to disabled adults, can support continuous distance learning, can encourage the learning in life and the survival skills that is necessary for daily life and participation in society, and can enhance social inclusion by cooperating with local educational workers.

III: Livelihood Component

Livelihood component consists of the following elements: skills development, self-employment, wage employment, financial services, and social protection (WHO 2010d).

Skills Development

CBR programmes help disabled individuals to explore occupational opportunities by enhancing the process of getting relevant knowledge and skills. Possible activities are training at home, joining occupational trainings with instructors capable to train trainees with different types of disabilities, development of business skills, provision of language interpretation, materials support and facilitating training by mainstream institutions, and enrolment and financial aid and training in specialised institutions.

Self-Employment

In this area, CBR programmes do not only assist disabled people to start their own business but also support their skills development, financial, and material resources. It can help to identify a market opportunity through market studies and adjust the activity compatible to the environment, to encourage individual to make choices that can match interests, skills, and resources for income generation.

Supporting disabled women includes the support in childcare arrangements. Furthermore, partnerships may be built with local government and mainstream organisations to develop activities to start to initiate inclusive schemes.

Wage Employment

The CBR programmes can help to ensure treatment equality in the workplace and fair employment services. There are several activities such as to promote the job fulfilment and employment rights for disabled peoples, to understand the policy environment with reference to the national and local employment policies, and to identify the most effective strategy to increase awareness on equal treatment and other practical examples including supporting disabled people for employment, providing assisting services, matching the person to the job, providing training to develop job seeking skills, providing continuous support such as periodic visits to the employee, and encouraging employers' organisations to recruit disabled people.

Financial Services

CBR programmes identify, facilitate, and promote access of disabled people to financial service. The programmes promote the habit of saving, encourage disabled people to start up their own business, and help to approach to financial services such as advocation for equal access for people with disabilities.

Social Protection

This element is to help people fight against extreme poverty especially elderly/people with illness. CBR programmes facilitate people with disabilities approaching to social benefits. They are designed not only to ensure disabled people are covered in partnership of existing concerned organisation but also to help get sufficient food and water. Moreover, the programmes ensure housing and accessibility, healthcare arrangement, and assistance like transportation, housing, and assistive equipment are available.

IV: Social Component

The social component includes personal assistance, relationships, marriage and family, culture and arts, recreation, leisure and sports, and justice (WHO 2010e).

Personal Assistance

CBR programmes utilise community resources to ensure people with disabilities and their families are able to access different options for personal assistance. The programmes work in partnership with disabled people's organisations to support the development and monitoring of appropriate personal assistance services for people with disabilities. They also aim to aid the improvement and monitoring of the concerned support, to assist in developing individual support plans and training opportunities such as communication and assertiveness skills, and to ensure families are supported and well-prepared to manage crisis situations by planning in advance with other stakeholders.

Relationships, Marriage, and Family

CBR supports disabled people to have good family and social relationships:

(a) Challenge and address stigma, prejudice, and discrimination by cooperation with mass media to enhance the images of disabled people.
(b) Provide support for parents to advocate with associations for disabled people to enhance their inclusion in community services.
(c) Work with families to promote independence which includes providing records and assistance to cope with their worries concerning their disabled members.
(d) Help to prevent violence including assistance to increase processes with stakeholders.
(e) Support people with limited social networks and connect disabled people to suitable networks in the society.

Culture and Arts

CBR programmes cooperate with stakeholders to support disabled people to join arts and cultural activities by working with the mainstream organisations and groups to ensure reasonable accommodation is available and working with spiritual and religious leaders and groups to eliminate discriminatory or harmful practices towards them and their families in the community.

Recreation, Leisure, and Sport

CBR programmes assist organisations to offer suitable recreation, leisure, and sports activities; to identify local recreation, leisure, and sports opportunities; to facilitate the disabled people to join by providing personal assistance on participation; and to make use of the activities to emphasise on inclusion and developing disability-specific programmes with appropriate training and resources.

Justice

CBR promotes disabled people's rights and assists them to act against discrimination. Activities for justice include:

(a) Develop an understanding of the local context such as identifying available resources in the local area and assisting people with disabilities to access justice.
(b) Promote the understanding of rights with cooperation with disabled people's organisations.
(c) Promote approach to informal paths with cooperation with religious leaders to help resolve family disputes.

V: Empowerment Component

Empowerment component is composed of advocacy and communication, community mobilisation, political participation, self-help groups, and disabled people's organisations (WHO 2010f).

Advocacy and Communication

CBR assists disabled people to protect their right to express their needs by skilful communication. Besides providing support to develop communication skills such as facilitate referrals to specialist service, the programmes address communication barriers through encouragement of good atmosphere in the society to enhance communication for people with disabilities. The setup is also to ensure CBR personnel are effective communicators in communicating with stakeholders in the different sectors.

Community Mobilisation

Community mobilisation is a policy to get the community involved to change and to take action. CBR programmes facilitate the community to explore the needs of disabled people. The activities include but not limited to finding out about the community by developing understandings of how disabled people live, motivating the community to participate, and creating opportunities for community participation to find out barriers that keep stakeholders from cooperating with them.

Political Participation

CBR ensures disabled people have sufficient support to take part in politics. Additionally, CBR ensures disability issues become a part of decision-making in political aspect. This element can be achieved by activities to facilitate development of political awareness such as connecting disabled people to supporting groups and organisations so that political participation skills may be learnt and strengthening disability awareness within the political system by conducting disability-awareness training with local councils.

Self-Help Groups

This element emphasises on the support and assistance of the formation of self-help groups. It can be achieved by:

(a) Providing assistance to form new self-help groups such as educating about the concept and encourage disabled people to organise
(b) Assisting to run the meetings
(c) Facilitating effective cooperation among self-help groups
(d) Building capacity by supporting them to function effectively and independently
(e) Developing partnerships with existing self-help groups
(f) Encouraging self-help groups to join CBR programmes
(g) Encouraging self-help groups to join together

Disabled People's Organisations

CBR works in partnership with disabled people's organisations to assist their formation. The workable activities also encourage them to support CBR as a strategy such as promote the importance of CBR and invite them to join CBR programmes. Supporting the setup of community-based disabled people's organisations by cooperation with disabled people's organisations at the national level to arrange skill sharing or training workshop is also important.

Planning and Evaluation in Community Rehabilitation

Planning in Community Rehabilitation

Careful planning is vital to the success of a community-based rehabilitation programme. Situation analysis process involves information gathering, stakeholder analysis, problem analysis, objective analysis, and resource analysis.

(a) *Information gathering* refers to the collection of basic facts and figures related to the people with disabilities, which include population, health, living conditions, education, culture, religion, government, etc.
(b) *Stakeholder analysis* involves individuals, patient groups, community organisations, and the government that may influence the development of the CBR programme. It is imperative for them to participate in the early stage of the management cycle because they have specific roles in the CBR programme.
(c) *Problem analysis* should be the main purpose of a CBR programme and focuses on addressing the problems faced by people with disabilities. The causes and effects of such problems could be elucidated through the analysis with the help of a "problem tree". Key stakeholders should participate and discuss to come up with actions and solutions.
(d) *Objective analysis* refers to setting of objectives for a CBR programme in response to the problems identified during problem analysis. It forms the basis of the CBR programme.
(e) *Resource analysis* – After situation analysis, priority setting should be done with regard to the available and suitable resources in the CBR programme to support the implementation of programme, including human resources, material resources, and financial resources. Stakeholders should formulate a programme plan, which includes goals, purpose, outcomes, and activities. A detailed work plan with specific tasks, responsible person, and timeline should also be defined. To make financial management more accountable and transparent, a budget is required for future monitoring and evaluation.

Evaluation of Community Rehabilitation Programmes

Evaluation of CBR programmes provides important information to demonstrate whether the programmes are effective and sustainable. It also provides evidence to the stakeholders and policymakers for continuing, expanding, refining, or terminating the programmes. Evaluation methods are diverse, and there is no consensus in the literature as to which assessment method is the best. For a CBR programme to succeed, ongoing evaluation by programme managers is crucial to identify the weakness and faults early so that corrective measures could be taken promptly. There are a few steps in a comprehensive evaluation.

a. Defining What to Evaluate

Evaluation aims to provide a comprehensive assessment of a CBR programme regarding its relevance, efficiency, effectiveness, impact, and sustainability. The criteria or indicators should be clear and unambiguous so the standards could be compared at different points of time. A useful mnemonic "**SMART**" could be used in defining quantifiable indicators, which stands for: **S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime-bound.

Evaluation could be done on the *process of care* and *patients' outcome*. For the assessment of *Process of care*, it includes the effectiveness of the programme governance system, the fulfilment of roles of each CBR personnel, the quality of care delivered and the resources used. For *patients' outcome*, the impact on patients' physical, psychological, and social health, the overall change in quality of life of patients and their carers, and the impact on community as a whole can be examined.

b. Data Collection

Service providers and patients could provide valuable information from different perspectives. Information could be collected by various means, such as retrospective case record reviews, self-administered questionnaires, telephone interviews, face-to-face interviews, or focus groups. Depending on the information required, different methods have their own strengths and weaknesses. Such data could be collected internally by the CBR personnel or externally by an independent agency.

c. Data Analysis

The crude data obtained from data collection need to be transformed into meaningful results. Quantitative data, such as numerical or categorical results, are usually analysed by descriptive statistics and various statistical tests depending on the types of data. Qualitative data such as ideas, concepts, opinions, etc. are analysed by thematic synthesis. Useful conclusions and recommendations could be drawn after the analysis for future improvement of CBR programme.

d. Dissemination of Findings

It is important that the findings could reach the intended audience for further actions. It could be in the form of a newspaper article, an evaluation report submitted to journal, and a presentation in a meeting or conference. The results of the evaluation should be able to influence the future direction of a CBR programme.

Case Report

A Multidisciplinary Chronic Obstructive Pulmonary Disease Rehabilitation Programme in a Government-Funded Primary Care Clinic in Hong Kong

Chronic obstructive pulmonary disease (COPD) is a common and preventable disease. According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD), it is characterised by persistent respiratory symptoms and airflow limitation because airway and/or alveolar abnormalities are usually caused by significant exposure to noxious particles or gases (Global Initiative for Chronic Obstructive Lung Disease 2019). Smoking is the most common risk factor for COPD. In Hong Kong, the prevalence of COPD in persons aged 65 or above was 1.2% in 2014/15 (Centre for Health Protection 2017). There were more than 14,000 COPD patients under the care of government-funded primary care clinics, or general out-patient clinics (GOPCs) in Hong Kong in 2016 (Hospital Authority 2018). COPD is listed as one of the non-communicable diseases in the government strategy and action plan "*Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong*" in May 2018. The plan targets at reducing the risk of premature mortality by 25% by 2025.

Management of COPD by a team of multidisciplinary professionals could enhance the quality of care. Since 2016, a GOPC in Kwai Chung district in Hong Kong established a multidisciplinary COPD rehabilitation programme with input from nurses, dieticians, and physiotherapists. Primary care physicians play a pivotal role in coordinating these services for patients with COPD, as well as performing clinical assessment and prescription of appropriate inhalation medications. Nurses are responsible for performing office spirometry, providing smoking cessation counselling services and inhalation technique assessment. Physiotherapists perform functional assessment using structured tools (e.g. 6-min walk test) and give professional advice to patients regarding breathing techniques and pulmonary hygiene and prescribe exercise regime. As cachexia is frequently seen in long-standing and advanced COPD patients, they are also referred to dietician for nutritional advice and supplementation.

The initial 2-year experience of this multidisciplinary COPD rehabilitation programme was encouraging. More than 100 COPD patients were invited to participate in the programme. Their mean age was 69 years. 73% of them were GOLD category B, C, or D patients (i.e. either high symptom burden, high exacerbation risk, or both). After consultation by doctor, the COPD patients were referred to nurses, physiotherapists, and dieticians if appropriate. They participated in a 1-h small group session jointly held by a doctor and a physiotherapist to enhance their knowledge in COPD and to empower them to manage COPD. The participants also practiced breathing techniques and performed muscle strengthening exercise. Those who joined the programme had higher rate of influenza and pneumococcal vaccinations, both of which exceeds 85%. They were also more likely to quit smoking, with overall quit rate of around 25%. The exacerbation rate leading to attendance in the emergency department or admission was only 4.9% as compared to the 10–15% in usual practice. Further research is undergoing to determine the cost-effectiveness of such rehabilitation programme.

Conclusion

With the ageing population, the need for rehabilitation is increasing. The design and implementation of a CBR programme should be tailored to specific populations and diseases with focus on the five main components as described. Careful planning and evaluation are also important for continuous improvement of the programmes. As the current evidence in literatures for community rehabilitation is diverse, future research with particular focus in local situations should be promoted and encouraged.

References

Census and Statistics Department. (2017). *Hong Kong Population Projections 2017–2066*. Hong Kong Special Administrative Region. Retrieved from https://www.statistics.gov.hk/pub/B1120015072017XXXXB0100.pdf

Centre for Health Protection. (2017). *Report of Population Health Survey 2014/15*. Department of Health, Hong Kong Special Administrative Region. Retrieved from https://www.chp.gov.hk/files/pdf/dh_phs_ 2014_15_full_report_eng.pdf.

Chung, E. Y. (2019). Identifying evidence to define community-based rehabilitation practice in China using a case study approach with multiple embedded case study design. *BMC Health Services Research, 19*(1), 6. https://doi.org/10.1186/s12913-018-3838-7.

Chung, E. Y., Packer, T., & Yau, M. (2011). When east meets west: Community-based rehabilitation in Chinese communities. *Disability and Rehabilitation, 33*(8), 697–705. https://doi.org/10.3109/09638288.2010.506240.

Finkenflugel, H., Wolffers, I., & Huijsman, R. (2005). The evidence base for community-based rehabilitation: A literature review. *International Journal of Rehabilitation Research, 28*(3), 187–201. https://doi.org/10.1097/00004356-200509000-00001.

Global Initiative for Chronic Obstructive Lung Disease. (2019). *Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease 2019 Report*. Retrieved from https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf

Hoeman, S. P. (1992). Community-based rehabilitation. *Holistic Nursing Practice, 6*(2), 32–41. https://doi.org/10.1097/00004650-199206020-00007.

Hospital Authority. (2018). *Hospital Authority Statistical Report 2016–2017*. Hong Kong Special Administrative Region. Retrieved from http://www3.ha.org.hk/data/HAStatistics/DownloadReport/2

Iemmi, V., Suresh Kumar, K., Blanchet, K., Gibson, L., Hartley, S., Murthy G. V. S., Patel, V., Weber, J., & Kuper, H. (2013). Community-based rehabilitation for people with physical and mental disabilities in low- and middle-income countries (protocol). *Cochrane Database of Systematic Reviews, Issue 7*. https://doi.org/10.1002/14651858.CD010617.

Kuipers, P., & Hartley, S. (2006). A process for the systematic review of community-based rehabilitation evaluation reports: Formulating evidence for policy and practice. *International Journal of Rehabilitation Research, 29*(1), 27–30. https://doi.org/10.1097/01.mrr.0000185950.02552.db.

Paudel, S., Bhandari, L., & Bhandari, D. B. (2017). Disability: A case screening programme approach. *Journal of Biosciences and Medicines, 5*(2), 10–21. https://doi.org/10.4236/jbm.2017.52002.

Shrivastava, S., Shrivastava, P., & Ramasamy, J. (2015). Exploring the scope of community-based rehabilitation in ensuring the holistic development of differently-abled people. *African Health Sciences, 15*(1), 278–280. https://doi.org/10.4314/ahs.v15i1.36.

Velema, J. P., Ebenso, B., & Fuzikawa, P. L. (2008). Evidence for the effectiveness of rehabilitation-in-the-community programmes. *Leprosy Review, 79*(1), 65–82. Retrieved from http://www.lepra.org.uk/platforms/lepra/files/lr/Mar08/Lep65-82.pdf.

Velema, J. P., Ebenso, B., Hartley, S., Jalovcic, D., Kuipers, P., & Mendoza, V. E. (2010). Research and evidence based practice in community based rehabilitation. In *CBR and inclusive development in Asia and the Pacific*. Bangkok: Asia Pacific Development Centre on Disability. https://doi.org/10.13140/RG.2.1.4265.6400.

World Health Organization. (1981). *Disability prevention and rehabilitation: Report of the WHO expert committee on disability prevention and rehabilitation*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/40896/WHO_TRS_668.pdf.

World Health Organization. (2010a). *Introductory booklet. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_introductory_eng.pdf?sequence=9.

World Health Organization. (2010b). *Health component. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_health_eng.pdf?sequence=7.

World Health Organization. (2010c). *Education component. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_education_eng.pdf?sequence=3.

World Health Organization. (2010d). *Livelihood component. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_livelihood_eng.pdf?sequence=11.

World Health Organization. (2010e). *Social component. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_social_eng.pdf?sequence=13.

World Health Organization. (2010f). *Empowerment component. Community-based rehabilitation: CBR guidelines*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44405/9789241548052_empower_eng.pdf?sequence=5.

Chapter 11
Primary Care for Older Adults

Chor Ming Lum

Introduction

Hong Kong has been proud of the cost-effectiveness of its health-care system, as measured by the life expectancy. As in 2017, average life expectancy is 84.3 which ranked top in the league table (Census and Statistics Department 2017). Despite that, the increased life expectancy is associated with increased functional limitations (Yu et al. 2016). While longevity is treasured, most if not all agree that healthy ageing and quality life are preferred to extension of poor quality life. This should be achieved through continuum of work throughout the whole life span, addressing on a biophysical-psychosocial model but not a disease-based model alone. This chapter reviews characteristics of older adults that make them unique and different from middle age adults, discusses the paradigm of healthy ageing, and reviews system of primary care conducive to supporting them in community living. The chapter will end with a discussion on challenges in Hong Kong to meet health-care needs of the ageing population.

Ageing, Characteristics of Older Adults, and the Clinical Implications

Ageing can be defined in different dimensions. There are different evolutionary, biological, and psychosocial theories that try to explain the "why, how, and who" phenomenon of ageing (Fedarko and McNabney 2016). From a biological point of view, it is best described as a state of altered homeostasis that makes a person more

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vulnerable to stress. This decline in physiological reserves starts in the third decade and occurs in each organ system and is influenced by diet, environment, and personal habits as well as genetic factors (Resnick and Marcantonio 1997). As the reserve progressively depicts, impairment or functional limitation starts. However, the rate and extent of the decline varies between and within individuals. With progression of individual life span, importance of genetic make-up towards health and functional capacity becomes less and less. Older adult is thus a heterogeneous group with wide variations in health and functional status. While it is tempting to define old age by a chronological order from year of birth, it is the biological age of a person that health-care system needs to work on.

Knowledge and skills in medicine have advanced rapidly over the past few decades. This is partly due to division of labour through sub-specialisation and that each of single-organ specialists makes advancement in individual organs. Symptoms are studied; normal references and management guidelines are derived based on a single-disease model. The approach works well if one has single-organ disease, while the remaining has well-preserved reserves. However, all organs have practically diminishing reserve at varying speed beyond middle age. Lack of this understanding may lead to delay or misdiagnosis, misinterpretation of results, or iatrogenesis from over- or undertreated due to misinformed risk/benefit ratio inferred from studies which have limited representation of older patients. An example is on the optimal Body Mass Index (BMI), of which older adults may benefit from a higher BMI than a conventional cutoff value at 23 kg/m^2 as in middle age population (Schooling et al. 2007; Prospective Studies Collaboration 2009; Auyeung et al. 2010). Management targets should be "person-centred" with reference to biological age of the individual. Illustration of this concept can take reference to the target glucose control among older adults (Huang 2016).

Healthy Ageing

Healthy ageing is defined as "the process of developing and maintaining the functional ability that enables well-being in older age" (WHO 2015). This functional ability comprises health-related attributes that enable people to be and to do what they have reason to value. It is common that, because of the word "healthy", one tends to equate it as state of "disease-free state". Thus, health-care worker who is not trained in proper elder care tends to focus on the "disease-label" model, i.e. to find out if the senior has diabetes mellitus, hypertension, stroke, etc., in order to define if one is healthy or not. However, as WHO (2015) points out, many older adults may have one or more conditions that are well controlled and have little influence on their functions. Functional ability depends on one's intrinsic capacity (biophysical-psychological profile) and the relevant environmental (social) con-

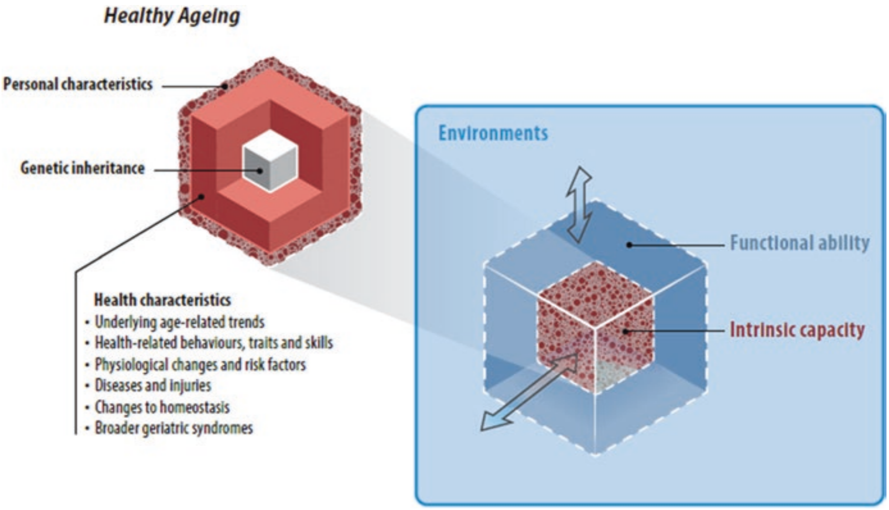

Fig. 11.1 Concept of healthy ageing. (Source: WHO 2015)

texts. This concept is best illustrated by Fig. 11.1 (WHO 2015). This concept brings in the importance of assessing an older adult on multidimension (biophysical-psychosocial) or holistically instead of disease label or treatment alone. While the social context on healthy ageing is important, it is in the domain of social gerontology and beyond the scope of this chapter. In the following discussion, it is assumed that the environment always enables the exercising of one's maximum functional ability.

As eluded before, ageing is inevitable and is a lifelong process starting from the third decade of life. Healthy ageing is viewed as a process of developing or maintaining the functional capacity. There are three hypothetical trajectories of healthy ageing as illustrated by Fig. 11.2 (WHO 2015).

In Fig. 11.2, trajectory A represents the "compression (or squaring) of morbidity" and is the ideal path that one aims at. In the model, despite the gradual decline of intrinsic capacity, functional capacity is relatively preserved or supported. The person still enjoys healthy ageing with compression of time span with loss of independence until the very late stage of life. Trajectory C represents another person who has progressive loss of functioning with extended disability life span. Potentially, a lot can be done to restore the trajectory from C to A. This is to be achieved through good primary care (see later sections). Trajectory B represents episodic illness that has accelerated decline in functioning. Restoration of function through interdisciplinary team should be attempted as far as possible. Whether this restoration work should be delivered at the primary or secondary/tertiary care level depends largely on role delineation, resources, and system where one works in.

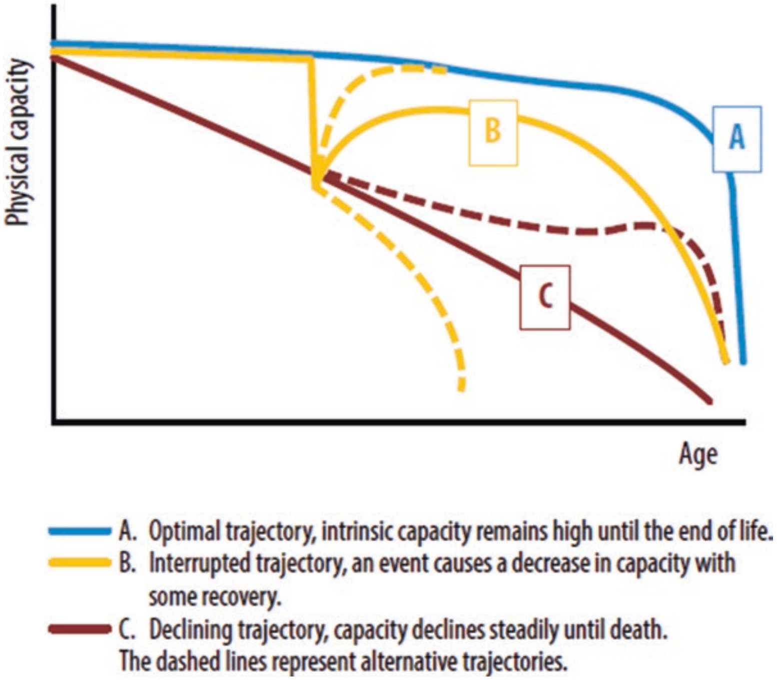

Fig. 11.2 Three hypothetical trajectories of physical capacity. (Source: WHO 2015)

Health and Functional Independence Status Among Older Adults in Hong Kong

The majority of older adults are independent and healthy. However, with the process of age-related changes, coupled with the epidemic of non-communicable diseases, older adults experience more functional limitations that jeopardised their subjective well-being than middle age adults. A survey by the Census and Statistics Department of Hong Kong (2007) reported that about 0.3% of people aged 65 and above reported excellent health, 6% very good health, 31% good health, 43% fair health, and 14% poor health. More than 43% of non-institutionalised population older than age 60 reported having had two or more chronic illness (Census and Statistics Department 2005). These chronic illnesses are translated to functional limitations or disabilities in older adults. Household survey by the Census and Statistics Department (2007) found that 21.5% of people age 60 years or above had one or more disabilities, of which restriction in bodily movement (14%), seeing difficulty (9.2%), and hearing difficulty (6.1%) are the commonest. Cognitive impairment is also prevalent in the older population. It is estimated that its incidence doubled every 5 years for person aged over 65 (Chiu et al. 1998) and about 8.9% of community dwelling older Chinese aged 70 years or above suffer from mild dementia (Lam 2008).

Both physical and cognitive impairment can lead to reduced independence on Basic or Instrumental Activity of Daily Livings (B-ADL or I-ADL). Household survey in 2004 (Census and Statistics Department 2005) found that 6.5% and 22.2% of non-institutionalised adults aged above 60 were not fully independent in their B-ADL and I-ADL, respectively, and the rates increased with advancing age. If nothing is done to delay the onset of ADL limitations and Disability-Adjusted Life Expectancy (DALE) (WHO 2000) remains constant, an extension of life expectancy per se will mean an extension of disability years that jeopardised the quality of life of the older adults and putting strains on the social cost of caring. This is what Hong Kong is facing (Yu et al. 2019). Although it will not be realistic to prevent all these conditions, there are multiple interventions that can delay their onset and thus compress the disability life years. The situation presents both challenges and opportunities to the existing health-care system. If older adults can optimise their health and live in their environment that promotes active participation, their experiences, skills, and wisdom will be valuable resources for the society (Primary Care Office 2018). Appropriate and targeted work at the primary health-care settings will be most instrumental in achieving the goal.

Primary Health Care for the Elderly

As illustrated in Fig. 11.3 (WHO 2015), healthy ageing involves building the intrinsic capacity so that functional ability can be maintained. Determinants of this intrinsic capacity depend on multiple factors, including genetic make-ups, age-related changes, lifestyles and behaviours, presence of non-communicable diseases, and injuries or communicable diseases that pre-dispose one to accelerated functional decline. With advancing age, the relative contribution of genetic factors decreases, and the impact of non-genetic factors increases. Many of these non-genetic factors are potentially modifiable and provide opportunity for intervention. Primary health care in the form of health promotion, case finding, and early intervention thus plays a pivotal role in maintaining high and stable capacity, or reversing or slowing down the decline in subjects with declining capacity. Where necessary, primary health-care service providers may also advise or refer older persons who have significant loss of capacity to secondary or tertiary levels of care (Primary Care Office 2018).

In response to the ageing population and the World Health Report on primary health care (WHO 2008), the Primary Care Office (PCO) under the Department of Health, Food, and Health Bureau of Hong Kong is set up to support and coordinate the development of primary care in Hong Kong (Food and Health Bureau 2010). This office was integrated with the new Primary Healthcare Office established within the Food and Health Bureau on 1 October 2019. At the initial phase of work, two clinical protocols in the form of reference frameworks for hypertension and diabetes are produced. Seeing into the growing ageing population, their altered state of homeostasis and associated clinical implications, and the importance of assessment and maintenance of functional ability (see previous section), the PCO produced the first version of the Hong Kong Reference Framework for Preventive Care for Older Adults in Primary Care Settings in 2012 and a revised edition in 2018 (Primary

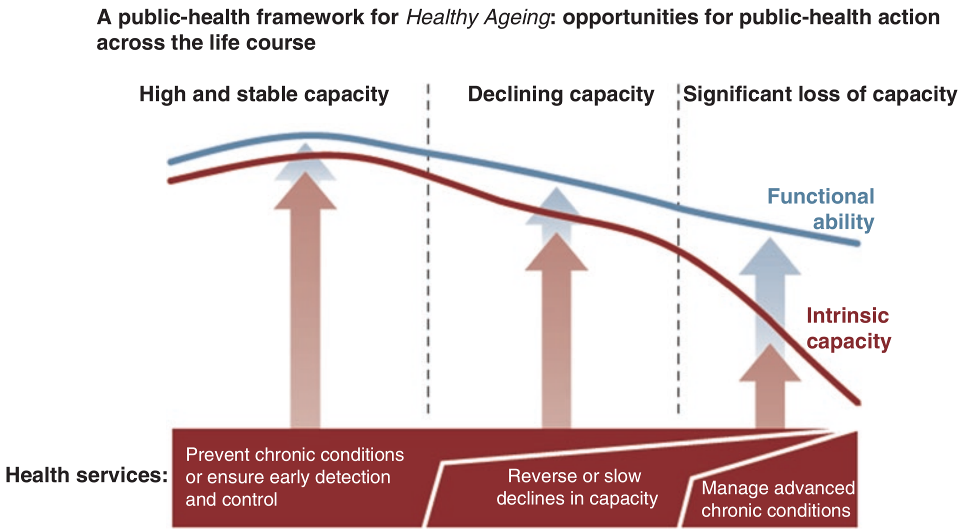

Fig. 11.3 A public-health framework for healthy ageing. (Source: WHO 2015)

Table 11.1 Recommendations on preventive care for older adults with disabilities

Preventive care	Recommendations
Assess the abilities on self-care and daily living	Assess functioning of daily living in community by B-ADL and I-ADL
Opportunistic screening of functional impairment	Hearing, vision, incontinence, falls, dental, depression, dementia, social isolation
Assess risk of malnutrition	Check BMI and monitor body weight
Review use of medications	Screen for problem related to medication use and polypharmacy
Assess social network and support	Screen for carer stress

Source: PCO (2018)

Care Office 2018). In the Reference Framework, PCO recommends to adopt both the population-based and high-risk individual approaches. The population-based approach addresses on the life course risk factor through health promotion (e.g. regular exercise), lifestyle modification (e.g. smoking cessation), and disease prevention (e.g. vaccination). The high-risk individual approach focuses on individuals who are identified as high risks which are defined by demographic, health characteristics, or life stage. An example of the "high-risk individual approach" identified through health characteristics or life stage is given in Table 11.1.

The following are highlights of the Reference Framework which are worthwhile to take note on:

1. While chronological age is a shortcut for administrative purpose, risk stratification on "high-risk individual" is based on biological age. The latter is a reflection of intrinsic capacity and can be inferred from the presence or absence of chronic diseases and the functional level or whether there is disability or not.
2. A life course perspective of maintaining independence is taken as the outcome of interest. This is along the line of healthy ageing as advocated by the WHO as discussed before.
3. The domains for preventive care take into account of the biological age of an individual. For example, an older adult who is biologically young (e.g. age 70 and without any chronic disease) should be screened for specific cancer and potential diseases that pose high cardiovascular risks (e.g. metabolic syndrome). On the other hand, for a biologically old adult (e.g. dysphagia and walking limitation after stroke), screening for malnutrition, social network, and support will be more important.
4. The domains to be screened are multidimensional (biophysical-psychosocial) and not restrictive to disease entities. Conditions (e.g. undernutrition, poor oral hygiene) falling short of a disease (e.g. hypertension, diabetes mellitus) may also reduce intrinsic capacity and should be screened. Depending on disability level, screening should also extend to "caregiver support". This approach is consistent with the paradigm as suggested by WHO (2017) in the "Integrated care for older people: guidelines on community level interventions to manage declines in intrinsic capacity".

5. While one does screening and potential measures on preventive care, one should take reference to normal or optimal values based on the wider population. An example of the "geriatric paradox" that takes reference of BMI and target glucose level is given in the previous section.

Primary Health System to Meet the Need of Older Population

Using a life span approach, ageing starts from early or middle adulthood gradually. The best approach is to build up bodily reserve (e.g. bone mineral density, lean muscle mass) through healthy lifestyle at an early stage so that more buffers are in place for the decline. Accelerated functional decline can be prevented or slowed down by disease prevention or early detection and management to prevent complications. These are implemented through health promotion or screening, using population or high-risk-based approach. These are key roles of the primary care teams. It is a common belief that good disease management can prevent its associated complications. The belief is subjected to debate if it genuinely prevents complications, or just delays its onset and inevitably happening if one lives long enough. There may also have episodic illnesses during the life span (trajectory B in Fig. 11.2) which may affect organ function (impairment), bodily function (ability limitation), or socialisation (activity restriction).

With advancement in medical knowledge and technology, these conditions can be managed though not cured. Despite maximum restoration efforts, culmination of deficits occurs (trajectory B in Fig. 11.2) though longevity is achieved (Yu et al. 2016). Depending on the intensity of input required, this restoration works may best be managed at the primary, secondary, or tertiary care levels. This trajectory is likely to repeat itself until the number of culminated deficits is high enough so that the person cannot live independently despite maximum community support. By then, institution support is required. Before this stage, the person is likely to remain in the community and requires variable health care, physical, and psychosocial supports that may also be needed by his/her informal caregiver. At the very late stage of life, the bodily homeostasis system fails and the physiological status fluctuates. That worries most caregivers, and initiation of advanced care planning or end-of-life care will benefit the person most. Whether the last journey should best be under the care at primary or secondary care level will depend on the needs of the individual as well as those of the family or caregiver.

While the above trajectory appears to be linear, it is more likely to be intercalated with episodic illnesses of which the senior requires secondary or tertiary care in the hospital setting. The need is particularly relevant for acute medical or surgical interventions. Unfortunately, older patients are more prone to deconditioning (Covinsky et al. 2011). An acute and fast track rehabilitation is required for restoration of bodily function at secondary or tertiary settings. For slow track rehabilitation or subsequent maintenance, home- or community-based rehabilitation is equally effective if not better than at the hospital (Langhorne and Baylan 2017; Hillier and Inglis-

Jassiem 2010). It should also be aware that any treatment in the hospital is time-limited, while life, irrespective of it is healthy ageing or with functional limitations, is continuous throughout the time span. Familiarisation to the surrounding environment and utilisation of associated facilities where one lives can facilitate the development of physical or social activities conducive to the maintenance of health or self-care level. It is thus reasonable to establish interface system between primary and secondary care for handover and that the primary care centre should be in proximity to where the person lives instead of travelling to "regional" centres.

From the person-centred perspective, the needs are dynamic. It has been shown that health promotion with education material only is not effective (Haines et al. 2011). Health promotion may best be delivered by one who has background training in health education and health promotion, such as the community health practitioners (CHPs) (Hong Kong College of Community Health Practitioners 2019). While screening can usually be done by simple questionnaires (e.g. clock drawing test for cognitive impairment, Geriatrics Depression Scale for depression) or measurements (e.g. body mass index or blood pressure), it should be done by properly trained workers who have knowledge of pitfalls and limitations of the tests and on appropriate interpretation with reference to older population.

A screening programme is never successful without follow-up management. As older adults are at a state of altered homeostasis and commonly having multiple interacting problems instead of segregated disease(s), a primary care physician with the knowledge, skills, and paradigm of analysing biophysical-psychosocial status of the older adult is required (see previous section on *Ageing, Characteristics of Older Adults and the Clinical Implications*). With gradual decline in bodily reserve, multidimensional intervention with nutrition backup, physical training and cognitive training are required to reverse frailty syndrome (Romera-Liebana et al. 2018). These will require inputs from allied health professionals such as dietitians, occupational therapists, and physiotherapists. With increasing level of ability limitation, the older adults (and/or the caregivers) may require community supports such as meals-on-wheel services, household cleansing, or respite care to support them at the community. Thus, the focus has shifted from health care to social service, or a combination of both with variable degree.

It is thus easily visualised that inputs by different professionals are required at different points of time, or altogether. A team of workers is needed. In general, there are different models of teamwork. The first is a multidisciplinary team approach of which multiple professionals work independently and separately without a common goal for the elder, and there is little exchange among members. The second is the interdisciplinary team approach of which the team members sit together, discuss, and work towards a common goal for the older adult. The third is transdisciplinary team approach with core and extended team members. In this model, a key worker, acting as the case manager, can apply basic skills of another profession as first tier work. If the task is beyond his or her ability, individual profession is called in to help. An example is a nurse to provide dietary advice on high protein diet and resistive exercise for health maintenance in the old. Equally a trained medical social worker should be able to provide the advice on diet and exercise. However, if the subject still persistently progresses with sarcopaenia, primary care physician may need to review for secondary causes, and inputs from professional physiotherapist and dietitian are required. In general, it is easier for health-care colleagues to adopt this transdisciplinary approach than social workers because of their shared learning on biological system. Depending on the skills mix of the health-care workers such as the CHPs, expected role of the "primary care", and resources available, the interdisciplinary or transdisciplinary team model is preferred.

Overall, one sees the needs of a system with the following:

(a) A community centre at proximity to the older adults so that the older adults can easily walk in (in reach) to seek advice or health check, or the workers can easily walk out (outreach) to provide services (counselling, social support, home adaptation etc.).
(b) A team of health-care workers who have the knowledge of biological, functional, psychological, and sociological aspects of the older adults and how they interact to the overall capacity of the senior.
(c) The team is a coordinated one, whether in an interdisciplinary or transdisciplinary manner.
(d) Dynamic interflow between the primary and secondary/tertiary care.

Models in Hong Kong

A possible model is one similar to the Jockey Club Cadenza Hub (*http://www.cadenza.hk/index.php?option=com_content&view=article&id=15&lang=en*) under the Community Cadenza Project. In this model, multiple disciplinary staff are housed in the same setting. Senior citizens can walk in anytime. The hub can also be referred by general practitioners for whatever allied health services. However, the Hub is a stand-alone one with multidisciplinary team members. There is a lack of primary care physicians with training in elderly care who can give advice to the health-care colleagues even when they encounter difficulties. The other issue is that the Hub does not outreach to seniors in the estate. Those who voluntarily walk in usually are the more health conscious and healthier than those "hidden elder" who neglect themselves, or are not aware of the problems oneself. It also lacks a dynamic flow between the Hub and the secondary/tertiary centre which is essential for a person-centred and seamless handover of care. Currently, a community health centre with similar model is piloted in the Kwai Tsing District of Hong Kong. The Kwai Tsing District Health Centre was opened on 24 September 2019 (see Chap. 23 for details). It will take a few years for the subsequent process and outcome evaluations to be available for further fine-tuning.

Another model is proposed by Our Foundation Hong Kong (2018). In the model, a proposed district health centre serves as the "hub" that integrates private primary care services, services from Department of Health, services from Hospital Authority, and services from social services to the older adults (person-centred). To make it successful, good coordination between the health and social sectors and within health-care sectors is essential. The model is yet to be tested.

Where Are We Now?

Hong Kong takes pride on longevity, with an average life expectancy at 84.3 (Census and Statistics Department 2017). Besides, she probably has one of the most cost-effective health-care systems with a total of 6.1% GDP spent on health-care expenditure, an equivalent of HK$20,243 or about US$2600 per person (Food and Health Bureau 2018) annually. Among the expenditure, roughly 51% were for public services, among which 73.3% were given to the public hospital system (Food and Health Bureau 2018). Public hospitals are run by the Hospital Authority and are geared towards acute conditions rather than the extended management of chronic illnesses. Although there are family medicine clinics under the Hospital Authority, it serves mainly as "step-down" clinics for other clinical specialties, instead of for preventive or holistic care, or as gatekeeper for appropriate workups and referrals. There are also "general out-patient clinics" which are taken to the Hospital Authority from the Department of Health. Whether the family medicine clinics or the general out-patient clinics should serve as primary or secondary care or should they be under the Hospital Authority, Department of Health, or a new "Primary Health Authority" are up to debate. Whatever the system to be, it should serve the principles, objectives, and roles of primary care.

However, while it is non-controversial that health promotion and risk assessment are under the domain of primary care, it is unclear how far does the continuum of care go. To quote from Primary Care Office (pp. 18, 2018) "… primary care providers are in a prime position in the …, as well as follow up care after medical conditions of patients have stabilized and after discharge from hospitals…." At another platform from Primary Care Office (2018), it is cited "Primary care contributes to …. treatment and care for acute and chronic diseases, … and rehabilitative, supportive and palliative care for disability or end-stage diseases". It should be noted that many of these aforementioned works are currently provided by the Hospital Authority at the secondary and tertiary care levels. As discussed before, the slow decline in function is likely to be intercalated by episodic illnesses with variable recovery. Reversal of the acute insult and the fast-track rehabilitation is best done at secondary or tertiary care, while the slow-track rehabilitation is preferred to be carried out in the community where the senior live in. There is a need for role delineation between different sectors. There is a need for facilitation towards seamless and dynamic flow between sectors that serve and benefit the older adults most.

If primary care includes slow-track rehabilitation and supportive service for independent living, there is a need for collaborative works between the health-care and social services teams. These two sectors should work with an interdisciplinary or transdisciplinary model and in a coordinated manner. In Hong Kong, these two sectors are under two separate bureaux, namely, the Food and Health Bureau and the Labour and Social Welfare Bureau, and with separate budgets. Hence, shared vision and goals, together with shared responsibility and accountability to services, need to be developed. For this model to work, the social worker should have basic knowledge of biology of the normal human being and some common diseases and the interactions among behaviour and illness behaviour and be able to adopt different theories in counselling for appropriate lifestyle behaviours. There are professional medical social workers or social gerontologists in Western countries such as the United Kingdom, the United States, Canada, and Australia. This is lacking in Hong Kong.

The Challenges Ahead

At birth, all humans are similar with exception of genetic composition. Along the life span, there is diversity in bodily health, physical capacity, psychological state, and social interactions. With the proliferation of knowledge in ageing and its related processes, special branches in medicine (geriatric medicine) or social science (gerontology) are developed. Workers in the field of elder care should have advanced training in the understanding of the needs of the elder, how he or she differs from a middle age adult, the goal, and the care needs required for the individual. These training needs are not universally recognised despite the volume of ageing population. In one of the teaching hospitals in Hong Kong, medical students are taught on the Primary Care Office's "Hong Kong Reference Framework for Diabetes care for Adults in Primary Care Settings" and "Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings" but not the Framework for older adults (Primary Care Office 2018).

Health care for older patients is viewed as part of the general adult care without recognition of their declining intrinsic capacity, multi-morbidity (multiple interacting problems) model, their recovery curve, and special care needs (Kong 2017). Moreover, elder care is not mandated in training programme leading to Specialists in Family Medicine. In the continuous professional development, once there was a Postgraduate Diploma in Community Geriatrics programme run by one of the universities in Hong Kong. More than 200 general practitioners were equipped with knowledge and skills specific for elder care during 2001 to 2007. Evaluation by graduates has indicated improved confidence and attitudes in looking after elderly patients with common geriatric disorders (Lam et al. 2009). The recently established Hong Kong Academy of Nursing has the least number (66) of fellows in Gerontology, compared to 90–462 fellows in each of the other 13 colleges (Wong 2019). Though it is recognised that there is an overall shortage of health-care workers to meet future demand of the increasing ageing population, the great challenge of shortage of trained workers for the older populations is yet to be realised.

Overall, despite the nature of a potential model, role delineation between primary and secondary care; coordination among different primary care teams and sectors, between primary and secondary teams; the lack of recognition on uniqueness and special care needs of older adults; and shortfalls on professionals trained for elder care all remain to be resolved in the health-care system.

References

Auyeung, T. W., Lee, J. S. W., Leung, J., et al. (2010). Survival in older men may benefit from being slightly overweight and central obese: A 5-year follow-up study in 4000 older adults using DXA. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences, 65A*(1), 990104.

Census and Statistics Department of Hong King SAR. (2017). *Hong Kong population projection 2017–2066*. Hong Kong: Government Logistics Department.

Census and Statistics Department of Hong Kong SAR. (2005). *Thematic household survey report number 21*. Hong Kong: Government Logistics Department.

Census and Statistics Department of Hong Kong SAR. (2007). *Thematic household survey report number 30*. Hong Kong: Government Logistics Department.

Chiu, H. F. K., Lam, L. C. W., Chi, I., et al. (1998). Prevalence of dementia in Chinese elderly in Hong Kong. *Neurology, 50*, 1002–1009.

Covinsky, E., Pierluissi, E., & Johnston, C. M. (2011). Hospitalization-associated disability. *Journal of American Medical Association, 306*(16), 1782–1793.

Fedarko, N. S., & McNabney, M. K. (2016). In A. Medina-Walpole, J. T. Pacala, & J. F. Potter (Eds.), *Geriatrics review syllabus* (9th edn, pp. 7–17). American Geriatrics Society.

Food and Health Bureau of the Hong Kong SAR. (2010). *Our partner for better health. Primary care development in Hong Kong: Strategy document*. Available from: https://www.fhb.gov.hk/download/press_and_publications/otherinfo/101231_primary_care/e_strategy_doc.pdf.

Food and Health Bureau of the Hong Kong SAR. (2018). *Hong Kong's Domestic Health Accounts (DHA): 1989/90-2015/16*.

Haines, T. P., Hill, A. M., Hill, K. D., et al. (2011). Patient education to prevent falls among older hospital inpatients. *Archives of Internal Medicine, 171*(6), 516–524.

Hillier, S., & Inglis-Jassiem, G. (2010). Rehabilitation for community-dwelling people with stroke: Home or center based? A systematic review. *International Journal of Stroke, 5*(3), 178–186.

Hong Kong College of Community Health Practitioners. (2019). About us. Retrieved from https://www.hkcchp.org/.

Huang, E. S. (2016). Management of diabetes mellitus on older people with comorbidities. *British Medical Journal, 353*, i2200.

Kong, T. K. (2017). Development and practice of geriatric medicine. In T. K. Kong, F. C. K. Mok, J. K. H. Luk, & C. C. M. Lum (Eds.), *The Hong Kong geriatrics society curriculum in geriatric medicine* (2nd ed., pp. 6–14). Hong Kong: Hong Kong Academy of Medicine Press.

Lam, L. C. W. (2008). Prevalence of very mild and mild dementia in community-dwelling older Chinese people in Hong Kong. *International Psychogeriatrics, 20*(1), 135–148.

Lam, T. P., Chow, R. W. M., Lam, K. F., et al. (2009). *Evaluative study on learning outcomes of postgraduate diploma in community geriatrics*. Family Medicine Unit, The University of Hong Kong.

Langhorne, P., & Baylan, S. (2017). Early supported discharge stroke services for people with acute stroke. *Cochrane Database of Systematic Reviews, 7*, CD000443. https://doi.org/10.1002/14651858.CD000443.pub4.

Our Hong Kong Foundation. (2018). *Fit for purpose: A health system for the 21st century research report*. Available from: https://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/ohkf_research_report_digital_1201.pdf.

Primary Care Office, Department of Health. (2018). *Hong Kong reference framework on preventive care for older adults in primary care settings*. Revised Edition December 2018. Available from: https://www.pco.gov.hk/english/resource/files/ref_framework_adults.pdf.

Prospective Studies Collaboration. (2009). Body-mass index and cause-specific mortality in 900 000 adults: Collaborative analyses of 57 prospective studies. *The Lancet, 373*(9669), 1083–1096.

Resnick, N. M., & Marcantonio, E. R. (1997). How should clinical care of the aged differ? *The Lancet, 350*, 1157–1158.

Romera-Liebana, L., Orfila, F., Segura, J. M., et al. (2018). Effects of a primary care-based multifactorial intervention on physical and cognitive function in frail, elderly individuals: A randomized controlled trial. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences, 73*(12), 1668–1674.

Schooling, C. M., Lam, T. H., Li, Z. B., et al. (2007). Obesity and mortality in a prospective Chinese elderly cohort. *Hong Kong Medical Journal, 13*(Supple 4), S13–S16.

Wong, K. Y. (2019). *8th annual general meeting 22 June 2019 the president report*. Hong Kong: The Hong Kong Academy of Nursing Limited. Available from https://www.hkan.hk/main/images/PDF/AGM_8th/4_President_Report.pdf.

World Health Organization. (2000). *The world health report 2000. Health systems: Improving performance*. Available from https://www.who.int/whr/2000/en/whr00_en.pdf.

World Health Organization. (2008). *The world health report 2008: Primary health care: Now more than ever*. Available from http://apps.who.int/medicinedocs/documents/s22232en/s22232en.pdf.

World Health Organization. (2015). *World report on ageing and health*. Available from: https://apps.who.int/iris/bitstream/handle/10665/186463/9789240694811_eng.pdf;jsessionid=9045B1E63F2DE28B7CCC3C802450A2F5?sequence=1.

World Health Organization. (2017). *Integrated care for older people. Guidelines on community level interventions to manage declines in intrinsic capacity*. Available from https://apps.who.int/iris/bitstream/handle/10665/258981/9789241550109-eng.pdf;jsessionid=5A5F701AB9225B4E60099B795C303783?sequence=1.

Yu, R., Wong, M., et al. (2016). Trends in activities of daily living disability in a large sample of community –dwelling Chinese older adults in Hong Kong: An age-period-cohort analysis. *BMJ Open, 6*(12), e013259.

Yu, R., Leung, J., Lum, C. M., Auyeung, T. W., Lee, J. S. W., Lee, R., & Woo, J. (2019). A comparisons of health expectancies over 10 years: Implications for elderly service needs in Hong Kong. *International Journal of Public Health, 64*(5), 731–742. https://doi.org/10.1007/s00038-019-01240-1.

Chapter 12
Palliative Care and End-of-Life Issues

Connie Chu and Jimmy Tsui

The Origin of Hospice Care in Hong Kong

The arrival of hospice care in Hong Kong profoundly changed the approach to end of life. Prior to the introduction of hospice, hospitals in Hong Kong were extremely congested, and camp beds were often used as the primary solution for overcapacity (Hutcheon 1999). This resulted in crowded, noisy, and dismal conditions for all patients, including those facing terminal illness.

It was in the 1970s when Sister Helen Kenny and Dr. Yu Wing Kwong, the then-matron and medical superintendent of Our Lady of Maryknoll Hospital (OLMH), respectively, first observed a need for hospice care in Hong Kong. At the time, the two worked primarily with terminal cancer patients and concluded that end-of-life care had much room for improvement. Sister Helen was particularly drawn to the concept of team care, in which health-care professionals, spiritual counsellors, and even family members were equally involved in the care of the patient. Little did she know that this concept would eventually become the foundation of the hospice care movement in Hong Kong.

In 1978, Sister Helen, along with several other Sisters, attended the 2nd International Congress on Palliative Care in Montreal, Canada. Having been established in 1976, the International Congress on Palliative Care was still in its infancy but nevertheless was able to offer enriching presentations by the pioneers of the hospice movement – Dr. Cicely Saunders, Dr. Victor Frankl, and Dr. Balfour Mount. The conference allowed Sister Helen and company to bring much-needed palliative care knowledge back to Hong Kong.

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Also attending the conference was Ms. Agnes Ho, a senior nurse from Caritas Medical Centre (CMC). Nurse Agnes shared Sister Helen's desire to improve the care of terminal patients in Hong Kong and upon her return shared her experience with her colleague Ms. Lucy Chung, who was also a nurse at CMC. Nurse Chung went on to become the first nurse from Hong Kong to attain a Master's degree in Hospice and Palliative Care in the United Kingdom. Through a mutual passion for hospice care, Nurse Chung, Sister Helen, and Dr. Yu began working together and in 1982 formed a small palliative care team comprising of doctors, nurses, and pastoral workers at OLMH.

Introduction of Hospice Service in Hong Kong

In 1982, OLMH was already admitting end-of-life patients though they lacked a designated ward. With the formation of the palliative care team, doctors at OLMH began referring suitable patients to the care of Nurse Chung. The early days of hospice service in Hong Kong were humble and understated, which meant the general public was largely unaware of its existence. Two years later, a hospice patient at OLMH felt that the service needed to be publicised and committed to shooting a short informational film that was later broadcasted on local television. The airing of the programme was the first introduction of hospice service to the Hong Kong community. Many were educated by the firm with proper care and symptom control; terminal patients may find fulfilment in their final days.

The year 1984 also marked the emergence of organised hospice care events in Hong Kong. With the generous funding from the Keswick Foundation, a local conference was established to inform health-care professionals and the community about hospice care. The conference was held in December at the Hong Kong Council of Social Services headquarters and had many notable attendees, including a special guest Dr. James Hanrathy, the then-director of St. Joseph's Hospice in Ireland, Dr. Yu, Dr. Kenny Lau, and Sisters Gabriel and Greaney of Ruttonjee Sanatorium.

Establishment of the Society for the Promotion of Hospice Care

The local conference in 1984 connected passionate professionals and further strengthened the fledgling hospice care community in Hong Kong. Many of these professionals eventually reconvened and agreed that Hong Kong needed an organisation to advocate and develop hospice and palliative services. This collective vision culminated in the founding of the Society for the Promotion of Hospice Care (SPHC) on 1 July 1986 (Society for the Promotion of Hospice Care 2006).

Under the newly established SPHC, Sister Gabriel was elected Chairperson, Reverend Ralph Lee as Vice Chairperson, Sister Greaney as Secretary, and Dr. Anthony Tam as Treasurer. The first office of the SPHC was located in a modest sideward at the Ruttonjee Sanatorium (Society for the Promotion of Hospice Care 2006). Upon its founding, the SPHC enacted three primary objectives:

- To promote hospice care in Hong Kong
- To implement a home care service
- To build an independent hospice

The Early Days of the Hospice Care Programme

The first palliative care team under the SPHC bore many similarities to the one formed by OLMH in 1982 and consisted of doctors, nurses, social workers, pastoral care workers, and a physiotherapist. One of the two nurses served as coordinator for the team. With the exception of the nurses, team members were "part-time" as they had other responsibilities at the Ruttonjee Sanatorium. The compact office assigned to the team was used primarily for meetings, clinical duties, and interviews with patients' relatives.

Back then, Ruttonjee Sanatorium was an establishment that catered to patients with tuberculosis and other pulmonary diseases. The majority of patients referred to the palliative care team were diagnosed with incurable lung cancer. The team's medical and nursing staff served mainly to advise on symptom management, provide practical and emotional support to patients and their relatives, and operate a hospice care outpatient clinic. The nurses also conducted home visits, often to address issues with medication or family relationships.

Under the team approach of the SPHC palliative care team, the scope of care extended beyond the clinical aspect. Family members were assured continuation of care, most commonly in bereavement services after the patient's death. Social workers provided assistance with housing and financial concerns, referrals to public resources, and counselling to relieve the fears and anxieties of the patients and their family members. Meanwhile, pastoral care workers offered spiritual and emotional support, rounding off the multifaceted care that the SPHC had pioneered in Hong Kong.

Bradbury Hospice and Jockey Club Home for Hospice

Shortly after its establishment, the SPHC began working in earnest towards the construction of an independent, specialised hospice facility intended to provide inpatient, day care, and home care services for terminally ill cancer patients and bereavement support for their families. The facility would also serve as the venue for education and training seminars on palliative care. This went on to become Bradbury Hospice (BBH) today. Through the generosity of several major sponsors including the Keswick Foundation Ltd., the Hong Kong Jockey Club Charities

Trust, the Bradbury Charitable Trust Fund, as well as the support of numerous beneficent individuals and organisations, the construction of BBH became a reality. BBH was built on a land granted by the Hong Kong Government and commenced operation in June 1992, becoming the first freestanding hospice facility in Hong Kong and setting a high standard for hospice care (Society for the Promotion of Hospice Care Ltd. 1996).

In the first 3 years, BBH's operational expenses were met through regular fund-raising campaigns and donations from companies and the general public. However, BBH strove to provide an affordable service and, therefore, would not have been able to rely solely on private donations in the long term. The SPHC had hoped that in due time, the Hong Kong Government would recognise the necessity of hospice care and incorporate the service into the broader health-care scheme in Hong Kong. The hospice services offered by BBH became fully recognised by the public, and on 1 April 1995, the Hong Kong Government agreed for the Hospital Authority (HA) to assume the management and funding of BBH from the SPHC (Society for the Promotion of Hospice Care Ltd. 1996). After the transfer, the HA began pursuing the development of palliative care service in the public sector.

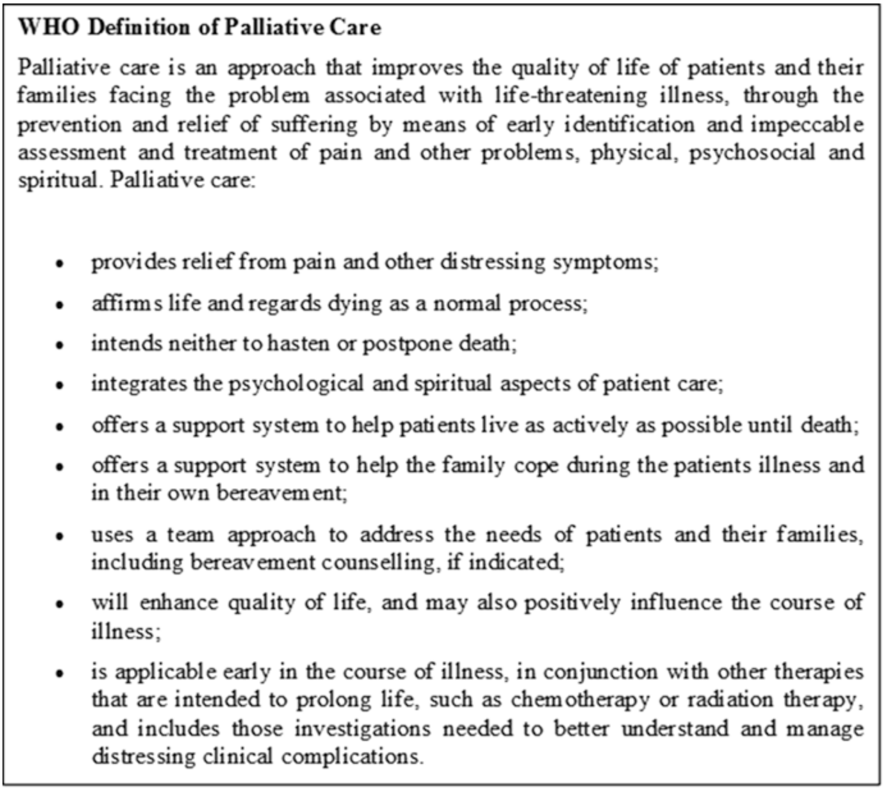
At the same time, the SPHC diversified its hospice services and in 1997 established the Jessie and Thomas Tam Bereavement Centre, which provided bereavement services to the community (Society for the Promotion of Hospice Care 2006). The SPHC went on to enter into direct patient services by opening the Jockey Club Home for Hospice ("JCHH") in 2016. The home-like facility offers holistic hospice and palliative care designed to support end-of-life patients as well as their families and caregivers. The establishment of the JCHH ushered in a new direction for hospice care in Hong Kong – one that focuses not only on facilitating a comfortable and dignified death but also adding life to the patients' remaining days.

What Is Palliative Care Service?

Since 2002, the World Health Organization ("WHO") has adopted the following definition on palliative care (Fig. 12.1).

According to the WHO (2014), the values and practices of palliative care should be integrated into general health care and cancer care. Studies have shown that early palliative care involvement in the treatment of patients with advanced non-small cell lung cancer ("NSCLC") and other advanced malignancies could improve the quality of life and even overall survival. This integrated model demonstrated significant benefits and value to the patients and their family members and even the broader health-care system (Ambroggi et al. 2018).

The goal of palliative care is to enable patients to maintain their quality of life and peace of mind, irrespective of whether or not their disease could be cured. Berger (2018) recommended for palliative care to be initiated upon the diagnosis of any chronic and/or life-threatening conditions. Over the course of the disease



WHO Definition of Palliative Care

Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten or postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patients illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated;
- will enhance quality of life, and may also positively influence the course of illness;
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

Fig. 12.1 WHO definition of palliative care. (Source: WHO 2014)

trajectory, patients may encounter pain and other symptoms caused by the side effects of treatment. Those involved may also experience emotional distress and even financial and social strains as a result of the illness. The role of palliative care is to provide support to patients and their families as they face the many challenges along the way.

Comparing Palliative Care with Hospice Care

"Hospice care" is a cross-professional and cross-sectorial collaborative care model primarily for patients with diseases that are no longer curable and who have agreed to abandon active treatment. The service focuses not only on relieving the suffering of dying patients but also providing support for the family members who care for them at home. The provision of care during the terminal stages of the disease, and in the last few hours of life, is the centre of palliative and hospice care services.

In Hong Kong, home hospice care services are mainly provided by public hospitals, and this is common among most Asian regions. However, several studies and service evaluations have indicated that the care of critically ill patients at home could not only improve the quality of life of patients and their families but also reduce health-care spending by minimising unnecessary hospitalisations (Chen et al. 2017; Benture et al. 2014; Kelley et al. 2013).

While palliative and hospice care share similarities in their approach to symptom relief and pain management, there are also notable differences between the two services. Hospice care emphasises comfort care – the relief of pain and other discomforts – for patients who have discontinued curative treatments. Conversely, palliative care emphasises care for patients with any type of serious illness across all stages of their disease trajectory.

Palliative Care and Cancer

Cancer has long been one of the most common diagnoses among palliative care patients and is, therefore, an integral part of the service's early and ongoing development. Over the past decade, cancer treatments have undergone many developmental breakthroughs that have led to improved prevention, early detection, and survival rate of the diseases. Health-care professionals have moved away from focusing solely on the diseased organs in favour of assessing the overall disease trajectory and managing symptoms with managements that promote reintegration of normal activities of daily living. Combination, or multimodality, therapy has become more prevalent and even routine in the treatment of certain types of cancer, such as breast, lung, colorectal, and prostate. These advancements have redefined cancer, formerly categorised as an acute and fatal disease, into a chronic illness (Alwan et al. 2010). According to DeVita (2005), cancer is one of the most curable chronic diseases of this century. The WHO also listed cancer as one of the four major chronic diseases as early as in 2010 (Alwan et al. 2010).

Prior to the inclusion of non-cancer and non-terminal diseases, cancer patients were the primary target population for palliative care (WHO 2014). The WHO (2014) has advocated for a team approach in which palliative care professionals and specialists, such as oncologists, would work together to provide treatment and symptom relief. The combined input of multiple practices would facilitate tailor-made adjustments and treatment evaluations to ensure that the highest quality of life is maintained. However, most Western and Asian countries continue to approach cancer with a traditional, acute care-driven mindset that prioritises curative measures over palliation. Furthermore, oncology is an officially recognised branch of acute, mainstream medicine, whereas palliative care service does not fall into the traditional health-care system and is mainly supported through charitable funds (Pietroburgo 2006; Mitchell 2008). Despite the increased efficacy of oncology care when provided in tandem with palliative care, the two fields have fundamentally opposing ideologies, creating a dichotomous relationship that continues to prevent collaborative patient care (Kaasa et al. 2018). It is therefore essential to identify effective methods to simultaneously deliver both services to patients not only at the end of life but throughout the duration of the disease process (Temel et al. 2010).

End-of-Life Issues

Preference of Place of Death

End-of-life care is challenging in many ways, but perhaps the most difficult aspect is fulfilling the wishes of the individuals. Where feasible, measures should be taken to ensure that a person is able to die in the place of choice and with their expressed needs met. A systematic review by Gomes (2013), involving over 100,000 people from 33 countries, found that most people preferred to die at home. In the United Kingdom, the Choice in End-of-Life Care Programme Board administered the VOICES survey to 7561 caregivers and found that the majority (81%) believed the deceased would have preferred to die at home (VOICES 2016).

In 2011, Escobar conducted a study to assess the congruence between preferred and actual place of death, and similar results were identified. Within the group of respondents, fewer than 60% had their wishes fulfilled (Escobar et al. 2011). This phenomenon was also identified in other European countries. Neergaard (2011) concluded that most terminally ill patients in Denmark wished to die at home as reported retrospectively by their bereaved relatives. However, the preference weakened significantly closer to death, and only one-quarter of deceased patients actually died in their own homes. This indicates that many patients and their family caregivers have unclear expectations on the disease trajectory and, as death approached, are unprepared for the increased physical and psychological toll. In Europe, the preference for home death is evident. However, more support must be offered to the caregiver role to make home care a more viable option.

Quality of Death Index

In the 2010 and 2015 Death Quality Indexes by the Economist Intelligence Unit (EIU), the United Kingdom (UK) was ranked first out of 80 countries in “quality of death” and “quality of palliative care”. Over the years, the United Kingdom has made numerous efforts to further the development of its palliative care service. Palliative care is an integrated part of the National Health System (“NHS”), which enables the service to be supported through public funds. Hospice care has been successfully popularised and benefits from deep community engagement and charity support. Furthermore, palliative and hospice care training development is comprehensive and accredited, with both general and specialised opportunities available across various disciplines and sectors (EIU 2015). The study also highlighted several key issues that the United Kingdom needs to be addressed. Symptom control standards and the fulfilment of patient require further improvements, while the provision of services during non-office hours remains insufficient (Hughs 2015).

Trend in Asia

In the 1980s, Hong Kong was a pioneer in the promotion and application of palliative and hospice care in Asia. However, in the 2015 Quality of Death Index, Hong Kong ranked 22nd in the quality of care for patients with serious illness, which was two places lower than in the previous survey in 2010 (EIU 2015). According to the EIU analysis, Hong Kong underperformed, especially when considering its high domestic wealth, compared to other Asian countries (EIU 2015). National income levels are often positively correlated with the quality of palliative care, and as such, affluent countries are typically clustered at the top of the index. In 2015, Australia and New Zealand ranked second and third, respectively, while four other wealthy Asia-Pacific economies ranked in the top 20. Taiwan ranked sixth, Singapore ranked 12th, Japan ranked 14th, and South Korea ranked 18th.

Taiwan's achievement was remarkable, having climbed from 14th in 2010 to sixth in shortly 5 years. In Taiwan, palliative care services began with home hospice before expanding into hospital hospice and, more recently, hospice shared-care services. In 1995, the Taiwan Ministry of Health began implementing hospice and palliative care-related regulations and policies, culminating in the enactment of Asia's first Natural Death Act in 2000, which guaranteed terminally ill patients the right to a natural and dignified death. Taiwan recognises the increasing demand for palliative care for both cancer and non-cancer patients, and yet, many patients' needs remain unmet (Tang et al. 2010; Wu et al. 2018). Moreover, despite a clear preference for home death, the proportion of patients who actually die at home is still less than 50%, with many still dying in hospitals or nursing homes. The circumstances that determine the location of the patient's eventual death are complex and involve factors such as demographics, marital status, socioeconomic status, and primary caregivers. Even in cases where patients successfully died at home, it is often because they were approved for a "terminal discharge" for ritualistic arrangements and, therefore, did not benefit from any prior home care (Ueng et al. 2015).

Singapore has a long history of providing home hospice care. Initiated in 1987, the service was originally charity funded but later recognised by the government. Singapore's home hospice provides 24-h services to end-of-life patients in which multidisciplinary teams, comprising doctors, nurses, medical social workers, counsellors, and volunteers, would conduct regular visits to patients and their loved ones at home. These visits would persist until the patients' death, after which subsequent bereavement support would be provided if required. Data from a 10-year retrospective analysis of Singapore's national registries has revealed that dying-at-home patients have fewer episodes of acute hospitalisations (Lee et al. 2017). Ho (2017) reported that, although most dying patients express a desire to die at home, in actuality the ultimate determinant of fulfilling their wish is the willingness of their families or caregivers and their ability to care for the patient at home until death.

Japan has been home to one of the world's oldest demographics since 2004. The fast-ageing trend is expected to continue, and by 2050, an estimated 40% of the country's population would be aged over 65 years (Murray et al. 2009). The Japan Ministry of Health has supported institutional palliative care services since 1991, and the number of palliative care units has since increased dramatically. However, by comparison, the growth of home palliative care services in Japan still lags behind many Western countries (Wright et al. 2010). Nonetheless, the ageing trend of the Japanese population dictates that more end-of-life care must be provided at home. An earlier population-based survey that comprehensively documented the preferences and predictors of place of death has yielded results which were also observed in Western countries. Significant discrepancies were found between the actual rate of home death and preference for care and death at home (Fukui et al. 2011). Upon further investigation into home hospice services in 2017, Fukui (2017) uncovered a similar scenario in Singapore in which caregiver preference was the most influential predictor of dying at home, even when patients were undecided on their preferred place of death.

Quality and Financial Implications in End-of-Life Care

Medical care interventions required at the end of life, especially pertaining to quality and cost control, are important and complex. A recent study in Taiwan on end-stage renal disease (ESRD) patients indicated that the medical expenses and use of intensive care services, including surgery, ICU hospitalisation, mechanical ventilation, resuscitation, and dialysis, in this group are comparatively higher than other end-stage cancer or organ failure patients (Chen et al. 2017). Verhofstede (2017) further commented that many of the medical procedures performed during the last 48 h of life are evidently not in the best interest of the patients. The majority of medical expenses in a person's lifetime are spent in hospital treatment during the final year life (Zhang et al. 2009). Despite the ever-mounting cost of health care, many studies have found that critically ill patients and their families receive suboptimal care, particularly for untreated pain and physical symptoms, psychological and emotional distress, caregiver burden, and unnecessary or unwanted treatments incongruent with pre-established wishes and care goals (Kelley et al. 2013; Wennberg et al. 2009).

On the other hand, literature consistently associate hospice care with symptom control and improvement as well as high patient and family satisfaction (Wright et al. 2010). At the end of life, the use of fewer hospital services could not only reduce medical expenses but also allow patients and their families to enjoy a better quality of life. Hospice care services have been associated with reduced hospital and intensive care unit admissions, reduced emergency department episodes, and significantly reduced hospital deaths (Ambroggi et al. 2018). However, the cost of home hospice care is often underestimated when considering home death. Many do not account for "hidden" costs, such as the provision of informal care, outpatient services, and out-of-pocket expenditures (Sole-Auro and and Crimmins 2014).

Additional caring consumables, domestic helper wages, and opportunity costs for patients and family members are also often overlooked (Higginson and Sen-Gupta 2000).

Ageing and End-of-Life Issues in Hong Kong

Although Hong Kong has had over 30 years of palliative and hospice care services development, more than 90% of the region's 40,000 annual deaths occur in hospitals (Woo et al. 2009). A retrospective study of palliative care and cancer deaths in Hong Kong in 2007 reported that 100% of cancer cases that received palliative care service prior to death died in hospitals. No cases died at home or in nursing homes (Tse et al. 2007). In a separate local study, only 6 of 1300 palliative care programme patients died in their homes. The rest died in hospitals (Liu, 2006). Furthermore, in this city with a population of more than 7 million (Census and Statistics Department 2016), there are currently only two purposely built, free-standing hospice care centres, and this is severely inadequate when compared to international standards (WHO 2017).

The ageing population in Hong Kong has a direct financial impact on the health-care system. One study predicted that the cost of health-care expenses for the elderly population would increase from 1.4% of Hong Kong's GDP in 2004 to 4.9% in 2036 (Chung et al. 2009). Furthermore, Hong Kong's low fertility rate and rapid ageing population would inevitably lead to an increased demand for long-term care. Given also that Hong Kong's life expectancy is currently the highest in the world (Census and Statistics Department 2016), the existing approach to end-of-life care must be reviewed to avoid further overloading an already strained health-care system.

Home is a place where people feel safe and have a sense of belonging (Gott et al. 2004). Understandably, many dying patients express a desire to die at home because it allows them to spend time with their relatives and friends in a familiar environment that offers them autonomy, privacy, and a sense of normality (Tang 2003). Family members who are willing to provide care for their dying relatives are an underutilised resource in the health-care system. The expression of filial piety is a prominent part of Asian and, more specifically, the Chinese culture. It is a Chinese tradition for children to care for their parents when they become sick to show their gratitude for their upbringing. "The ability to die in one's own bed is being considered the most blessed" (Tang 2000). However, dying at home has many challenges and potential repercussions for family members. While many caregivers may be very willing to provide care at home to fulfil their loved ones' wish for a home death, they must also consider their own physical fitness, emotional well-being, resources in terms of money and time, and the uncertainty and possibility of dealing with uncontrolled symptoms (Lau 2010; Tsuchida et al. 2018; Wales et al. 2018).

In September 2019, the Food and Health Bureau (2019) launched a public consultation to solicit public views on end-of-life care legislative proposals regarding advance directives (AD) and dying in place, which aims to uphold patient self-determination and interest, and to avoid conflicting regulations.

Palliative Care and Hospice in the Community

An Integrative Care Model

Primary care is the first line of care for most of the Hong Kong population with practices of a broad, holistic approach to the physical, psychosocial, and spiritual health of the patient and family members (Hong et al. 2010). In Hong Kong, general practitioners (GPs), or family doctors, provide the majority of primary care services. In 2017, the Census and Statistics Department (2017) found that 70.5% of the 2.8 million surveyed users of Western medicine used a family doctor. An older survey conducted by the Hong Kong Council of Social Service in 1998 observed that 56.5% of the surveyed individuals had indicated that their entire family used the same family doctor (Dickinson 1998). GPs are often able to establish strong doctor-patient relationships and continuity of care with their patients.

Towards the end of life, the role of GPs in the care of their patients may take on new dimensions. GPs who have maintained close relationships with their patients are well-suited to serve as their advocate on health-care matters, including end of life. The involvement of GPs in home visits at the end of life has been associated with dying at home, which indicates that they are also effective facilitators of home deaths (Aabom et al. 2005). Moreover, GPs are able to utilise their strong doctor-patient relationship to provide psychological support during crises (Bulsara et al. 2005). There are also many barriers that GPs may encounter with their end-of-life patients. GPs may encounter difficulties in setting aside their curative approach to patient care for one that prioritises the patients' comfort and quality of life (Gwinn 2000). Some GPs may lose contact with their end-of-life patients, who may spend more time under specialist care, and this would inevitably erode rapport and current knowledge of the patient. Therefore, GPs must be proactive in maintaining their involvement with end-of-life patients (Aabom and Pfeiffer 2009).

In countries such as the United States, the United Kingdom, and Australia, GPs are encouraged to take care of end-of-life cases (Gwinn 2000; NSW Ambulance 2019). A palliative care nurse practitioner would collaborate with the patient's GP and provide support on symptom control. The two professionals would collaborate on the patient's care until his/her death (Kennedy 2012). While nurse practitioners are not currently well developed in Hong Kong, there are other ways to support GPs in the care of end-of-life patients. As the Hong Kong population continues to age, the integration of primary and palliative care becomes increasingly important. Presently, the involvement of GPs towards the end-of-life care is rather limited. In general, GPs would refer the more complex cases, such as terminally ill patients, to private specialists or public hospitals. Unfortunately, the doctor-patient relationship and continuity of care may be negatively affected in the process.

In an integrative care model, palliative care doctors and hospice home care nurses would be in the supporting role and work closely with GPs to formulate treatment plans for the terminally ill patients. With adequate support and with timely and pertinent information, GPs would be able to remain involved in the care of their long-time patients and maintain continuity of care. The GPs' longitudinal care may also provide reassurance for the patients and family members, resulting in lower stress and higher quality of death (Bulsara et al. 2005).

Home Hospice

Death is something every person experiences, and when that time comes, people would likely want to be near their loved ones and spend those precious last moments in a place that feels familiar and safe – home.

> Thank you for the loving and meticulous care you provided for our mother. In all the confusion, your service was like a lighthouse that showed us the way and guided our hearts. Even more important is that you helped our mother depart this world peacefully and comfortably, as was her wish.

This message is from a thank you card written by family members of a former patient who passed away at home with the support of a local home hospice service in Hong Kong. There were 43 signatures on the card, each from a family member who wanted to show gratitude to the home hospice team. When the patient was staying at the hospice centre for symptom control, the two primary caregivers were stressed but also relieved that the patient received quality care and passed away comfortably. But when the patient decided that she wanted to pass away at home, that caused significant disagreement within the family. Most of the family wanted to support the patient's last wish, but the two primary caregivers felt that "they have had enough". With the support of the hospice team, a family conference was held to mediate conversation between the disagreeing parties so that the two could come to an understanding. The two primary caregivers were eventually convinced by the rest of the family to take a brief vacation to relieve their stress. Thankfully, they were able to return in time to be with the patient before she passed away.

Home hospice service is the principal component of the integrative care model. The service is more complex and intensive than general community nursing and is designed to enable patients with advanced diseases to be cared for at home for as long as possible or until death (Kennedy 2012; Clark 2017). Each patient has a single contact point, i.e. a case manager, who is also a hospice home care nurse. The case manager would be responsible for assessing the patient's physical and psychological status within the context of his/her decision for home care, as well as caregiver readiness and competence to support hospice care at home. The case manager would also oversee crisis management (especially incidents that occur outside of office hours), prevent costly and unnecessary investigative procedures and hospital admissions (Benture et al. 2014), and help the patient achieve a higher level of comfort and quality of life (Boer et al. 2017; Ranganathan et al. 2013; Benture et al. 2014). Another important role of the case manager would be to liaise and collaborate with the patient's GP in symptom management and psychosocial-spiritual care.

At the end of life, most emergency hospital admissions are due to symptom management issues or caregiving breakdown. According to a survey by Chung (2017) and other similar studies in Western countries, most respondents indicated a preference to be cared for at home in the last year of their lives. However, that preference shifted to hospital admission, particularly for the last week before death. In fact, patients and family members often changed their mind. Those who made the initial decision to remain or even die at home might not have understood or foreseen the future difficulties (Aoun et al. 2005; Harding et al. 2012). The clinician's ability to anticipate the situation and assess caring capabilities is essential in helping the caregivers to plan ahead.

To most people, witnessing a loved one struggling with his/her deteriorating condition and the side effects of treatment is an uncomfortable experience. Family caregivers grappling with the difficulties of symptom management often feel powerless to help the patient. These negative feelings would gradually affect the caregivers' morale and emotions, making daily life more difficult (Soothill et al. 2001). Effective family caregiver support involves more than providing information and training on patient care. It is also about sharing knowledge, offering practical assistance, and addressing emotional, spiritual, and financial needs. Morris (2015) opined that health-care professionals should encourage family caregivers to actively participate in patient care. On the other hand, caregiver support also means helping them understand that they themselves are service recipients (Harding et al. 2012). It is crucial for health-care professionals to establish a relationship of mutual trust with family caregivers through systematic assessments, close follow-up, as well as guidance and encouragement. Family caregivers who feel physically and mentally supported throughout their difficulties are less likely to become overstressed and could afford to spend more quality time with the patient.

Hospice Care Centre: A Supporting Service

A hospice centre is a place where pain and symptoms could be controlled. Freestanding hospice care centres generally operate on a smaller scale, with no more than 30 beds (Doyle 2009). A recent systematic review (Hughes et al. 2019) compiled data regarding the attributes of hospice care that past users considered most valuable. The frontrunners were effective pain and symptom control, 24-h home support, and social and emotional support provided by day care units. Although the analyses were originated from various settings, these attributes were, nevertheless, consistently valued by patients and family caregivers alike. In the integrative care model, hospice care centres serve as an ancillary component to palliative care. Although end-of-life patients tend to benefit from care by family members, professional interventions may, at times, be needed. Crises, in the form of uncontrolled symptoms and deterioration, are often intense and stressful events. For many family caregivers, crises would likely provoke or exacerbate caregiver stress, which could complicate the overall situation (SUPPORT 1995; Soothill et al. 2001). In these instances, the support of a hospice care centre is crucial.

The transition from the community to inpatient hospice is a critical process that must be smooth, controlled, and mindful of the patient and his/her family members. The comfort of both the patient and family caregivers should be prioritised to avoid escalating their stress. Once the patient's symptoms have been successfully controlled and the family caregivers have received adequate psychological and caregiving support, the option to return to the community for home hospice should be made available where possible. At present, there is a lack of integration between home hospice and inpatient hospice services in Hong Kong. The integration of the services is important in maintaining a smooth continuum of care for the patient. It would also enable clinicians to be kept up-to-date on the patient's progress and remain involved in future treatment (Rosenberg et al. 2019; Waddington et al. 2008).

The key to achieving a "good death" is not tied to any specific method of service delivery or type of venue. It is achieved through a system – one that could provide continuous and holistic assessments and timely medical and nursing care support for the unique needs of each patient and his/her family caregivers. In the end, it all comes down to "*The right help at the right time, from the right people* with the aim that more coordinated care can relieve distress at the end of life" (VOICES 2015).

Appendix

The hospice movement began in Hong Kong when the Society for the Promotion of Hospice Care was established in June 1986 by a dedicated group of advocates for the better care of patients with terminal illness.

Bradbury Hospice was officially opened on 7 November 1992, becoming the first independent hospice in Hong Kong. The 26-bed facility was built to provide a holistic care service for underprivileged patients with terminal illness. Pictured is Charles, Prince of Wales, attending the opening ceremony. Backed by strong support from the government, the hospice was handed over to the Hospital Authority on 1 April 1995, signifying the recognition of hospice care in the overall health-care system of Hong Kong.

The Hong Kong Palliative Nursing Association, formally known as the Hong Kong Hospice Nurses' Association, was established on 25 June 1997 with the goal to gather palliative care nurses and promote hospice development.

The Hong Kong Society of Palliative Medicine, an academic body of palliative medicine specialists in Hong Kong, was established in May 1997. The membership consists of local medical practitioners and other interested health-care professionals.

The **Jockey Club Home for Hospice** is the first of its kind in Hong Kong – a family-oriented hospice residence that takes a modern, compassionate approach to hospice and palliative care by instilling hope and positivity in the patients and their loved ones. The groundbreaking ceremony took place on 24 October 2013, and construction was completed in mid-2016. Inpatient care services were initiated shortly after in December 2016.

References

Aabom, B., & Pfeiffer, P. (2009). Why are some patients in treatment for advanced cancer reluctant to consult their GP? *Scandinavian Journal of Primary Health Care, 27*, 58–62.

Aabom, B., Kragstrup, J., Vondeling, H., Bakketeig, L. S., & Støvring, H. (2005). Population-based study of place of death of patients with cancer: Implications for GPs. *British Journal of General Practice, 55*(518), 684–689.

Alwan, A., et al. (2010). Global status report on noncommunicable diseases 2010. *WHO: 2008–2013 action plan for the global strategy for the prevention and control of noncommunicable diseases*.

Ambroggi, M., Biasini, C., Toscani, I., et al. (2018). Can early palliative care with anticancer treatment improve overall survival and patient-related outcomes in advanced lung cancer patients? A review of the literature. *Supportive Care in Cancer, 26*(9), 2945–2953.

Aoun, S., Kristjanson, L. J., Currow, D. C., & Hudson, P. L. (2005). Caregiving for the terminally ill: At what cost? *Palliative Medicine, 19*(7), 551–555.

Benture, N., Resnizky, S., Balicer, R., & Tsanani, T. (2014). Utilization and cost of services in the last 6 months of life of patients with cancer – With and without home hospice care. *American Journal of Hospice & Palliative Medicine, 31*(7), 723–725.

Berger, A. M. M., Hinds, P. S. P. R. F., & Puchalski, C. M. M. F. F. (2018). *Handbook of supportive oncology and palliative care: Whole-person and value-based care*. New York: Springer.

Boer, D., Hofstede, J. M., de Veer, A. J. E., et al. (2017). Relatives' perceived quality of palliative care: Comparisons between care settings in which patients die. *BMC Palliative Care, 16*(1), 1–8.

Bulsara, C., Ward, A. M., & Joske, D. (2005). Patient perceptions of the GP role in cancer management. *Australian Family Physician, 34*(4), 299–302.

Census and Statistics Department. (2016). *Hong Kong monthly digest of statistics*. The Government of the Hong Kong Special Administration Region.

Census and Statistics Department. (2017). *Thematic household survey report no. 63*. The Government of the Hong Kong Special Administration Region, 22.

Chen, B., Fan, V. Y., Chou, Y. J., & Kuo, C. C. (2017). Costs of care at the end of life among elderly patients with chronic kidney disease: Patterns and predictors in a nationwide cohort study. *BMC Nephrology, 18*(36), 1–14. https://doi.org/10.1186/s12882-017-0456-2.

Chung, R. Y. N., Tin, K. Y. K., Cowling, B. J. C., Chan, K. P., et al. (2009). Long-term care cost drivers and expenditure projection to 2036 in Hong Kong. *BMC Health Services Research, 9*, 172.

Clark, A. (2017). A day in the life of a home hospice nurse. *Home Healthcare Now, 35*(2), 123–124.

DeVita, V. T., Hellman, S., & Rosenberg, S. A. (2005). *Cancer: Principles and practice of oncology*. Lippincott Williams & Wilkins.

Dickinson, J. A. (1998). Estate doctors and policy on family medicine. *Hong Kong Medical Journal, 4*(3), 311–314.

Doyle, D. (2009). *Getting started: Guidelines and suggestions for those starting a hospice/palliarie care service* (2nd ed.). Houston: IAHPC Press.

Economic Intelligent Unit. (2015). *The 2015 quality of death index*. Retrieved from https://eiuperspectives.economist.com/sites/default/files/2015%20EIU%20Quality%20of%20Death%20Index%20Oct%2029%20FINAL.pdf

Escobar, P., Luis, C., Claus, M., Zepf, K. I., Letzel, S., Fischbeck, S., & Weber, M. (2011). Preference for place of death in Germany. *Journal of Palliative Medicine, 14*(10), 1097–1103.

Food and Health Bureau, Government of Hong Kong. (2019). *End-of-life care: Legislative proposals on advance directives and dying in place*. Retrieved from https://www.fhb.gov.hk/download/press_and_publications/consultation/190900_eolcare/e_EOL_care_legisiative_proposals.pdf

Fukui, S., Yoshiuchi, K., Fujita, J., et al. (2011). Japanese people's preference for place of end-of-life care and death: A population-based nationwide survey. *Journal of Pain and Symptom Management, 42*(6), 882–892. https://doi.org/10.1016/j.jpainsymman.2011.02.024.

Fukui, S., Morita, T., & Yoshiuchi, K. (2017). Development of a clinical tool to predict home death of a discharged cancer patient in Japan: A case-control study. *International Journal of Behavioral Medicine, 24*(4), 584–592.

Gomes, B., Calanzani, N., Marjolein, G., Hall, S., & Higginson, I. J. (2013). Heterogeneity and changes in preferences for dying at home: A systematic review. *BMC Palliative Care, 12*(7), 1427–1684x. https://doi.org/10.1186/1472-684X-12-7.

Gott, M., Seymour, J., & Bellamy, G. (2004). Older people's views about home as a place of care at the end of life. *Palliative Medicine, 18*(5), 460–467.

Gwinn, R. B. (2000). Family physician should be experts in palliative care. *American Family Physician, 61*(3), 636–642.

Harding, R., Epiphaniou, E., Hamilton, D., et al. (2012). What are the perceived needs and challenges of informal caregivers in home cancer palliative care? *Supportive Care in Cancer, 20*(9), 1975–1982. https://doi.org/10.1007/s00520-011-1300-z. Epub 2011 Nov 10.

Higginson, I. J., & Sen-Gupta, G. J. (2000). Place of care in advanced cancer: A qualitative systematic literature review of patient preferences. *Journal of Palliative Medicine, 3*(3), 287–300.

Ho, B. J., Akhileswaran, R., Pang, G. S. Y., et al. (2017). An 11-year study of home hospice service trends in Singapore from 2000 to 2010. *Journal of Palliative Medicine, 20*(5), 461–472.

Hong, T. C., Lam, T. P., & Chao, D. V. K. (2010). Barriers for primary care physicians in providing palliative care service in Hong Kong – Qualitative study. *The Hong Kong Practitioner, 32*(1), 3–9.

Hughes, N. M., Noyes, J., Eckley, L., & Pritchard, T. (2019). What do patients and family-caregivers value from hospice care? A systematic mixed studies review. *BMC Palliative Care, 18*(18), 1–13.

Hughs, J. (2015). UK: The best place in the world to die. *BMJ online*, h5440.

Hutcheon, R. (1999). *Bedside manner: Hospital and health care in Hong Kong*. Hong Kong: Chinese University Press.

Kaasa, S., Loge, J. H., Aapro, M., et al. (2018). Integration of oncology and palliative care: A lancet oncology commission. *Lancet Oncology, 19*(11), e588–e653. https://doi.org/10.1016/S1470-2045(18)30415-7.

Kelley, A. S., Deb, P., Du, Q., et al. (2013). Hospice enrollment saves money for medicare and improves care quality across a number of different lengths-of-stay. *Health Affairs, 32*(3), 552–561.

Kennedy, J. (2012). Nurse practitioners as an integral part of the hospice plan of care. *Home Healthcare Nurse, 30*(1), 48–51.

Lau, K. S. (2010). Facilitating home death. *Newsletter of Hong Kong society of palliative medicine*, *Oct Issue No.2* (pp. 24–25).

Lee, Y. S., Akhileswaran, R., Ong, E. H. M., et al. (2017). Clinical and socio-demographic predictors of home hospice patients dying at home: A retrospective analysis of hospice care association's database in Singapore. *Journal of Pain Symptom Management, 53*(6), 1035–1041.

Liu, F. C. F. (2006). Community palliative care in Hong Kong. In C. L. W. Chan (Ed.), *Death, dying and bereavement – A Hong Kong Chinese experience* (pp. 183–193). Hong Kong: Hong Kong University Press.

Mitchell, G. (2008). Palliatice care a patient-centered approach. In G. Mitchell (Ed.), *Palliatice care a patient-centered approach*. New York: CRC Press.

Morris, S. M., King, C., Turner, M., & Payne, S. (2015). Family carers providing support to a person dying in the home setting: A narrative literature review. *Palliative Medicine, 29*(6), 487–495.

Murray, M. A., Fiset, V., Young, S., & Kryworuchko, J. (2009). Where the dying live: A systematic review of determinants of place of end-of-life cancer care. *Oncology Nursing Forum, 36*(1), 69–77.

Neergaard, M. A., Jensen, A. B., Sondergaard, J., Sokolowski, I., Olesen, F., & Vedsted, P. (2011). Preference for place-of-death among terminally ill cancer patients in Denmark. *Scandinavian Journal of Caring Sciences, 25*(4), 627–636.

NSW Ambulance. (2019). *General practitioner information kit – Authorised palliative care plans: Respecting patient wishes*. Ambulance Service of New South Wales. Retrieved from https://www.slhd.nsw.gov.au/btf/pdfs/Amb/GP_Booklet.pdf

Pietroburgo, J. (2006). Charity at the deathbed: Impacts of public funding changes on hospice care. *American Journal of Hospice & Palliative Medicine, 23*(3), 217–223.

Ranganathan, A., Dougherty, M., Waite, D., & Casarett, D. (2013). Can palliative home care reduce 30-day readmissions? Results of a propensity score matched cohort study. *Journal of Palliatie Medicine, 16*(10), 1290–1293.

Rosenberg, L. B., Greenwald, J. L., & Jacobsen, J. C. (2019). To prepare patients better: Reimagining advance care planning. *American Family Physician, 99*(5), 278–280.

Society for the Promotion of Hospice Care. (2006). *Across 20 years commemorative photo album* (pp. 13–31).

Society for the Promotion of Hospice Care Ltd. (1996). *Ten years profile 1986–96*.

Sole-Auro, A., & Crimmins, E. M. (2014). Who cares? A comparison of informal and formal care provision in Spain, England and the USA. *Ageing and Society, 34*(3), 495–517.

Soothill, K., Morris, S. M., Harman, J. C., et al. (2001). Informal carers of cancer patients: What are their unmet psychosocial needs? *Health and Social Care in the Community, 9*(6), 464–475.

Tang, S. T. (2000). Meanings of dying at home for Chinese patients in Taiwan. *Cancer Nursing, 23*(5), 367–370.

Tang, S. T. (2003). When death is imminent: Where terminally ill patients with cancer prefer to die and why. *Cancer Nursing, 26*(3), 245.

Tang, S. T., Huang, E. W., Liu, T. W., et al. (2010). Propensity for home death among Taiwanese cancer decedents in 2001–2006, determined by services received at end of life. *Journal of Pain and Symptom Management, 40*(4), 566–574. https://doi.org/10.1016/j.jpainsymman.2010.01.020.

Temel, J., Greer, J. A., Muzikansky, A., et al. (2010). Early palliative care for patients with metastatic non–small-cell lung cancer. *The New England Journal of Medicine, 363*(8), 733–742.

The D. H. Chen Foundation. (2015). *Supporting palliative and hospice care services in Hong Kong*. Retrieved from http://dhchenfoundation.com/initiatives/supporting-palliative-and-hospice-care-services-in-hong-kong/

The SUPPORT Principal Investigators. (1995). A controlled trial to improve care for seriously ill hospitalzied patients. *Journal of American Medical Association, 274*(20), 1591–1598.

Tse, D. M. W., Chan, K. S., Lam, W. M., et al. (2007). The impact of palliative care on cancer deaths in Hong Kong: A retrospective study of 494 cancer deaths. *Palliative Medicine, 21*(5), 425–433.

Tsuchida, T., Onishi, H., Ono, Y., et al. (2018). Population-based survey regarding factors contributing to expectation for death at home. *Asia Pacific Family Medicine, 17*, 7. https://doi.org/10.1186/s12930-018-0044-z.

Ueng, R. S., Hsu, S. H., Shih, C. Y., et al. (2015). The present and future of community/home-based palliative care in Taiwan. *The Journal of Nursing, 62*(2), 18–24. https://doi.org/10.6224/JN.62.2.18.

Verhofstede, R., Smets, R., Cohen, J., et al. (2017). End-of-life care and quality of dying in 23 acute geriatric hospital wards in Flanders, Belgium. *Journal of Pain and Symptom Management, 53*(4), 693–702.

VOICES. (2015). *National survey of bereaved people (VOICES)-quality of care delivered in the last 3 months of life for adults who died in England.*

VOICES. (2016). *National survey of bereaved people (VOICES): England, 2015*.

Waddington, C., HLSP, & Egger, D. (2008). *Integrated health services – What and why?* (Technical brief No. 1). World Health Organization.

Wales, J., Kurahashi, A. M., & Husain, A. (2018). The interaction of socioeconomic status with place of death: A qualitative analysis of physician experiences. *BMC Palliative Care, 17*(1), 87. https://doi.org/10.1186/s12904-018-0341-1.

Wennberg, J. E., Bronner, K., Skinner, J. S., et al. (2009). Inpatient care intensity and patients' ratings of their hospital experiences. *Health Affairs, 28*(1), 103–112.

WHO. (2014). *Global atlas of palliative care at the end of life* (pp. 1–102). World Health Organization.

WHO. (2017). *10 facts on palliative care*. In (Vol. 2019): World Health Organization.

Woo, J. M. A., Lo, R. S. K., Lee, J., et al. (2009). Improving end-of-life care for non-cancer patients in hospitals: Description of a continuous quality improvement initiative. *Journal of Nursing and Healthcare of Chronic Illness, 1*(3), 237–244. https://doi.org/10.1111/j.1752-9824.2009.01026.x.

Wright, A. A., Keating, N. L., Balboni, T. A., et al. (2010). Place of death: Correlations with quality of life of patients with cancer and predictors of bereaved caregivers' mental health. *Journal of Clinical Oncology, 28*(29), 4457–4464.

Wu, M. P., Huang, C. M., Sun, W. J., & et al. (2018). The promotion of resources integration in long-term care service: The experience of Taiwan. *The Journal of Nursing, 65*(1), 24–32.

Zhang, B., Wright, A. A., Huskamp, H. A., et al. (2009). Health care costs in the last week of life. *Archives of Internal Medicine, 169*(5), 480–488.

Part III
Social Context

Chapter 13
Equity, Quality, and Gatekeeping

Tommy K. C. Ng, Ben Y. F. Fong, and Marcus H. T. Fung

Equity, Inequity, Equality, Inequality, and Gatekeeping

Equity and Inequity

Equity in health is the absence of avoidable or remediable differences among groups of people (World Health Organization 2019a). On the other hand, equity can be defined as the absence of systematic differences in health between the groups with different underlying social circumstances (Braveman and Gruskin 2003). Providing resources in an equal way for equal needs is one of the elements of health equity (Braveman 2006). Hence, resource allocation is vital in avoiding health inequity in primary health care because people in poverty and lower social status should also have access to good quality of health-care service. People should be valued equally to and have access to the health-care resources to obtain optimal health. Braveman (2014) views health equity and health disparities as correlated since the reduction of health disparities is the process of moving towards greater equity in health.

Health inequity, which is the systematic differences in health, can lead to unfair, but avoidable, differences in health outcomes. It can be caused by structural inequities, including personal, interpersonal, and institutional. According to the report from National Academies of Sciences, Engineering, and Medicine (2017), several determinants of health, such as social, environment, economic, and cultural, can produce health inequities. Racism is one of the important issues of socioeconomic differences, and it is necessary to address this problem to improve health inequities. In the United States, residential segregation is associated with the health outcome

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(Bailey et al. 2017). It is found that more than 70% of the white person lives within a neighbourhood of white. Likewise, the quality of the residential environment, education level, and limited access of health-care service are the main factors that lead to poor health outcomes, such as higher mortality rate of the infant and psychological distress. Gee and Ford (2011) have reckoned that racial residential segregation may have negative impact to the health of individuals by exposure to pollutants and infectious agents. Similarly, employment also plays a role that can lead to health inequities in that the occupation can determine the exposure of work hazard, excessive overtime, and other related factors that can affect the health status of the individual (Landsbergis et al. 2018). To reduce health inequities, policy aiming to reduce health difference, such as subsidy for the people in poverty, is important in achieving health equity. Likewise, health promotion and supports for modifying behaviour can address health inequities (Newman et al. 2015).

In Hong Kong, the Elderly Health Care Voucher Scheme is an example of achieving health equity. An annual voucher amount of HK$2000 is eligible for the elderly aged 65 or above, with the accumulation limit of HK$5000 (Health Care Voucher 2019). The purpose of the scheme is about providing subsidy for the elderly to access private primary health-care services by enrolled medical practitioners, dentists, Chinese medicine practitioners, occupational therapists, and so on. In addition, the Cataract Surgery Programme is providing subsidy of HK$5000 for patients who are waiting to undergo cataract surgery at the public hospitals to have the surgery performed by private ophthalmologists (Hospital Authority 2018). The private-public partnership is essential to place the health-care system more equitable (Lai and Leung 2012).

Equality and Inequality

The equality of allocation of health-care resources is vital to promoting holistic care for the people. “No one is denied adequate medical treatment due to lack of means” has been a long-standing policy of the Government of the Hong Kong Special Administrative Region. In Hong Kong, public hospitals provide affordable and heavily subsidised services to the general public with universal access and no means test (Food and Health Bureau 2008). This allocation framework of health-care resources ensures the majority of people can obtain equal and high-quality health services. Kreng and Yang (2011) have suggested the development of health promotion and equal accessibility of health-care resources based on the demand are the main implications of equitable resource allocation. Simply supporting with accessible health-care resource may not be enough for the community. The United Kingdom has an action plan for achieving equality of health by establishing specific programme to enable disabled and elderly to access health-care service (Department of Health of UK 2012). Moreover, health interventions with research and knowledge application help to reduce health inequalities.

Health inequality refers to the difference in the health achievements or the distribution of health determinants of the individuals and groups (Kawachi et al. 2002).

It is about the high incidence of diseases in one group of people compared with another group in the population. The determinants of health contribute to health inequality. According to the World Health Organization (2019b), income and social status, level of education, physical environment, gender, and other determinants are related to the health status of the individuals. Riumallo-Herl, Canning, and Kabudula (2019) have concluded that socioeconomic status is one of the important indicators of health inequality for the reason that the household consumption and wealth are associated with individual's health. Moreover, politics also lead to health inequalities and prevalence of diseases (Kickbusch 2015).

In the demographic perspective, age, gender, and marital status of the individuals influence the utilisation of health services (Janković et al. 2009). This means that the demography of the population also serves as factors affecting health equality. Moreover, geographic perspective can result in unequal health service distribution. For example, Bangkok, the capital and the largest urban area of Thailand, contains the majority of the health resources, including the number of health-care professionals and beds, compared to the rural areas of Thailand (Nishiura et al. 2004). Hence, people living in rural areas are less likely to achieve greater quality of care. On the other hand, there is a health difference between the employed and unemployed individuals in the access to health-care resources in northern Sweden (Brydsten et al. 2018).

Distinguishing Health Equality and Health Equity

Indeed, it is easy to be confused with the definitions of equality and equity in health. Table 13.1 summarises the main difference of health equality and health equity. Health equality is about equal distribution of the health-care resources rather than fairness. Moreover, Fig. 13.1 can visually show the difference of equality and equity. It is clear that in equality the government will provide the same health-care resources to everybody in the population. In equity, the government will provide various health-care resources to the population groups based on their needs and circumstances. People with lower socioeconomic status may receive subsidisation to enhance the access to health-care services. With health equality, it is possible that the population may not achieve equal health outcome, while similar health outcome is possible under the policy of health equity.

Table 13.1 Main differences of health equality and health equity

Health equality	Health equity
Focus on equal	Focus on fairness
Health-care resources are distributed equally	Health-care resources are distributed according to socioeconomic and geographic differences
Patients can equally access health-care resources	The access to the health-care resources is based on the patients' need

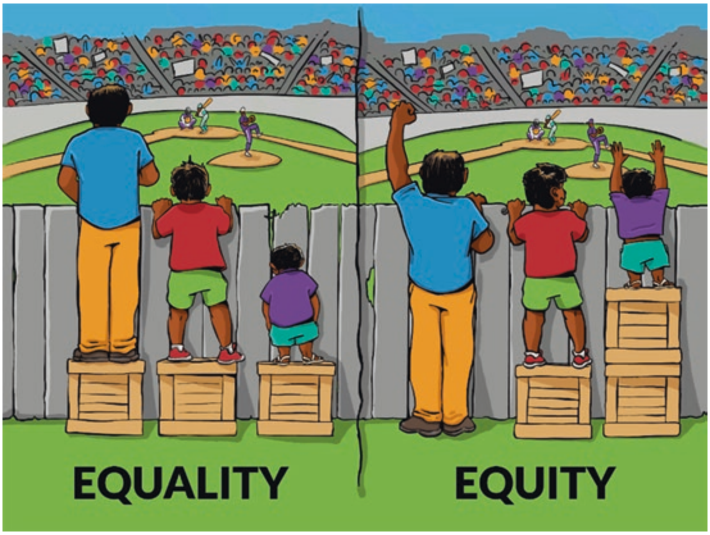

Fig. 13.1 Differences between equality and equity. (Source: Interaction Institute for Social Change, retrieved from http://interactioninstitute.org/illustrating-equality-vs-equity/)

Gatekeeping

Gatekeeping in health-care system means patients can only access to secondary care with referral of primary care physicians. The gatekeeping system can lead to reduction of avoidable and unnecessary specialist outpatient services. On the other hand, a strong and effective primary health-care system is required to support the large demands of primary care in the community. Gatekeeping can facilitate better continuity of care because referral involves the exchange of medical information between the primary and secondary care doctors (Papp et al. 2014). It allows patients to receive better and comprehensive care. There will be a reduction of self-referral (Dumontet et al. 2017), and it helps to reduce the abuse of the specialist service. Research shows that strong primary care allows improved quality of care, better cost control and population health, as well as less socioeconomic inequality in health (Kringos et al. 2013).

Gatekeeping occurs in some European countries, such as Spain, the United Kingdom, Denmark, and Germany, with various approaches (Expert Panel on effective ways of investing in Health 2014). The health-care systems in Spain and the United Kingdom require patients to obtain a referral from the primary care physicians for specialist consultations. Moreover, nurses are allowed to have more involvement in primary care in the management and promotion of health. Primary care nurses can act in the role of primary care physicians without weakening the quality of care. They provide quality chronic disease management (Roland et al. 2012). Besides, patients can have direct access to particular specialists, namely, ear and throat, under gatekeeping approach in Denmark. The gatekeeping system can shorten the highly specialised treatment of the patients (Pedersen et al. 2012). However, the gatekeeping policy in Germany is not strictly enforced. Patients can access directly to secondary care, but patients are encouraged to obtain referrals from primary care physicians because the cost of direct access to secondary care is increased. The German systems generate high coordination and improved quality of care to the patients as avoidable hospitalisation can be identified under gatekeeping (Hofmann and Mühlenweg 2017). Gatekeeping is beneficial to the patients, care providers, and health-care system, with improved quality of care.

Why Equity, Equality, and Gatekeeping Are Important in Primary Care?

Equity is important in primary care in the fair and just distribution of health services within the community. Governments should continuously invest more on health care and regulate the health system to ensure the provision of fair and just health services to the population. Primary health care contributes to greater effectiveness of health services since the primary care settings can achieve health equity by providing services to people in need, in an accessible way with a broad and comprehensive range, including the needs of the minority (Starfield 2009). Allowing people to use health services for improvement of quality of life is essential and is a prime objective in primary care. Likewise, the function of health-care providers is directly responsible for the benefits of the patients (Starfield 2012). The communication and coordination between patients and doctors are associated with the reduction of problems among patients with chronic disease, because primary care providers can provide recommendations to the patients and advocate health education for improving the quality of life among patients (Parchman et al. 2005).

Furthermore, patients can receive the same level of care when there is equality of primary care, and the difference of the accessibility of health service in the community is addressed by the involvement of local people (Preston et al. 2010). For example, easier access to primary care doctors is associated with the earlier diagnosis of breast cancer (Wang et al. 2008), improving the health outcome by early detection. Likewise, socioeconomic and geographic differences affect the accessibility, and so equal access to primary care can avoid unnecessary medical costs for patients and government as there may be fewer avoidable tests and hospitalisations.

Gatekeeping is a key role of primary care doctors in referring patients to specialty care, hospital services, and diagnostic tests (Greenfield et al. 2016). Patients will receive appropriate care in an affordable way by making the full use of resources when staying in primary care. It may also allow a reduced waiting time to consult the specialist or for hospitalisation. The overall cost of health care becomes relatively lower under gatekeeping (Kringos et al. 2013). For example, the cost of drug treatment per year is found to be lower (Garrido et al. 2011). Furthermore, lower ambulatory cost and health expenditure are paid by the patients, while healthier population is found in regions with higher density of primary care physicians and lower density of specialists. In disease prevention, gatekeeping by primary care physicians takes an important role by early detection of clinical problems. The doctors recommend screening tests, including mammography and Pap smears, to female patients and prostate cancer screening to male patients, boosting the successful rate of early treatment (Phillips et al. 2004; Rubin et al. 2015).

However, patients are less satisfied with the gatekeeping policy because of the inconvenience in seeking specialists and at times with longer waiting time, as found in China (Wu et al. 2016). Moreover, patients prefer direct access to the specialists because gatekeeping system leads to heavy utilisation of primary care and hence long waiting time (Sripa et al. 2019). Nevertheless, patients are satisfied with referrals which are initiated by primary care doctors and contain detailed information about the diseases, thus increasing the certainty of diagnosis (Rosemann et al. 2006). Hence, gatekeeping works in both ways. The system allows patients to visit primary care doctors first and to get the referral for confirmation of certain diseases and conditions. Improving health outcomes and, at the same time, reducing unnecessary expenditures are beneficial to the patients under the gatekeeping arrangement.

Health Education, Promotion, and Literacy

With the emphasis of gatekeeping in primary care, health education and promotion can be enhanced. General practitioners are in a strategic position to educate service users and promote healthy lifestyle to the community. Effective preventive care can be delivered by health education and promotion, achieving better quality of life of the population. Moreover, involvement of nurses in health promotion practice is shown to be effective in reaching optimal outcome of the promotion because the nurses can provide continuing education and motivation (Maijala et al. 2016). Support of primary care nurses can contribute to the success of primary health care. To succeed in health promotion delivered by nurses, the attitude of respect and appreciation from the primary health care leaders are important.

Health awareness and literacy of the community is increased by attending the primary care centres because health-related information is obtained in the primary care settings (Örsal et al. 2019). Taggart et al. (2012) have revealed that the interventions in primary care can effectively improve health literacy and help to change the smoking behaviour. Smokers can easily reach the pharmacotherapy in primary care settings, resulting in effective smoking cessation (Jones et al. 2014). Primary care providers can ask about the smoking habits of the patients during each visit and advise the patients to quit smoking. Once the patients are willing to quit smoking, intensive therapy and supports can be provided. Moreover, follow-up action can easily be arranged in the primary care settings so that patients consult general practitioners regularly.

Nurse-Led Care Management Model

The importance of primary care is about improving the health awareness and the level of health literacy of the people with the purpose of changing their behaviours and lifestyle. Nurse-led health management model is effective in improving the blood pressure level of the patients as nurses are more motivated to participate in the management model (Loon et al. 2010). People are more confident with the decisions of the intervention because they are able to clearly communicate with the nurses, as some nurses have training in health behavioural changes and thus are competent in motivating the clients to change and improve their behaviours. Home visits and telephone follow-up by the nurses also contribute to enhancement of patient adherence for the purpose of effective blood pressure control (Zhu et al. 2014). In community health practice, nurses have a major role in primary care education and health promotion. They can contribute to improvement of peoples' health status and literacy. Therefore, primary care physicians can focus more on the clinical care of the patients, while the nurses can concentrate on healthy lifestyle and interventions.

Community health practitioners (CHPs) are appointed to assist the nurses in community-based care in a new initiative of the Hong Kong Special Administrative Region in primary care. A district health centre was set up as a pilot scheme in 2019, working closely with private general practitioners and Chinese medicine practitioners in the community. CHPs are required to have post-secondary education in health-related studies, such as public health, community health, nutrition, gerontology, and sports science. CHPs support the case managers, who are nurses, in professional counselling and treatment sessions. They also arrange health promotion activities, patient empowerment programmes, and rehabilitation exercises. The position of CHPs is new to Hong Kong. CHPs play a significant role in primary, community-based, care under the nurse-led model in the enhancement of community action and capacity to avoid exposing to health risks leading to positive health. Well-trained CHPs can help empower and monitor the health behaviours of citizens and the actions of the community.

Patient Satisfaction and Effectiveness of Treatment

Patients are the first priority, and their welfare is the major goal of the primary care. It is indispensable to have quality management in primary care for optimising the effectiveness of treatment and maximising patient satisfaction. Goetz et al. (2015) have examined the effectiveness of the European Practice Assessment (EPA) programme in primary care in Switzerland. Under EPA, medical practices need to enrol in the programme and be validated in five domains, namely, quality and safety, infrastructure, information, finance, and people. In addition, questionnaire survey of patients and staff and thorough visit by auditors are also required to obtain the accreditation certificate. There are significant improvements of the five indicators after having adopted the programme and accreditation (Goetz et al. 2015). Furthermore, complaint management, information given to the patients, and medical equipment are improved, resulting in the enhanced quality of care. In Germany, EPA in primary care practices has also significantly improved the quality of care, as indicated by the increase of the total score of quality and safety (Szecsenyi et al. 2011). For the patients, improved quality of care is reflected in greater satisfaction. Likewise, good relationship between physicians and patients also contributes to the satisfaction level of the patients because of better coordination of the care (Alberto Sánchez et al. 2014). Once the doctors are willing to listen and have established a trust and healing relationship, patients are more satisfied with the care.

Continuity of the care is another feature of primary care. Shared information, by electronic medical records, between primary care practitioners and specialists will improve patient satisfaction. Primary care physicians can make referral to the specialists through electronic medical record system, and specialists can review the patients' details thoroughly and accurately. Electronic medical record can also facilitate the coordination of gatekeeping and better communication. Referring physicians are satisfied with the referral with the feedback from specialists, such as treatment suggestions, follow-up plan, and so on (Forrest et al. 2000). Pertinent medical findings by the specialists are also available to the primary care physicians for review during follow-up sessions in the continuity of care. This coordination and sharing clinical information can achieve better quality of care and services to the patients (Thorsen et al. 2012). Likewise, it is beneficial to the patients to get second opinion and advice about the diagnosis and appropriate treatment when necessary and when in doubt. In summary, quality management in primary care with comprehensive coordination with specialists can enhance the quality of care, effectiveness of treatment, and, more importantly, patient satisfaction.

Equitable Health, Health Equality, and Good Gatekeeping in Primary Care

The benefits of primary care consist of reducing health expenditure, enhancing quality of care, and improving health outcome of the population. To promote equitable health in primary care, the accessibility of care, broad coverage of care, affordability of the patients, and positive health outcome are the main components (Hung et al. 2012). To provide equitable access of health-care service is the main focus for many developing countries since the minority groups often do not reach basic care easily. Affordability among countries of different income status can lead to a gap in accessing the primary care, and so health policy with financial subsidisation can assist people in low-income countries to have access to basic primary care (Davis and Ballreich 2014). Hence, strategies formulated to meet the needs of the vulnerable and underserved population can produce better health outcome for the community (Lavoie 2014). Governments should evaluate the needs of the population to develop equitable primary health care.

To treat health equality in primary care, equal distribution of health-care resources is mandatory to meet the health needs of the population. Farley et al. (2001) have concluded that equal access to primary care physicians is associated with equal survival rate of cervical cancer among distinct ethnic group. Nevertheless, there are various determinants of equality of health, namely, socioeconomic, political, geographical, and so on. The distribution of primary care has to be based on the needs of the community. In the geographic perspective, resource allocation of primary care, especially physicians, is vital in addressing the inequality of health access and health outcomes. Wang and Tang (2013) have suggested additional supplies of primary care to the central region because of high demand and less to the urban areas for obvious reasons. Through constant and continuing assessment of the needs of different areas of the community, policymakers can allocate health-care resources properly and fairly. Affordability of the primary care is one of the concerns for the patients, particularly those who are disadvantaged or less affluent. According to Liu et al. (2012), patients in Hong Kong are relatively unwilling to pay for private primary care due to less affordability of the expensive private services even if they are more effective. To assist the elderly to access primary care, they are provided an annual HK$2000 voucher by the government to alleviate their medical burden under Health-Care Voucher Scheme. Ideally, the elderly can use the voucher for primary care, but the usage rate is low because they are not willing to change their usual practice (Yam et al. 2011). Meanwhile, the elderly tend to spend the voucher for one time or save the benefit to more amount rather than using the money in management and prevention of diseases (Lai et al. 2018). Other than providing subsidisation, the government should also educate the citizens to focus more on disease management and prevention.

Gatekeeping allows patients to make good use of primary care in the community. Li et al. (2017) found that gatekeeping system can increase the use of primary care and reduce the use of specialists and inpatient service since patients need to attend the primary care service prior to referrals to specialists. Gatekeeping can contribute to equity of health service since the general practitioners are more familiar with the patients, and they have a more stable patient-doctor relationship, that allows the reduction of referral to specialists (Grasdal and Monstad 2011). With a stable and regular family doctor, more patients can receive equitable health service. Importantly, availability and accessibility of primary care are vital for determining the success of gatekeeping. To develop good gatekeeping for primary care, recruitment and retention of quality primary care workforce is crucial to the success (Wu and Lam 2016).

Path to Impact

Primary care is essential care in the community for improving health behaviour and health status of the population, as well as the quality of life. To attain equitable health, health equality, and good gatekeeping in primary care, a balanced approach of these three aspects is undoubtable because governments cannot just distribute equal health-care resources to the community without any assessment of the needs among the various groups and sectors in the population. Reaching and meeting the needs of the people is more important than allocating the resources alone without any evaluation. To apply a good gatekeeping, government needs to provide reasonable and practical guidelines and resources for the general practitioners to function effectively. Likewise, all governments should promote health-care schemes which combine several layers of support, including accessibility of services and incentives for primary care physicians and practitioners. The identification, assessment, and improvement of accessibility, quality, and community perception of health care are the paths to better provision of the primary care to the people. This will help reduce the overuse of public health system and improve quality of care. Moreover, primary care workers, including physicians and nurses, and CHPs are the backbone and are crucial for the success of high-quality primary health care in the community.

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References

Alberto Sánchez, C., Javier Prado-Galbarro, F., García-Pérez, S., & Sarría Santamera, A. (2014). Factors associated with patient satisfaction with primary care in Europe: Results from the EUprimecare project. *Quality in Primary Care, 22*(3), 147–155.

Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: Evidence and interventions. *The Lancet, 389*(10077), 1453–1463.

Braveman, P. (2006). Health disparities and health equity: Concepts and measurement. *Annual Review of Public Health, 27*, 167–194.

Braveman, P. (2014). What are health disparities and health equity? We need to be clear. *Public Health Reports, 129*(Suppl2), 5–8.

Braveman, P., & Gruskin, S. (2003). Defining equity in health. *Journal of Epidemiology & Community Health, 57*(4), 254–258.

Brydsten, A., Hammarström, A., & San Sebastian, M. (2018). Health inequalities between employed and unemployed in northern Sweden: A decomposition analysis of social determinants for mental health. *International Journal for Equity in Health, 17*(1), 59.

Davis, K., & Ballreich, J. (2014). Equitable access to care – How the United States ranks internationally. *New England Journal of Medicine, 371*(17), 1567–1570.

Department of Health of UK. (2012). *Equality objective action plan*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216801/DH-Equality-Objectives-Action-Plan.pdf.

Dumontet, M., Buchmueller, T., Dourgnon, P., Jusot, F., & Wittwer, J. (2017). Gatekeeping and the utilization of physician services in France: Evidence on the Médecin traitant reform. *Health Policy, 121*(6), 675–682.

Expert Panel on effective ways of investing in Health. (2014). *Definition of a frame of reference in relation to primary care with a special emphasis on financing systems and referral systems*. European Commission.

Farley, J. H., Hines, J. F., Taylor, R. R., Carlson, J. W., Parker, M. F., Kost, E. R., Rogers, S. T., Harrison, T. A., Macri, C. I., & Parham, G. P. (2001). Equal care ensures equal survival for African-American women with cervical carcinoma. *Cancer, 91*(4), 869–873.

Food and Health Bureau. (2008). *Your health your life healthcare reform consultation document.* Retrieved from https://www.fhb.gov.hk/beStrong/files/consultation/Condochealth_full_eng.pdf.

Forrest, C. B., Glade, G. B., Baker, A. E., Bocian, A., von Schrader, S., & Starfield, B. (2000). Coordination of specialty referrals and physician satisfaction with referral care. *Archives of Pediatrics & Adolescent Medicine, 154*(5), 499–506.

Garrido, M. V., Zentner, A., & Busse, R. (2011). The effects of gatekeeping: A systematic review of the literature. *Scandinavian Journal of Primary Health Care, 29*(1), 28–38.

Gee, G. C., & Ford, C. L. (2011). Structural racism and health inequities: Old issues, new directions. *Du Bois Review: Social Science Research on Race, 8*(1), 115–132.

Goetz, K., Hess, S., Jossen, M., Huber, F., Rosemann, T., Brodowski, M., Künzi, B., & Szecsenyi, J. (2015). Does a quality management system improve quality in primary care practices in Switzerland? A longitudinal study. *BMJ Open, 5*(4), e007443.

Grasdal, A. L., & Monstad, K. (2011). Inequity in the use of physician services in Norway before and after introducing patient lists in primary care. *International Journal for Equity in Health, 10*(1), 25.

Greenfield, G., Foley, K., & Majeed, A. (2016). Rethinking primary care's gatekeeper role. *BMJ, 354*, i4803.

Health Care Voucher. (2019). *Background of elderly health care voucher scheme.* Retrieved from https://www.hcv.gov.hk/eng/pub_background.htm.

Hofmann, S. M., & Mühlenweg, A. M. (2017). Primary care physicians as gatekeepers in the German healthcare system: Quasi-experimental evidence on coordination of care, quality indicators, and ambulatory costs. *American Journal of Medical Research, 4*(2), 47–72.

Hospital Authority. (2018). *Cataract surgeries programme (CSP).* Retrieved from https://www3.ha.org.hk/ppp/csp.aspx?lang=eng.

Hung, L. M., Rane, S., Tsai, J., & Shi, L. (2012). Advancing primary care to promote equitable health: Implications for China. *International Journal for Equity in Health, 11*(1), 2.

Janković, J., Simić, S., & Marinković, J. (2009). Inequalities that hurt: Demographic, socio-economic and health status inequalities in the utilization of health services in Serbia. *European Journal of Public Health, 20*(4), 389–396.

Jones, S. J., Gardner, C. L., & Cleveland, K. K. (2014). Development of a smoking cessation algorithm for primary care providers. *The Journal for Nurse Practitioners, 10*(2), 120–127.

Kawachi, I., Subramanian, S. V., & Almeida-Filho, N. (2002). A glossary for health inequalities. *Journal of Epidemiology & Community Health, 56*(9), 647–652.

Kickbusch, I. (2015). The political determinants of health-10 years on. *BMJ: British Medical Journal (Online), 350*.

Kreng, V. B., & Yang, C. T. (2011). The equality of resource allocation in health care under the National Health Insurance System in Taiwan. *Health Policy, 100*(2–3), 203–210.

Kringos, D. S., Boerma, W., van der Zee, J., & Groenewegen, P. (2013). Europe's strong primary care systems are linked to better population health but also to higher health spending. *Health Affairs, 32*(4), 686–694.

Lai, T. Y., & Leung, G. M. (2012). Equity and efficiency in healthcare: Are they mutually exclusive? *Hong Kong Journal of Ophthalmology, 16*(1), 2–5.

Lai, A. H. Y., Kuang, Z., Yam, C. H. K., Ayub, S., & Yeoh, E. K. (2018). Vouchers for primary healthcare services in an ageing world? The perspectives of elderly voucher recipients in Hong Kong. *Health & Social Care in the Community, 26*(3), 374–382.

Landsbergis, P. A., Choi, B., Dobson, M., Sembajwe, G., Slatin, C., Delp, L., Siqueira, C. E., Schnall, P., & Baron, S. (2018). The key role of work in population health inequities. *American Journal of Public Health, 108*(3), 296–297.

Lavoie, J. G. (2014). Policy and practice options for equitable access to primary healthcare for indigenous peoples in British Columbia and Norway. *The International Indigenous Policy Journal, 5*(1), 6.

Li, W., Gan, Y., Dong, X., Zhou, Y., Cao, S., Kkandawire, N., Cong, Y., Sun, H., & Lu, Z. (2017). Gatekeeping and the utilization of community health services in Shenzhen, China: A cross-sectional study. *Medicine, 96*(38), e7719.

Liu, S., Yam, C. H., Huang, O. H., & Griffiths, S. M. (2012). Willingness to pay for private primary care services in Hong Kong: Are elderly ready to move from the public sector? *Health Policy and Planning, 28*(7), 717–729.

Loon, K. M. S., van der Weijden, T., Ronda, G., van Steenkiste, B., Winkens, B., Elwyn, G., & Grol, R. (2010). Improving lifestyle and risk perception through patient involvement in nurse-led cardiovascular risk management: A cluster-randomized controlled trial in primary care. *Preventive Medicine, 50*(1–2), 35–44.

Maijala, V., Tossavainen, K., & Turunen, H. (2016). Health promotion practices delivered by primary health care nurses: Elements for success in Finland. *Applied Nursing Research, 30*, 45–51.

National Academies of Sciences, Engineering, and Medicine. (2017). *Communities in action: Pathways to health equity*. National Academies Press.

Newman, L., Baum, F., Javanparast, S., O'Rourke, K., & Carlon, L. (2015). Addressing social determinants of health inequities through settings: A rapid review. *Health Promotion International, 30*(2), 126–143.

Nishiura, H., Barua, S., Lawpoolsri, S., Kittitrakul, C., Leman, M. M., Maha, M. S., & Muangnoicharoen, S. (2004). Health inequalities in Thailand: Geographic distribution of medical supplies in the provinces. *Southeast Asian Journal of Tropical Medicine and Public Health, 35*, 735–740.

Örsal, Ö., Duru, P., Örsal, Ö., Tırpan, K., & Çulhacı, A. (2019). Analysis of the relationship among health awareness and health literacy, patient satisfaction levels with primary care in patients admitting to primary care health centers. *Patient Education and Counseling, 102*(2), 376–382.

Papp, R., Borbas, I., Dobos, E., Bredehorst, M., Jaruseviciene, L., Vehko, T., & Balogh, S. (2014). Perceptions of quality in primary health care: Perspectives of patients and professionals based on focus group discussions. *BMC Family Practice, 15*(1), 128.

Parchman, M. L., Noël, P. H., & Lee, S. (2005). Primary care attributes, health care system hassles, and chronic illness. *Medical Care*, 1123–1129.

Pedersen, K. M., Andersen, J. S., & Søndergaard, J. (2012). General practice and primary health care in Denmark. *Journal of the American Board of Family Medicine, 25*(Suppl 1), S34–S38.

Phillips, K. A., Haas, J. S., Liang, S. Y., Baker, L. C., Tye, S., Kerlikowske, K., Sakowski, J., & Spetz, J. (2004). Are gatekeeper requirements associated with cancer screening utilization? *Health Services Research, 39*(1), 153–178.

Preston, R., Waugh, H., Larkins, S., & Taylor, J. (2010). Community participation in rural primary health care: Intervention or approach? *Australian Journal of Primary Health, 16*(1), 4–16.

Riumallo-Herl, C., Canning, D., & Kabudula, C. (2019). Health inequalities in the South African elderly: The importance of the measure of social-economic status. *The Journal of the Economics of Ageing*. https://doi.org/10.1016/j.jeoa.2019.01.005.

Roland, M., Guthrie, B., & Thomé, D. C. (2012). Primary medical care in the United Kingdom. *Journal of the American Board of Family Medicine, 25*(Suppl 1), S6–S11.

Rosemann, T., Wensing, M., Rueter, G., & Szecsenyi, J. (2006). Referrals from general practice to consultants in Germany: If the GP is the initiator, patients' experiences are more positive. *BMC Health Services Research, 6*(1), 5.

Rubin, G., Berendsen, A., Crawford, S. M., Dommett, R., Earle, C., Emery, J., Fahey, T., Grassi, L., Grunfeld, E., Gupta, S., Hamilton, W., Hiom, S., Hunter, D., Lyratzopoulos, G., Macleod, U., Mason, R., Mitchell, G., Neal, R. D., Peake, M., Roland, M., Seifert, B., Sisler, J., Sussman, J., Taplin, S., Vedsted, P., Voruganti, T., Walter, F., Wardle, J., Watson, E., Weller, D., Wender, R., Whelan, J., Whitlock, J., Wilkinson, C., de Wit, N., & Zimmermann, C. (2015). The expanding role of primary care in cancer control. *The Lancet Oncology, 16*(12), 1231–1272.

Sripa, P., Hayhoe, B., Garg, P., Majeed, A., & Greenfield, G. (2019). Impact of GP gatekeeping on quality of care, and health outcomes, use, and expenditure: A systematic review. *British Journal of General Practice, 69*(682), e294–e303.

Starfield, B. (2009). Primary care and equity in health: The importance to effectiveness and equity of responsiveness to peoples' needs. *Humanity and Society, 33*(1–2), 56–73.

Starfield, B. (2012). Primary care: An increasingly important contributor to effectiveness, equity, and efficiency of health services. SESPAS report 2012. *Gaceta Sanitaria*, (Suppl 1), 20–26.

Szecsenyi, J., Campbell, S., Broge, B., Laux, G., Willms, S., Wensing, M., & Goetz, K. (2011). Effectiveness of a quality-improvement program in improving management of primary care practices. *Canadian Medical Association Journal, 183*(18), E1326–E1333.

Taggart, J., Williams, A., Dennis, S., Newall, A., Shortus, T., Zwar, N., Denney-Wilson, E., & Harris, M. F. (2012). A systematic review of interventions in primary care to improve health literacy for chronic disease behavioral risk factors. *BMC Family Practice, 13*(1), 49.

Thorsen, O., Hartveit, M., & Baerheim, A. (2012). General practitioners' reflections on referring: An asymmetric or non-dialogical process? *Scandinavian Journal of Primary Health Care, 30*(4), 241–246.

Wang, F., & Tang, Q. (2013). Planning toward equal accessibility to services: A quadratic programming approach. *Environment and Planning B: Planning and Design, 40*(2), 195–212.

Wang, F., McLafferty, S., Escamilla, V., & Luo, L. (2008). Late-stage breast cancer diagnosis and health care access in Illinois. *The Professional Geographer, 60*(1), 54–69.

World Health Organization. (2019a). *Equity*. Retrieved from https://www.who.int/healthsystems/topics/equity/en/.

World Health Organization. (2019b). *The determinants of health.* Retrieved from https://www.who.int/hia/evidence/doh/en/.

Wu, D., & Lam, T. P. (2016). Underuse of primary care in China: The scale, causes, and solutions. *Journal of American Board of Family Medicine, 29*(2), 240–247.

Wu, J., Zhang, S., Chen, H., Lin, Y., Dong, X., Yin, X., Lu, Z., & Cao, S. (2016). Patient satisfaction with community health service centers as gatekeepers and the influencing factors: A cross-sectional study in Shenzhen, China. *PLoS One, 11*(8), e0161683.

Yam, C. H., Liu, S., Huang, O. H., Yeoh, E. K., & Griffiths, S. M. (2011). Can vouchers make a difference to the use of private primary care services by older people? Experience from the healthcare reform programme in Hong Kong. *BMC Health Services Research, 11*(1), 255.

Zhu, X., Wong, F. K. Y., & Wu, L. H. (2014). Development and evaluation of a nurse-led hypertension management model in a community: A pilot randomized controlled trial. *International Journal of Clinical and Experimental Medicine, 7*(11), 4369–4377.

Chapter 14
Social Responsibility and Ethics in Health Care

Tiffany C. H. Leung and Jacky C. K. Ho

Introduction to Morality and Ethics

The notion of morality and ethics has been widely examined in a range of academic research fields. To understand the complexity and implicit relationship between morality and ethics, individuals understand how they are responsible for their moral actions and articulate their responsibilities and how individuals behave as good members of society (Gray et al. 2014).

Morality refers to the values and beliefs of individuals, groups, or societies to act what is right or wrong in the society and concerns about the relationships between people and how they best live in harmony and peace (Doherty and Purtilo 2016). Morality includes three distinct areas: (i) values are intrinsic values and qualities of individuals, groups, or societies; (ii) moral duty describes particular actions of individuals, groups, or society that play a vital role to reduce harm and build a human foundation that could survive and thrive; and (iii) moral character or virtue describes attitudes and traits, such as justice, courage, and honesty (Doherty and Purtilo 2016).

Ethics is a systematic study and reflection on morality to examine moral situation and calls moral assumption into questions (Doherty and Purtilo 2016). Individuals highly depend on two major ethical and extreme positions: (i) ethical absolutism refers to claims that are universally applicable moral principles and right or wrong that are objective qualities and (ii) ethical relativism refers to claims that are highly subjective and apply moral principles depending on the context rather than universally moral principles (De George 2014).

Ethical theories vary across cultures, nations, and countries. Traditional ethical theories tend to be absolute in nature that can deploy universally moral principles and rules in any situation, while contemporary ethical theories offer another aspect

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which is known as a relativistic position (Crane and Matten 2016). However, ethical pluralism offers a middle ground between absolutism and relativism that accepts a wide range of moral grounds, rules, and principles in order to establish a general consensus on ethical dilemmas in certain situations (Crane and Matten 2016). Some theoretical frameworks of ethics overlap with ethical theories or principles. Thus, there is no single universal rule, theoretical framework, or ethical principle that can dominate in a particular ethical conflict or dilemma.

This chapter sets to give a brief introduction of morality and ethics and then provides a general overview of major ethical theories and approaches in health care. The third section shows corporate scandals and issue management. The fourth section introduces global sustainability reporting practices in the health-care sector. The next section discusses four major ethical issues in community health care and the health-care industry and followed by concluding remarks.

Major Ethical Theories and Approaches in Health Care

This section provides a general overview of four common ethical theories and approaches, namely, utilitarianism, ethics of duties, rights and justice, as well as virtue ethics in the health-care ethics. The following paragraphs will explain the general concept in detail.

First, the most important teleological theory for understanding health-care ethics is utilitarianism which is regarded as one of the consequentialist theories of ethics (Doherty and Purtilo 2016). The original advocators of utilitarianism are two British philosophers, Jeremy Bentham and John Stuart Mill. Utilitarianism is also known as the ‘greatest happiness principle’ that emphasises on collective welfare rather than individual desires or self-interests (Crane and Matten 2016). Utilitarianism has become very prominent in the quantitative analysis of economics that measures the utility of particular actions. Such measure is so-called cost-benefit analysis that rational decision-makers determine the morality of decisions entirely based on the best consequence or the highest aggregate utility (Crane and Matten 2016). This concept is related to beneficence to demonstrate compassion, kindness, and considering the best option or the greatest welfare for the patients or clients (Pozgar 2013). Sometimes, sole reliance on the weighting of the aggregate utility appears to be insufficient to find out the most intended outcome (Doherty and Purtilo 2016). The major critics of utilitarianism are the subjective viewpoints of individuals, quantification of pleasure and pain, and distribution of utility (Crane and Matten 2016).

Second, ethics of duties and ethics of rights and justice are two influential non-consequentialist theories. Ethics of duties is often known as deontology which was contributed by the German philosopher, notably Immanuel Kant. Kant (1785/1996) places a high emphasis on the control of individual choices that is in line with a moral rule or a standard that is valid for everyone facing ethical dilemmas (Crane and Matten 2016; Doherty and Purtilo 2016). Deontology is related to the principle of autonomy that plays strong influence within health-care ethics in the modern society (Doherty and Purtilo 2016). Thus, autonomy respects for individuals and the right of a patient to make his or her own decision about the treatment based on the basis of fidelity, honesty, and confidentiality. However, such autonomous behaviour of patients can reduce the recovery of the medical treatment, such as refusing to take medication of treatment and to receive blood transfusion or organ transplant (Pozgar 2013).

Third, ethics of rights refers to the famous British philosopher, John Locke, who advocates that human beings should be protected and respected by the government (Crane and Matten 2016). Aristotle and Plato provide in-depth analysis on justice as a virtue, so justice can be viewed as a moral quality of individuals and justice cannot be separated from social justice (Banks and Gallagher 2009). Individual rights should be addressed equally and fairly, and this is linked to the notion of justice that individuals are treated what they deserve (Crane and Matten 2016). John Locke's ethics of rights somehow influences John Rawls's (1971) *A Theory of Justice*. Arnold et al. (2014) suggest that theories of justice are often described as fairness in two major types: (i) procedural justice is often viewed as fairness that individuals are entitled to receive rewards for their contribution, and (ii) distributive justice is usually seen as fairness that is determined by the positive or negative consequences that are fairly distributed. In particular, health-care services appear to in line with the concept of distributive justice (Pozgar 2013). Rawls (1971, 1993) proposes two important criteria to achieve justice: (i) individuals have equal rights that are equivalent to basic liberties; and (ii) social and economic inequalities are usually assessed by the greatest benefit of the least advantaged people and open to all situations of equality and fairness. In the health-care context, how individuals are treated is based on equality and fairness in the distribution of benefits and risks (Pozgar 2013).

Fourth, virtue ethics has become an alternative or complementary and integrity-based approach to consequentialist ethical theories (Banks and Gallagher 2009). Virtues are manifested in actions that are moral virtues, a set of excellent and virtuous character traits, for example, honesty, friendship, and patience, in order to become a virtuous person (MacIntyre 1984). Virtue ethics enables individuals to acquire these virtuous traits by learning and adopting in daily practices rather than acquiring these virtuous traits by birth (MacIntyre 1984). Importantly, the Chinese Philosopher, Confucius, wrote the ideal moral character, which is known as the gentleman (Jūn Zǐ) whose Chinese virtues include 'rén', 'zhì', and 'yì' in the Confucian moral philosophy that refers to benevolence, wise, and justice in the western tradition (Crane and Matten 2016). Some common virtuous traits are often similar to other religious traditions, such as Islam, Christianity, and Buddhism, that cover virtues as one of the excellent character traits (Banks and Gallagher 2009).

The above discussion offers a brief overview of four common ethical theories and approaches in health-care ethics and provides various viewpoints on how individuals make moral decision in ethical dilemmas or moral conflicts in different settings. There is no single ethical theory or approach that represents the absolute view of any ethical conflict in the community health care or the health-care settings. The four main ethical theories or approaches can be seen as useful 'lens' or 'prism' to assist moral agents to use a certain angle, for example, utilitarianism, ethics of duties, rights and justice, and virtue ethics, to express ethical standpoints in a pluralist society (Crane and Matten 2016).

Corporate Scandals and Issue Management

A spate of critical scandals and unforeseen incidents in different industries that appear to violate ethical theories and approaches in health care as discussed above, such as an increasing adoption of toxic chemical (e.g. DDT in the food chain), the health and nutrition issues in the fast food industry (e.g. McDonald's Big Mac), as well as the security of the global supply food and water (e.g. Nestlé), have already raised stakeholder concerns and scepticism about the quality of products and services (Brooks and Dunn 2017; Crane and Matten 2016; Leung 2019b). In particular, there are a number of scandals in the health-care industry, such as whistleblowing in the pharmaceutical industry (Boumil et al. 2010), data privacy and security in hospital settings (Reynolds 2012), and abuse scandals in the residential-care services or nursing homes (Pillemer and Moore 1990; Jönson 2016; Ng et al. 2018b, c). These scandals pose systemic and operational implications in health-care delivery, including primary care.

However, the social costs of the community of these scandals or negative incidents are difficult to measure or quantify in financial terms. Large corporations with innovative stage tend to have more tangible resources, such as capital, employees, and partners, to manage their stakeholders to develop mutual influence rather than unilateral relationships or interactive with limited stakeholders (Mirvis and Googins 2006). These corporations tend to develop a responsive program or adopt proactive systems to manage their issue management rather than to adopt defensive approach (i.e. deny any responsibilities) or reactive approach to manage negative scandals or unforeseen crises (i.e. doing the least that is required) (Mirvis and Googins 2006). Regarding the transparency issues of corporate activities, passive organisations tend to cover and hide the negative news or unfavourable information to stakeholders, such as GlaxoSmithKline (GSK) was accused of hiding their products to cause serious health problems or even deaths and concealing associated risks of their products or services (Aeby et al. 2014; Leung and Gray 2016; Leung and Snell 2017, 2019; Leung 2019a; Noronha et al. 2015). Some transforming companies have already adopted Global Reporting Initiative (GRI) as a full disclosure practice to enhance transparency, accountability, and responsibility in response to operational risks, unforeseen crises, or corporate scandals.

Global Sustainability Reporting Practices in the Heath-care Sector

In 2015, the United Nations examined and evaluated the 10 Millennium Development Goals (MDGs) and further extended them to 17 Sustainable Development Goals (SDGs) to achieve the new targets of the 2030 Agenda for Sustainable Development (The United Nations 2017). Approximately 40% of the global 250 companies and national 100 companies are expected to play active role in integrating their business strategies to address some of SDGs, and thus the SDGs will be considered as a high profile in corporate reporting in the next few years (KPMG 2015, 2017).

There are three important organisations that consider accountability, transparency, and responsibility in form of sustainability reporting or corporate social reporting to be related to the health-care sector, including (1) the International Organization for Standardization (ISO) (e.g. ISO 14000 – Environmental Management System, ISO 26000 – Guidance on Social Responsibility, ISO 31000: 2009 – Risk Management Standards, and ISO 50001 – Energy Management System), (2) the Global Reporting Initiative (GRI), and (3) the United Nations Global Compact (UNGC) (Adams and Narayanan 2007; Leung and Ng 2018). However, KPMG (2017) states that the GRI framework is the most widely adopted framework by 75% of the Global 250 companies. This framework tends to be a comprehensive guideline that incorporates government policies, market regulator reporting standards, and references from different countries, regions, and local stock exchanges.

Klynveld Peat Marwick Goerdeler (KPMG), one of the international and major accounting firms, has continuously accessed voluntary and mandatory corporate responsibility reporting among global and national companies over the last 20 years. According to the KPMG's (2017) international survey, over 93% of the global 250 companies and over 75% of national 100 companies report both financial information (e.g. assets, liabilities, and profits) and nonfinancial information (e.g. ethical, social, and environmental information) in annual reports, sustainability reports, or corporate webpages. More importantly, the global reporting rate of health-care sector is over 75% in 2017, and the most substantial growth from the health-care sector has gradually increased by 8% since 2015 (KPMG 2017).

Importantly, the Global Reporting Initiative (GRI) guideline includes three main disclosure categories, namely, economic, environmental, and social dimensions, while social dimensions are subdivided into four dimensions, including labour practices and decent work, human rights, society, and product responsibility (Global Reporting Initiative 2015; Ng et al. 2018a) (see Table 14.1).

67% of the global 250 companies and over 40% of the national companies tend to adopt the third-party assurance of social and environmental information in the corporate annual reports or standalone sustainability reports which is often viewed as an international standard practice (KPMG 2017). The reliability and accuracy of such information is regarded as important business value for global 250 companies and national 100 companies that not only reduce the scepticism of stakeholders among false disclamation of certified products or services but also enhance companies to achieve some of the Sustainable Development Goals (SDGs) suggested by the United Nations (KPMG 2017; PwC 2018).

Ethical Issues in Community Health Care and the Health-Care Industry

Social responsibility and social accountability have been emphasised increasingly in the health-care industry in the twenty-first century. Numerous reports have witnessed rising conflicts between health-care providers and patients (clients),

Table 14.1 Global reporting guideline

Category	Economic	Environment	Social			
Sub-category			Labour practice and decent work	Human right	Society	Product responsibility
Aspects	Economic performance	Materials	Employment	Investment	Local communities	Customer health and safety
	Market presence	Energy	Labour/management relations	Non-discrimination	Anti-corruption	Product and service labelling
	Indirect economic impacts	Water	Occupational health and safety	Free of association and collective bargaining	Public policy	Marketing communications
	Procurement practices	Biodiversity	Training and education	Child labour	Anti-competitive behaviour	Customer privacy
		Emissions	Diversity and equal opportunity	Forced or compulsory labour	Compliance	Compliance
		Effluents and waste	Equal remuneration for women and men	Security practices	Supplier assessment for impacts on society	
		Products and services	Supplier assessment for labour practices	Indigenous rights	Grievance mechanism for impacts on society	
		Compliance	Labour practices grievance mechanisms	Assessment		
		Transport		Supplier human rights assessment		
		Overall		Human rights grievance mechanisms		
		Supplier environmental assessment				
		Environmental grievance mechanisms				

Source: Global Reporting Initiative (2015) increasing number on legal cases regarding medical malpractice, minimal control over pricing on medicinal products, market-driven approach in the pharmaceutical industry, trends on privatisation in health-care industry, or raising capital by issuing shares of stock in a public market. It is crucial to create a multidisciplinary dialogue for the abovementioned incidents more seriously in a socially responsible and ethical manner, in order to achieve a global mission for a healthy and sustainable community. The following subsections will focus on the four major subcategories in the social aspects within the Global Reporting Initiative (GRI) guideline: (i) training and education in health-care practices, (ii) health-related human rights, (iii) public policy in society and (iv) product responsibility. These subcategories in the social aspects are largely relevant to community health-care and the health-care industry.

Training and Education in Health-Care Practices

Universities and professional colleges are facing the challenge to meet growing demands and needs by educating the health-care practitioners to be socially responsible and preparing them to respond in such manner within the society's priority health needs (Boelen and Heck 1995). Revision of the curriculum design in the undergraduate programme has begun in some countries, as students are expected to participate in a global health experience and expose to diverse cultural settings. This movement in the redesign of programme structure has provided significant educational value and formed the foundation of preparing globally engaged and socially responsible health-care professionals (Drain et al. 2007). There are several objectives of this global health experience, such as promoting the opportunity to exposure of diseases uncommon to the developed or high-income countries, professional network development, fulfilling social responsibility, and providing care to the underprivileged (Dacso et al. 2013).

The establishment of the World Health Organization (WHO) has transformed the global health network, as it helps to foster connectivity and resource sharing ideology to a wider global community. Many large-scale international development programmes were created and executed based on the collaboration between the WHO and the local governments, nongovernmental organisations (NGOs), and universities with global missions. This initiative has broadened the scope of clinical practices to a population-based approach, promoted disease prevention, and effectively addressed the priority health concerns of the host communities, capacity building, programme administration, and standardisation (Melby et al. 2016).

Health-care professionals are more aware of their social responsibility and ethical consideration in the twenty-first century since many populations in the low- and middle-income countries and subpopulations in the high-income countries suffer from poor health and a lack of access to health care, arising commonly from poverty, inadequate infrastructure, and shortage of human resource for health, as suggested by the important Declaration of Alma-Ata in 1978 and the Ottawa Charter for Health Promotion in 1986 (Kim 2013; Kim et al. 2013; WHO 2018). In addition, studies have shown that some of the future generation of health-care practitioners held negative attitude towards patients of low socioeconomic status and tended to be reluctant to address the needs of vulnerable populations (Dhalla et al. 2002; Woo et al. 2004). This may be due to more students and graduates come from privileged background and are socially distant from socioeconomic vulnerabilities (Dhalla et al. 2002; Woo et al. 2004).

Privatisation of the health-care industry with economic imperatives engendered an increase in self-interest pursuit over social responsibility and thus seems to disrupt the social contract and obligation of health-care services for the local regions or communities which it obliged to serve, particularly in primary health care (Choudhry et al. 2004). Therefore, education for health-care practitioners should be under a training curriculum that focuses on developing social responsibility. This would require pedagogical discussion and collaboration within the professional community that future health-care practitioners who have been equipped under this notion of training are more likely to gain greater sense of sophistication in understanding of the issues, the relevance of social responsibility in health-care service, and the importance of social accountability (Dharamsi et al. 2010).

Health-Related Human Rights

It is an ethical duty for all human beings to have a right to well-being, and 'health' is among the six fundamental dimensions of well-being placing first in its order (Powers and Faden 2006). Governments, NGOs, and corporations have a synergistic responsibility to fulfil this ethical duty by assimilating the available resources. Developing countries bore 93% of the global disease burden, while only 5% of the global health research and development expenditures were directed to health problems in these countries (Council on Health Research for Development 1990). The right to well-being is not only limited to whether each individual could have access to health care or the building of health infrastructure but also extend to factors leading to a healthy life, such as safe drinking water and adequate sanitation, safe food, adequate nutrition and housing, healthy working and environmental conditions, health-related education and information, as well as gender equality (WHO 2017). Health services and access to health facilities must be provided without any discrimination. Discrimination is linked to the marginalisation of specific population groups leading to their further vulnerability to poverty and ill health (Bourgois et al. 2017). Studies showed that ethnic minority groups and indigenous people have limited access to adequate health services, received less health information, and lived in poor housing, as well as their children are more to suffer from high mortality rate and severe malnutrition compared to the general population (Leatherman 2005; Willen 2012).

'The International Covenant on Economic, Social and Cultural Rights' and the 'Convention on the Rights of the Child' stated the right to well-being (health) is built on two crucial human rights principles and critical components: nondiscrimination and equality. The Declaration of Alma-Ata addressed the gross inequality in the health status in different countries (WHO 1978). Countries have the obligation to remove all discrimination and ensure equality in the access of healthcare service and the underlying determinants of health (e.g. adequate nutrition, housing, and water) and strive to eliminate discrimination on sex, race, and disability for people to have the rights to public health service and medical care, despite the country's difficult financial situation and no justification for the lack of protection of vulnerable groups from health-related discrimination, should they seek aid from global organisations, such as the WHO, the United Nations, the World Bank, and the International Monetary Fund (IMF). These organisations are accountable to mobilise resources and developing resolutions to address health-related human rights including health development, women's health, reproductive health, child and adolescent health, nutrition, HIV/AIDS, drugs, violence, mental health, essential medicines, indigenous people's health, and emergencies (Meier 2017).

Public Policy in Society

Public health policy determines whether a given society has adequate resources and access to health care, universal coverage, and efficient resource allocation to the community, particularly the underprivileged group of population. Adoption of a socially responsible value in the process of policy making is vital to ensure all relevant stakeholders, including local to national communities, and participate and provide their valid opinions. Local community could be a particular district or province in the given country, and national level could be the sum of different districts to form a statutory state. It is important to have a local-level policy-making-driven approach to formulate public health policy at the national level, since policy-making at macro-levels may not be able to accommodate the diversity of local conditions that directly affect the health and well-being of local residents of different communities. Community empowerment and active local participation in health development could help the community on capacity building to improve local conditions for a healthier and autonomous society since local communities are affected by their own decisions (Mittelmark 2001).

National policy-makers with a good intention to implement public health policy may fail to address the needs and health concerns of local community and may cause serious damage to the health service system. Local-level participation could provide positive feedback for reasonable modification to existing or new policies for successful implementation that fits the local conditions and needs. In the case of Latin American countries, different social groups have been continually segregated into separate health system segments, such as salaried population and non-salaried population. This segregation has been created from a longstanding economic and social inequality caused by the perception that the national economy frameworks of these countries are the major barriers to fulfil the rights to health (Cotlear et al. 2014).

On the other hand, social responsibility should be considered in health-care organisations and the pharmaceutical industry. Pharmaceutical companies create medicines and therapies to help alleviate or lessen diseases while making substantial profits. They have an important role in making and facilitating ease of access to medicine for the impoverished people globally if they are to become more socially responsible (Siniora 2017). Corporate social responsibility (CSR) in the health sector is largely different from CSR in profit-making organisations because medicine and medical care are essential for the common good of the society (Leung 2019b). Poor individuals cannot afford expensive medications or treatments due to market and patent requirements, the absence of generics or affordable charges to patented medications.

An example to illustrate the incorporation of CSR value into a corporate culture is the Aleris, a Scandinavian health care and care services provider. It has developed robust CSR initiatives by helping hospitals in Ukraine to develop standard of practices, provide continuing education for doctors in the country, and provide funding support for various research groups that tackle diseases of global concerns (Aleris 2015). Socially responsible decision-making for improved equity in health is stimulated by policymakers and other major stakeholders. Collaborations of local community and national leaders could help understand the actual needs in order to realise better health services for local citizens. Therefore, public policy should provide incentives for private health-care organisations and pharmaceutical companies to encourage CSR initiatives and to create ease of access to medicines, treatments, and health-care services for people in the underprivileged societies in order to improve the quality of health, life, and humanity for the world.

Product Responsibility

Product responsibility is related to products and services that have direct impact to stakeholders in general and, in particular, customers. This aspect is largely related to consumer rights, such as the right to safe and efficacious products, the right to truthful measurements, and product labelling that are largely in line with not only the United Nations Guidelines for Consumer Protection (UNGCP) but also the European Union (EU) regulations and different national laws (Crane and Matten 2016). Arguably, manufacturers and producers in the pharmaceutical industry and the health-care industry should exercise due care to ensure their products are fit for the purpose, safe to use, and free from defects (Boatright 2012). Otherwise, manufacturers and producers are liable for any negative litigations and consequences for their products and services, such as compensation for consumers, legal fine or penalty, and reputation risk.

Product and Service Labelling

The United States Food and Drug Agency (FDA) sent over 70 warning letters to different pharmaceutical companies due to their malpractices (Aeby et al. 2014). In particular, Johnson & Johnson's Janssen Pharmaceutical Unit was accused of the off-label promotion of its antipsychotic drug Risperdal, and they not only provided lucrative incentives for sale representatives to promote this product but also claimed that this drug was safe to use (Aeby et al. 2014). In addition, Vanderlee et al. (2012) conducted a study of calorie amounts and serving size in Canada and found that mandatory nutrition labelling practices and voluntary industry measures of packaged foods and beverages were misleading to health-care consumers that led to substantial underestimate of calorie intake. Therefore, dual-column nutrition labels are highly recommended and state nutritional information for one serving and multiple servings of a product (Vanderlee et al. 2012).

Due to negative scandals and incidents in the pharmaceutical industry and the health-care industry, there is a growing demand for anti-counterfeit drugs and health product packaging technologies as well as security features. Thus, the global packaging and labelling services market is expected to increase at a compound annual growth rate (CAGR) of 5.3% between 2015 and 2023 in response to the growth of this sector (Transparency Market Research 2018). The pharmaceutical industry and the health-care industry also play an important role to minimise environmental impact as social responsibility and sustainable development, as these companies tend to spend more financial resources on research and development (R&D) on green and bio-based alternatives in order to maintain the highest standards of packaging and product labelling (Transparency Market Research 2018).

Marketing Communication

Heath communication is largely linked to two major areas of marketing communication and health care that could improve personal health and public health (Mukherjee 2015). Nowadays, different marketing strategies, such as data mining techniques, neuro-marketing tools, and social media of positive stories, are widely adopted in the pharmaceutical industry and the health-care industry to promote new products and services to targeted individuals. Pharmaceutical companies and health-care firms spend tremendous amount of money on promotional activities (Huebner 2014). Advertising is one of the major aspects of marketing communications. However, the pharmaceutical industry and the health-care industry tend to pay less attention to ethical problems in sales promotion, public relations, and different tactics of marketing communications (Crane and Matten 2016). Thus, firms in these industries should take the social aspects of corporate social responsibility into consideration in selling their products and services to the general public.

Critics of these marketing communications and advertising practices could be examined at two levels: individual level and social level. At individual level, the use of misleading, deceptive practices and direct-to-consumer marketing induce health-care consumers to create false beliefs about particular products or highlight certain health-care companies in consumers' minds in order to persuade consumers to purchase products or even change their health-care attitudes and consumer behaviours (Crane and Matten 2016). It is difficult to define deception in these settings. However, it depends on whether companies deliberately make false claims or impressions to the health-care consumers. Thus, consumer deception occurs when individuals making rational decision-making are largely interfered with different marketing communication tactics, taking advantage of and relying on false beliefs (Boatright 2012).

For example, a food product claims to be 'low fat' with the intended meaning that the product is lower in fat than another similar product. However, a product with 80% fat could be labelled as 'low fat' with another product with 85% fat (Crane and Matten 2016). The 'low-fat' product appears to be impressive for healthy diet customers, but such misleading labelling could not truly reflect the healthy description of the product. Thus, the 'low-fat' labelling product could induce individuals who are currently overweight to take more calories in their daily lives (Wansink and Chandon 2006).

At social level, a major concern is related to the aggregated social and cultural impacts of marketing communication that enhance materialism and consumerism in the community (Crane and Matten 2016). There are four major criticisms in relation to marketing communication: (i) individuals are highly exposed to different intrusive and unavoidable advertisements everywhere, such as television, newspaper, and social media; (ii) companies tend to generate artificial wants to increase the substantial demand of the new health-related products, such as vitamins, supplements, and health-care devices; (iii) individuals are highly indulged in marketing communication to generate materialism in the society and to create a culture of individual consumption with happiness; and (iv) marketing communication constantly creates perpetual dissatisfaction and discontent with our daily lives and continuously develops a sense of insecurity and inadequacy (Crane and Matten 2016).

More importantly, critics of marketing communication appear to be concerned with targeting vulnerable health-care consumers, such as children, the elderly, and the patients, as marketers tend to take advantage of these vulnerable groups. There are several reasons why these vulnerable health-care consumers tend to be exploited, such as children under five are too young to make a rational decision, the silver group is easily manipulated and convinced by the health care promoters, and the patients physically and emotionally need pain reliever to cure their diseases or illness (Crane and Kazmi 2010; Crane and Matten 2016). Pertinently, pharmaceutical companies spend substantial amount of money to persuade healthy individuals to believe they are sick so as to extend the boundaries of curable illness to expand potential markets that sell their products and offer treatments (Moynihan et al. 2002). Ironically, the corporate construction of disease has already taken over the social construction of illness (Moynihan et al. 2002).

Concluding Remarks

This chapter firstly provides a brief introduction of morality and ethics and offers an overview of four major ethical theories and approaches in health-care ethics or other disciplines. There is no particular ethical theory that can represent the absolute viewpoints of ethical dilemmas in the health-care settings. However, individuals who make moral decision in ethical conflicts are largely based on different factors, such as moral values, briefs, and cultures. Corporate scandals in various industries, in general, and the health-care industry, in particular, show how different companies adopt different approaches to respond to such negative incidents. Nowadays, global companies tend to incorporate SDGs into their business strategies and follow the global trend of sustainability reporting practices that provide a benchmark of managing economic, social, and environmental performance at industry and international levels. The four major subcategories in the social aspects of the Global Reporting Initiative (GRI) guideline are described, making references to health-care settings to introduce a basic level of understanding in this area. In order to maintain integrity, accountability, and social responsibility of the health-care professionals, adoption of the GRI guideline, developing a global health governance framework, and deploying enterprise risk management for the pharmaceutical industry and the health-care sector could minimise potential ethical disputes, allegations, and reputation risks.

Unfortunately, these practices have not largely been taken up by the health-care industry over the world. There are lots of work to be done to improve the education and training of health service providers in the knowledge of social responsibility and practice of ethical professional care. Reorientation of the health-care delivery systems is necessary to nurture and support good medical practice as well as good manufacturing practice (GMP), which is a standard requirement in the pharmaceutical industry. Timely approaches in primary care shall steer integrated and interdisciplinary services to serve our communities in the most effective and equitable manner in the new era.

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References

Adams, C., & Narayanan, V. (2007). The standardization of sustainability reporting. In J. Unerman, J. Bebbington, & B. O'Dwyer (Eds.), *Sustainability accounting and accountability* (pp. 70–85). Oxon: Routledge.

Aeby, P., Brears, R., Leereveld, W., Mancini, S., Neghaiwi, N., Pojasek, R., Soulodre, L., & Chiappe, S. V. (2014). *RepRisk insight: ESG risk in the corporate world*. Zurich: RepRisk AG.

Aleris. (2015). *Corporate social responsibility in healthcare and care services 2015: Developing sustainable healthcare & care services in Scandinavia*. Stockhlom: Aleris.

Arnold, D., Beauchamp, T. L., & Bowie, N. E. (2014). *Ethical theory and business* (9th ed.). Essex: Pearson Education Limited.

Banks, S., & Gallagher, A. (2009). *Ethics in professional life: Virtues for health and social care*. Hampshire: Palgrave Macmillan.

Boatright, J. R. (2012). *Ethics and the conduct of business* (7th ed.). Upper Saddle River: Pearson Education.

Boelen, C., & Heck, J. (1995). *Defining and measuring the social accountability of medical schools*. Geneva: World Health Organization.

Boumil, S. J., Nariani, A., Boumil, M. M., & Berman, H. A. (2010). Whistleblowing in the pharmaceutical industry in the United States, England, Canada and Australia. *Journal of Public Health Policy, 31*(1), 17–29.

Bourgois, P., Holmes, S. M., Sue, K., & Quesada, J. (2017). Structural vulnerability: Operationalizing the concept to address health disparities in clinical care. *Academic Medicine, 92*(3), 299–307.

Brooks, L., & Dunn, P. (2017). *Business and professional ethics: For directors, Executive & Accountants* (8th ed.). Boston: Cengage Learning.

Choudhry, S., Choudhry, N. K., & Brown, A. D. (2004). Unregulated private markets for healthcare in Canada? Rules of professional misconduct, physician kickbacks and physician selfreferral. *Canadian Journal of Public Health, 170*, 1115–1118.

Cotlear, D., Gómez-Dantés, O., Knaul, F., Atun, R., Barreto, I. C. H. C., Cetrángolo, O., et al. (2014). Universal health coverage in Latin America 2: Overcoming social segregation in health care in Latin America. *The Lancet, 385*(9974), 1248–1259.

Council on Health Research for Development (COHRED). (1990). *Health Research: Essential link to equity in development*. New York: Oxford University Press.

Crane, A., & Kazmi, B. A. (2010). Business and children: Mapping impacts, managing responsibilities. *Journal of Business Ethics, 91*(4), 567–586.

Crane, A., & Matten, D. (2016). *Business ethics: Managing corporate citizenship and sustainability in the age of globalization* (International edition). Oxford: Oxford University Press.

Dacso, M., Chandra, A., & Friedman, H. (2013). Adopting an ethical approach to global health training: The evolution of the Botswana–University of Pennsylvania partnership. *Academic Medicine, 88*, 1646–1650.

De George, R. T. (2014). *Business ethics* (7th ed.). Upper Saddle River: Prentice Hall.

Dhalla, I. A., Kwong, J. C., Streiner, D. L., Baddour, R. E., Waddell, A. E., & Johnson, I. L. (2002). Characteristics of first-year students in Canadian medical schools. *Canadian Medical Association Journal, 166*, 1029–1035.

Dharamsi, S., Espinoza, N., Cramer, C., Amin, M., Bainbridge, L., & Poole, G. (2010). Nurturing social responsibility through community service-learning: Lessons learned from a pilot project. *Medical Teacher, 32*, 905–911.

Doherty, R. F., & Purtilo, R. B. (2016). *Ethical dimensions in the health professions*. Missouri: Elsevier.

Drain, P. K., Primack, A., Hunt, D. D., Fawzi, W. W., Holmes, K. K., & Gardner, P. (2007). Global health in medical education: A call for more training and opportunities. *Academic Medicine, 82*, 226–230.

Global Reporting Initiative. (2015). *G4 sustainability reporting guidelines*. Amsterdam: Global Reporting Initiative.

Gray, R., Adams, C. A., & Owen, D. (2014). *Accountability, social responsibility and sustainability: Accounting for society and the environment*. Harlow: Pearson Education Limited.

Huebner, J. M. (2014). Moral psychology and the intuition that pharmaceutical companies have a ‘special obligation to society’. *Journal of Business Ethics, 122*(3), 501–510.

Jönson, H. (2016). Framing scandalous nursing home care: What is the problem? *Ageing & Society, 36*, 400–419.

Kant, E. (1785/1996). *The metaphysics of morals. Cambridge texts in the history of philosophy*. Cambridge: Cambridge University Press.

Kim, J. Y. (2013). Time for even greater ambition in global health. *The Lancet, 382*, e33–e34.

Kim, J. Y., Farmer, P., & Porter, M. E. (2013). Redefining global health-care delivery. *The Lancet, 382*, 1060–1069.

KPMG. (2015). *KPMG international survey of corporate social reporting 2015*. Rotterdam: KPMG.

KPMG. (2017). *KPMG international survey of corporate social reporting 2017*. Rotterdam: KPMG.

Leatherman, T. (2005). A space of vulnerability in poverty and health: Political-ecology and biocultural analysis. *Ethos, 33*, 46–70.

Leung, T. C. H. (2019a). Legitimacy-seeking strategies in the gambling industry: The case of responsible gambling. *Sustainability Accounting, Management and Policy Journal, 10*(1), 97–125.

Leung, T. C. H. (2019b). Personal social responsibility and sustainable development. In W. L. Filho (Ed.), *Encyclopedia of sustainability in higher education*. Cham: Springer. https://doi.org/10.1007/978-3-319-63951-2_272-1.

Leung, T. C. H., & Gray, R. (2016). Social responsibility disclosure in the international gambling industry: A research note. *Meditari Accountancy Research, 24*(1), 73–90.

Leung, T. C. H., & Ng, A. W. (2018). Accountability and sustainable development. In W. L. Filho (Ed.), *Encyclopaedia of sustainability in higher education*. Cham: Springer.

Leung, T. C. H., & Snell, R. S. (2017). Attraction or distraction? Corporate social responsibility in Macao's Gambling Industry. *Journal of Business Ethics, 145*(3), 637–658.

Leung, T. C. H., & Snell, R. S. (2019). Strategies for social and environmental accounting: The case of multinational gambling companies. *Journal of Business Ethics, 145*(3), 637–658. https://doi.org/10.1007/s10551-019-04190-z.

MacIntyre, A. (1984). *After virtue: A study in moral theory*. Notre Dame: University of Notre Dame Press.

Meier, B. M. (2017). Human rights in the World Health Organization: Views of the director-general candidates. *Health and Human Rights, 19*(1), 1.

Melby, M. K., Loh, L. C., Evert, J., Prater, C., Lin, H., & Khan, O. A. (2016). Beyond medical "Mission" to impact-driven short-term experiences in Global Health (STEGHs): Ethical principles to optimize community benefit and learner experience. *Academic Medicine, 91*(5), 633–638.

Mirvis, P., & Googins, B. K. (2006). *Stages of corporate citizenship: A developmental framework*. Boston: The Center for Corporate Citizenship at Boston College.

Mittelmark, M. B. (2001). Promoting social responsibility for health: Health impact assessment and healthy public policy at the community level. *Health Promotion International, 16*(3), 269–274.

Moynihan, R., Heath, I., & Henry, D. (2002). Selling sickness: The pharmaceutical industry and disease-mongering. *British Medical Journal, 324*, 886–891.

Mukherjee, A. (2015). Role of communications in healthcare marketing. *International Journal of Pharmaceutical and Healthcare Marketing, 9*(4). https://doi.org/10.1108/IJPHM-09-2015-0046.

Ng, A. W., Ben, Y. F., & Leung, T. C. H. (2018a). Health and sustainability: Reinforcing the link between the public and private sectors through tertiary institutions. In U. Azeiterio, M. L. Akerman, W. L. Filho, A. Setti, & L. Brandli (Eds.), *Lifelong Learning and Education in Healthy and Sustainable Cities* (*World Sustainability Series*) (pp. 169–186). Cham: Springer.

Ng, A. W., Leung, T. C. H., & Ho, J. C. K. (2018b). Performance measurement and accreditation approach of elderly care service providers: Experience from East and West. In P. Yuen, A. W. Ng, & B. Fong (Eds.), *Sustainable Health and Long-Term Care Solutions for an Aging Population* (pp. 126–144). Hershey: IGI Global.

Ng, A. W., Leung, T. C. H., & Tsang, K. T. (2018c). Social Enterprise for Elderly Housing: Policy for accountability and public-private responsible financing. *Journal of Population Ageing*, 1–20.

Noronha, C., Leung, T. C. H., & Lei, O. L. (2015). Corporate social responsibility disclosure in Chinese railway companies. *Sustainability Accounting, Management and Policy Journal, 6*(4), 446–474.

Pillemer, K., & Moore, D. W. (1990). Highlights from a study of abuse of patients in nursing homes. *Journal of Elder Abuse Neglect, 2*(1/2), 5–29.

Powers, M., & Faden, R. (2006). *Social justice: The moral foundations of public health and health policy*. New York: Oxford University Press.

Pozgar, G. D. (2013). *Legal and ethical issues for health professionals* (3rd ed.). Burlington: Jones & Bartlett Learning.

PwC. (2018). *Compliance and Assurance*. Retrieved from https://www.pwc.com/gx/en/services/sustainability/compliance-and-assurance.html

Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Harvard University Press.

Rawls, J. (1993). *Political liberalism. The Dewey essay in philosophy, no. 4*. New York: Columbia University Press.

Reynolds, G. W. (2012). *Ethics in information technology*. Boston: Cengage Learning.

Siniora, D. (2017). *Corporate social responsibility in the health care sector*. Pittsburgh: Duquesne University.

The United Nations. (2017). *The sustainable development Agenda*. [online] http://www.un.org/sustainabledevelopment/development-agenda/

Transparency Market Research. (2018). *Packaging and Labeling (Healthcare) Service Market – Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2015–2023*. Retrieved from https://www.transparencymarketresearch.com/packaging-labeling-services-market.html

Vanderlee, L., Goodman, S., Yang, W. S., & Hammond, D. (2012). Consumer understanding of calorie amounts and serving size: Implications for nutritional labelling. *Canadian Journal of Public Health, 103*(5), 327–331.

Wansink, B., & Chandon, P. (2006). Can 'low fat' nutrition labels lead to obesity? *Journal of Marketing Research, 43*(4), 605–617.

WHO. (1978). *Declaration of Alma-Ata in 1978: Health For All in Year 2000*. Retrieved from http://www.who.int/publications/almaata_declaration_en.pdf

WHO. (2017). *The right to health*. Geneva: WHO.

WHO. (2018). *The Ottawa Charter for Health Promotion*. Retrieved from http://www.who.int/healthpromotion/conferences/previous/ottawa/en/

Willen, S. S. (2012). How is health-related "deservingness" reckoned? Perspectives from unauthorized im/migrants in Tel Aviv. *Social Science & Medicine, 74*, 812–821.

Woo, J. K., Ghorayeb, S. H., Lee, C. K., Sangha, H., & Richter, S. (2004). Effect of patient socioeconomic status on perceptions of first- and second year medical students. *Canadian Medical Association Journal, 170*, 1915–1919.

Chapter 15
Health Seeking Behaviour: Doctor Shopping

Fowie Ng, Graeme D. Smith, Chun Cheong Ma, and Leon Wai Li

Introduction

Contemporary doctor shopping concept is a growing complexed phenomenon. Doctor shopping is not a new phenomenon as it is a reflection of human nature and health behaviour in virtually all cultures. It has appeared in health-care market internationally. However, the emphasis of the context varies among different countries. Many of the current emphasis stressed the multiple consultations of similar conditions by different doctors. Patients tend to go to more than one doctor to seek treatment and advice for their discomforts or diseases. However, they may not reveal their consultation history to the next doctor during the consultation. This has posed problems to the individuals as well as to the care providers and the health-care system. The other type of doctor shopping is even more problematic in which patients go to multiple doctors for polypharmacy especially to get opioids or other restricted drugs. With the latest new trend of e-doctor shopping under the concept of 'Big Health', the rise of 'Internet+health care' is adding to the new knowledge of doctor shopping.

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Definition of Health Seeking Behaviour and Doctor Shopping

Biernikiewicz et al. (2019) have recently studied about doctor shopping by a systematic review of more than 2800 records of literature from PubMed and Google Scholar in order to look at the different definitions of doctor shopping in the world. Their conclusion is that the definition of doctor shopping is heterogeneous. Out of their review, 40% of studies have concentrated on the use of polypharmacy such as the use of opioids, psychoactive drugs and antidepressants. The remaining studies have focused on doctor shopping for the chronic and frequent diseases. It is observed that most studies of doctor shopping are collected from countries or regions with easy accessibility of health care including the USA, France, Taiwan and Hong Kong followed by Japan, Australia and India.

Factors that have increased doctor shopping health seeking behaviours can include ‘poor patient satisfaction’, ‘chronic and longer disease’, ‘younger age’, ‘longer distance for access of health-care facility’ as well as ‘comorbidities’ and ‘active substance abuse’. The prevalence of doctor shopping can be ranging from 0.5% among opioid users in the USA to some 38% of patients shopping in general practice in Hong Kong. On the other hand, there are gaps in the current literature to look at any emerging new phenomenon of doctor shopping in the digital health era in order to shed lights into how to prevent the health seeking behaviour using doctor shopping to reduce unnecessary consultation and the associated waste of clinical resources.

The World Perspective

Doctor Shopping in Hong Kong

Despite many commonalities, there are distinct regional variations in the phenomenon of doctor shopping around the world. Hong Kong has a compartmentalised health-care system in that public hospitals account for 94% of total in-patient bed days and 15% ambulatory visits. This has led to the common ‘doctor shopping’ as Hong Kong does not have a well-organised primary care network or referral system (Leung et al. 2003). According to the Food and Health Bureau (FHB) (2008), the consultation document ‘Your Health Your Life’ calls for reform of the service delivery model in order to meet the future need and expected surging public health-care expenditures. It emphasises the target in promoting people in adopting more primary health care and family medicine services. Studies have been conducted in understanding the citizens’ preconceptions, misunderstanding and determinant factors towards family medicine and primary health care services and the situation of ‘doctor shopping’.

In the survey conducted by the Hong Kong College of Family Physicians (HKCFP) and Social Sciences Research Centre (2008), respondents replied that they had selected doctors on the basis of whether the doctor had some specific and formal training and had reputation in providing family medicine services. Another study studied the attitude and incentives for patients with chronic diseases and found that they often chose the specialists rather than randomly picking up a family medicine doctor (Mercer et al. 2011). Patients with chronic disease such as diabetes and overactive bladder need a long-term care by doctors, and such therapeutic relationship required a long time to develop. This had contributed to doctor shopping behaviour in order to find the doctor the patients trusted for the long-term management and medication. Unfortunately, the lack of information available to the public in accessing qualified family doctors and public education has encouraged doctor shopping among people with chronic discomfort (Lee et al. 2010).

Hong Kong is a fast-paced city and people tend to look for immediate relief from the symptoms. Nonetheless, in the study by Hariman et al. (2013), 73.3% of patients reported engaging in doctor shopping because of persistence of symptoms. The findings are comparable to those by Lo et al. (1994) among 68–75% patients attending Government Out-Patient Departments (GOPDs). The two studies reveal it is common that Hong Kong people seek multiple doctors for a single illness as they think the previous treatment or medication is not effective.

Hariman et al. (2013) have further suggested that people's perception of need is a crucial factor in affecting the behaviour of doctor shopping, especially in paediatric patients. A common reason for the prevalence of doctor shopping among paediatric patients is that the parents easily feel anxious and concerned about the possible and unknown traumatic effects when their kids get sick, like a fever, which could actually be the manifestation of underlying illnesses (Totapally 2005). 'Fever phobia' has widely connected to doctor shopping in that parents' perception of need could greatly contribute to seek more physicians than to observe and manage the actual symptoms (Janicke et al. 2001; Gunduz et al. 2016). Siu (2014) has also noted that people without perceived need to visit physicians would seldom conduct 'doctor shopping'. Such behaviour is more common among parents of patients with minor diseases as they consider primary care doctors can treat insignificant illness which they perceive to have no major impact to health (Lee et al. 2010).

Furthermore, cost of accessibility, i.e. consultation fees, can be one of independent variables leading to doctor shopping. The Hong Kong College of Family Physicians has conducted a survey with over 1000 respondents and demonstrated that more than 90% of respondents have expressed that cost can be the most vital factor in affecting their choice of services. Therefore, if the services are supported and funded by the government, people will be more inclined to them in securing an adequate cure to the illnesses (HKCFP Research Committee 2008). In addition, Lee et al. (2010) have noted that 45% of the respondents will change to different doctors whenever they got flulike illnesses if they are covered by medical insurance or staff medical benefit scheme and more than half of them will have more than one doctor.

The concurrent use of Western and Chinese medicine is a common phenomenon in Hong Kong. This has particularly encouraged doctor shopping (Fung et al. 2015). Hong Kong people have a cultural belief that Western biomedicines have potential harmful effects to human body. They sometimes would switch the remedy to complementary and alternative medicine (CAM) (Weizman et al. 2012). However, when people have found one particular doctor could not cure them over a period of time, they will start to go doctor shopping. Yet, they also consider traditional Chinese medicine (TCM) practitioners to have a 'less standardised' qualification system and would have preferred to stick with a regular TCM practitioner who is trustworthy and has positive interaction in the doctor-patient relationship (Siu 2014).

Doctor Shopping in China

China has currently one of the highest numbers of hospitals in the world. There are more than 33,000 hospitals in China offering the whole range of three levels of care including both Western and Chinese medicine or integrated medicine with a revenue of roughly Renminbi (RMB), or Chinese Yuan, 3554.3 billion in 2018 (Globe Newswire 2019). Traditionally, local citizens are accustomed to seek primary care in the outpatient departments at their local hospitals. Many of these outpatient departments served more than 5000 cases daily, packing virtually every corner of the clinic areas. Patients can pick and choose or shop among their favourite clinicians from the signage board showing the photos and the charges for registration of doctors. This is termed 'Gua Hao' in Chinese, meaning registration. The registration fees of each doctor are different according to the ranks, skills, reputation and popularity. The fees can range from RMB 0.5 to RMB 200 or even more. In order to alleviate the geographical disparity of accessibility of primary care, community health centres (CHCs) are set up to provide primary care and health promotion activities in local areas to allow for more choices for citizens. By 2015, some 34,000 CHCs have been set up to serve more than 706 million people in China (UNAIDS 2017). They also assumed the role as the bottom or foundation level of the three-tiered health-care system in China. However, citizens are still free to choose or shop among CHCs, secondary hospitals in the middle as well as tertiary hospitals at the top level.

With the advent of the Internet and smartphones, China has widely adopted the use of smartphone and the Internet for a lot of daily living activities such as shopping online with different e-payment systems including 'WeChat pay' and 'Alipay'. Annual e-shopping event of Alibaba's Double 11 (11 November) Single Day sales has increased to more than RMB 213.5 billion which has broken the world record in terms of sales (CNBC 2018). In health care, a new phenomenon has come up with the term 'Internet+health care' which has emerged in the Chinese health-care market and has been promulgated by listed health service providers. One of the services is called 'speed consultation'. Patients can choose their doctors online to submit online questions for a fee of RMB9 per general consultation or RMB19 for specialist doctor from tertiary hospital (Guahao 2019). More than 628,000 and 2.3 million services have been provided by these speed general and specialist consultations, respectively. The doctors will reply their enquiry online with their medical opinions. A lot of these speed consultations are of first or second opinions, and it is also common for patients to ask more than one doctor online due to the relative cheaper service charges. Another listed health-care company has set up the ‘One-minute’ Clinic in Wuzhen in the outskirt of Shanghai. China has launched a pilot unstaffed clinic box for consultation and prescribing. More than 1000 units will be placed across eight provinces and cities in China using hybrid artificial intelligence (AI) doctor and real doctor online to provide 24 h health services (Mobihealthnews 2019). These are new forms of doctor shopping in the digital health literature and have the potential to change health behaviour in this largest population in the world.

Doctor Shopping in Asia

Studies have revealed that the situation is changing in some growing economies and well-developed economies in Asia. The doctor shopping prevalence rates are 6.3% and 23% in Taiwan and Japan, respectively (Hariman et al. 2013; Wang and Lin 2010; Sato et al. 1995).

In Taiwan, the National Health Insurance (NHI) programme as of 1995 covers almost all citizens (Lin et al. 2015). In recent years, surprisingly about 26% of the 23 million inhabitants utilise NHI for traditional Chinese medicine (TCM) doctor shopping, while the rest (74%) goes to Western medicine or both TCM and Western medicine (Chen et al. 2007). Regarding Western medicine doctor shopping, there is about 48.6% of Western medicine used to seek advice from at least 5 different Western medicine doctors, and 5.6% of these Western medicine doctor shoppers show an intriguing behavioural phenomenon of seeking at least 12 TCM doctors in a year (Chen et al. 2006). Complementary and alternative medicine and TCM are well covered in the Taiwan National Health Insurance system (Lin et al. 2015). Thus the flourishing doctor shopping demand in Taiwan is less likely to be affected by the socioeconomic status. Among the consumers, mostly are veterans, low-income group or those suffering from serious health (Wolsko et al. 2002).

Regarding doctor shopping in Japan, a study by Sato et al. (1995) included 1088 patients from a general medicine outpatient clinic. The study stated that 23% of participants have admitted doctor shopping. They sometimes visited two or more medical practitioners for the same episode of illness. Additionally, Hagihara et al. (2005) studied 303 internal-medicine patients and found that 27.7 percent have been involved in doctor shopping. Most of the participants in the two studies expressed that they usually shop doctor as a result of insufficient patient and doctor communication and unacceptable attitude of the doctor during the visits. The prevalence of doctor shopping is encouraged by the health service delivery structure in Japan as patients can freely visit different medical organisations without doctors’ referrals; hence doctor shopping prevails (Ohira et al. 2012).

In Korea, the governmental national health system enables clinics to have inpatient services. Local hospitals can provide a wide range of services to patients. Patients can choose any services wanted without referral (Kwon 2003; Chun et al. 2009). Ock et al. (2014) have found that the patients and doctors in Korea have a misconception on the purpose of primary care. As Korea has a freely accessible health-care system, the gatekeeper function of primary care to medical care is weakened by people's perception of illness, resulting in doctor shopping. For example, people believed that they can attend hospital outpatient services only when they have chronic diseases because they trust such services and consider them to be more effective for treatment. Furthermore, this situation can be related to the referral system, which enables patients to directly access the hospital without prior visit to a clinic. This may be a failure of the health-care delivery system in Korea (Chun et al. 2009).

Malaysia is another country with significant prevalence of doctor shopping. The problem of polypharmacy happened among more than 50% of the elderly patients according to a study carried out by the Clinic University Science Malaysia Hospital (Senik and Kadir 2006). Moreover, Hassan et al. (2005) have examined 442 family-medicine outpatients and found that 56% of the participants shopped doctors due to the perception and variables of the illness, for example, persistence of symptoms. Besides, a study conducted to understand the doctor shopping behaviour and its predisposing factors among dermatology patients has explained that imperfect information, prevailing health literacy and comparatively low educational level of Malaysians about the local health-care economy and system are the leading factors of frequent doctor shopping for multiple doctor consultations. Co-payment from out-of-pocket money of a small portion of the actual full medical cost is another determining factor to facilitate doctor shopping. Moreover, patients' predominant illness and their experience in consulting a doctor are also significant factors in contributing to doctor shopping. However, in the long term it may result in undesirable waste of resources and finance (Andylim et al. 2018).

Doctor Shopping in North America

Classically, all forms of doctor shopping entail multiple visits with a single health-care professional or visit with different health-care professionals for a single illness (Sansone and Sansone 2012). However, from the patients' perspective, excessive doctor shopping pattern in North America can be further explained by physician-related factors and patient-related factors.

As per physician-related factors, a US community-based study has uncovered that inconvenient working hours, poor accessibility (i.e. remote locations), insufficient consultation time by the clinician and even undesirable personal qualities and traits of the physician are factors that significantly determine the prevalence (Kasteler et al. 1976). Furthermore, there are numerous reasons to drive doctor shopping in North America with reference to the findings of existing studies, which reported that patients show strong inclination to doctor shopping due to persistence of annoying signs and symptoms (Lo et al. 1994). Furthermore, patients who perceived no significant change in the illness level (Hassan et al. 2005) and the lack of best knowledge of the provided diagnosis and treatment course (Hagihara et al. 2005) are the causes of doctor shopping. However, in North America, the explicit definitions of ‘doctor shopping’ can vary considerably in the existing literature.

In the USA, the term ‘doctor shopping’ is largely different from other places across the globe. The traditional definition of ‘doctor shopping’ in the USA refers to a patient obtaining controlled medical substances from multiple health-care practitioners, however, the respective health-care practitioners are not well informed about the dosage or quantity of the previous practitioners’ prescriptions to the respective patient (Lineberry and Bostwick 2004). Nonetheless, in the USA, there is a stunning doctor shopping phenomenon of patient consultation with multiple health-care professionals during a short time frame, which poses an explicit intention to deceive their drugs’ prescriber to obtain controlled substances (Shaffer and Moss 2010).

Moreover, there is increasing number of commentaries and empirical studies that revealed more people are inclined to active doctor shopping in North America, while the results mostly reported the issue of substance misuse/abuse (Biernikiewicz et al. 2019; Shaffer and Moss 2010). A recent systematic review reported that the prevalence rate of doctor shopping for opioid in the USA is 0.5%, yet this astonishing number is big enough to draw a public health concern (Biernikiewicz et al. 2019). As for opioid misuse, studies collectively have indicated that youngsters are the primary opioid doctor shoppers, especially those with a lower socioeconomic status (Kappa et al. 2016; Chenaf et al. 2016a, b; Cepeda et al. 2015).

Doctor Shopping in the UK

Doctor shopping has raised an emerging public health problem in the UK. However, the UK is different from other countries in doctor shopping due to its very rigorous system for tracing the drug prescription practices of doctors. Under the UK law, only ‘appropriate practitioners’, a prescriber who is a health-care professional, can write a prescription, applying to both National Health Service and private prescriptions. Despite this, the issue of doctor shopping has raised significant public health concerns in recent years. Two characteristics outline this phenomenon, addiction to a substance for personal use and a desire to sell medications. In the former category, an individual may be completely unaware that they are engaging in a criminal activity, believing that they are merely ‘bending the rules’ ‘or satisfying their own needs’. However, consulting multiple medical providers to procure medications is a serious criminal offence with public health consequences. Greener (2017) warned of the emergence of doctor shopping in the UK, highlighting the urgent need for increased awareness among health-care professionals and encouraging government investment in services to deal with the underlying causes of prescription drug abuse. Drug-related death is increasing exponentially year after year, across all regions of the UK. In 2016, the UK Advisory Council on the Misuse of Drugs (ACMD) reported that millions of British citizens are on prescription-only analgesic medications that have not been legitimately prescribed (ACMD 2016). Despite a call from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) for the strengthening of drug monitoring systems across Europe, including the UK, doctor shopping appears to be on the rise.

The main issue in the UK is absence of hard data to determine the extent of the problem of doctor shopping. It is presumed that the problem is not as severe as countries like America. However the UK may already be sitting on the verge of a public health crisis, fuelled by the abuse of medications. Indeed, it is believed that millions of UK citizens are already addicted to some form of medication. This may only be the 'tip of the iceberg', raising concerns that drug activities may be taking place in the shadows. Medical prescribers in UK are under a high degree of oversight, which should prevent the development of poor prescribing activities. Any doctor prescribing excessive or inappropriate drug should, in theory, be easily detected. However, despite high levels of scrutiny, clear warning signs can be seen within the UK, exemplified by increasing numbers of 'tramadol'-related deaths recently. Greener (2017) believed that increasing awareness of health-care professionals to the classical characteristics of a typical doctor shopper in UK may help curb the problem. Detecting individuals who visit multiple health-care providers, frequently report the loss of their medication or constantly request early supply of drug may all help alleviate the extent of the problem. Sensitivities exist when dealing with this type of drug-related problem. Addiction forums firmly believe in individuals that have drug addiction need support and should not be punished. Despite this, UK law enforcement agencies seek the resources and power to deliver a clear message to those who are engaged in illegal drug activities, including doctor shopping. In summary, without appropriate action the UK faces potentially catastrophic consequences, as seen in the USA.

Concluding Remarks

There are doctor shoppers' behaviour for opioids in some societies and the fairly strong tendency to visit multiple clinicians in a short period of time for the sake of polypharmacy. The systematic review has suggested that a good patient-doctor relationship and a positive patient experience are the two corrective strategies for problem behaviours to reduce the rate of the socially undesirable doctor shopping phenomenon (Biernikiewicz et al. 2019). For example, the clinicians can closely monitor their patients by the application of different telehealth or digital health to check the health status, lifestyle pattern and habits and even provide some sorts of primary health education for health protection and disease or injury prevention which can in turn help build a strong doctor-patient rapport. Once a solid rapport was established, the doctors would be an influential facilitator to explain the natural course of the illness and educate the target patients the know-how of the pros and cons regarding certain high-risk pharmacy. This is a harmonious and cost-effective way to facilitate mutual understanding of the agreed medical management plan in the long term.

Whereas the use of Western medicine and complementary and alternative medicine (CAM) or traditional Chinese medicine (TCM) is well covered by Taiwan's National Health Insurance (Lin et al. 2015), in order to reduce or prevent the possibility of medical service overuse, some recommendations deserve further attention. Poor doctor-patient relationship is often a culprit of medical service overuse. Thus a good training model should first be established to reinforce better doctor-patient relationships in the long run. Second, doctors' personal quality enhancement should be considered such as acting with care. In addition, mandatory continuing medical education is suggested to all doctors and public health education to the community at large. These interventions will hopefully raise the doctors' awareness on patients' medical history and patients' health literacy on preventive medicine, resulting in less doctor shopping.

Around the world, doctor shopping is a common phenomenon. Current literature concerning health seeking behaviour of doctor shopping has stressed mainly on two areas which are polypharmacy and the multiple consultation of doctors physically with the same or similar disease or condition. From the current experiences in China, it is essential to further enhance the scope and coverage of doctor shopping in the digital health areas such as e-doctor shopping and 'Internet+health care' as the opportunity cost of access in doctor shopping activity has been greatly reduced. There is another big gap in the literature of domestic doctor shopping in other countries.

Globally, it is well recognised that the health-care professionals in the community need to be more aware of the issues of doctor shopping. Increased awareness of the classical characteristics of the typical 'doctor shopper', which may not greatly vary around the world, may be the first step towards identification and curbing the public health threat posed by this phenomenon. As such, international frameworks or indicators could be developed to facilitate international comparisons and to come up with a potentially international portfolio for policymakers to understand their situations and to develop strategies which alleviate the associated problems of doctor shopping.

References

Advisory Council on the Misuse of Drugs. (2016). *Diversion and illicit supply of medicines*. https://www.gov.uk/government/uploads/attachment_data/file/580296/Meds_report_final_report_15_December_LU_2_pdf

Andylim, N. F., Jamil, A., Nor, N. M., & Abidin, M. A. Z. (2018). Doctor shopping behaviour and its predisposing factors amongst dermatology patients. *Jurnal Sains Kesihatan Malaysia (Malaysian Journal of Health Sciences), 16*(2), 71–76. https://doi.org/10.17576/jskm-2018-1602-02.

Biernikiewicz, M., Taieb, V., & Toumi, M. (2019). Characteristics of doctor-shoppers: A systematic literature review. *Journal of Market Access & Health Policy, 7*(1), 1595953. https://doi.org/10.1080/20016689.2019.1595953.

Cepeda, M. S., Fife, D., Berwaerts, J., Friedman, A., Yuan, Y., & Mastrogiovanni, G. (2015). Doctor shopping for medications used in the treatment of attention deficit hyperactivity disorder: Shoppers often pay in cash and cross state lines. *The American Journal of Drug and Alcohol Abuse, 41*(3), 226–229.

Chen, T. J., Chou, L. F., & Hwang, S. J. (2006). Patterns of ambulatory care utilization in Taiwan. *BMC Health Services Research, 6*(1), 54.

Chen, F. P., Chen, T. J., Kung, Y. Y., Chen, Y. C., Chou, L. F., Chen, F. J., & Hwang, S. J. (2007). Use frequency of traditional Chinese medicine in Taiwan. *BMC Health Services Research, 7*(1), 26.

Chenaf, C., Kabore, J. L., Delorme, J., Pereira, B., Mulliez, A., Roche, L., Eschalier, A., Delage, N., & Authier, N. (2016a). Incidence of tramadol shopping behavior in a retrospective cohort of chronic non-cancer pain patients in France. *Pharmacoepidemiol Drug Safety, 25*(9), 1088–1098.

Chenaf, C., Kabore, J. L., Delorme, J., Pereira, B., Mulliez, A., Roche, L., & Authier, N. (2016b). Codeine shopping behavior in a retrospective cohort of chronic noncancer pain patients: Incidence and risk factors. *The Journal of Pain, 17*(12), 1291–1301.

Chun, C., Kim, S., Lee, J., & Lee, S. (2009). Republic of Korea. Health system review. *Health Systems in Transition (European Observatory on Health Systems and Policies), 11*(7). 71–117.

CNBC. (2018). *Alibaba sets new singles day record with more than $30.8 billion in sales in 24 hours*. Retrieved from https://www.cnbc.com/2018/11/11/alibaba-singles-day-2018-record-sales-on-largest-shopping-event-day.html

Fung, C. S., Wong, C. K., Fong, D. Y., Lee, A., & Lam, C. L. (2015). Having a family doctor was associated with lower utilization of hospital-based health services. *BMC Health Services Research, 15*(1), 42.

GlobeNewswire. (2019). *China Hospital Industry Report, 2019–2025*. Retrieved from https://www.globenewswire.com/news-release/2019/05/30/1857465/0/en/China-Hospital-Industry-Report-2019-2025-In-2018-Chinese-Hospitals-Registered-a-Revenue-of-Roughly-RMB3-554-3-Billion-Surging-by-14-2-YoY.html

Greener, M. (2017). Will the UK face an opioid abuse epidemic? *Opioid abuse report*. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1002/psb.1604

GuaHao. (2019). *3-minutes can find your tertiary hospital specialist*. Retrieved from https://wy.guahao.com

Gunduz, S., Usak, E., Koksal, T., & Canbal, M. (2016). Why fever phobia is still common? *Iranian Red Crescent Medical Journal, 18*(8), e23827.

Hagihara, A., Tarumi, K., Odamaki, M., & Nobutomo, K. (2005). A signal detection approach to patient–doctor communication and doctor shopping behaviour among Japanese patients. *Journal of Evaluation in Clinical Practice, 11*(6), 556–567.

Hariman, K. W., Lam, S. C., Lam, Y., Luk, K., Poon, K., & Li, A. M. (2013). Fever as a predictor of doctor shopping in the paediatric population. *Hong Kong Medical Journal, 19*(1), 6–12.

Hassan, N., Ismail, S. B., & Noor, S. H. (2005). Doctor-shopping behaviour amongst adult patients attending family medicine clinic, Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan. *International Medical Journal Tokyo, 12*(4), 251.

HKCFP Research Committee. (2008). What sort of primary healthcare service does the public want? *Hong Kong Practitioner, 30*, 24–28.

Janicke, D. M., Finney, J. W., & Riley, A. W. (2001). Children's health care use: A prospective investigation of factors related to care-seeking. *Medical Care, 39*(9), 990–1001.

Kappa, S. F., Green, E. A., Miller, N. L., Herrell, S. D., Mitchell, C. R., Mir, H. R., & Resnick, M. J. (2016). Narcotic use and postoperative doctor shopping by patients with nephrolithiasis requiring operative intervention: Implications for patient safety. *The Journal of Urology, 196*(3), 763–768.

Kasteler, J., Kane, R. L., Olsen, D. M., & Thetford, C. (1976). Issues underlying prevalence of "doctor-shopping" behavior. *Journal of Health and Social Behavior, 17*(4), 328–339.

Kwon, S. (2003). Payment system reform for health care providers in Korea. *Health Policy and Planning, 18*(1), 84–92.

Lee, A., Siu, S., Lam, A., Tsang, C., Kung, K., & Li, P. (2010). The concepts of family doctor and factors affecting choice of family doctors among Hong Kong people. *Hong Kong Medical Journal, 16*(2), 106–115.

Leung, G. M., Castan-Cameo, S., McGhee, S. M., Wong, I. O., & Johnston, J. M. (2003). Waiting time, doctor shopping, and nonattendance at specialist outpatient clinics: Case-control study of 6,495 individuals in Hong Kong. *Medical Care, 41*(11), 1293–1300.

Lin, M. H., Chang, H. T., Tu, C. Y., Chen, T. J., & Hwang, S. J. (2015). Doctor-shopping behaviors among traditional Chinese medicine users in Taiwan. *International Journal of Environmental Research and Public Health, 12*(8), 9237–9247.

Lineberry, T. W., & Bostwick, J. M. (2004, August). Taking the physician out of "physician shopping": A case series of clinical problems associated with Internet purchases of medication. *Mayo Clinic Proceedings, 79*(8), 1031–1034. Elsevier.

Lo, A. Y., Hedley, A. J., Pei, G. K., Ong, S. G., Ho, L. M., Fieldling, R., Cheung, K. K., & Daniel, L. (1994). Doctor-shopping in Hong Kong: Implications for quality of care. *International Journal for Quality in Health Care, 6*(4), 371–381.

Mercer, S. W., Griffiths, S. M., Lam, C. L. K., Lee, A., Wong, W. C. W., Lam, T. P., et al. (2011). Incentives and barriers to adopting the family doctor model in Hong Kong: An in-depth qualitative study of the views, knowledge, and attitudes of patients. *Hong Kong Medical Journal, 17*(3), 25.

Mobihealthnews. (2019). *Ping an good doctor launches commercial operation of one-minute clinics in China*. Retrieved from https://www.mobihealthnews.com/news/asia-pacific/ping-good-doctor-launches-commercial-operation-one-minute-clinics-china

Ock, M., Kim, J. E., Jo, M. W., Lee, H. J., Kim, H. J., & Lee, J. Y. (2014). Perceptions of primary care in Korea: A comparison of patient and physician focus group discussions. *BMC Family Practice, 15*(1), 178.

Ohira, Y., Ikusaka, M., Noda, K., Tsukamoto, T., Takada, T., Miyahara, M., et al. (2012). Consultation behaviour of doctor shopping patients and factors that reduce shopping. *Journal of Evaluation in Clinical Practice, 18*(2), 433–440.

Sansone, R. A., & Sansone, L. A. (2012). Doctor shopping: A phenomenon of many themes. *Innovations in Clinical Neuroscience, 9*(11–12), 42.

Sato, T., Takeichi, M., Shirahama, M., Fukui, T., & Gude, J. K. (1995). Doctor-shopping patients and users of alternative medicine among Japanese primary care patients. *General Hospital Psychiatry, 17*(2), 115–125.

Senik, S., & Kadir, A. A. (2006). Clinic University Science Malaysia Hospital. *International Medical Journal, 13*(2), 121–126.

Shaffer, E. G., & Moss, A. H. (2010). Physicians' perceptions of doctor shopping in West Virginia. *West Virginia Medical Journal, 106*(4), 10–14.

Siu, J. Y. M. (2014). Seeing a doctor is just like having a date: A qualitative study on doctor shopping among overactive bladder patients in Hong Kong. *BMC Family Practice, 15*(1), 27.

The Food and Health Bureau, the HKSAR Government. (2008). *Your health your life – Healthcare reform consultation document*. Retrieved from https://www.fhb.gov.hk/beStrong/files/consultation/exsummary_eng.pdf

Totapally, B. R. (2005). Fever, fever phobia and hyperthermia: What pediatricians need to know. *International Pediatrics, 20*(2), 95.

UNAIDS. (2017). *China's community health services are a model for the world*. Retrieved from https://www.unaids.org/en/resources/presscentre/featurestories/2017/august/20170821_community-health

Wang, M. J., & Lin, S. P. (2010). Study on doctor shopping behavior: Insight from patients with upper respiratory tract infection in Taiwan. *Health Policy, 94*, 61–67.

Weizman, A. V., Ahn, E., Thanabalan, R., Leung, W., Croitoru, K., Silverberg, M. S., et al. (2012). Characterisation of complementary and alternative medicine use and its impact on medication adherence in inflammatory bowel disease. *Alimentary Pharmacology & Therapeutics, 35*(3), 342–349.

Wolsko, P. M., Eisenberg, D. M., Davis, R. B., Ettner, S. L., & Phillips, R. S. (2002). Insurance coverage, medical conditions, and visits to alternative medicine providers: Results of a national survey. *Archives of Internal Medicine, 162*(3), 281–287.

Chapter 16
Healthcare Volunteers' Significant Impact on Primary Care: Experiences and Challenges from the Perspective of a Non-government Organisation

Kar-wai Tong

Introduction

The World Health Organization (WHO 2013) has forewarned that healthcare systems cannot operate without a healthcare workforce, as there was an estimated global dearth of 7.2 million skilled healthcare workers in 2013 and it would reach 12.9 million by 2035. Hong Kong is no exception, and the government best guesstimated that there would be shortfalls of 500, 755 and 1007 medical doctors in 2020, 2025 and 2030, respectively (Food and Health Bureau, Hong Kong 2017). To reduce the impact of insufficient skilled workers, healthcare organisations have adopted task shifting as one of the solutions by redistributing specific healthcare tasks among workers in a rational approach and delegating appropriate tasks from skilled healthcare workers to less trained ones (WHO 2008a). Under these contexts, the WHO has recommended well in advance the strategic use of healthcare volunteers:

> *Countries should recognize that essential health services cannot be provided by people working on a voluntary basis if they are to be sustainable. While volunteers can make a valuable contribution on a short term or part time basis, trained health workers who are providing essential health services, including community health workers, should receive adequate wages and/or other appropriate and commensurate incentives.* (WHO 2008a, p. 4, Recommendation 14)

The United Nations (UN) volunteers (2018, p. xii) supplement the WHO's reminder above, though not exactly in the healthcare context, emphasising the need to adjust one's mentality to magnify volunteers' inputs:

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> *Volunteerism strengthens local ownership, solidarity and inclusive participation, and it allows for swift responses to proximate crises. At the same time, under certain conditions volunteerism can be exclusive, burdensome, short-term and of limited effectiveness. This potential duality of volunteerism means that governments and development partners have an important role to play in maximizing volunteerism's positive contributions. Stakeholders must be mindful not to partner with volunteers as a source of cheap labour but rather would be well advised to nurture volunteerism as an attribute of resilient communities.*

Health Volunteerism

Healthcare volunteering is one of the specialties in volunteerism. Examples of healthcare volunteers' involvements include resilience building (Merchant et al. 2010), helping AIDS patients or dying patients (Snyder and Omoto 1992; Emanuel et al. 1999), boosting social immunity (Majiyagbe 2004), enhancing infection control precautions (Pittet et al. 2008) and health screening (Gaziano et al. 2015). The venues of volunteering may cover, for instance, the Olympic and Paralympic games (Reeser et al. 2005), ambulance services (St John Ambulance, United Kingdom (UK) 2015), churches (Bopp et al. 2007), hospitals and clinics. Healthcare volunteers with a motivation to provide worthwhile services may feel more satisfied than other volunteers (Tuckman and Chang 1994).

Roles of Healthcare Volunteers

Healthcare volunteers are not necessarily laypersons and they have been playing significant roles. In developing countries, people consider healthcare volunteerism to be "the best means" to help remote, underserved and underprivileged societies where local healthcare needs cannot be met properly (Alam and Oliveras 2014, p. 2). In Nepal, female healthcare volunteers, christened the "Florence Nightingales of Nepal", have become the backbone of its healthcare system for over three decades (Kandel and Lamichhane 2019, p. e19). Health Volunteers Overseas (2019) has also trained over 3,000 local workers in developing countries each year. More and more medical students and healthcare professionals are willing to volunteer in developing countries (Rominski et al. 2015) to improve maternal and new-born health in Uganda (Ackers et al. 2017) and to train healthcare workers in remote areas of China for basic orthopaedic rehabilitative services (Operation Concern n.d.), for example. In developed jurisdictions, healthcare volunteering is also important in Queensland and New South Wales, for instance (Deputy Premier and Minister for Health, Queensland 2009; Department of Health, New South Wales 2018). The UK is no exception, where in a review, a member of the House of Lords realised a "huge potential" to strengthen volunteering in healthcare and social care (Neuberger 2008, p. 3).

Not everyone welcomes healthcare volunteers. In sub-Saharan African countries, some local experts had negative perceptions towards international healthcare volunteers, possibly out of professional reasons, differences in lifestyle, cultural and language barriers, etc. (Laleman et al. 2007). In the UK, there has also been a call for a culture change in the National Health Service (NHS) that healthcare volunteering is not a "peripheral fringe" or something "nice to have", but it forms a part of the healthcare system that volunteers are partners with assets, instead of dependents of the NHS institutions (Boyle et al. 2017, p. 5).

Mutual Benefit of Healthcare Volunteering

Healthcare volunteering is reciprocal. In England and Wales, 21 arthritis patients aged over 50 were trained to become lay leaders in self-management programmes, and it was proven that these patient leaders and other participants of the programmes experienced positive changes (Hainsworth and Barlow 2001). In Connecticut, a study using logotherapy to treat veteran patients suffering from combat-related post-traumatic stress disorder reported that through volunteering works, these patients rectified their strong misbelief that they had not been able to make changes and were motivated to act for the future and to rediscover meanings in life (Southwick et al. 2006). Healthcare volunteers may also serve the society and at the same time gain educational and professional exposure (Gorski et al. 2017).

Management of Healthcare Volunteers

To enhance sustainability of volunteerism in healthcare settings is important. From an organisational viewpoint, a number of factors may influence the performance of healthcare volunteers: maintenance of a positive relationship between volunteers and the community, appropriate and continuous training for volunteers, organisational recognition of volunteers' contributions through financial and nonfinancial incentives, as well as clear role delineation, supervision and operational support for volunteers, formal healthcare workers and clients (Vareilles et al. 2017). In particular, the relationship between formally trained healthcare workers and lay volunteers in areas such as scopes of work, locations of care and ratio to population may affect the quality of care (Leon et al. 2015). To strike a balance, Wells et al. (1990) suggested the use of a mixture of healthcare professionals and laypersons with shared authority to enhance the ownership of health education programmes. In the USA, a survey engaging 105 hospitals found that they were concerned most in recruitment and retention of volunteers, administrative issues and financial crisis, whereas opportunities were embedded in areas such as associating volunteers' contributions with achievement of hospital outcomes and making an impact on the communities; enlarging the pools, roles and jobs of volunteers; strengthening organisational support for volunteers; and improving the efficiency and effectiveness of volunteer management (Rogers et al. 2013).

From individuals' perspective, the different thoughts of volunteers and staff may cause damages to the organisational health such as staff morale and service quality (Rogelberg et al. 2010). Further intra-organisational tensions between volunteers and employees may arise from their respective and conflicting identities in circumstances like who led the organisations, whether volunteers' expectations were unrealistic in the eyes of paid staff and the debate between volunteers' motivation and creativity and staff's structured managerialism (Kreutzer and Jäger 2011). Gender may also lead to variations in healthcare volunteers' effectiveness (Zweigenhaft et al. 1996).

With respect to the nature of volunteer works, the degree of their meaningfulness may cause volunteers to join or quit the work (Schnell and Hoof 2012). In international healthcare programmes, the engagement of local healthcare professionals may be required; or else, the so-called global programmes may only meet volunteers' self-interests instead of the needs of the local people (Wilson et al. 2012). For domestic healthcare programmes, motivating factors of volunteerism may be diverse. To boost motivation and enhance sustainability, healthcare organisations may better support first-time healthcare volunteers by, for example, arranging facilitators, defining clear roles and responsibilities for them and assuring the importance of their contributions (Withers et al. 2013). Some sorts of financial incentives or nonmonetary drives like recognition, supervision, training and support may be required (Takasugi and Lee 2012). More flexible rather than more rigid protocols in activities and a partnership, instead of a supervisor-subordinate relationship, between healthcare officials and volunteers may better the volunteering work (Kowitt et al. 2015).

How to integrate healthcare volunteerism into policymaking is an issue worthy of further explorations (Executive Board of the UN Development Programme and of the UN Population Fund 2002). In the UK, sections 52(5A)(3)(c) and (d) of its National Health Service and Community Care Act 1990 explicitly require local authorities in Scotland to consult voluntary organisations and voluntary housing agencies concerned when they prepare or review local community care service plans. In China, Articles 7, 38 and 69 of the Law of the People's Republic of China on the Protection of the Rights and Interests of the Elderly[1] as amended in 2018 promote voluntary services for the elderly and at the same time encourage elders to volunteer to help social developments if their capacities allow. Its Regulation on Voluntary Services[2] also became effective on 1 December 2017 to protect the legal rights of volunteers, clients and voluntary service organisations and to encourage, regulate and develop voluntary services within the territory of China (Articles 1 & 2).

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[1] 《中華人民共和國老年人權益保障法》 in Chinese.

[2] 《志願服務條例》 in Chinese.

Primary Care and Healthcare Volunteers

A strong primary healthcare system is essential to enhance citizens' health (Ministry of Health, New Zealand 2018). It is an effective and less expensive key to improve the general lack of continuity and responsiveness in healthcare (Boerma 2006). Primary care may not be construed perfectly, and its definitions may be made in accordance with different criteria, such as specialties, activities, level of care, settings as well as attributes like entry point of contact or requiring referrals, longitudinality and comprehensiveness (Committee on the Future of Primary Care of the Institute of Medicine 1996, pp. 27–28). In the USA, the Institute of Medicine (1994, p. 15) made its first definition of primary care in 1978 and revised it afterwards as follows:

> *[T]he provision of integrated, accessible healthcare services by clinicians who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing in the context of family and community* (with emphases).

The WHO (2019) sees primary care from a wider angle:

> *Primary healthcare is a whole-of-society approach to health and well-being centred on the needs and preferences of individuals, families and communities. It addresses the broader determinants of health and focuses on the comprehensive and interrelated aspects of physical, mental and social health and wellbeing. It provides whole-person care for health needs throughout the lifespan, not just for a set of specific diseases. Primary healthcare ensures people receive comprehensive care – ranging from promotion and prevention to treatment, rehabilitation and palliative care – as close as feasible to people's everyday environment.*

In fact, the Declaration of Alma-Ata 1978 has reaffirmed the important role of primary care in the provision of holistic healthcare, and it requires the full participations of all sectors in a community on top of the health sector. It relies on not only healthcare professionals and paramedics but also community healthcare workers.

To build a strong primary care system requires a transformation of the conventional healthcare. It involves access to affordable healthcare and remodelling of the traditional ambulatory-based, institutional-based, generalist and specialist modes to establish clusters of primary care centres, where primary care teams collaborate with the community such as community health workers, volunteers and self-help groups (WHO 2008b). Community healthcare workers may include broadly paid staff and nonpaid volunteers (Cherrington et al. 2010), with training at various levels (Christopher et al. 2011), and may be named otherwise like village health volunteers, health guides, "barefoot doctors", etc. (Hanvoravongchai and Wibulpolprasert 2015, p. 1586).

Healthcare volunteers help enhance primary care in developing and developed countries. In Latin American countries and Thailand, village-based healthcare volunteers have provided considerable assistance in malaria surveillance and treatment for decades (Okanurak and Ruebush II 1996). In Bangladesh, community healthcare volunteers helped identification and diagnoses of acute respiratory infections effectively at the household level and those volunteers who had received fundamental training and were under regular supervision performed better than volunteers who had not (Hadi 2003). In the UK, healthcare volunteers have created a "more beneficial reality for patients" in the community by facilitating them to secure ordinary living, organising education and entertainments, arranging transports, enhancing existing services, suggesting alternative solutions to healthcare and advancing public health through health promotions (The National Association of Health Authorities 1987, p. 108; Jones 2004). In the USA, Witmer et al. (1995) pointed out that the approach of using community health workers should not be forgotten in the strategic planning, as it had made important improvements in preventive and primary care.

A Snapshot of Volunteering in Hong Kong

Volunteers are an important source of support for charitable organisations and non-government organisations (NGOs). In Hong Kong, almost all NGOs providing social services (in a broader sense) are charitable organisations. The Hong Kong Council of Social Service (HKCSS) is a federation of NGOs in the field of social services, and its agency members provide approximately 90% of all local social services (HKCSS n.d.). In 2017, 98.5% of its 458 agency members attained a charitable status (HKCSS 2017, p. 5).

Volunteering is however not very prevalent in Hong Kong. A local telephone interview survey reported that 17% of the 1,104 respondents were involved in formal volunteering at a mean of 9.69 volunteer hours (ranging 1–150 h) in the past month before the survey and a mean of 49.11 h (1–1800 h) in the past year, while 74% of the respondents participated in informal volunteering (Yip and Cheng 2014). In respect of healthcare volunteering, as revealed in another study in Hong Kong, healthcare organisations were not volunteers' first choice to serve, whereas less than 18% of health and medical organisations or hospitals had volunteers work for them in the previous year before the study and they engaged volunteers mostly not for medical or personal care services but for administrative tasks like clerical or fund-raising works (Agency for Volunteer Service 2011). Details are presented in Table 16.1.

Health Volunteerism in Early Years of Hong Kong

Hong Kong was originally a fishing village, where missionaries such as the Medical Missionary Society of China and the London Medical Society were the first groups of "health volunteers" in the 1830s–1850s to introduce western medicine to Hong Kong as a means of preaching the word of God (Law 2018, pp. 23–24). This "new" approach of medicine was not readily acceptable or was even unwelcomed by the local Chinese in those years, as they had been accustomed to seeing traditional Chinese medicine practitioners trained under a different system of medical knowledge (Ho 2017).

Table 16.1 The public's participation in volunteer work in Hong Kong

Targets	Findings			
Individuals	**(A) Number of respondents** (Agency for Volunteer Service 2011, p. 13): 1514			
	Volunteered in the previous year: 18.6%			
	Volunteered but not in the previous year: 17.3%			
	No experience: 64.2% (p. 15)			
	(B) Volunteering venues (p. 35):			
	Venues	*Volunteered in the past year (%)*	*Volunteered, but not in the past year (%)*	*Never volunteered (%)*
	Social services organisations	8.8	9.9	81.3
	Educational institutes	5.1	4.9	89.9
	Religious bodies	3.8	2.3	93.8
	Health and medical organisations or hospitals	1.4	1.8	96.8
Organisations where volunteers had worked for in the previous year before the study	**Types of organisations**			
	Social services organisations: 60.8%			
	Religious institutions: 28.1%			
	Health and medical organisations or hospitals: 17.4% (p. 152)			
Healthcare organisations engaging volunteers	**Nature of volunteering work:**			
	Clerical: 79.4%			
	Fundraising, recreational and paying visits: 55.9%			
	Management services: 52.9%			
	Promotion, advocacy and campaigns: 50%			
	Counselling: 44.1%			
	Professional services: 35.3%			
	Medical care services: 32.4%			
	Escorting services: 17.6%			
	Skill coaching: 11.8%			
	Befriending services: 8.8%			
	Personal care services: 5.9% (p. 167)			
	Enhancement of volunteers' performance by			
	Mentoring or supervision: 79.4% (p. 138)			
	Training: 76.5% (p. 136)			
	Social activities: 76.5% (p. 137)			

Adapted from Agency for Volunteer Service (2011)

In the evolution of healthcare volunteerism in Hong Kong, it does not form a complete picture if the Tung Wah Group of Hospitals (TWGHs) is not mentioned, as it is a landmark of local healthcare volunteerism with an organisational approach. Before the establishment of the first local Chinese hospital in 1869, there was an ancestral hall named Kwong Fook I-tz'u[3] to house dying people and coffins, including those in transit to respective home villages of the deceased for burials (Sinn 1989). After the press reported widely the unacceptable hygienic situations in this hall, the then colonial government finally agreed to the local community leaders' proposal to subsidise the setup of the Tung Wah Hospital (Ma 2011). This first Chinese hospital was integrated subsequently with the Kwong Wah Hospital and the Tung Wah Eastern Hospital in 1931 to establish the TWGHs (n.d.-b), which is now the "Hong Kong's number one charitable body" (Chief Secretary for Administration, Hong Kong, cited in the Hong Kong Association of Banks 2017, paragraph 2), providing medical and health, educational and community services (TWGHs n.d.-a).

Healthcare Volunteers' Impact on Primary Care in Hong Kong: An NGO's Experience

The Hong Kong Society for Rehabilitation (HKSR) has been practising healthcare volunteerism for decades. It is a charitable organisation founded in 1959 (HKSR 1960). In 2017/2018, it had a staff pool of over 800 people, and its volunteer attendances were nearly 6,000, accumulating more than 39,000 volunteer hours (HKSR 2018b, pp. 23 & 25). Volunteers in the HKSR make their contributions diversely and may be grouped under a few categories, for example, casual lay volunteers for individual activities, long-term lay volunteers as if they were permanent staff, professional volunteers such as nurses and doctors as advisors, patient/ex-user volunteers as peer supporters or informal health leaders of other patients, volunteer advocates for the rights and benefits of chronic patients through self-help organisations (SHOs) and volunteer leaders sitting on management committees and the board of the organisation. The rationale for the author's selection of this NGO as a case study is twofold: volunteers' impetus in this organisation and his personal network with the HKSR.[4]

A Charismatic Volunteer Leader: Having Made the HKSR an Icon and a Pioneer in Local Rehabilitation Services

The founder of the HKSR is an orthopaedic surgeon, the late Harry Fang, who has been well known as the "father of rehabilitation" in Hong Kong, even after his death in 2009 (HKSR 2018d; The University of Hong Kong 2002, p. 116; So 2009; Evans 2014). He made the HKSR an icon in the history of development of local rehabilitation services.

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[3] 廣福義祠 in Chinese.

[4] Details are spelt out in the section of "Disclosures and Conflict of Interests".

Under Fang's visionary and charismatic leadership, the HKSR has been a pioneer in rehabilitation services in Hong Kong and Mainland China. It established the first inpatient medical rehabilitation centre in 1962 and the second one in 1984 (HKSR 1984, p. 7). It has maintained connections with China since 1984 (HKSR 1984, p. 8) and has been designated since 1986 a collaborating centre for rehabilitation of the WHO to provide training and consultancy services in China and the Western Pacific Region (WHO n.d.). The HKSR has also operated since 2006 a non-profit-making long-term care and residential home for the elderly with 350 beds in Shenzhen, one of the only two cross-border facilities between Hong Kong and China to serve elders of the two territories (HKSR 2006, p. 9). After Fang passed away, the succeeding volunteer leaders inherited his innovative spirit and set up an internal unit of research and advocacy in 2012, the first of its kind among local NGOs, to help its evidence-based work and promote an inclusive society (HKSR 2013, p. 9).

Other Volunteer Leaders: To Help Materialise the Concept of Holistic Care

All advisors and members of management committees and the board of the HKSR are volunteers, and some of them have been patients or caregivers receiving services of the HKSR. The present practice not only fulfils the mission of the HKSR to build an inclusive and enabling environment (HKSR 2018a) but also allows service planning and improvement from the users' perspective (Willard-Grace et al. 2016).

Working towards holistic care, the HKSR has been providing more than mere medical rehabilitation, and such a mission could not have been successful without the efforts of volunteer leaders. One initiative of primary care with long-term impact is the commencement of special accessible transport services, "Rehabus", in Hong Kong. The HKSR started to run the first ever fleet of Rehabuses in Hong Kong in July 1978 on a self-financed basis to enable persons with disabilities (PwDs) to return to the society for social activities such as employment, schooling and training, as recorded in its 1977/1978 annual report when the then President of the HKSR, J. L. Marden, complimented the contributions of volunteer members (HKSR 1978, p. 5):

> *[T]he Society again scored a first in the provision of the REHABUS* [sic] *service. This service has been in operation since the beginning of this month* [July 1978]. *… At this point, I wish to congratulate Mr. M. B. Lee, under whose capable leadership the Rehabus Committee is able to solicit necessary donation of vehicles and funds for the operation of service … and before long, the Society shall be able to cater to the needs of the disabled for transportation in all aspects of work and leisure. The Rehabus service is a big contribution to the integration of the disabled into the community.*

Rehabus has been under recurrent subventions from the government since 1980 (HKSR 1980, p. 28). The HKSR is currently running three fleets of special accessible transport services, with respective annual service loads at about 926,000, 177,000 and 76,000 trips as at 31 March 2018 (HKSR 2018b, pp. 14 & 45): (a) government-subsidised Rehabus; (b) self-financed buses to serve elders with mobility difficulties to attend medical appointments in public health institutes, chartered contractually by the Hospital Authority (HA), a statutory organisation established under the HA Ordinance (Cap 113) to manage all public hospitals and institutes, including special and general outpatient clinics (HA 2019); and (c) personalised hire cars operating on a self-financed basis for wheelchair users.

Patient Volunteers: To Boost Patient Self-Management and Empowerment

In connection with empowering patients to enhance primary care, the HKSR was the first organisation in Hong Kong to place emphasis on patients' mutual-aid self-help with a structured patient self-management system. In 1994, the HKSR established a new unit titled "Community Rehabilitation Network" (CRN), which was the first similar entity in the Asian Pacific region (Hong Kong government 1995, paragraph 9.36), to promote self-help and community care among chronic patients, PwDs and their families (HKSR 1995, p. 3). One of its employee physiotherapists introduced a Chronic Disease Self-Management Programme (CDSMP) to Hong Kong through the CRN (Poon et al. 2014). The CDSMP was developed by researchers at the Stanford Patient Education Research Center (Lorig 2015) and involves a paradigm shift from mere clinical outcomes to developing chronic patients' self-management skills, so as to enhance their confidence and proactiveness to manage chronic diseases to better daily living (National Center for Chronic Disease Prevention and Health Promotion, USA n.d.).

Academic studies conducted together with the CRN using the CDSMP approach have shown positive impact on patients. A randomised controlled trial involving 148 chronic patients found that patients in the experimental group using the CDSMP had significantly stronger self-efficacy in self-management of diseases, made use of more cognitive approaches to cope with pain and symptoms and were more energetic than the counterparts in the comparison group who took part in a Tai Chi interest class (Siu et al. 2007). A further study using the concept and framework of the CDSMP in a pilot layperson-led community-based self-management programme for patients with chronic inflammatory arthritis, together with a shared care model involving the CRN, hospital settings and patient self-help groups, also confirmed the significant benefits of the CDSMP to participating patients in the matter of improvement in pain symptom, cognitive management and exercise behaviours (Leung et al. 2016). A number of patients participated in the CDSMP programmes have volunteered to become peer supporters or informal health leaders of other patients, and they continue to practice the skills learned even after the completion of the programmes. Throughout the years, the CRN has provided supervisions and other supports to facilitate these patients to do physical exercises regularly.

Volunteer Advocates: To Fight for Patients' Rights and Benefits in the Long Run

The history of SHOs in Hong Kong commenced in 1964 when a group of visually impaired people established the first self-help entity (Hong Kong government 1995) and SHOs began to bloom in the early 1990s (Rehabilitation Programme Plan Review Working Group, Hong Kong 2007). The HKSR set up for the first time ten SHOs in 1994/1995 for chronic patients suffering from Alzheimer's disease, epilepsy, glaucoma, renal diseases, cardiac diseases, Parkinson's disease, etc. to enable them to share experience, to give mutual support and to "feel less alone" (HKSR 1995, p. 30). The HKSR has helped establish and supported 88 SHOs since then (HKSR 2018b, p. 27). As at May 2018, the HKSR maintained connections with approximately 180 SHOs, some of which were set up under the assistance of the HKSR and the remaining ones otherwise. The government recognises the contributions of these SHOs and proposed in 2014 to enhance financial support for them (Chief Executive of Hong Kong 2014, paragraph 81(ix)). As at October 2018, the government subsidised 93 SHOs under a 2-year financial support scheme (Social Welfare Department, Hong Kong 2018). In addition, the Hong Kong Jockey Club Charities Trust allocated a sum of HK$8 million (around USD1.03 million) in 2017/2018 for the HKSR to run a 3-year pilot project to inaugurate a sustainable model of SHOs' developments (HKSR 2018b, p. 15). To promote health education and let the community know more about chronic diseases, the HKSR has been inviting SHOs to run "human library"[5] activities to allow in-person sharing between patients and the general public (HKSR 2018c).

SHOs in Hong Kong do not stop at the stages of sharing experience and mutual support, and they have played positive roles in healthcare: promoting the rights of PwDs and an inclusive society, arranging public health activities, conducting research and advocating policy changes, etc. (Hong Kong government 1995, paragraph 2.20). That said, Mok (2005) commented that while SHOs in North America and Europe did not only concern individuals' wellbeing and empowerment but also social changes, it was not the case among SHOs in Hong Kong, as local patients felt helpless to influence government policies that affected their daily living, and he recommended SHOs to form coalitions and seek professional help to strengthen their negotiation power.

Time changes the societal dynamics. The recommendation of Mok (2005) came true successfully. In October 2017, the Hong Kong Alliance for Rare Diseases made a petition outside the government headquarters, urging for policy changes to provide affordable drugs to patients suffering from uncommon diseases like spinocerebellar atrophy and tuberous sclerosis complex (Mak 2017). A highlight of the petition was that a 23-year-old female university student born with spinal muscular atrophy, a genetic disorder, used two fingers to have typed a 22-page proposal to the government to request for life-saving muscle drugs at an annual cost estimate of

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[5] 真人圖書館 in Chinese.

HK$6 million per person (approximately USD0.77 million per head per year; Cheung 2017). Surprisingly 3 days after the petition, the Chief Executive of Hong Kong (2017, paragraphs 165 & 166) promulgated officially in her policy address that the government has committed to providing subsidised specific drug treatments for patients with rare diseases.

Another example of SHOs' changing roles is about patients' voices in the Medical Council of Hong Kong, a statutorily established body under the Medical Registration Ordinance (Cap 161) to manage medical doctors' registrations and disciplines. After the failure of the government in carrying out a legislative reform of the Medical Council in 2016 (Hong Kong government 2017), the first ever election of patient members to take seats in the Medical Council in the history of Hong Kong was held in December 2018 (Secretary of the Medical Council of Hong Kong 2018). This election has resulted in a new council composition, with three lay members elected by patient organisations and five other laypersons appointed by the government and the Consumer Council, in addition to 24 medical doctors from the government, the HA and various medical professional bodies (section 3(2) of the Medical Registration Ordinance). To facilitate the election, effective 29 June 2018, the HKSR has become the only NGO listed in regulation 4(2) of the Medical Council (Election and Appointment of Lay Members) Regulation (Cap 161F), bearing the capacity as a statutory "reference authority" to vet the eligibility of any entities with a principal objective to safeguard or represent patients' interests for registration into the register for elections of lay patient representatives to sit on the Medical Council.

Barriers to a Holistic Approach to Primary Care in Hong Kong

The HKSR has been working towards the concept of holistic and inclusive primary care, as exemplified by pioneering Rehabus services, trying to integrate both the medical and social models to promote patient self-management and empowerment, as well as supporting SHOs to express their needs. There are a few observations from the stories of the HKSR.

Government's Narrow Interpretation of Primary Care

Health is a wealth for daily living, emphasising social and personal resources and physical capacities, according to the Ottawa Charter for Health Promotion (WHO 1986). Health requires whole-person care, taking into account the changing environment as well as individuals' physiological, intellectual, sociocultural, psychosocial and spiritual needs (White et al. 2011, p. 33).

Primary care also requires a holistic approach. As pointed out by the Declaration of Alma-Ata 1978, the Ottawa Charter for Health Promotion 1986 and the WHO (2019), primary care is not the sole responsibility of the healthcare sector, and it takes a whole-of-society approach to address the broader determinants of health in terms of physical, mental, and social health and wellbeing. In Hong Kong, the Primary Care Office of the Department of Health (2019) explains primary care narrowly as the first level of care and the entry point of contact in the entire healthcare system, with a wide spectrum of services adjacent to people's locations of residence and work, and provided by a diverse group of healthcare practitioners, such as doctors, traditional Chinese medicine practitioners, dentists, chiropractors, podiatrists, nurses, therapists of different disciplines, clinical psychologists, pharmacists, optometrists and dieticians.

The narrow interpretation above is not conducive to the enhancement of primary care in a whole-person manner, and it will not facilitate NGOs to help improve citizens' health in Hong Kong. To take the HKSR as an example, its scopes of services fall mainly into four categories: (a) social services such as elderly homes; (b) transportation services such as Rehabus and other special transport services; (c) rehabilitation, health and wellness services comprising the CDSMP; and (d) vocational services such as assisting PwDs to find jobs. These categories are regulated by various government bureaus and departments, including the Labour and Welfare Bureau, the Transport and Housing Bureau, the Food and Health Bureau, the Social Welfare Department and the Transport Department, in addition to the HA, thus creating a complicated bureaucratic web with different philosophies, priorities, policies, rules and regulations. The HKSR is one of the real examples in Hong Kong to show that primary care does not fall within the ambit of the healthcare sector merely. Without a whole-of-society philosophy in the government, the role played by the Primary Care Office is limited.

Lack of a Whole-of-Society Approach

The requirement of a whole-of-society approach for primary care calls for appropriate cross-departmental government policies. SHOs provide an illustration to exhibit the bureaucracy of the government. While it is a good news to have had a successful advocacy case for patients with rare diseases (Chief Executive of Hong Kong 2017, paragraphs 165 & 166) and a historic start to have attained patients' seats in the Medical Council (Secretary of the Medical Council of Hong Kong 2018), these two initiatives were managed by the Food and Health Bureau. As for the wellbeing, rights and benefits of members of SHOs, most of them are subject to the rehabilitation policies in Hong Kong under the administration of another bureau, the Labour and Welfare Bureau. As the government is not used to adopting a whole-of-society approach, it is still a challenging process for SHOs to attempt to influence local rehabilitation policies, as reflected by Chan (2008, p. 200) that it was "a major breakthrough success" to have incorporated specific learning disabilities of children in the rehabilitation programme plan (RPP) in the 2005 review exercise. The RPP is an important exercise for rehabilitative services, as it sets out the strategic directions in the short, medium and long run to meet the needs of PwDs (Chief Executive of Hong Kong 2017, paragraph 187). However, the progress of RPP planning was slow, and the government had completed only three reviews in 40 years' time, where the first RPP was in place in 1976, with subsequent reviews in 1994, 1998 and 2005 (Health and Welfare Bureau, Hong Kong 1999; Rehabilitation Programme Plan Review Working Group, Hong Kong 2007). Another round of the review commenced in 2018 (Hong Kong government 2018).

Medical Dominance

The lack of a whole-of-society mindset in primary care is not confined to the government but within the local healthcare field too, out of different philosophies of care as exemplified in different models of disability. The medical model and the social model of disability are historically the two major conceptual ones (WHO 2002), and the debate between these two models is not new (Swain and French 2000). The term "medical model" is not well defined, and it is characterised by a hierarchical doctor-patient relationship that doctors play a dominant role to make decisions for passive patients (Fawcett 2017). This model takes a disability-specific approach and perceives disability as an individual's problem (DePauw 1997), where disability is a personal condition pending correction or cure (Reid and Knight 2006).

On the other hand, people advocating the social model argue that disability is closely related to the social world, it exists inside the social structures and it is "socially produced" (Oliver 1992, p. 101). The society has disabled PwDs and excluded them from full participation in normal social activities (Union of the Physically Impaired against Segregation and the Disability Alliance 1975). The social model is an inclusive approach to empower and emancipate PwDs by removing physical and conceptual barriers that oppress them (Curtis and Pettigrew 2010, p. 114). A summary of the debate is depicted in Table 16.2.

The CDSMP story of the HKSR was a case showing the tension between different models of disability. In Hong Kong, medical dominance was considered a barrier to the development of chronic patients' self-help movement (Wong and Chan 1994). The CDSMP may be seen as an integrated model in-between the medical model and the social model, with inputs from healthcare professionals as well as patients' self-efforts and empowerment. Despite the encouraging research results, it has not been a smooth path for the growth and root deepening of the CDSMP in Hong Kong. It took more than a decade for the medical sector in general to understand it, to appreciate its genuine effectiveness and to clear up their misperceptions on the use of nonmedical approaches for the management of chronic illnesses, as

Table 16.2 A brief summary of the medical model and the social model of disability

	Medical model	Social model
Disability	An individual problem	A social problem
The agent of change	Healthcare professionals	Individuals, advocates or anybody who affects the arrangement between PwDs and the society
Modes of change	Medical care; personal adjustment	Social integration; environmental manipulation
Remedy	Cure or normalisation of PwDs	Interactions between PwDs and society
Rights of PwDs	Never be equal to persons without disability	With the same rights to full equality in society as all citizens

Source: Adapted from Hodkinson (2016, p. 31, Table 2.1)

recalled by the employee physiotherapist of the HKSR who introduced the CDSMP to Hong Kong. With a belief in the beauty of patient self-management, the HKSR ploughed through that difficult period of time by conducting evidence-based research, introducing the concept and effectiveness of the CDSMP to healthcare practitioners and the general public in every possible chance like seminars and talks and knocking the doors of different departments in local hospitals and universities to identify potential collaborators. The long efforts of the HKSR have finally paid off. The HA made strategies in 2009 to help people stay healthy and one of which was a shift of focus from a paternalistic model of care to a partnership model, emphasising patient empowerment and engagement through collaborations with NGOs to develop healthcare programmes similar to the CDSMP for chronic patients (HA 2009).

Another new chance has arisen. Further to the acceptance of the concept of patients' self-management by the HA (2009), the Chief Executive of Hong Kong (2017, paragraph 159) has announced using a new medical-social collaborative model to improve primary care by establishing local district health centres to arouse citizens' self-management of health and public awareness of disease prevention and to provide support for chronic patients, so as to relieve pressure facing hospitals and healthcare professionals. The contract of the first district health centre was awarded in March 2019 (Hong Kong Government 2019a). In view of the new philosophy of the government and the expertise accumulated in the CDSMP, the HKSR is planning to consolidate its experiences from the last few decades and to advocate the use of health coaches to further enhance the concepts of patient self-management and empowerment. If successful, this initiative will bring local healthcare volunteerism to a higher altitude by creating a new service model in primary care and transforming volunteers from informal health leaders into semi-trained health coaches. Such consolidation may serve as a means of task shifting to address the ever-rising demand for healthcare and the severe shortage of professional workforce in Hong Kong. However, with reference to the past paternalistic attitude of the medical sector, the HKSR may need to go through another long journey, taking care of the controversial use of the brand new category of health coaches in healthcare.[6] A whole-of-society approach for primary care is still a long way to go in Hong Kong.

Between Now and the Future

It is not necessary to debate the importance of primary care and the strategic use of healthcare volunteers in a society. Primary care serves as one of the practical solutions for complex and diverse contemporary global healthcare challenges (Schäfer et al. 2011), especially under the contexts of ageing population, low fertility rates and concerns on financial sustainability of healthcare systems, etc. (Tong and Fong 2014). To support primary care, healthcare volunteers are one of the stakeholders playing a significant role in both developing and developed countries. With the case study of the HKSR, it shows that in Hong Kong, while healthcare volunteers may make important contributions, a robust and holistic approach of primary care still requires the leadership of the government and the understanding and open-mindedness of the healthcare professionals. There have been some encouraging developments in patient advocacy, but it is worth noting that such achievements in advocacy, together with the HA's acceptance of a patient self-help model (HA 2009) and the government's new health district centres (Chief Executive of Hong Kong 2017, paragraph 159), are all under the purview of the Food and Health Bureau. Sole reliance on a single bureau does not work, and serious concerns are nonetheless in existence if the government continues to approach primary care in a bureaucratic and departmental manner, not to mention the barriers arising from the mindset of medical dominance. The establishment of new district health centres under a medical-social collaborative model is a good move, but it is too early to assess its effectiveness, as the first district health centre (i.e. Kwai Tsing District Health Centre) just commenced operations on 25 September 2019 (Hong Kong Government 2019b). Change of the mentality of the government and healthcare professionals is a powerful master key to the success of primary care in Hong Kong.

Another key to boost the success of primary care rests in volunteers. Healthcare volunteerism in primary care is a treasure. The contributions of healthcare volunteers in the form of task shifting are positive in both developing and developed countries. It has also been pointed out that healthcare volunteers may have more satisfaction than other volunteers (Tuckman and Chang 1994). In Hong Kong, it

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[6] The first district health centre, namely, the Kwai Tsing District Health Centre, posted vacancy advertisements in the period of March–May 2019 to recruit "community health practitioners", requiring potential candidates to have completed post-secondary education in health-related studies, such as public health, community health practices, nutrition, gerontology and sport science. "Community health practitioner" is a new healthcare staff category in Hong Kong, and the impact of this new staff grade in district health centres on the HKSR's proposed health coaches is subject to further study.

seems that the use of healthcare volunteerism has not been optimal. As listed in Table 16.1, about 65% of the respondents did not have any volunteer experience; healthcare organisations did not fall into volunteers' top three preferred venues; and among the healthcare NGOs under study, around 50–80% of them required healthcare volunteers to do administrative works and only 6–44% of them asked volunteers to support people-oriented services such as personal care, medical care and counselling (Agency for Volunteer Service 2011). A telephone interview survey reaffirmed that only 17% of the respondents were involved in formal volunteering with a mean of less than 10 volunteer hours in the past month before the survey (Yip and Cheng 2014).

These findings have illustrated that not only healthcare volunteerism but also volunteerism in general are not prevalent in Hong Kong, that volunteers may not like to work or may not understand the works in healthcare setting and that local healthcare organisations may not see volunteerism as a partnership mode, but something "nice to have" as perceived similarly by the NHS institutions of the UK (Boyle et al. 2017, p. 5). If task shifting is an international strategy to manage the global paucity of healthcare workforce, in the wording of Neuberger (2008, p. 3), there is an unexplored "huge potential" in healthcare volunteerism in Hong Kong, in areas such as recruiting and retaining volunteers (Rogers et al. 2013), as well as deepening the meaningfulness of healthcare volunteer work (Schnell and Hoof 2012). The current situation of Hong Kong echoes the statement of the Executive Board of the UN Development Programme and of the UN Population Fund (2002, p. 4), "Although volunteering constitutes an enormous reservoir of skills, energy and local knowledge, it is rarely recognised as a strategic resource …." Apart from the stakeholders' change of mentality as discussed above, for the purpose of optimising primary care in Hong Kong, more research is needed to understand the root causes of the present apathy of the general public to volunteerism in general and the lack of enthusiasm in volunteering in healthcare organisations in particular.

Limitations

The present discussion is mainly based on literature review. As for the case of the HKSR, its stories principally come from its official website and publications such as annual reports, as well as the author's personal observations.[7] For some unpublished stories of this 60-year NGO, without the support of any written evidence, it is not avoidable at some occasions such as the growth of the CDSMP in Hong Kong that the author had to rely on the oral statements and memories of a few key officers of the HKSR who had witnessed the processes of developments. Because of the constraints in resources and expertise, the author has not conducted any structured oral history interviews in this regard. In addition, this chapter is case-specific, and

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[7] Details are contained in the section of "Disclosures and Conflict of Interests".

the discussion herein may not be generalised or applicable to other scenarios within or outside Hong Kong. The viewpoints discussed in this chapter are entirely those of the author and in any circumstances do not represent the official positions of the HKSR. The author accepts the full responsibility for any errors or omissions in this chapter.

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References

Ackers, H. L., Ackers-Johnson, J., Chatwin, J., & Tyler, N. (2017). *Healthcare, frugal innovation, and professional voluntarism: A cost-benefit analysis*. Cham: Springer.

Agency for Volunteer Service, Hong Kong. (2011). *Survey on volunteering in Hong Kong 2009*. Retrieved from http://www.avs.org.hk/symposium/pdf/AVS_BOOKlet_21.pdf

Alam, K., & Oliveras, E. (2014). Retention of female volunteer community health workers in Dhaka urban slums: A prospective cohort study. *Human Resources for Health, 12*(29)., 11 pages). https://doi.org/10.1186/1478-4491-12-29.

Boerma, W. G. W. (2006). Coordination and integration in European primary care. In R. B. Saltman, A. Rico, & W. G. W. Boerma (Eds.), *Primary care in the driver's seat. Organizational reform in European primary care*. London: Open University Press.

Bopp, M., Wilcox, S., Laken, M., Hooker, S. P., Saunders, R., Parra-Medina, D., Butler, K., & McClorin, L. (2007). Using the RE-AIM framework to evaluate a physical activity intervention in churches. *Preventive Chronic Diseases, 4*(4), A87, 9 pages.

Boyle, D., Crilly, T., & Malby, B. (2017). *Can volunteering help create better health and care?* London: The HelpForce Fund. Retrieved from https://www.helpforce.community/wp-content/uploads/Helpforce-Can-volunteering-help-create-better-health-and-care.pdf

Chan, C. W. (2008). Overview of specific learning disabilities (SLD)/dyslexia developments over the last decade in Hong Kong. *Hong Kong Journal of Paediatrics (new series), 13*(3), 196–202.

Cherrington, A., Ayala, G. X., Elder, J. P., Arredondo, E. M., Fouad, M., & Scarinci, I. (2010). Recognizing the diverse roles of community health workers in the elimination of health disparities: From paid staff to volunteers. *Ethnicity & Disease, 20*(2), 189–194.

Cheung, E. (2017, October 8). Using only two fingers, Hong Kong girl types 22-page proposal calling for life-saving muscle drug. *South China Morning Post*. Retrieved from https://www.scmp.com/news/hong-kong/health-environment/article/2114344/using-only-two-fingers-hong-kong-girl-types-22

Chief Executive of Hong Kong. (2014). *The 2014 policy address: Support the needy, let youth flourish, unleash Hong Kong's potential*. Retrieved from https://www.policyaddress.gov.hk/2014/eng/pdf/PA2014.pdf

Chief Executive of Hong Kong. (2017). *The Chief Executive's 2017 policy address: We connect for hope and happiness*. Retrieved from https://www.policyaddress.gov.hk/2017/eng/pdf/PA2017.pdf

Christopher, J. B., Le May, A., Lewin, S., & Ross, D. A. (2011). Thirty years after Alma-Ata: A systematic review of the impact of community health workers delivering curative interventions against malaria, pneumonia and diarrhoea on child mortality and morbidity in sub-Saharan Africa. *Human Resources for Health, 9*(27)., 11 pages). https://doi.org/10.1186/1478-4491-9-27.

Committee on the Future of Primary Care of the Institute of Medicine. (1996). *Primary care: America's health in a new era*. Washington, DC: National Academy Press.

Curtis, W., & Pettigrew, A. (2010). *Education studies: Reflective reader*. Exeter: Learning Matters.

Department of Health, New South Wales. (2018 reviewed). *NSW health framework for engaging, supporting and managing volunteers*. Retrieved from https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2011_033.pdf

DePauw, K. P. (1997). The (1n)visibility of disability: Cultural contexts and "sporting bodies". *Quest, 49*(4), 416–430. https://doi.org/10.1080/00336297.1997.10484258.

Deputy Premier and Minister for Health, Queensland. (2009, May 11). *Healthcare volunteers contribution is priceless* [Press release]. Retrieved from http://statements.qld.gov.au/Statement/Id/63821

Emanuel, E. J., Fairclough, D. L., Slutsman, J., Alpert, H., Baldwin, D., & Emanuel, L. L. (1999). Assistance from family members, friends, paid care givers, and volunteers in the care of terminally ill patients. *The New England Journal of Medicine, 341*(13), 956–963. https://doi.org/10.1056/NEJM199909233411306.

Evans, A. (2014, September 12). Director recognised for 25 years of training rehabilitation methods in Hong Kong and mainland. *South China Morning Post*. Retrieved from https://www.scmp.com/news/hong-kong/article/1590304/director-recognised-25-years-training-rehabilitation-methods-hong

Executive Board of the United Nations Development Programme and of the United Nations Population Fund. (2002). *United Nations Volunteers: Report of the administrator (DP/2002/18)*. Retrieved from https://www.unv.org/sites/default/files/UNDP%20EB%20Report%20%28DP%202002-18%29.pdf

Fawcett, J. (2017). Thoughts about nursing conceptual models and the medical model. *Nursing Science Quarterly, 30*(1), 77–80. https://doi.org/10.1177/0894318416680710.

Food and Health Bureau, Hong Kong. (2017). *Strategic review on healthcare manpower planning and professional development*. Hong Kong: Author. Retrieved from https://www.fhb.gov.hk/download/press_and_publications/otherinfo/180500_sr/e_sr_final_report.pdf.

Gaziano, T. A., Abrahams-Gessel, S., Denman, C. A., Montano, C. M., Khanam, M., Puoane, T., & Levitt, N. S. (2015). An assessment of community health workers' ability to screen for cardiovascular disease risk with a simple, non-invasive risk assessment indicator in Bangladesh, Guatemala, Mexico and South Africa. *Lancet Global Health, 3*(9), e556–e563. https://doi.org/10.1016/S2214-109X(15)00143-6.

Gorski, H., Gull, B., Harris, T., Garfield, T., Ashby, J., & Kamimura, A. (2017). Volunteer experiences at a free clinic in the United States: A qualitative study. *Diversity and Equality in Health and Care, 14*(3), 130–135.

Hadi, A. (2003). Management of acute respiratory infections by community health volunteers: Experience of Bangladesh Rural Advancement Committee (BRAC). *Bulletin of the World Health Organization, 81*(3), 183–189. https://doi.org/10.1590/S0042-96862003000300008.

Hainsworth, J., & Barlow, J. (2001). Volunteers' experiences of becoming arthritis self-management lay leaders: "It's almost as if I've stopped aging and started to get younger!". *Arthritis Care & Research, 45*(4), 378–383. https://doi.org/10.1002/1529-0131(200108)45:4<378::AID-ART351>3.0.CO;2-T.

Hanvoravongchai, P., & Wibulpolprasert, S. (2015). Training of local health workers to meet public health needs. In R. Detels, M. Gulliford, Q. Abdool Karim, & C. C. Tan (Eds.), *Oxford textbook of global public health* (Vol. 1, 6th ed., pp. 1585–1593). Oxford: Oxford University Press.

Health and Welfare Bureau, Hong Kong. (1999). *Hong Kong rehabilitation programme plan (1998–99 to 2002–03)*. Retrieved from https://www.fhb.gov.hk/en/press_and_publications/otherinfo/RPP/TOC.HTM

Health Volunteers Overseas. (2019). *Our story*. Retrieved from https://hvousa.org/whoweare/our-history/

Ho, F. C. S. (2017). *Western medicine for Chinese: How the Hong Kong College of Medicine achieved a breakthrough*. Hong Kong: Hong Kong University Press.

Hodkinson, A. (2016). *Key issues in special educational needs & inclusion* (2nd ed.). London: SAGE.

Hong Kong Government. (1995). *White paper on rehabilitation: Equal opportunities and full participation: A better tomorrow for all*. Hong Kong: Author. Retrieved from https://www.lwb.gov.hk/download_gb/press_and_publications/otherinfo/WP95ENG.DOC.

Hong Kong Government. (2017, May 24). *Government proposes to amend Medical Registration Ordinance* [Press release]. Retrieved from https://www.info.gov.hk/gia/general/201705/24/P2017052300451.htm

Hong Kong Government. (2018, March 12). *Government engages public in defining scope of new Hong Kong rehabilitation programme plan* [Press release]. Retrieved from https://www.info.gov.hk/gia/general/201803/12/P2018031200294.htm

Hong Kong Government. (2019a, March 4). *Contract awarded for Kwai Tsing District Health Centre*. Retrieved from https://www.info.gov.hk/gia/general/201903/04/P2019030400465.htm

Hong Kong Government. (2019b, September 24). *First District Health Centre officially opens in Hong Kong*. Retrieved from https://www.info.gov.hk/gia/general/201909/24/P2019092400717.htm

Hospital Authority, Hong Kong. (2009). *Helping people stay healthy: Strategic service plan 2009–2012*. Retrieved from http://www.ha.org.hk/ho/corpcomm/Strategic%20Plan/2009-12.pdf

Hospital Authority, Hong Kong. (2019). *Introduction*. Retrieved from http://www.ha.org.hk/visitor/ha_visitor_index.asp?Content_ID=10008&Lang=ENG&Dimension=100&Parent_ID=10004

Jones, H. (2004). *Volunteering for health: A research report produced for the Welsh Assembly Government*. Wales: Volunteering Unit, Wales Council for Voluntary Action. Retrieved from https://www.wales.nhs.uk/documents/volunteering-for-health-report-e.pdf.

Kandel, N., & Lamichhane, J. (2019). Female health volunteers of Nepal: The backbone of healthcare. *The Lancet, 393*(10171), e19–e20. https://doi.org/10.1016/S0140-6736(19)30207-7.

Kowitt, S. D., Emmerling, D., Fisher, E. B., & Tanasugarn, C. (2015). Community health workers as agents of health promotion: Analyzing Thailand's village health volunteer program. *Journal of Community Health, 40*(4), 780–788. https://doi.org/10.1007/s10900-015-9999-y.

Kreutzer, K., & Jäger, U. (2011). Volunteering versus managerialism: Conflict over organizational identity in voluntary associations. *Nonprofit and Voluntary Sector Quarterly, 40*(4), 634–661. https://doi.org/10.1177/0899764010369386.

Laleman, G., Kegels, G., Marchal, B., Van der Roost, D., Bogaert, I., & Van Damme, W. (2007). The contribution of international health volunteers to the health workforce in sub-Saharan Africa. *Human Resources for Health, 5*(19)., 9 pages). https://doi.org/10.1186/1478-4491-5-19.

Law, Y. H. (2018). *The history of development of western medicine in Hong Kong: 1842–1990* (香港西醫發展史: 1842–1990 in Chinese, book title in English translated by the author of this chapter). Hong Kong: Chung Hwa Book Co.

Leon, N., Sanders, D., Van Damme, W., Besada, D., Daviaud, E., Oliphant, N. P., et al. (2015). The role of 'hidden' community volunteers in community-based health service delivery platforms: Examples from sub-Saharan Africa. *Global Health Action, 8*(1), 27214, 7 pages. https://doi.org/10.3402/gha.v8.27214.

Leung, Y. Y., Kwan, J., Chan, P., Poon, P. K. K., Leung, C., Tam, L. S., et al. (2016). A pilot evaluation of arthritis self-management program by lay leaders in patients with chronic inflammatory arthritis in Hong Kong. *Clinical Rheumatology, 35*(4), 935–941. https://doi.org/10.1007/s10067-014-2791-z.

Lorig, K. (2015). Chronic disease self-management program: Insights from the eye of the storm. *Frontiers in Public Health, 2*(253)., 3 pages). https://doi.org/10.3389/fpubh.2014.00253.

Ma, S. Y. (2011). The making and remaking of a Chinese hospital in Hong Kong. *Modern Asian Studies, 45*(5), 1313–1336. https://doi.org/10.1017/S0026749X10000107.

Majiyagbe, J. (2004). The volunteers' contribution to polio eradication: Editorials. *Bulletin of the World Health Organization, 82*(1), 2.

Mak, R. (2017, October 15). Sufferers of rare diseases in Hong Kong need more support – That, at least, is one thing political rivals can agree on. *South China Morning Post*. Retrieved from https://www.scmp.com/comment/insight-opinion/article/2114851/sufferers-rare-diseases-hong-kong-need-more-support-least

Merchant, R. M., Leigh, J. E., & Lurie, N. (2010). Healthcare volunteers and disaster response — First, be prepared. *The New England Journal of Medicine, 362*(10), 872–873. https://doi.org/10.1056/NEJMp1001737.

Ministry of Health, New Zealand. (2018). *Primary healthcare*. Retrieved from https://www.health.govt.nz/our-work/primary-health-care

Mok, B. H. (2005). Organizing self-help groups for empowerment and social change. *Journal of Community Practice, 13*(1), 49–67. https://doi.org/10.1300/J125v13n01_04.

National Center for Chronic Disease Prevention and Health Promotion, USA. (n.d.). *Chronic disease self-management program (CDSMP)*. Retrieved from https://www.cdc.gov/arthritis/marketing-support/1-2-3-approach/docs/pdf/provider_fact_sheet_cdsmp.pdf

Neuberger, J. (2008). *Volunteering in the public services: Health and social care: Baroness Neuberger's review as the governments volunteering champion*. London: Cabinet Office, Office of the Third Sector. Retrieved from http://webarchive.nationalarchives.gov.uk/20081230001255/http://cabinetoffice.gov.uk/media/cabinetoffice/third_sector/assets/neuberger.pdf.

Okanurak, K., & Ruebush, T. K., II. (1996). Village-based diagnosis and treatment of malaria. *Acta Tropica, 61*(2), 157–167. https://doi.org/10.1016/0001-706X(95)00115-U.

Oliver, M. (1992). Changing the social relations of research production? *Disability*. *Handicap and Society, 7*(2), 101–114. https://doi.org/10.1080/02674649266780141.

Operation Concern. (n.d.). *Service scope* (in Chinese). Retrieved from http://www.operationconcern.org/demo12B/ambit.html

Pittet, D., Allegranzi, B., Storr, J., Bagheri Nejad, S., Dziekan, G., Leotsakos, A., & Donaldson, L. (2008). Infection control as a major World Health Organization priority for developing countries. *Journal of Hospital Infection, 68*(4), 285–292. https://doi.org/10.1016/j.jhin.2007.12.013.

Poon, P. K. K., So, A., & Loong, E. L. C. (2014). Self-management in community-based rehabilitation programmes for persons with chronic diseases. In K. W. Tong & K. N. K. Fong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions* (pp. 53–73). Hong Kong: City University of Hong Kong Press.

Primary Care Office of the Department of Health, Hong Kong. (2019, March revised). *Concept of primary care and family doctor*. Retrieved from https://www.pco.gov.hk/english/careyou/concept.html

Reeser, J. C., Berg, R. L., Rhea, D., & Willick, S. (2005). Motivation and satisfaction among polyclinic volunteers at the 2002 Winter Olympic and Paralympic Games. *British Journal of Sports Medicine, 39*(4), e20, 5 pages. https://doi.org/10.1136/bjsm.2004.015438.

Rehabilitation Programme Plan Review Working Group, Hong Kong. (2007). *Hong Kong rehabilitation programme plan (2005–2007)*. Retrieved from https://www.lwb.gov.hk/eng/advisory/rac/rpp_report.htm

Reid, D. M., & Knight, M. G. (2006). Disability justifies exclusion of minority students: A critical history grounded in disability studies. *Educational Researcher, 35*(6), 18–23. https://doi.org/10.3102/0013189X035006018.

Rogelberg, S. G., Allen, J. A., Conway, J. M., Goh, A., Currie, L., & McFarland, B. (2010). Employee experiences with volunteers: Assessment, description, antecedents, and outcomes. *Nonprofit Management & Leadership, 20*(4), 423–444. https://doi.org/10.1002/nml.20003.

Rogers, S. E., Rogers, C. M., & Boyd, K. D. (2013). Challenges and opportunities in healthcare volunteer management: Insights from volunteer administrators. *Hospital Topics, 91*(2), 43–51. https://doi.org/10.1080/00185868.2013.806012.

Rominski, S. D., Yakubu, J., Oteng, R. A., Peterson, M., Tagoe, N., & Bell, S. A. (2015). The role of short-term volunteers in a global health capacity building effort: The project HOPE-GEMC experience. *International Journal of Emergency Medicine, 8*(1), 23, 5 pages. https://doi.org/10.1186/s12245-015-0071-6.

Schäfer, W., Groenewegen, P. P., Hansen, J., & Black, N. (2011). Priorities for health services research in primary care. *Quality in Primary Care, 19*(2), 77–83.

Schnell, T., & Hoof, M. (2012). Meaningful commitment: Finding meaning in volunteer work. *Journal of Beliefs & Values, 33*(1), 35–53. https://doi.org/10.1080/13617672.2012.650029.

Secretary of the Medical Council of Hong Kong. (2018). *2018 election of lay members of the Medical Council of Hong Kong: Polling notice*. Retrieved from https://www.mchk.org.hk/files/Polling_Notice_final_E.pdf

Sinn, E. (1989). *Power and charity: The early history of the Tung Wah Hospital, Hong Kong*. Hong Kong: Oxford University Press.

Siu, A. M. H., Chan, C. C. H., Poon, P. K. K., Chui, D. Y. Y., & Chan, S. C. C. (2007). Evaluation of the chronic disease self-management program in a Chinese population. *Patient Education and Counseling, 65*(1), 42–50. https://doi.org/10.1016/j.pec.2006.04.013.

Snyder, M., & Omoto, A. M. (1992). Who helps and why? The psychology of AIDS volunteerism. In S. Spacapan & S. Oskamp (Eds.), *Helping and being helped: Naturalistic studies* (pp. 213–239). Newbury Park: Sage.

So, P. (2009, September 4). Harry Fang – ‘A towering figure in both public and private life’. *South China Morning Post*. Retrieved from https://www.scmp.com/article/691457/harry-fang-towering-figure-both-public-and-private-life

Social Welfare Department, Hong Kong. (2018). *Financial support scheme for self-help organisations of persons with disabilities/chronic illnesses (2018–2020) (from 1.10.2018 to 30.9.2020)*. Retrieved from https://www.swd.gov.hk/storage/asset/section/742/en/Update_Homepage_List_of_FSS_(2018-2020)_Eng.pdf

Southwick, S. M., Gilmartin, R., McDonough, P., & Morrissey, P. (2006). Logotherapy as an adjunctive treatment for chronic combat-related PTSD: A meaning-based intervention. *American Journal of Psychotherapy, 60*(2), 161–174. https://doi.org/10.1176/appi.psychotherapy.2006.60.2.161.

St John Ambulance, UK. (2015). *Volunteering opportunities with St John Ambulance*. Retrieved from http://www.sja.org.uk/sja/volunteer.aspx

Swain, J., & French, S. (2000). Towards an affirmation model of disability. *Disability & Society, 15*(4), 569–582. https://doi.org/10.1080/09687590050058189.

Takasugi, T., & Lee, A. C. K. (2012). Why do community health workers volunteer? A qualitative study in Kenya. *Public Health, 126*(10), 839–845. https://doi.org/10.1016/j.puhe.2012.06.005.

The Declaration of Alma-Ata. (1978). Retrieved from https://www.who.int/publications/almaata_declaration_en.pdf

The Hong Kong Association of Banks. (2017). *Speech by CS at HKAB food for love project launch ceremony*. Retrieved from https://www.hkab.org.hk/DisplayWhatsNewsAction.do?ss=2&id=3716

The Hong Kong Council of Social Service. (n.d.). *Who we are*. Retrieved from http://www.hkcss.org.hk/e/fc_detail1.asp?fc_id=15

The Hong Kong Council of Social Service. (2017). *Survey on information disclosure in NGO annual reports: April 2017*. Retrieved from https://governance.hkcss.org.hk/sites/default/files/2017-10/Survey%20on%20Information%20Disclosure%20in%20NGO%20Annual%20Reports.pdf

The Hong Kong Society for Rehabilitation. (1960). *Annual report 1959–1960*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (1978). *Annual report 1977–1978*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (1980). *Annual report 1979–1980*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (1984). *Rehabilitation 25 (1959–1984)*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (1995). *Annual report 1994–1995*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (2006). *2005–2006 annual report*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (2013). *2012–2013 annual report: Faithful in our engagements, excelling in our work*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (2018a). *About us*. Retrieved from https://www.rehabsociety.org.hk/about-us/hksr-introduction/

The Hong Kong Society for Rehabilitation. (2018b). *Annual report 2017–2018: A new page: Empowering persons with disabilities to live a fulfilling life*. Hong Kong: Author.

The Hong Kong Society for Rehabilitation. (2018c). *Mutual help human library & exhibition*. Retrieved from https://www.rehabsociety.org.hk/mutual-help-human-library-exhibition/

The Hong Kong Society for Rehabilitation. (2018d). *Our founder*. Retrieved from https://www.rehabsociety.org.hk/about-us/hksr-introduction/

The Hospital Authority Ordinance (Cap 113), Hong Kong.

The Institute of Medicine, United States. (1994). *Defining primary care: An interim report*. Washington, DC: National Academy Press.

The Law of the People's Republic of China on the Protection of the Rights and Interests of the Elderly (as amended in 2018) (《中華人民共和國老年人權益保障法》 (2018 修正)), China.

The Medical Council (Election and Appointment of Lay Members) Regulation (Cap 161F), Hong Kong.

The Medical Registration Ordinance (Cap 161), Hong Kong.

The National Association of Health Authorities. (1987). *NHS handbook* (3rd ed.). London: Macmillan Press.

The National Health Service and Community Care Act 1990, United Kingdom.

The Regulation on Voluntary Services (《志願服務條例》), China.

The Tung Wah Group of Hospitals. (n.d.-a). *About us*. Retrieved from http://www.tungwah.org.hk/en/about/about-us/

The Tung Wah Group of Hospitals. (n.d.-b). *History of Tung Wah Group of Hospitals*. Retrieved from https://www.tungwah.org.hk/en/about/our-origin/

The University of Hong Kong. (2002). *Growing with Hong Kong: The university and its graduates: The first 90 years*. Hong Kong: Author.

Tong, K.-w., & Fong, K. N.-k. (2014). Introduction: Challenges in healthcare and community care in Hong Kong. In K.-w. Tong & K. N.-k. Fong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions* (pp. 1–16). Hong Kong: City University of Hong Kong Press.

Tuckman, H. P., & Chang, C. F. (1994). The healthcare volunteer. *Hospital Topics, 72*(2), 23–27. https://doi.org/10.1080/00185868.1994.9948482.

Union of the Physically Impaired against Segregation, & the Disability Alliance. (1975). *Fundamental principles of disability*. Retrieved from http://www.disability.co.uk/sites/default/files/resources/fundamental%20principles.pdf

United Nations Volunteers. (2018). *2018 state of the world's volunteerism report: The thread that binds volunteerism and community resilience*. Retrieved from https://www.unv.org/sites/default/files/UNV_SWVR_2018_English_WEB.pdf

Vareilles, G., Pommier, J., Marchal, B., & Kane, S. (2017). Understanding the performance of community health volunteers involved in the delivery of health programmes in underserved areas: A realist synthesis. *Implementation Science, 12*(1), 22, 12 pages. https://doi.org/10.1186/s13012-017-0554-3.

Wells, B. L., DePue, J. D., Buehler, C. J., Lasater, T. M., & Carleton, R. A. (1990). Characteristics of volunteers who deliver health education and promotion: A comparison with organization members and program participants. *Health Education Quarterly, 17*(1), 23–35. https://doi.org/10.1177/109019819001700105.

White, L., Duncan, G., & Baumle, W. (2011). *Foundations of basic nursing* (3rd ed.). Clifton Park: Delmar Cengage Learning.

Willard-Grace, R., Sharma, A. E., Parker, C., & Potter, M. B. (2016). Engaging patients as partners in practice improvement: A survey of community health centers. *Journal of Clinical Outcomes Management, 23*(7), 311–319.

Wilson, J. W., Merry, S. P., & Franz, W. B. (2012). Rules of engagement: The principles of underserved global health volunteerism. *The American Journal of Medicine, 125*(6), 612–617. https://doi.org/10.1016/j.amjmed.2012.01.008.

Withers, M., Browner, C. H., & Aghaloo, T. (2013). Promoting volunteerism in global health: Lessons from a medical mission in northern Mexico. *Journal of Community Health, 38*(2), 374–384. https://doi.org/10.1007/s10900-012-9627-z.

Witmer, A., Seifer, S. D., Finocchio, L., Leslie, J., & O'Neil, E. H. (1995). Community health workers: Integral members of the healthcare work force. *American Journal of Public Health, 85*(8), 1055–1058. https://doi.org/10.2105/AJPH.85.8_Pt_1.1055.

Wong, D., & Chan, C. (1994). Chapter 5. Advocacy on self-help for patients with chronic illness: The Hong Kong experience. *Prevention in Human Services, 11*(1), 117–139. https://doi.org/10.1080/10852359409511199.

World Health Organization. (n.d.). *WHO collaborating centres global database*. Retrieved from http://apps.who.int/whocc/Detail.aspx?cc_ref=CHN-83&cc_city=hong

World Health Organization. (1986). *The Ottawa Charter for health promotion*. Retrieved from https://www.who.int/healthpromotion/conferences/previous/ottawa/en/

World Health Organization. (2002). *Towards a common language for functioning, disability and health ICF*. Retrieved from http://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1

World Health Organization. (2008a). *Task shifting: Rational redistribution of tasks among health workforce teams*. Geneva: Author.

World Health Organization. (2008b). *The world health report 2008: Primary healthcare (now more than ever)*. Retrieved from https://www.who.int/whr/2008/en/

World Health Organization. (2013). *A universal truth: No health without a workforce*. Geneva: Author.

World Health Organization. (2019). *Primary healthcare*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/primary-health-care

Yip, P. S. F., & Cheng, Q. (2014). *2014 Hong Kong altruism index survey*. Hong Kong: The Hong Kong Jockey Club Centre for Suicide Research and Prevention of the University of Hong Kong. Retrieved from https://csrp.hku.hk/wp-content/uploads/2015/05/AltruismReportFinal-0804.pdf.

Zweigenhaft, R. L., Armstrong, J., Quintis, F., & Riddick, A. (1996). The motivations and effectiveness of hospital volunteers. *Journal of Social Psychology, 136*(1), 25–34. https://doi.org/10.1080/00224545.1996.9923026.

Chapter 17
Social Marketing in Health Promotion and Behaviours in Lifestyle Modification

Edward Pinkney, Hoi Fung Wong, and Pui Fai Wong

Introduction

The field of social marketing emerged out of the creative advertising boom of the 1970s, with the aim of using commercial techniques to achieve prosocial or public health goals (Weinreich 2006). In recent years, just as the world is seeing the decline of traditional advertising agencies, superseded by technology start-ups and the opportunities provided by the Internet, there has also been an emergence of new approaches to health promotion and behaviour change. The public health community must embrace these changes to tackle today's complex global health challenges.

One of the most substantive developments brought about by the emergence of the Internet has been the vast quantities of consumer data produced. When advertising was dominated by television, billboards and the print media, it was generally difficult to measure cost-effectiveness, and the power was with the agencies. The nineteenth-century retailer John Wanamaker is credited with saying, "Half the money I spend on advertising is wasted; the trouble is I do not know which half" (Kurtz et al. 2009). Since the new millennium, the emergence of digital advertising and e-commerce has changed the way people communicate and share information, with implications that go beyond social marketing into behaviour change, led by new innovations and allowing behaviour to be monitored and influenced like never before.

To the extent that social marketing is an academic field, social marketers should be perfectly placed at the cutting edge of emerging technologies. Many multibillion-dollar technology companies whose products the public use today originated from

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academia – including Google. Founded in 1998, Google launched its advertising platform 2 years later, allowing businesses to tailor adverts to demographics searching for specific keywords and terms and to see the number of views and clicks received for each advert. Google also brought greater transparency and rigour to the costing of campaigns via an auction system that ranked certain keywords according to popularity. While online banner advertisements had already existed since the mid-1990s, Google provided every Internet user with a data centre to instantly devise, test and manage mass advertising campaigns, whether their budget was a few dollars or millions. Advertising has since become a field for data scientists and the every man. Google had effectively handed insular traditional advertising agencies a notice of termination.

Over the last 15 years, social media platforms have staked a claim for marketing budgets. More organic forms of peer-to-peer ("viral") marketing have emerged, enabled by the ubiquity of smartphones. The next 15 years seem certain to bring more technology breakthroughs spurred by interest in artificial intelligence, new sources of data from wearable devices and Internet-connected hardware, and improvements in how the vast quantities of data are utilised the big data. These present both challenges and opportunities for the social marketing field and public health community, particularly in an interdependent global society that continues to tackle with social and economic inequalities.

Theories of Social Marketing and Behaviour Change

Origin of Social Marketing

The term "social marketing" was coined in 1971 (Kotler and Zaltman 1971) and can be interpreted as implying that traditional marketing is anti-social. However, there is a long history of private sector marketers and the public health community working in tandem to pursue the common goals (Reich 2002). Just as with traditional marketing, social marketing involves navigating policy, advocacy, public relations (PR), communications, education and advertising. One of the central strategic concepts taken from traditional marketing is known as the "marketing mix", or the 4Ps, which urges a focus on the product, place, price and promotion of any marketing campaign (Weinreich 2006). Consideration for "policy" and "partnerships" has also been suggested as additional Ps that contribute to a "social marketing mix" (Luca and Suggs 2010).

In examining the marketing mix of a campaign, marketers need to closely analyse competitors, which in social marketing involves examining any organisation or circumstance that is contributing to the adoption of a competing behaviour which is deemed desirable. In recent years, there have been debates about sugar consumption and its role in health. In 2014 the government of Mexico introduced a tax on drinks with added sugar. A study of this measure found that there was a reduction in the purchasing of these drinks and an increase in the purchasing of non-taxed drinks such as water (World Health Organization 2017). Effectively, policymakers enabled the price of water to be positioned in such a way relative to competing sugar-laden drinks so that it was deemed preferable by the consumers. This has encouraged other governments to explore similar levies. One would expect opposition from soft drink manufacturers who have invested in lobbying campaigns to oppose the taxes and shift the blame away from their products (Du et al. 2018).

From the Marketing Mix to Behaviour Change

The concept of marketing assumes the presence of buyers and sellers exchanging goods (Kotler and Levy 1969), but this often is not the case with regard to health behaviours. The limitations of application of the concept of marketing to public health have led to criticism of the "marketing mix" for being outdated or unhelpful in social marketing, and other concepts have emerged that focus less on the notion of a market and more on the nature of the targeted behaviour and the motivations and triggers involved (Gordon 2012). There is, however, little consensus on these theories, and one book on behaviour change identifies and lists 83 such theories (Michie et al. 2014).

A 2011 review of frameworks for social marketing proposed the "behaviour change wheel" (Michie et al. 2011) as a comprehensive guiding theory for behaviour change. According to the model, individuals must have the capability, opportunity and motivation to change (Michie et al. 2011). Numerous external factors such as wider legislation, guidelines and marketing are recognised as affecting these three individual behaviour change components (Michie et al. 2011). For instance, in the case of excessive alcohol consumption, most people will have the capability and opportunity to change their behaviour by substituting alcohol with other beverages. With that said, this may be easier or harder depending on whether the individual is, say, a bartender or living and working in somewhere where alcohol is banned. The behaviour change wheel encourages a person-centred approach to behaviour change that recognises these individual or group differences.

Another planning tool known as the Health Belief Model looks at behaviours in terms of risks and rewards, specifically, the perceived likelihood and impact of the negative health outcome related to the behaviour (or positive outcome) and the barriers to change (Champion and Skinner 2008). Where the goal is a shift away from a negative behaviour or towards a positive behaviour, the sum of the likelihood, impact and barriers is described as the individual's "readiness to act" (Champion and Skinner 2008). Also considered are the perceived triggers that will initiate behaviour or behaviour change and the self-efficacy of the individual making the change. A 2014 study that looked at the willingness of hospital inpatients to engage in safety practices found that the Health Belief Model was useful in predicting patient engagement (Bishop et al. 2015).

Social marketing and behaviour change efforts can be distinguished between those that involve direct, consumer-targeted initiatives ("downstream") and those that focus on addressing broader factors ("upstream") such as policy and legislation (Gordon 2013). Meanwhile, a "midstream" approach refers to engaging at the community ("meso") level with potential collaborators and cocreators, such as educators, local community members and peers of the target audience (Wood 2016). Midstream approaches that involve cocreation with the communities remain underemployed in social marketing, perhaps largely due to the managerial challenges they pose (McHugh et al. 2013), but collaborating with communities can help ensure that programmes address local needs with sensitivity to cultural dynamics and in a manner that strengthens community capabilities (Luca et al. 2016).

The transition from a broad-based marketing model of behaviour change to one that encompasses the psychological underpinnings of behaviour has coincided with the growing popularity of the behavioural sciences, and the emergence of behavioural economics, which explores the explanations for individuals deviating from behaviour typically considered optimal (Saunders et al. 2015).

Behaviourist theories and ideas popularised by the increasing use of cognitive-behavioural therapy have been integrated into Internet platform and smartphone apps as key tools for behaviour change (Ernsting et al. 2017). The growing influence on people's lives of connected technologies and the data that they produce about how people behave add weight to arguments that behaviours can be influenced through top-down policy-based "nudges" (Piniewski et al. 2011). For instance, the UK's Behavioural Insights Team found that by using public messaging that framed a decision around social reciprocity, it could increase organ donor registrations (Hallsworth et al. 2014).

While behavioural sciences have offered the promise of new techniques that can be used in health promotion, they have also highlighted the challenges of trying to catalogue behavioural motivations and triggers. A UK research team identified and categorised 93 behaviour change techniques (BCTs) used in behaviour change interventions (Cane et al. 2015). These include factors that are related to perceived rewards and punishments of specific behaviours, social support and comparison, goal-setting and feedback and the formation of habits. If 93 techniques did not seem challenging enough to assimilate into a singular model for practitioners, attempts to correspond BCTs to specific mechanisms of action produced 2636 links (Carey et al. 2018). Such efforts may be a step towards more rigorous evaluation and planning tools, but it seems unlikely that there will be a human genome-style breakthrough in the understanding of psychological constructs any time soon, and policymakers and practitioners must continue to be open to approaches to behaviour changes that employ human creativity and imagination.

It may ultimately be that biological bases and markers for motivation and behaviour take precedence over cognitive aspects. A 2018 paper argues that tools that test or influence neurological and physiological processes such as heart rate, skin response or eye tracking can be used to help design social marketing interventions that are more cost-effective (Harris et al. 2018). Meanwhile, research is ongoing into how the brain responds to persuasive messaging (Tompson et al. 2015).

Coupled with research into the genetic basis of behaviour (Bevilacqua and Goldman 2013), the hope is that behaviour change interventions will be able to precisely target cognitive and neural pathways and even be tailored to the individual based on their personal biochemistry and genetic predispositions, such as those implicated in alcohol or drug abuse (Naqvi and Morgenstern 2015). Inevitably, theories and models of marketing and behaviour change will need to evolve as the science and evidence-based evolves.

Emerging Evidence

One of the earliest studies evaluating 48 mass media health campaigns found positive changes in the behaviour of 8% of the targeted population (Hornik 2002). The most successful campaigns involved alcohol reduction and oral health and those with a law enforcement aspect such as seatbelt usage (Hornik 2002). Campaigns were also found to be more effective where the adoption of new behaviours was targeted, as opposed to the prevention or cessation of problematic behaviours; however successful antismoking efforts demonstrate that a systematic campaign to counter harmful behaviours can be successful (Ng et al. 2014; Xiao et al. 2013).

A 2010 Lancet study suggested that interventions that combine mass media efforts with other strategies such as community-based or regulatory activities may be more effective when it comes to preventing problematic behaviours (Wakefield et al. 2010). For instance, successful efforts to reduce smoking involved mass media campaigns combined with tobacco taxation and restrictions on commercial advertising and product packaging (Wakefield et al. 2010). The success of these efforts can be viewed as a disruption of the “marketing mix” used by corporations promoting the problematic behaviour (or an “anti-marketing”), with efforts to interfere in each of the price, promotion, place and product of cigarette marketing (El-Toukhy et al. 2018).

Despite the success of smoking reduction, evidence points to the difficulty of sustaining change in lifestyle behaviours, including nutrition and exercise, due to competing factors that can influence people to lapse into previous habits (Nestle 2006). Consequently, social marketing tends to be most effective where the behaviour change involves a singular decision, such as in vaccines or screenings (Evans 2006; French et al. 2010).

The construct of self-efficacy is recognised as a central feature and predictor of behaviour change (Williams and Rhodes 2016). Referring to the individual’s belief in their ability to make changes, self-efficacy is closely related to goal-setting and social influence, both of which are also found to be highly influential on behaviour. A 2017 meta-analysis concluded that goal-setting is an effective BCT and perhaps even a critical component of interventions (Epton et al. 2017). One of the benefits of the use of goal-setting in interventions is that it can be facilitated by non-clinicians and via computerised programmes (Bodenheimer and Handley 2009).

As for social factors, Albert Bandura has suggested self-efficacy as the pathway between psychosocial factors and health behaviours (Bandura 2004). A 2013 review highlights social influences as being of primary importance in the adoption of behaviours, noting that real-world social networks and the emergence of online social media present opportunities for behaviour change (Centola 2013).

The Digital Future

In the words of the WHO Director-General, "Harnessing the power of digital technologies is essential for achieving universal health coverage" (WHO 2019). Looking at the evidence involving digital and social media channels for behaviour change, a 2013 review found 34 intervention studies that used digital platforms such as mobile app, Facebook app, YouTube or web app to promote behaviours involving water intake, physical activity, diet and nutrition, sexual health and mental health (Chou et al. 2013). Key benefits identified for such interventions were that they could be low cost, carry greater reach, involve interactivity and allow messages to be tailored to the individual (Chou et al. 2013). Building on this, a 2017 systematic review found that while behaviour change interventions underutilise social elements, there is strong evidence for the effectiveness of social network interventions (Hunter et al. 2017).

Although a 2017 systematic review found insufficient evidence for the use of social media in health promotion involving everyday lifestyle changes (Johns et al. 2017), a 2014 meta-analysis of digital interventions involving interactive components, such as entering data or choosing from options, found them to be effective for increasing knowledge, self-efficacy, intention and behaviours relating to sexual health (Wayal et al. 2014). In a review of UK National Health Service-approved mobile apps, techniques for behaviour change included goal-setting, self-monitoring, incentives and rewards, as part of an approach known as "gamification" – motivations commonly associated with online gaming (Edwards et al. 2016). Studies show that gamification can have a positive effect in achieving health behaviour outcomes, although these are subject to the context in which such techniques are utilised (Hamari et al. 2014).

Despite widespread use of the Internet and its obvious influence on behaviours one way or another, there is a tendency for research on the role of digital technologies in behaviour change to produce vague conclusions. One reason for this may be that the Internet inherently leans towards individualisation, decentralisation and a lack of control – conditions that do not easily lend themselves towards scientific evaluation. Software is also subject to regular updates and evolutions, meaning that any study of an online service or intervention may rapidly become outdated. Additionally, there are unquestionably risks associated with the use of social networks for behaviour change that make researchers cautious, such as concerns recently exposed by criticisms of how Facebook has influenced public opinion, not to mention concerns around personal privacy and civil liberties that are unlikely to disappear (Dunn et al. 2018).

The Challenges

To the extent that social marketing is a derivative of, or alternative to, traditional marketing, it could be considered inherently at a disadvantage due to:

- *Information constraints*: Since a public health intervention rarely involves product sales, it can be inherently more difficult to collect data and measure outcomes than in the private sector.
- *Budget constraints*: Often grant funding is involved, which can carry restrictive conditions and involve a time lag. Budget constraints will also affect the hiring of talents and purchasing of advertising space.
- *Ethical constraints*: Marketing might in itself be ethically neutral or amoral, but public health marketing cannot be. Risks of perceived conflicts of interest when engaging in any form of marketing or promotion of health behaviours can be greater due to the expectation of impartiality.

The challenges of trying to mirror commercial marketing have led to scepticism about the potential for downstream approaches, and efforts have increasingly oriented around more upstream policy and regulatory change (Gordon 2013; Kennedy et al. 2018). As Wymer (2011) argues, reliance on traditional marketing techniques, particularly in pursuit of individual behaviour change, may in fact be a hindrance due to it being a derivative approach. Andreasen (2002) has also argued that perceptions of social marketing are weak and that the field of social marketing has itself been poorly marketed.

Looking more broadly at campaigns targeting behaviour change, the question of how best to evaluate programmes presents another challenge. Even where outcomes are positive, it can be challenging to precisely replicate interventions (Murray et al. 2016). It may be that successes were a result of a combination of delivery channels as well as cultural and environmental factors that collided circumstantially and serendipitously and cannot easily be controlled. Although the public health community can look to carry out RCTs to evaluate specific initiatives, attempts at evaluation will be affected by how stable and consistently replicable the intervention is (Murray et al. 2016), as Heraclitus is quoted as saying, “No man steps into the same river twice”. For this reason, guiding frameworks that can evolve and be used adaptively, and that leave space for creativity, might be considered equally as important as evidence of an intervention’s impact when developing new interventions.

There are also ethical dilemmas and issues posed by mass health campaigns that raise questions about what particular ethical framework is used, e.g. consequentialist or deontological (Petersen 2009). For example, should public health groups partner with or accept funding from corporations involved with promoting unhealthy foods – as the recent EAT-Lancet campaign did – should public health groups be very stringent in avoiding conflicts of interest by positioning themselves in opposition to such corporations? These are difficult questions. The anti-consequentialist would perhaps take a sterner position in saying that social marketers should not view corporations that promote unhealthy foods as allies. Yet from the consequentialists' perspective in which "the ends tend to justify the means", such an approach could be considered entirely justifiable or even necessary for progress.

Those that urge caution would also assert that in bold campaigns, without careful planning, there is a high risk of unintended consequences. For instance, messaging targeting obesity has been implicated in extreme dieting and eating disorders (Ramos-Salas 2015). Antismoking campaigns that use authoritarian health messaging may increase smoking in young people by cultivating feelings of defiance and rebelliousness (Wolburg 2004). Effectiveness of fear appeals may also be dependent on the efficacy of the target audience, having a contrary effect in those with low self-efficacy (Kok et al. 2018). Anti-tobacco campaign may also lead to stigma towards those with lung cancer due to the close association it has with smoking (Riley et al. 2017). As such, there is a need to carefully consider the evidence for the intervention, the behaviours that the individual may substitute for a behaviour that is being discouraged, the emotions and motivations that are being appealed to and other unintended effects.

Careful mapping of the potential ramifications and knock-on effects of an intervention must be carried out, including any possible iatrogenic effects of a campaign (Buchanan 1994; Sumnall and Bellis 2007), and due respect should be given to the "precautionary principle" (Martuzzi and Tickner 2004) when evaluating risks, which urges cautious risk assessment when faced by uncertainty. Even if there is clear evidence of benefit, what is good for one group, or what has been found to work well in one demographic, may mean something else for another. Notably, much of the research in the behavioural sciences has been carried out in wealthy, developed societies that are unlikely to be representative of the wider global population (Henrich et al. 2010).

The neglect of policy for the developing world and more deprived sectors of society does not merely mean that such countries and communities remain as they were. Instead, they often experience the side effects of policies, regulations and public health campaigning elsewhere. For instance, as sugar taxes are introduced to developed countries, soda manufacturers like Coca-Cola are increasingly incentivised to target less-regulated markets in developing parts of the world (Henderson et al. 2012). Public health programmes aimed at shifting the public away from certain behaviours or products may also have implications for communities that were involved in the production. Such complexity and uncertainty highlight the importance of stakeholder consulting and add weight to arguments in support of using both upstream policy-oriented approaches and also grass-roots, decentralised campaigns that tend to have a better understanding of complex and nuanced local issues, even if efficiencies and economies of scale tend to favour mass targeted programmes.

Examples

Case Study: The VERB Campaign to Promote Physical Activity in the USA During 2002–2006

In 2001, the US Centers for Disease Control and Prevention received US$125 million in funding from Congress to develop a media campaign, using the social marketing principles of product, price, place and promotion, to tackle childhood obesity, aiming to increase physical activity among children aged 9–13 years (Wong 2004). Evidence from systematic reviews suggested that parents and teachers have a positive influence on children's healthy behaviour including their physical activity levels (Ward et al. 2015; Xu et al. 2015); therefore parents, teachers and youth leaders were also targeted as the secondary audience to prompt them to encourage, support, recognise and reward children when they participate in physical activities (Wong 2004; Wong et al. 2008).

What Methods Were Used?

The US Congressional mandated that the campaign should use the same communication tactics that are employed by the best children's marketers (Wong 2004). Therefore, the programme utilised a multitude of media channels, such as television, radio, print, the Internet and out-of-home media (Wong et al. 2008). Following the 4Ps of product, place, price and promotion (Wong 2004), the marketing messages aimed to reinforce positive behaviours and encourage a can-do attitude rather than to condemn sedentary activity, which was an approach unlike many other health messages for children that used a more negative ("do not do") approach (Wong et al. 2008).

Beyond direct advertising, various promotional events were organised to facilitate community outreach to actively engage the audience with the campaign and encourage them to have fun, to enjoy themselves while being active with friends and to have confidence that they can be physically active for life (Huhman et al. 2004).

What Were the Campaign Outcomes?

In the first year of the campaign, the effect on increasing physical activity levels was limited only to a subpopulation that had a low active lifestyle (i.e. those that had <3 sessions of free-time activity a week before the survey), along with parents with education level less than high school, younger children 9–10 years old and girls aged from 9 to 13 years old (Huhman et al. 2005).

The effect on physical activity levels later spread to the entire target population in the second year, producing more widespread behaviour change (Huhman et al. 2007, 2010). After the second year of the campaign, a statistically significant dose-response effect of exposure to VERB on physical activity sessions and some of the psychosocial outcomes were observed (Huhman et al. 2007, 2010), indicating that the campaign was successful in driving positive physical behaviour and psychosocial improvement in children, at least in the short term.

Challenges and Wider Implications

Crucially, the campaign ended without a commitment to ongoing evaluation, meaning that there is no way to know if the goal of sustaining youth activity beyond the campaign period was achieved (Institute of Medicine et al. 2007). The short-termism of the campaign presents obvious cause for criticism, along with the little emphasis on competing behaviours and the role of corporate marketing and unhelpful policy that may perniciously influence children's behaviours. As *The Lancet* reported in 2015, children have faced ever more sophisticated and well-resourced marketing of sedentary behaviours and food that is energy-dense and nutrient-poor (Lobstein et al. 2015). While $125m seems a large budget for a public health campaign, by way of example to show how little this was relative to corporate budgets, in 1997 US advertising for candy and soft drinks was $765m and $549m, respectively (Story and French 2004). Today, it is likely that a campaign of this kind would need to employ a three-pronged approach involving downstream direct marketing efforts, midstream community collaboration and also upstream policy, corporate and structural factors.

Case Study: Mental Health Stigma and the UK's Time to Change Campaign

Stigma, discrimination and ignorance with regard to mental illness are considered to cause a substantial hindrance to active participation in society, such as employability (Brohan and Thornicroft 2010), and access to treatment and support (Henderson et al. 2013), risking to create a persistent vicious cycle for those affected. The issue of mental health discrimination is recognised in the mental health strategies of the UK government and the World Health Organization as key challenges that need to be addressed (Gronholm et al. 2017).

In 2007, two of the UK's largest mental health charities, Mind and Rethink Mental Illness, partnered to launch Time to Change (TTC), a £20m campaign aiming to challenge prejudices around mental illness in the UK and help those affected to be more open about their condition and to access appropriate support. The campaign message boldly aimed to "end the stigma" around mental illness. Initially running for 4 years, evaluation was undertaken by the Institute of Psychiatry, King's College London, to assist with the review and potential continuation of the campaign.

What Methods Were Used?

The campaign utilised mass media marketing techniques alongside social contact events which tried to create attitudinal change in the UK public, with individuals (including numerous celebrities) disclosing their own conditions and pledging to end the stigma. TTC established community stalls around the country as part of a TTC Roadshow to engage members of the public in "tackling the stigma" around mental illness, utilising those with "lived experience" of mental illness to support delivery and interaction.

Stigma can be categorised as self-stigma and public stigma, where public stigma can often involve fear and perceived danger of the stigmatised individual, and self-stigma can involve feelings of guilt and low self-worth (Corrigan 2016). An effective anti-stigma campaign, therefore, has to tackle both of these forms of stigma, in addition to attitudes of health professionals that may influence both the attitudes of the public and the individuals affected.

Efforts to combat stigma and discrimination often employ two approaches: education (involving trying to increase mental health literacy) and social contact (interaction between the target demographic for change and the stigmatised group). Evidence suggests that of these two, social contact is the more effective of the two (Corrigan 2016).

Unintended Side Effects

One of the challenges of a mass media campaign involving mental health is how to tackle stigmatising misinformation about mental health without instilling alternative inaccurate and unhelpful perceptions of mental health. For instance, a perception of mental health that shifts causal interpretations of mental illness away from personal responsibility towards biogenetic models, which while reducing blame (National Academies of Sciences 2016), can reinforce perceptions that mental illness is something that cannot be prevented or recovered from (Evans-Lacko et al. 2012; Kvaale et al. 2013). Mass advertising that dispels fears around mental health by likening mental illness to routine physical problems, such as a "numb arm", as done in one of the TTC adverts (Time to Change 2012), can be viewed as overly simplistic, reducing the seriousness of the issue or increase the tendency to self-diagnose.

It is also important to recognise the potential for "disease mongering" – i.e. widening of the boundaries of mental health diagnosis (The Plos Medicine Editors 2013) – and to be conscious of the risks of mental illness being overdiagnosed and overtreated (Dowrick and Frances 2013). In this sense, social contact events should show more promise, and indeed, TTC seems to have focused more on this area in recent years, and much of the available evaluation studies focus on the social contact aspect of the campaign.

Campaign Outcomes and Wider Implications

Evaluations of the TTC campaign found reductions in discrimination and associated behaviours in the short term (Evans-Lacko et al. 2013b), improvements in finding and retaining employment (Henderson et al. 2012) and awareness of the campaign predicted more willingness to disclose and intent to seek help (Henderson et al. 2017). A 10-year study between 2003 and 2013 found significant positive attitudinal change with regard to prejudice and exclusion since the launch of the campaign (Evans-Lacko et al. 2014), and a 2013 economic evaluation suggested that TTC was a cost-effective intervention (Evans-Lacko et al. 2013a).

An assessment of the TTC mass social contact events found improvements in intended behaviours towards those with mental health problems and future engagement with the campaign (although no evidence of improvements in willingness to disclose a mental health problem) (Evans-Lacko et al. 2012). Uncertainties around long-term effectiveness (Gronholm et al. 2017) of the campaign and of social contact interventions indicate the need for continuing evaluation and consideration for structural factors that could potentially contribute to the elasticity of negative attitudes, including among health workers – a group that showed some resistance to attitudinal change (Brindle 2013).

One of the limitations of the campaign to date, at least in so far as the degree to which the campaign is addressing mental illness in the UK population, is that most of the studies evaluate the effectiveness of TTC with regard to attitudes and discrimination but not with regard to mental health itself. Concerns about the inadequate supply and quality of mental health services have been growing in recent years (Ratnarajan 2016), with a survey of 1000 GPs in 2018 suggesting that 40% of all GP consultations involve a mental health issue (Osborne 2018). As anti-stigma campaigns have improved awareness of professional services and willingness to seek help, it is important to consider whether this might inadvertently have increased demand on already heavily burdened mental health services and hindered those most in need from accessing support. As discussed by Westfall et al. (2016), stigma prevention efforts may have also encouraged conversations that focus on openness and acceptability and crowded out those involving origins and prevention of mental illness.

Drawing Conclusions and Looking Ahead

Just as product or service marketing is a central function of businesses, the promotion of healthy, prosocial behaviours is a central function of governments and civic institutions. Some progress has been made, evidenced by declining rates of infectious diseases worldwide, despite the continuing risk of pandemics in a highly connected global society (Dye 2014). Meanwhile, increasing lifespans have led to a greater incidence of non-communicable diseases, which now make up over half of the global disease burden (Benziger et al. 2016). Since such conditions can largely be prevented and managed with lifestyle modifications (Pryor et al. 2017), there is evidently a lot more work to be done with regard to health promotion and behaviour change.

Over the coming decades, overstretched health services and too few health professionals in ageing societies look set to shift the responsibility for health care towards two parties: the first, technology, with all its promise and pitfalls, and the other, broader communities of people without medical expertise. Technology companies with platforms that enable communities to build and promote new applications show the potential for technology to foster forms of community cocreation. The future of social marketing and behaviour change will inevitably build on such precedents, harnessing technology to develop more midstream peer-to-peer platforms and programmes that utilise social and community capital.

Public health partnerships between the public and private sector have grown increasingly important in modern global society, but present challenges and issues of contention (Buse and Waxman 2001; Ciccone 2010). Just as being too closely associated with corporate influences can be unethical and lead to conflicts of interest, viewing corporations as merely enemies or competitors can be equally unhelpful. Public social marketing budgets can scarcely hope to compete with corporate marketing budgets, and any attempt to rely on a direct game of competition to capture public attention is to inevitably misallocate resources. On the other hand, public health groups must be proactive in identifying risks and opportunities in a globalised society, even at times if this means taking action before all the data and evidence comes in. The growth of the global marketplace has coincided with environmental damage and risks that threaten the health of communities and the natural environment, and it may well be that community behaviour change interventions will need to be balanced with substantive regulatory policy and innovation. Although it remains a challenge to influence behaviour and lifestyle change across demographics, the history of successful campaigns reveals some of the important factors for successful social marketing.

To this end, health leaders must be prepared to ride the wave of technological innovation and to operate in a collaborative and policy-driven manner, with a view to long-term systems of health. From the lens of developed, liberal societies, this ultimately means trusting that people can be receptive to good ideas, that they desire to be healthy and that they have an innate interest in making our communities healthier.

References

Andreasen, A. (2002). Marketing social marketing in the social change marketplace. *Journal of Public Policy & Marketing, 21*(1), 3–13. https://doi.org/10.1509/jppm.21.1.3.17602.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 31*(2), 143–164. https://doi.org/10.1177/1090198104263660.

Benziger, C. P., Roth, G. A., & Moran, A. E. (2016). The global burden of disease study and the preventable burden of NCD. *Global heart, 11*(4), 393–397.

Bevilacqua, L., & Goldman, D. (2013). Genetics of impulsive behaviour. *Philosophical transactions of the Royal Society of London Series B, Biological Sciences, 368*, 20120380. https://doi.org/10.1098/rstb.2012.0380.

Bishop, A. C., Baker, G. R., Boyle, T. A., & MacKinnon, N. J. (2015). Using the Health Belief Model to explain patient involvement in patient safety. *Health Expectations, 18*(6), 3019–3033. https://doi.org/10.1111/hex.12286.

Bodenheimer, T., & Handley, M. A. (2009). Goal-setting for behavior change in primary care: An exploration and status report. *Patient Education and Counseling, 76*(2), 174–180. https://doi.org/10.1016/j.pec.2009.06.001. Epub 2009 Jun 27.

Brindle, D. (2013). Mental health anti-stigma campaign fails to shift health professionals' attitudes. *The Guardian*. Retrieved from https://www.theguardian.com/healthcare-network/2013/apr/03/mental-health-anti-stigma-campaign

Brohan, E., & Thornicroft, G. (2010). Stigma and discrimination of mental health problems: Workplace implications. *Occupational Medicine, 60*(6), 414–415. https://doi.org/10.1093/occmed/kqq048.

Buchanan, D. R. (1994). Social marketing: A critical appraisal. *Health Promotion International, 9*(1), 49–51. https://doi.org/10.1093/heapro/9.1.49.

Buse, K., & Waxman, A. (2001). Public-private health partnerships: A strategy for WHO. *Bulletin of the World Health Organization, 79*(8), 748–754.

Cane, J., Richardson, M., Johnston, M., Ladha, R., & Michie, S. (2015). From lists of behaviour change techniques (BCTs) to structured hierarchies: Comparison of two methods of developing a hierarchy of BCTs. *British Journal of Health Psychology, 20*(1), 130–150. https://doi.org/10.1111/bjhp.12102.

Carey, R. N., Connell, L. E., Johnston, M., Rothman, A. J., de Bruin, M., Kelly, M. P., & Michie, S. (2018). Behavior change techniques and their mechanisms of action: A synthesis of links described in published intervention literature. *Annals of Behavorial Medicine, 53*(8), 693–707. https://doi.org/10.1093/abm/kay078.

Centola, D. (2013). Social media and the science of health behavior. *Circulation, 127*, 2135–2144. https://doi.org/10.1161/CIRCULATIONAHA.112.101816.

Champion, V. L., & Skinner, C. S. (2008). The health belief model. *Health Behavior and Health Education: Theory, Research, and Practice, 4*, 45–65.

Chou, W. Y., Prestin, A., Lyons, C., & Wen, K. Y. (2013). Web 2.0 for health promotion: Reviewing the current evidence. *American Journal of Public Health, 103*(1), e9–e18. https://doi.org/10.2105/ajph.2012.301071.

Ciccone, D. K. (2010). Arguing for a centralized coordination solution to the public-private partnership explosion in global health. *Global Health Promotion, 17*(2), 48–51. https://doi.org/10.1177/1757975910365224.

Corrigan, P. W. (2016). Lessons learned from unintended consequences about erasing the stigma of mental illness. *World Psychiatry, 15*(1), 67–73. https://doi.org/10.1002/wps.20295.

Dowrick, C., & Frances, A. (2013). Medicalising unhappiness: New classification of depression risks more patients being put on drug treatment from which they will not benefit. *BMJ, 347*, f7140. https://doi.org/10.1136/bmj.f7140.

Du, M., Tugendhaft, A., Erzse, A., & Hofman, K. J. (2018). Sugar-sweetened beverage taxes: Industry response and tactics. *The Yale Journal of Biology and Medicine, 91*(2), 185–190.

Dunn, A. G., Mandl, K. D., & Coiera, E. (2018). Social media interventions for precision public health: Promises and risks. *npj Digital Medicine, 1*(47). https://doi.org/10.1038/s41746-018-0054-0.

Dye, C. (2014). After 2015: Infectious diseases in a new era of health and development. *Philosophical Transactions of the Royal Society B: Biological Sciences, 369*(1645), 20130426. https://doi.org/10.1098/rstb.2013.0426.

Edwards, E. A., et al. (2016). Gamification for health promotion: Systematic review of behaviour change techniques in smartphone apps. *BMJ Open, 6*(10), e012447. https://doi.org/10.1136/bmjopen-2016-012447.

El-Toukhy, S., et al. (2018). Banning tobacco price promotions, smoking-related beliefs and behaviour: Findings from the International Tobacco Control Four Country (ITC 4C) Survey. *Tobacco Control, 27*(3), 310–318. https://doi.org/10.1136/tobaccocontrol-2017-053648.

Epton, T., Currie, S., & Armitage, C. J. (2017). Unique effects of setting goals on behavior change: Systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology, 85*(12), 1182–1198.

Ernsting, C., Dombrowski, S. U., Oedekoven, M. O., Sullivan, J. L., Kanzler, M., Kuhlmey, A., & Gellert, P. (2017). Using smartphones and health apps to change and manage health behaviors: A population-based survey. *Journal of Medical Internet Research, 19*(4), e101–e101. https://doi.org/10.2196/jmir.6838.

Evans, W. D. (2006). How social marketing works in health care. *BMJ, 332*(7551), 1207–1210. https://doi.org/10.1136/bmj.332.7551.1207-a.

Evans-Lacko, S., et al. (2012). Mass social contact interventions and their effect on mental health related stigma and intended discrimination. *BMC Public Health, 12*, 489. https://doi.org/10.1186/1471-2458-12-489.

Evans-Lacko, S., Henderson, C., Thornicroft, G., & McCrone, P. (2013a). Economic evaluation of the anti-stigma social marketing campaign in England 2009–2011. *British Journal of Psychiatry, 202*(s55), s95–s101. https://doi.org/10.1192/bjp.bp.112.113746.

Evans-Lacko, S., et al. (2013b). Influence of time to change's social marketing interventions on stigma in England 2009–2011. *British Journal of Psychiatry, 202*(s55), s77–s88. https://doi.org/10.1192/bjp.bp.113.126672.

Evans-Lacko, S., Corker, E., Williams, P., Henderson, C., & Thornicroft, G. (2014). Effect of the time to change anti-stigma campaign on trends in mental-illness-related public stigma among the English population in 2003–13: An analysis of survey data. *The Lancet Psychiatry, 1*(2), 121–128. https://doi.org/10.1016/S2215-0366(14)70243-3.

French, J., Blair-Stevens, C., McVey, D., & Merritt, R. (2010). *Social marketing and public health: Theory and practice*. Oxford: Oxford University Press.

Gordon, R. (2012). Re-thinking and re-tooling the social marketing mix. *Australasian Marketing Journal, 20*(2), 122–126.

Gordon, R. (2013). Unlocking the potential of upstream social marketing. *European Journal of Marketing, 47*(9), 1525–1547. https://doi.org/10.1108/EJM-09-2011-0523.

Gronholm, P. C., Henderson, C., Deb, T., & Thornicrof, G. (2017). Interventions to reduce discrimination and stigma: The state of the art. *Social Psychiatry and Psychiatric Epidemiology, 52*(3), 249–258. https://doi.org/10.1007/s00127-017-1341-9.

Hallsworth, M., et al. (2014). *EAST Four simple ways to apply behavioural insights. The Behavioural Insights Team Publications*. London: Cabinet Office.

Hamari, J., Koivisto, J., & Sarsa, H. (2014). *Does gamification work?--A literature review of empirical studies on gamification*. In: 2014 47th Hawaii international conference on system sciences (HICSS), IEEE, pp. 3025–3034

Harris, J. M., Ciorciari, J., & Gountas, J. (2018). Public health social media communications and consumer neuroscience. *Cogent Psychology, 5*, 1434058. https://doi.org/10.1080/23311908.2018.1434058.

Henderson, C., Corker, E., Lewis-Holmes, E., Hamilton, S., Flach, C., Rose, D., Williams, P., Pinfold, V., & Thornicroft, G. (2012). England's time to change antistigma campaign: One-year outcomes of service user-rated experiences of discrimination. *Psychiatric Services, 63*(5), 451–457. https://doi.org/10.1176/appi.ps.201100422.

Henderson, C., Evans-Lacko, S., & Thornicroft, G. (2013). Mental illness stigma, help seeking, and public health programs. *American Journal of Public Health, 103*, 777–780. https://doi.org/10.2105/ajph.2012.301056.

Henderson, C., Robinson, E., Evans-Lacko, S., & Thornicroft, G. (2017). Relationships between anti-stigma programme awareness, disclosure comfort and intended help-seeking regarding a mental health problem. *British Journal of Psychiatry, 211*, 316–322. https://doi.org/10.1192/bjp.bp.116.195867.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*, 61–83. https://doi.org/10.1017/S0140525X0999152X.

Hornik, R. (2002). *Public health communication: Evidence for behavior change*. Lawrence Erlbaum Associates, Inc., Publishers.

Huhman, M. E., Heitzler, C., & Wong, F. (2004). The VERB campaign logic model: A tool for planning and evaluation. *Preventing Chronic Disease, 1*, A11–A11.

Huhman, M. E., Potter, L. D., Wong, F. L., Banspach, S. W., Duke, J. C., & Heitzler, C. D. (2005). Effects of a mass media campaign to increase physical activity among children: Year-1 results of the VERB campaign. *Pediatrics, 116*, e277–e284. https://doi.org/10.1542/peds.2005-0043.

Huhman, M. E., Potter, L. D., Duke, J. C., Judkins, D. R., Heitzler, C. D., & Wong, F. L. (2007). Evaluation of a National Physical Activity Intervention for Children: VERB™ Campaign, 2002–2004. *American Journal of Preventive Medicine, 32*, 38–43. https://doi.org/10.1016/j.amepre.2006.08.030.

Huhman, M. E., Potter, L. D., Nolin, M. J., Piesse, A., Judkins, D. R., Banspach, S. W., & Wong, F. L. (2010). The influence of the VERB campaign on children's physical activity in 2002 to 2006. *American Journal of Public Health, 100*, 638–645. https://doi.org/10.2105/ajph.2008.142968.

Hunter, R. F., de la Haye, K., Badham, J., Valente, T., Clarke, M., & Kee, F. (2017). Social network interventions for health behaviour change: A systematic review. *The Lancet, 390*, S47. https://doi.org/10.1016/S0140-6736(17)32982-3.

Institute of Medicine et al. (2007). *Progress in preventing childhood obesity: How do we measure up?* Washington, DC: The National Academies Press. https://doi.org/10.17226/11722.

Johns, D. J., Langley, T. E., & Lewis, S. (2017). Use of social media for the delivery of health promotion on smoking, nutrition, and physical activity: A systematic review. *The Lancet, 390*, S49. https://doi.org/10.1016/S0140-6736(17)32984-7.

Kennedy, A.-M., Kemper, J. A., & Parsons, A. G. (2018). Upstream social marketing strategy. *Journal of Social Marketing, 8*(1), 258–279. https://doi.org/10.1108/JSOCM-03-2017-0016.

Kok, G., Peters, G. Y., Kessels, L. T. E., Ten Hoor, G. A., & Ruiter, R. A. (2018). Ignoring theory and misinterpreting evidence: The false belief in fear appeals. *Health Psychology Review, 12*(2), 111–125.

Kotler, P., & Levy, S. (1969). Broadening the concept of marketing. *Journal of Marketing, 33*(1), 10–15. https://doi.org/10.2307/1248740.

Kotler, P., & Zaltman, G. (1971). Social marketing: An approach to planned social change. *Journal of Marketing, 35*, 3–12. https://doi.org/10.1177/002224297103500302.

Kurtz, D. L., MacKenzie, H., & Snow, K. (2009). *Contemporary marketing*. Stamford: Cengage Learning.

Kvaale, E. P., Haslam, N., & Gottdiener, W. H. (2013). The 'side effects' of medicalization: A meta-analytic review of how biogenetic explanations affect stigma. *Clinical Psychology Review, 33*, 782–794. https://doi.org/10.1016/j.cpr.2013.06.002.

Lobstein, T., Jackson-Leach, R., Moodie, M. L., Hall, K. D., et al. (2015). Child and adolescent obesity: Part of a bigger picture. *The Lancet, 385*, 2510–2520. https://doi.org/10.1016/S0140-6736(14)61746-3.

Luca, N. R., & Suggs, L. S. (2010). Strategies for the social marketing mix: A systematic review. *Social Marketing Quarterly, 16*(4), 122–149.

Luca, N. R., Hibbert, S., & McDonald, R. (2016). Midstream value creation in social marketing. *Journal of Marketing Management, 32*(11–12), 1145–1173. https://doi.org/10.1080/0267257X.2016.1190777.

Martuzzi, M., & Tickner, J. A. (2004). *The precautionary principle: Protecting public health, the environment and the future of our children*. Copenhagen: WHO Regional Office for Europe.

McHugh, P., Stead, M., Domegan, C., Hughes, T., & Collins, K. (2013). Value co-creation in social marketing: Functional or fanciful? *Journal of Social Marketing, 3*(3), 239–256. https://doi.org/10.1108/JSOCM-03-2013-0020.

Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science, 6*, 42. https://doi.org/10.1186/1748-5908-6-42.

Michie, S., West, R., Campbell, R., Brown, J., & Gainforth, H. (2014). *ABC of behaviour change theories*. London: Silverback Publishing.

Murray, E., Hekler, E. B., Andersson, G., Collins, L. M., et al. (2016). Evaluating digital health interventions: Key questions and approaches. *American Journal of Preventive Medicine, 51*(5), 843–851. https://doi.org/10.1016/j.amepre.2016.06.008.

Naqvi, N. H., & Morgenstern, J. (2015). Cognitive neuroscience approaches to understanding behavior change in alcohol use disorder treatments. *Alcohol Research: Current Reviews, 37*(1), 29–38.

National Academies of Sciences, Engineering, and Medicine. (2016). *Ending discrimination against people with mental and substance use disorders: The evidence for stigma change*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23442.

Nestle, M. (2006). Food marketing and childhood obesity — A matter of policy new England. *Journal of Medicine, 354*, 2527–2529. https://doi.org/10.1056/NEJMp068014.

Ng, M., Freeman, M. K., Fleming, T. D., Robinson, M., et al. (2014). Smoking prevalence and cigarette consumption in 187 countries, 1980–2012. *Journal of the American Medical Association, 311*, 183–192. https://doi.org/10.1001/jama.2013.284692.

Osborne, K. (2018). Almost half of GP consultations 'now include a mental health issue'. *Pulsetoday*. Retrieved from http://www.pulsetoday.co.uk/clinical/clinical-specialties/mental-health/almost-half-of-gp-consultations-now-include-a-mental-health-issue/20036839.article.

Petersen, J. (2009). *Social marketing and public health*. London: University College London.

Piniewski, B., Codagnone, C., & Osimo, D. (2011). *Nudging lifestyles for better health outcomes: Crowsourced data and persuasive technologies for behavioural change*. Luxembourg: Publications Office of the European Union.

Pryor, L., Da Silva, M. A., & Melchior, M. (2017). Mental health and global strategies to reduce NCDs and premature mortality. *The Lancet Public Health, 2*(8), e350–e351.

Ramos-Salas, X. (2015). The ineffectiveness and unintended consequences of the public health war on obesity. *Canadian Journal of Public Health, 106*(2), e79–e81. https://doi.org/10.17269/cjph.106.4757.

Ratnarajan, J. (2016). GPs like me can't help mental health patients in 10 minutes – It's cruel. *The Guardian*. https://www.theguardian.com/healthcare-network/views-from-the-nhs-front-line/2016/may/16/gps-cant-help-mental-health-depression-patients-10-minutes-cruel

Reich, M. R. (Ed.). (2002). *Public-private partnerships for public health (volume 1)*. Cambridge, MA: Harvard University Press.

Riley, K. E., Ulrich, M. R., Hamann, H. A., & Ostroff, J. S. (2017). Decreasing smoking but increasing stigma? Anti-tobacco campaigns, public health, and cancer care. *AMA journal of Ethics, 19*(5), 475–485.

Saunders, S. G., Barrington, D. J., & Sridharan, S. (2015). Redefining social marketing: Beyond behavioural change. *Journal of Social Marketing, 5*(2), 160–168. https://doi.org/10.1108/JSOCM-03-2014-0021.

Story, M., & French, S. (2004). Food advertising and marketing directed at children and adolescents in the US. *The International Journal of Behavioral Nutrition and Physical Activity, 1*(1), 3. https://doi.org/10.1186/1479-5868-1-3.

Sumnall, H. R., & Bellis, M. A. (2007). Can health campaigns make people ill? The iatrogenic potential of population-based cannabis prevention. *Journal of Epidemiology and Community Health, 61*, 930–931. https://doi.org/10.1136/jech.2007.060277.

The Plos Medicine Editors. (2013). The paradox of mental health: Over-treatment and under-recognition. *PLOS Medicine, 10*(5), e1001456. https://doi.org/10.1371/journal.pmed.1001456.

Time to Change. (2012). The stand up kid – Time to change [video file]. *YouTube*. Retrieved from http://www.easybib.com/guides/citation-guides/apa-format/youtube-video/

Tompson, S., Lieberman, M. D., & Falk, E. B. (2015). Grounding the neuroscience of behavior change in the sociocultural context. *Current Opinion in Behavioral Sciences, 5*, 58–63.

Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261–1271.

Ward, S., Bélanger, M., Donovan, D., & Carrier, N. (2015). Systematic review of the relationship between childcare educators' practices and preschoolers' physical activity and eating behaviours. *Obesity Reviews, 16*, 1055–1070. https://doi.org/10.1111/obr.12315.

Wayal, S., Bailey, J. V., Murray, E., Rait, G., Morris, R. W., Peacock, R., & Nazareth, I. (2014). Interactive digital interventions for sexual health promotion: A systematic review and meta-analysis of randomised controlled trials. *The Lancet, 384*(special issue), S85. https://doi.org/10.1016/S0140-6736(14)62211-X.

Weinreich, N. (2006). *What is social marketing*. Retrieved from http://www.social-marketing.com/Whatis.html

Westfall, J., Miller, B. F., & Bazemore, A. (2016). No room for prevention: The unintended consequence of mental health stigma reduction efforts. *Health affairs*. Retrieved from https://www.healthaffairs.org/do/10.1377/hblog20160630.055649/full/

Williams, D. M., & Rhodes, R. E. (2016). The confounded self-efficacy construct: Conceptual analysis and recommendations for future research. *Health Psychology Review, 10*(2), 113–128.

Wolburg, J. (2004). The need for new anti-smoking advertising strategies that do not provoke smoker defiance. *Journal of Consumer Marketing, 21*, 173. https://doi.org/10.1108/07363760410534713.

Wong, F. (2004). VERB – A social marketing campaign to increase physical activity among youth. *Preventing Chronic Disease, 1*(3), A10.

Wong, F. L., Greenwell, M., Gates, S., & Berkowitz, J. M. (2008). It's what you do!: Reflections on the VERB campaign. *American Journal of Preventive Medicine, 34*, S175–S182. https://doi.org/10.1016/j.amepre.2008.03.003.

Wood, M. (2016). Midstream social marketing and the co-creation of public services. *Journal of Social Marketing, 6*, 277–293.

World Health Organisation. (2019). *WHO releases first guideline on digital health interventions*. Retrieved from https://www.who.int/news-room/detail/17-04-2019-who-releases-first-guideline-on-digital-health-interventions

World Health Organization. (2017). *Taxes on sugary drinks: Why do it?* (Vol. 2019). Geneva: World Health Organization.

Wymer, W. (2011). Developing more effective social marketing strategies. *Journal of Social Marketing, 1*, 17–31. https://doi.org/10.1108/20426761111104400.

Xiao, D., Chen, Z., & Wang, C. (2013). Effects of a short-term mass-media campaign against smoking. *The Lancet, 382*, 1964–1966. https://doi.org/10.1016/S0140-6736(13)61839-5.

Xu, H., Wen, L. M., & Rissel, C. (2015). Associations of parental influences with physical activity and screen time among young children: A systematic review. *Journal of Obesity, 2015*, 546925–546925. https://doi.org/10.1155/2015/546925.

Chapter 18
Public Health in the Context of Environment and Housing

Joseph H. L. Chan and Chun Cheong Ma

Introduction

Built environment and housing have considerable impacts on physical health and psychological health, well-being and even building occupants' performance (Xie et al. 2017). In the twenty-first century, many people spend much of the day in indoor environment, and most of this is in the home of developed countries. Health-associated risks in domestic buildings are therefore of significant relevance.

Given profound research endeavours have well indicated that the most vulnerable population groups, e.g. sick, poor, elderly, minority etc., spending even more of their time in built environments, thus, they are the most in the pressing need of healthy and well-planned built environments in order to avoid being social health burdens. Even though a number of relevant concepts such as "adequate housing" and "sustainable buildings" have emerged in recent years, yet health and wellness considerations are not very often considered as the prime concerns in construction and rehabilitation of buildings. Moreover, construction and housing standards are primarily based on engineering knowledge and aesthetics of buildings. Previous research and systematic reviews, however, reveal that physical and mental health problems are significantly linked with all physical living environment, in particular,

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inadequate housing and dilapidated housing (Hoisington et al. 2015). Decent housing has profoundly improved the health and wellness status of building occupants in developed countries across the globe, while some specific health hazards such as unintentional injuries and exposure to heavy metal, like lead and radon, can still be found even in housing with good and well-designed condition.

Epidemiologic studies show that the global ageing population is estimated to increase alarmingly in the following decade. By 2050, population aged 60 or above accounts for 22% of the total population in the globe (Kanasi et al. 2016). However, this global trend warns the policymakers, health practitioners and environment engineering practitioners that more fragile, susceptible and ill population will increase vigorously. A sound and comprehensive built environment and public health planning is imperative for sustainable development and to address unprecedented challenges ahead. Furthermore, special design features of the building providing synergistic effects in shaping human behaviour include access to safe places for physical activity, facilities for active travel as well as an environment to facilitate healthier choices in diet (Hoisington et al. 2015).

This chapter presents a comprehensive review of contemporary research on effects of built environment on health and wellness and provides interdisciplinary insights for possible improvement of housing, built environment and health outcomes of building occupants in the community at large with best evidence.

Definition of Health and Wellness

There is nothing more important than population and wellness. From an ordinary perspective, "“health” is used to be defined as “the physical body is under conditions without disease” (Xie et al. 2017). However, all human being was defined as a unique and complicated biopsychosocial entity; simply put, this means human not only has physical characteristics but also psychological and social characteristics. World Health Organization (WHO) provided a definition of health, “Health is a state of complete physical, mental and social well-being and note merely the absence of disease or infirmity” (WHO 2018).

While in the context of primary health care and preventive medicine, the National Wellness Institute proposed the wellness concept that was found crucial to help achieve sustainable health and city development. There are eight dimensions in wellness (Fig. 18.1) and it is defined as a dynamic and active process of a person becoming aware of and making choices towards a healthy life (the University of California, Davis Campus n.d.; Stoewen 2017). Other than that, wellness is more than merely being free from illness or sickness. It is a vibrant and dynamic process of a change of growth. Wellness is likewise considered as “a conscious, self-directed and evolving process of achieving full potential” (National Wellness Institute 2018).

Fig. 18.1 Eight dimensions of wellness. (Adapted from Stoewen 2017)

Healthy Building of Built Environment

With the fast growing development in economy and advancement in science and medical technology, there is an increasing demand for healthy buildings ever than before as possible results of increase in household disposable money income and shifting of labour-intensive manual work to knowledge-intensive work (Davies 2009). Al horr et al. (2016) pointed out that many people spend at least 90% of their time in indoor environment. Thereby, healthy building environment is of prime importance to public health-friendly development.

WHO was the first international authority to identify the concept of healthy buildings. WHO described the environment as being free of hazardous building materials and should be capable of promoting health and comfort of building occupants in order to meet the social needs and increase building occupants' productivity (Barton and Grant 2008).

There is a more conclusive definition of healthy building over the past few decades. The concept of healthy building was firstly and simply considered as a design primer for a built environment (Hoisington et al. 2015). In 1993, healthy building concepts extended to the interior environment; as such, indoor elements and interior environmental quality have reflected a positive relationship with human health (Wyon 1993; Fisk et al. 1993). At the Healthy Building Conference in Espoo of Finland in 2000, apart from temperature, humidity ventilation and illumination, the healthy building concept evolved to space planning, colour and mental needs of the building occupants (Loftness et al. 2007). In 2016, healthy building in the white paper was revised in Europe and shaped the idea of a high-performance building, which is characterised by human comfort, safety and sustainability in order to meet arising occupants' needs (Brunsgaard and Fich 2016). Some studies also suggested that healthy building shall put the construction process and construction workers' physiological, psychological health and safety into consideration (Love et al. 2010; Zhang et al. 2014). Apart from that, sustainable development has been overwhelmingly put into account recently; the behind rationale suggested that health status and building lifecycle could be largely affected by an array of environmental pollutions (Chang et al. 2007; Kahhat et al. 2009).

Collectively speaking, in recent years, international studies have gradually achieved consensus on the conceptual framework of healthy building, of which no longer purely consider the exterior design, aesthetic building outlook and health condition of indoor environment. However, it conversely added other important attributes into the construction framework, such as the process of construction, well-being of construction process of the stakeholders, surrounding environment as well as importantly the occupants' physiological, psychological and social needs. Furthermore, the China Academy of Building Research likewise echoed previous studies and proposed that healthy buildings should take all development stages of a building into account in the nation (China Academy of Building Research 2016).

Effects of Built Environment on Health

Previous studies have established sound foundations that the features of the built environment play an important role in shaping health behaviours and overall well-being of the community dwellers. Identification of variables related to built environment that can mediate and moderate health effects is imperative for sustainable health and environment. The following sections provide an overview upon the dynamic interaction between built environment and health in terms of physiological and psychological perspectives. Some research suggested that health inequalities are strongly associated with the poor environments, whereas in which exists a good number of disadvantaged lives. Such places are typically being reported for lacking regular maintenance, high levels of graffiti and littering and even fear of crime. These undesirable phenomena can force the underprivileged population into more sedentary and isolated circumstances (Bird 2016). Recent evidence-based epidemiological review studies have suggested that urbanisation and modern development of the built environment does provide good numbers of socioeconomic benefits, yet the ambitious developments also have brought undesirable effects to population health.

Over the past few decades, there has been rising recognition globally on the impacts of urban environment and built environment on human health and public health (Roux 2003; Macintyre et al. 2002; Perdue et al. 2003; Rao et al. 2007;

Vlahov et al. 2007). The current evidences collectively conclude that well-planned built environment with primary health and public health development is imperative for both affluent and poor environments.

Physiological Perspective

Poor built environment not only shows positive correlation with communicable diseases but also non-communicable diseases (NCD), e.g. cardiovascular disease and chronic respiratory disease (WHO 2011; Walls et al. 2016), and including mental disorders such as depression and post-traumatic stress disorder.

Cardiovascular Disease

Global mortality rates from non-communicable diseases (NCD) have been reported astonishingly high and keep increasing (WHO 2014). A recent systematic review reported that more than 70% of global cardiovascular diseases (CVDs) are attributable to modifiable risk factors (Malambo et al. 2016). Rapid globalisation and increasing urbanisation and global change in social norms and values promote the global trends towards unhealthy lifestyles (Maher et al. 2012). However, the ecological model has stated that tremendous human behaviour changes are strongly influenced by various factors such as social environment, neighbourhood environment, urban planning as well as transportation planning, yet the neighbourhood environment is regarded as an important culprit (Sallis et al. 2009, 2012; Bracy et al. 2014). Furthermore, Malambo et al. (2016) conducted a comprehensive review of literature and reported that neighbourhood environment and CVD risk factors and outcomes were found to have a statistically significant correlation ($p < 0.05$). Moreover, neighbourhood environmental attributes were significantly associated with myocardial infarction, coronary heart disease, congestive heart failure, angina and stroke (Chum and O’Campo 2015; Hamano et al. 2013; Kan et al. 2008).

Malambo et al. (2016) suggest that an array of neighbourhood environment attributes is related to physical inactivity. Regional density distribution of fast-food outlets, high walkable neighbourhood environment and supermarkets or grocery stores have significant association with metabolic syndrome, blood pressure, diabetes mellitus (type 2) and body mass index (BMI). Furthermore, road proximity and density and convenience of traffic are regarded as leading factors of CVD outcomes.

Furthermore, food environment like the density and the distribution of fast food restaurants was found to have moderate to strong association with BMI or blood pressure (Holsten 2009; O Ferdinand et al. 2012; Mackenbach et al. 2014). Higher accessibility to fast-food shops and limited accessibility to supermarkets are regarded as moderate to strong evident leading factors to drive the community dwellers to access to convenience shops and fast-food outlets. Thus in the long term it inevitably promotes the propensity of consuming unhealthy foods and results in poor BMI level and blood pressure levels hitting alarming level (Inagami et al. 2006; Malambo et al. 2016).

Asthma and Respiratory Diseases

Paediatric asthma and allergy are bothering and prevalent epidemic across the globe. Environmental factors are regarded as key leading culprit in this respiratory and immunological epidemiology (Casas et al. 2016; Brodin et al. 2015; Tischer et al. 2017). The association between urban development and respiratory diseases has recently been drawing increased attention. Biodiversity is regarded as a significant role in the reduction of prevalence and incidence rate of allergic conditions and respiratory diseases. Studies also revealed that increase in biodiversity of the living environment has inverse association with immune system dysfunctions (Hanski et al. 2012; Mhuireach et al. 2016). Moreover, greenness, density of built-up area and density of native vegetation have significant roles in the incidence rate of atopic sensitisation. A notion suggests that the higher the greenness covering rate, the denser the native vegetation and less dense built-up area would result in lowered incidence rate of immunological or respiratory diseases (Ruokolainen et al. 2015). According to Tischer et al. (2017), residential surrounding greenness and proximity to green space are negatively associated with the respiratory health impacts in recent epidemiology studies. In one of the recent meta-analysis studies, Fuertes et al. (2016) critically confirmed the protective effects of greenness alone on the alleviation of asthma and allergic problems.

Loss of natural environment and shrinkage of microbial diversity in the built community due to the decline of biodiversity, in the long term, might contribute to the increase in number of immunological and inflammatory diseases. Moreover, slumping of diverse microbial environment in early stage of life might largely reduce the chance of exposure to allergens and in turn lead to weakened immune response among younger group of community dwellers and compromise the human immunological tolerance against harmful or lethal allergens (Casas et al. 2016; von Mutius 2016). Collectively, these results strongly echoed the findings of Dadvand et al. (2014) that planned arrangement of green and grey coverage in the living environment might tremendously affect air pollutant levels and the concentration of allergens and in turn affect human health outcomes.

Physical Activity

Indoor environment is different from the natural environment in the aspect of diversity of ways of life, in which physical activity patterns can be deliberately shaped (Roof and Oleru 2008). Configuration and organisation of urban space, types and organisation of the level of scale of built and natural features, quality of landscaping, transportation systems and the interconnectivity and accessibility of local facilities and services are factors that determine the community dwellers' incentive to participate actively in physical activities. A study by Brownson et al. (2009) indicated that quality of air, pollution and risk perceptions about personal safety have shown moderate evidence to reflect the dynamic interplay between the physical living environment and physical activity patterns of community dwellers. Generally speaking, built environment poses considerable influence on physical activity patterns and frequency and even determines the physical inactive incidence rate, as well as obesity.

Obesogenic environments have been pointed out as a culprit of physical inactive and sedentary lifestyle (Swinburn et al. 1999; Ulijaszek 2018). Attributes to obesogenic environments are sedentary occupations, great preponderance of motorised transport, cheap and easy availability of highly refined carbohydrates as well as high-fat and high-cholesterol foods and beverages (Booth et al. 2001). Population in high income countries (HICs) with greater propensity has less physical activity but higher obesity rates (Ulijaszek 2017). The phenomena of physical inactivity and obesity are largely attributed by the ever availability of water, foods, electricity, transport, instantly available health care services, communication infrastructure and welfare provision. Community dwellers are no longer living in rural lifestyle (Ulijaszek 2017).

Cancer Mortality

The built environment comprises conditions affecting availability of recreational facilities, walkability, health promotion resources and education resources such as playgrounds, sports courts, grocery, and besides undesirable amenities such as fast-food shops and liquor stores that dramatically affect population health behaviours (Gomez et al. 2015). The Multilevel Biologic and Social Integrative Construct defines three primary hierarchical levels, macro-environmental, individual and biologic factors, to explain how the built environment interacts with cancer aetiology. Among non-communicable health concerns, cancer is categorised as an important contributor. Current epidemiology evidence has shown it poses nearly 50% of lifetime risk to the population (Lynch and Rebbeck 2013).

A recent study by Gomez et al. (2015) stated that built environment could influence the general health outcomes of community dwellers by means of health behaviours, building material selection, access to resources and psychosocial mechanisms. All of them have influential effects on cancer across the continuum of cancer risks, diagnosis, treatment, prognosis, survival rate and mortality. Furthermore, neighbourhood environments have significant association with carcinogenesis, cancer survival and health behaviours (Gehlert et al. 2007; Lynch and Rebbeck 2013; Khoury et al. 2013; Hiatt et al. 2014). Cancer risks have been well established on the attribution to environmental exposures such as environmental contaminants and heavy metals.

Psychological Perspective

Increasing number of studies have illustrated that the built environment poses critical influences on the psychological health or mental health of community dwellers. However, from the microscopic perspective, mental health status can easily be affected by the housing quality, noise, indoor air quality and occupant density (Evans 2003; Hoisington et al. 2015). Recently, a number of preclinical studies have established evidence to reveal the influence of microbiome of the built environment (MoBE) on human emotional behaviours (Smith et al. 2014; Bravo et al. 2011; Neufeld et al. 2011; Heijtz et al. 2011). Other studies likewise provide perspectives that MoBE possess potent effects in human systemic inflammation (Forsberg et al. 2013; Forsythe et al. 2007; Karimi et al. 2009; Miniello et al. 2010; Belkaid and Segre 2014), cognitive function (Gareau 2014; Smith et al. 2014), neuroinflammation (Lee et al. 2011), autoimmunity (Horai et al. 2015) and blood-brain barrier function (Braniste et al. 2014). Specifically, there has been an increasing recognition of the association between inflammation and a number of mental health problems, such as neuropsychiatric disease (Felger and Lotrich 2013; Haroon et al. 2012; Miller and Raison 2015; Raison et al. 2010; Rook et al. 2018). Furthermore, emerging studies have revealed that unhealthy built environment is one of the attributing factors that disturb immune-regulation. On the other hand, immune-regulation is found to be a driving factor in some psychiatric disorders. There is a popular stress-diathesis model to establish a solid concept of the onset of psychiatric disorders. This model suggests that every single individual has biopsychosocial vulnerabilities by exposing to stressors, like poor or unhealthy environment, and in turn these undesirable stressors will deteriorate the mental health level of community dwellers from optimal to suboptimal level (Hoisington et al. 2015).

Depression

Depression has been considered as "a disabling psychiatric disorder that is the fourth leading cause of disability worldwide and the leading cause of nonfatal public heath burden" (James et al. 2017; Üstün et al. 2004). There is moderate to strong evidence that reduced accessibility to mental health services in a built environment is always associated with poorer quality of care (Williams et al. 2007). Back in 1988, McLeroy et al. (1988) proposed the social-ecologic model of health which explained the context of built environment or living environment is playing an important and critical role in shaping individual's behaviours and ways of life. Evidences have indicated the health level and status have significant correlation with the contextual built environment, e.g. urban design and land use patterns (Handy et al. 2002). There are multiple mechanisms that allow the built environment to influence mental health. Street connectivity, population density and mixed land use are significantly associated with utilitarian walling, whereas these factors can in turn compromise the rights and opportunities to engage in leisure and recreation activities. Studies have also shown that depression risk is correlated with reduced leisure or recreation engagement. However, higher population density may, to certain extent, increase social interactions that in the long term lower the depression to safe level (Felger and Lotrich 2013). However, further validation and reliability studies are required to confirm its level of confidence.

On the other hand, many studies have reported that mixed land use, street connectivity and higher population density can gradually increase air pollution and noise by concentrating the traffic, and if community dwellers are frequently exposed to such stressors, the possibility to develop depression is higher (Marshall et al. 2009; Cho et al. 2014; Szyszkowicz 2007; Szyszkowicz et al. 2009; Basner et al. 2014).

Recommendations

Built environment planning has been found to be a barrier, but also a gate, leading quality and healthy ways of life. In response to the importance of such complex relationship between the built environment and health, some feasible recommendations are made to bridge the gap between built environment and public health based on literature review.

Community Living-Friendly Environment

Environment and health policymakers should take the greenness of residential surrounding into account and conduct the assessment on the built environment at different stages of property development. Residential surrounding greenness is a novel and innovative technology, and regional greenness assessment is based on the satellite-derived Normalised Difference Vegetation Index (NDVI). The NDVI is an indicator of regional greenness level with reference to land surface reflectance of visible (red) and near-infrared parts of the spectrum (Weier and Herring 2000). Its functional values range from −1 to +1. The higher positive numbers imply the more photosynthetically active vegetation (greenness) (Tischer et al. 2017). With consistent application of this assessment practice, more community living-friendly environments can be warranted, and fewer public health burdens can be achieved.

A considerable number of studies have been well established to support a highly walkable built environment, which can provide significant effects on lowering the prevalence of NCDs, such as CVDs and CVD-associated disease, like high BMI, diabetes mellitus and other serious metabolic syndrome (Leal and Chaix 2011). An active physical lifestyle is strongly associated with active personal transportation. Hence well-structured transportation routes such as cycling or safe walkable environment can largely promote the community dwellers to achieve healthy lifestyle through regular walking or cycling (Frank et al. 2005). Besides, only if bicycle parking is secured and convenient in the built environment, more community dwellers would be encouraged to practise such ways of life in the long term (Pikora et al. 2003; Pucher et al. 2010). Moreover, setting up bicycle stations with full services is imperative, so as to motivate people to choose cycling for personal transport and leisure purposes (Pucher et al. 2010; Martens 2007). Furthermore, Wang et al. (2016) observe that other supporting facilities such as benches and boundary fencing have significant effect upon cycling activity level in terms of enhancement.

Healthy community design standard is crucial for sustainable city development to cater for ageing population and the emerging new generation needs and demands. Cedar Creek Sustainable Planning Services have proposed the Healthy Living and Active Design. It provides practical approaches for decision-makers to create an accessible network and formulate an implementation plan, which dictates the laws, regulations and requirements about the use of open space. Thereby, it is an essential tool to score both the land use and implementation measures for capturing the strength and comprehensive land use plan.

Healthy Buildings

Mao et al. (2017) carried out a study to identify the factors affecting healthy buildings with reference to more than 200 papers. A total of 30 factors having impacts on healthy buildings were summarised based on the result of a bibliometric analysis and interview of experts. This study classified the 30 factors into 4 categories with reference to the different stages of lifecycle of building, i.e. design, construction, operation and demolition. Sixteen factors were identified as key impact factors with an importance index higher than 80 out of 100. In fact, the concept of healthy building has become a fertile area of research, with the rapid urbanisation process and increasing demand in developing countries. Another research by Al horr et al. (2016) investigated the linkage between indoor environmental quality and occupants' comfort and well-being. They concluded that building designers and engineers should consider more factors such as sick building syndrome and thermal comfort in formulating the design of indoor environment. Interestingly, the literature reveals that green building designs cannot guarantee the buildings to be comfortable and healthy. It is suggested that there should be closer monitoring of building performance and occupants' well-being during the operational stage of building.

Interdisciplinary Research

By encouraging and promoting interdisciplinary research collaboration between young and senior medical, environmental and engineering scholars, active long-term collaborations can help translate the best evidence from research findings into improving policy. Such policy can improve the public health profile of the community at large and, in particular, in the areas of health disparities and primary health in facing the pressing ageing issues. In addition, respective local and international funding parties of biomedical and public health research and practice are suggested to put health and built environment issues into top priorities and conduct regular public health promotion and education on health protection. The interdisciplinary research on health and built environment or urban design has been emerging in recent years. For example, Tran (2016) carried out a case study to investigate the neighbourhood scale which linked built environment with health effects. It suggested that more commitment on health issues was needed in urban development and urban planning to improve the quality of life for people. Gibson et al. (2011) considered the impact of housing on health in terms of internal housing conditions, area characteristics and housing tenure. It was found that there was no systematic review of altering housing tenure on public health. Further studies could be conducted in this important area to enrich the existing body of knowledge.

Concluding Remarks

Based on comprehensive review of contemporary studies on the impact of built environment on public health, this chapter reviews issues from both physiological perspective and psychological perspective. In response to the importance of complex relationship between the built environment and public health, some feasible recommendations are made to bridge the gap between the level of built environment and public health. Built environment profile and status have already drawn an increasing attention on health of the community dwellers and received moderate to strong evidence supports. Further studies are required to investigate the mechanism and to establish feasible solutions in the face of upcoming challenges of urbanisation and housing development.

References

Al horr, Y., Arif, M., Katafygiotou, M., Mazroei, A., Laushik, A., & Elsarrag, E. (2016). Impact of indoor environmental quality on occupant well-being and comfort: A review of the literature. *International Journal of Sustainable Built Environment, 5*(1), 1–11.

Barton, H., & Grant, M. (2008). Testing time for sustainability and health: Striving for inclusive rationality in project appraisal. *The Journal of the Royal Society for the Promotion of Health, 128*(3), 130–139.

Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., Janssen, S., & Stansfeld, S. (2014). Auditory and non-auditory effects of noise on health. *The Lancet, 383*(9925), 1325–1332.

Belkaid, Y., & Segre, J. A. (2014). Dialogue between skin microbiota and immunity. *Science, 346*(6212), 954–959.

Bird, C. (2016). The built environment and health. *Perspectives in Public Health, 132*(3), 105.

Booth, S. L., Sallis, J. F., Ritenbaugh, C., Hill, J. O., Birch, L. L., Frank, L. D., et al. (2001). Environmental and societal factors affect food choice and physical activity: Rationale, influences, and leverage points. *Nutrition Reviews, 59*(3), S21–S36.

Bracy, N. L., Millstein, R. A., Carlson, J. A., Conway, T. L., Sallis, J. F., Saelens, B. E., et al. (2014). Is the relationship between the built environment and physical activity moderated by perceptions of crime and safety? *International Journal of Behavioral Nutrition and Physical Activity, 11*(1), 24.

Braniste, V., Al-Asmakh, M., Kowal, C., Anuar, F., Abbaspour, A., Tóth, M., et al. (2014). The gut microbiota influences blood-brain barrier permeability in mice. *Science Translational Medicine, 6*(263), 263ra158.

Bravo, J. A., Forsythe, P., Chew, M. V., Escaravage, E., Savignac, H. M., Dinan, T. G., et al. (2011). Ingestion of Lactobacillus strain regulates emotional behavior and central GABA receptor expression in a mouse via the vagus nerve. *Proceedings of the National Academy of Sciences, 108*(38), 16050–16055.

Brodin, P., Jojic, V., Gao, T., Bhattacharya, S., Angel, C. J. L., Furman, D., & Maecker, H. T. (2015). Variation in the human immune system is largely driven by non-heritable influences. *Cell, 160*(1–2), 37–47.

Brownson, R. C., Hoehner, C. M., Day, K., Forsyth, A., & Sallis, J. F. (2009). Measuring the built environment for physical activity: State of the science. *American Journal of Preventive Medicine, 36*(4), S99–S123.

Brunsgaard, C., & Fich, L. B. (2016). ‘Healthy buildings’: Toward understanding user interaction with the indoor environment. *Indoor and Built Environment, 25*(2), 293–295.

Casas, L., Tischer, C., & Täubel, M. (2016). Pediatric asthma and the indoor microbial environment. *Current Environmental Health Reports, 3*(3), 238–249.

Chang, C. Y., Huang, S. M., & Guo, S. J. (2007). Medical records for building health management. *Journal of Architectural Engineering, 13*(3), 162–171.

China Academy of Building Research. (2016). Healthy building evaluating standard (T/ASC02-2016). China (in Chinese).

Cho, J., Choi, Y. J., Suh, M., Sohn, J., Kim, H., Cho, S. K., et al. (2014). Air pollution as a risk factor for depressive episode in patients with cardiovascular disease, diabetes mellitus, or asthma. *Journal of Affective Disorders, 157*, 45–51.

Chum, A., & O’Campo, P. (2015). Cross-sectional associations between residential environmental exposures and cardiovascular diseases. *BMC Public Health, 15*(1), 438.

Dadvand, P., Villanueva, C. M., Font-Ribera, L., Martinez, D., Basagaña, X., Belmonte, J., et al. (2014). Risks and benefits of green spaces for children: A cross-sectional study of associations with sedentary behavior, obesity, asthma, and allergy. *Environmental Health Perspectives, 122*(12), 1329.

Davies, P. G. (2009). Why the definition of health matters. *BMJ: British Medical Journal (Online), 2009*, 338.

Evans, G. W. (2003). The built environment and mental health. *Journal of Urban Health, 80*(4), 536–555.

Felger, J. C., & Lotrich, F. E. (2013). Inflammatory cytokines in depression: Neurobiological mechanisms and therapeutic implications. *Neuroscience, 246*, 199–229.

Ferdinand, A., Sen, B., Rahurkar, S., Engler, S., & Menachemi, N. (2012). The relationship between built environments and physical activity: A systematic review. *American Journal of Public Health, 102*(10), e7–e13.

Fisk, W. J., Mendell, M. J., Daisey, J. M., Faulkner, D., Hodgson, A. T., Nematollahi, M., & Macher, J. M. (1993). Phase 1 of the California healthy building study: A summary. *Indoor Air, 3*(4), 246–254.

Forsberg, A., Abrahamsson, T. R., Björkstén, B., & Jenmalm, M. C. (2013). Pre-and post-natal Lactobacillus reuteri supplementation decreases allergen responsiveness in infancy. *Clinical & Experimental Allergy, 43*(4), 434–442.

Forsythe, P., Inman, M. D., & Bienenstock, J. (2007). Oral treatment with live Lactobacillus reuteri inhibits the allergic airway response in mice. *American Journal of Respiratory and Critical Care Medicine, 175*(6), 561–569.

Frank, L. D., Schmid, T. L., Sallis, J. F., Chapman, J., & Saelens, B. E. (2005). Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ. *American Journal of Preventive Medicine, 28*(2), 117–125.

Fuertes, E., Markevych, I., Bowatte, G., Gruzieva, O., Gehring, U., Becker, A., et al. (2016). Residential greenness is differentially associated with childhood allergic rhinitis and aeroallergen sensitization in seven birth cohorts. *Allergy, 71*(10), 1461–1471.

Gareau, M. G. (2014). Microbiota-gut-brain axis and cognitive function. In *Microbial endocrinology: The microbiota-gut-brain axis in health and disease* (pp. 357–371). New York: Springer.

Gehlert, S., Rebbeck, T., Lurie, N., Warnecke, R., Paskett, E., & Goodwin, J. (2007). *Cells to society: Overcoming health disparities*. Washington, DC: National Cancer Institute.

Gibson, M., Petticrew, M., Bambra, C., Sowden, A. J., Wright, K. E., & Whitehead, M. (2011). Housing and health inequalities: A synthesis of systematic reviews of intervention aimed at different pathways linking. *Health & Place, 17*, 175–184.

Gomez, S. L., Shariff-Marco, S., DeRouen, M., Keegan, T. H., Yen, I. H., Mujahid, M., et al. (2015). The impact of neighborhood social and built environment factors across the cancer continuum: Current research, methodological considerations, and future directions. *Cancer, 121*(14), 2314–2330.

Hamano, T., Kawakami, N., Li, X., & Sundquist, K. (2013). Neighbourhood environment and stroke: A follow-up study in Sweden. *PLoS One, 8*(2), e56680.

Handy, S. L., Boarnet, M. G., Ewing, R., & Killingsworth, R. E. (2002). How the built environment affects physical activity: Views from urban planning. *American Journal of Preventive Medicine, 23*(2), 64–73.

Hanski, I., von Hertzen, L., Fyhrquist, N., Koskinen, K., Torppa, K., Laatikainen, T., et al. (2012). Environmental biodiversity, human microbiota, and allergy are interrelated. *Proceedings of the National Academy of Sciences, 109*(21), 8334–8339.

Haroon, E., Raison, C. L., & Miller, A. H. (2012). Psychoneuroimmunology meets neuropsychopharmacology: Translational implications of the impact of inflammation on behavior. *Neuropsychopharmacology, 37*(1), 137.

Heijtz, R. D., Wang, S., Anuar, F., Qian, Y., Björkholm, B., Samuelsson, A., et al. (2011). Normal gut microbiota modulates brain development and behavior. *Proceedings of the National Academy of Sciences, 108*(7), 3047–3052.

Hiatt, R. A., Porco, T. C., Liu, F., Balke, K., Balmain, A., Barlow, J., et al. (2014). A multilevel model of postmenopausal breast cancer incidence. *Cancer Epidemiology and Prevention Biomarkers, 23*, 2078.

Hoisington, A. J., Brenner, L. A., Kinney, K. A., Postolache, T. T., & Lowry, C. A. (2015). The microbiome of the built environment and mental health. *Microbiome, 3*(1), 60.

Holsten, J. E. (2009). Obesity and the community food environment: A systematic review. *Public Health Nutrition, 12*(3), 397–405.

Horai, R., Zárate-Bladés, C. R., Dillenburg-Pilla, P., Chen, J., Kielczewski, J. L., Silver, P. B., et al. (2015). Microbiota-dependent activation of an autoreactive T cell receptor provokes autoimmunity in an immunologically privileged site. *Immunity, 43*(2), 343–353.

Inagami, S., Cohen, D. A., Finch, B. K., & Asch, S. M. (2006). You are where you shop: Grocery store locations, weight, and neighborhoods. *American Journal of Preventive Medicine, 31*(1), 10–17.

James, P., Hart, J. E., Banay, R. F., Laden, F., & Signorello, L. B. (2017). Built environment and depression in low-income African Americans and Whites. *American Journal of Preventive Medicine, 52*(1), 74–84.

Kahhat, R., Crittenden, J., Sharif, F., Fonseca, E., Li, K., Sawhney, A., & Zhang, P. (2009). Environmental impacts over the life cycle of residential buildings using different exterior wall systems. *Journal of Infrastructure Systems, 15*(3), 211–221.

Kan, H., Heiss, G., Rose, K. M., Whitsel, E. A., Lurmann, F., & London, S. J. (2008). Prospective analysis of traffic exposure as a risk factor for incident coronary heart disease: The Atherosclerosis Risk in Communities (ARIC) study. *Environmental Health Perspectives, 116*(11), 1463.

Kanasi, E., Ayilavarapu, S., & Jones, J. (2016). The aging population: Demographics and the biology of aging. *Periodontology 2000, 72*(1), 13–18.

Karimi, K., Inman, M. D., Bienenstock, J., & Forsythe, P. (2009). Lactobacillus reuteri–induced regulatory T cells protect against an allergic airway response in mice. *American Journal of Respiratory and Critical Care Medicine, 179*(3), 186–193.

Khoury, M. J., Lam, T. K., Ioannidis, J. P., Hartge, P., Spitz, M. R., Buring, J. E., et al. (2013). Transforming epidemiology for 21st century medicine and public health. *Cancer Epidemiology and Prevention Biomarkers, 22*(4), 508–516.

Leal, C., & Chaix, B. (2011). The influence of geographic life environments on cardiometabolic risk factors: A systematic review, a methodological assessment and a research agenda. *Obesity Reviews, 12*(3), 217–230.

Lee, Y. K., Menezes, J. S., Umesaki, Y., & Mazmanian, S. K. (2011). Proinflammatory T-cell responses to gut microbiota promote experimental autoimmune encephalomyelitis. *Proceedings of the National Academy of Sciences, 108*(Supplement 1), 4615–4622.

Loftness, V., Hakkinen, B., Adan, O., & Nevalainen, A. (2007). Elements that contribute to healthy building design. *Environmental Health Perspectives, 115*(6), 965.

Love, P. E., Edwards, D. J., & Irani, Z. (2010). Work stress, support, and mental health in construction. *Journal of Construction Engineering and Management, 136*(6), 650–658.

Lynch, S., & Rebbeck, T. R. (2013). Bridging the gap between biological, individual and macroenvironmental factors in cancer: A multi-level approach. *Cancer Epidemiology and Prevention Biomarkers, 22*(4), 485–495.

Macintyre, S., Ellaway, A., & Cummins, S. (2002). Place effects on health: How can we conceptualise, operationalise and measure them? *Social Science & Medicine, 55*(1), 125–139.

Mackenbach, J. D., Rutter, H., Compernolle, S., Glonti, K., Oppert, J. M., Charreire, H., et al. (2014). Obesogenic environments: A systematic review of the association between the physical environment and adult weight status, the SPOTLIGHT project. *BMC Public Health, 14*(1), 233.

Maher, D., Ford, N., & Unwin, N. (2012). Priorities for developing countries in the global response to non-communicable diseases. *Globalization and Health, 8*(1), 14.

Malambo, P., Kengne, A. P., De Villiers, A., Lambert, E. V., & Puoane, T. (2016). Built environment, selected risk factors and major cardiovascular disease outcomes: A systematic review. *PLoS One, 11*(11), e0166846.

Mao, P., Qi, J., Tan, Y., & Li, J. (2017). An examination of factors affecting healthy building: An empirical study in east China. *Journal of Cleaner Production, 162*, 1266–1274.

Marshall, J. D., Brauer, M., & Frank, L. D. (2009). Healthy neighborhoods: Walkability and air pollution. *Environmental Health Perspectives, 117*(11), 1752.

Martens, K. (2007). Promoting bike-and-ride: The Dutch experience. *Transportation Research Part A: Policy and Practice, 41*(4), 326–338.

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 15*(4), 351–377.

Mhuireach, G., Johnson, B. R., Altrichter, A. E., Ladau, J., Meadow, J. F., Pollard, K. S., & Green, J. L. (2016). Urban greenness influences airborne bacterial community composition. *Science of the Total Environment, 571*, 680–687.

Miller, A. H., & Raison, C. L. (2015). Are anti-inflammatory therapies viable treatments for psychiatric disorders?: Where the rubber meets the road. *JAMA Psychiatry, 72*(6), 527–528.

Miniello, V. L., Brunetti, L., Tesse, R., Natile, M., Armenio, L., & Francavilla, R. (2010). Lactobacillus reuteri modulates cytokines production in exhaled breath condensate of children with atopic dermatitis. *Journal of Pediatric Gastroenterology and Nutrition, 50*(5), 573–576.

National Wellness Institute. (2018). *About wellness*. Retrieved from https://www.nationalwellness.org/page/AboutWellness

Neufeld, K. M., Kang, N., Bienenstock, J., & Foster, J. A. (2011). Reduced anxiety-like behavior and central neurochemical change in germ-free mice. *Neurogastroenterology & Motility, 23*(3), 255–264. e119.

Perdue, W. C., Stone, L. A., & Gostin, L. O. (2003). The built environment and its relationship to the public's health: The legal framework. *American Journal of Public Health, 93*(9), 1390–1394.

Pikora, T., Giles-Corti, B., Bull, F., Jamrozik, K., & Donovan, R. (2003). Developing a framework for assessment of the environmental determinants of walking and cycling. *Social Science & Medicine, 56*(8), 1693–1703.

Pucher, J., Dill, J., & Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventive Medicine, 50*, S106–S125.

Raison, C. L., Lowry, C. A., & Rook, G. A. (2010). Inflammation, sanitation, and consternation: Loss of contact with coevolved, tolerogenic microorganisms and the pathophysiology and treatment of major depression. *Archives of General Psychiatry, 67*(12), 1211–1224.

Rao, M., Prasad, S., Adshead, F., & Tissera, H. (2007). The built environment and health. *The Lancet, 370*(9593), 1111–1113.

Roof, K., & Oleru, N. (2008). Public health: Seattle and King County's push for the built environment. *Journal of Environmental Health, 71*(1), 24–27.

Rook, G. A., Raison, C. L., & Lowry, C. A. (2018). Childhood microbial experience, immunoregulation, inflammation, and adult susceptibility to psychosocial stressors and depression. In *Inflammation and immunity in depression* (pp. 17–44). https://doi.org/10.1016/B978-0-12-811073-7.00002-7.

Roux, A. V. D. (2003). Residential environments and cardiovascular risk. *Journal of Urban Health, 80*(4), 569–589.

Ruokolainen, L., Von Hertzen, L., Fyhrquist, N., Laatikainen, T., Lehtomäki, J., Auvinen, P., et al. (2015). Green areas around homes reduce atopic sensitization in children. *Allergy, 70*(2), 195–202.

Sallis, J. F., Linton, L. S., Kraft, M. K., Cutter, C. L., Kerr, J., Weitzel, J., et al. (2009). The active living research program: Six years of grantmaking. *American Journal of Preventive Medicine, 36*(2), S10–S21.

Sallis, J. F., Floyd, M. F., Rodríguez, D. A., & Saelens, B. E. (2012). Role of built environments in physical activity, obesity, and cardiovascular disease. *Circulation, 125*(5), 729–737.

Smith, C. J., Emge, J. R., Berzins, K., Lung, L., Khamishon, R., Shah, P., et al. (2014). Probiotics normalize the gut-brain-microbiota axis in immunodeficient mice. *American Journal of Physiology-Gastrointestinal and Liver Physiology, 307*(8), G793–G802.

Stoewen, D. L. (2017). Dimensions of wellness: Change your habits, change your life. *The Canadian Veterinary Journal, 58*(8), 861.

Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6), 563–570.

Szyszkowicz, M. (2007). Air pollution and emergency department visits for depression in Edmonton, Canada. *International Journal of Occupational Medicine and Environmental Health, 20*(3), 241–245.

Szyszkowicz, M., Rowe, B., & Colman, I. (2009). Air pollution and daily emergency department visits for depression. *International Journal of Occupational Medicine and Environmental Health, 22*(4), 355–362.

The University of California, Davis Campus (n.d.). *What is wellness*. Retrieved from https://shcs.ucdavis.edu/wellness/what-is-wellness

Tischer, C., Gascon, M., Fernández-Somoano, A., Tardón, A., Materola, A. L., Ibarluzea, J., et al. (2017). Urban green and grey space in relation to respiratory health in children. *European Respiratory Journal, 49*(6), 1502112.

Tran, M. (2016). Healthy cities – Walkability as a component of health-promoting urban planning and design. *Journal of Sustainable Urbanisation, Planning and Progress, 1*(1), 11–21.

Ulijaszek, S. J. (2017). *Models of obesity: From ecology to complexity in science and policy* (Vol. 78). Cambridge: Cambridge University Press.

Ulijaszek, S. J. (2018). Physical activity and the human body in the (increasingly smart) built environment. *Obesity Reviews, 19*, 84–93.

Üstün, T. B., Ayuso-Mateos, J. L., Chatterji, S., Mathers, C., & Murray, C. J. (2004). Global burden of depressive disorders in the year 2000. *The British Journal of Psychiatry, 184*(5), 386–392.

Vlahov, D., Freudenberg, N., Proietti, F., Ompad, D., Quinn, A., Nandi, V., & Galea, S. (2007). Urban as a determinant of health. *Journal of Urban Health, 84*(1), 16–26.

von Mutius, E. (2016). The microbial environment and its influence on asthma prevention in early life. *Journal of Allergy and Clinical Immunology, 137*(3), 680–689.

Walls, K. L., Boulic, M., & Boddy, J. W. (2016). The built environment – A missing "cause of the causes" of non-communicable diseases. *International Journal of Environmental Research and Public Health, 13*(10), 956.

Wang, Y., Chau, C. K., Ng, W. Y., & Leung, T. M. (2016). A review on the effects of physical built environment attributes on enhancing walking and cycling activity levels within residential neighborhoods. *Cities, 50*, 1–15.

Weier, J., & Herring, D. (2000). *Measuring vegetation (NDVI & EVI)*. http://earthobservatory.nasa.gov/Features/MeasuringVegetation/Date. Last updated: August 30 2000.

Williams, D. R., Gonzalez, H. M., Neighbors, H., Nesse, R., Abelson, J. M., Sweetman, J., & Jackson, J. S. (2007). Prevalence and distribution of major depressive disorder in African Americans, Caribbean blacks, and non-Hispanic whites: Results from the National Survey of American life. *Archives of General Psychiatry, 64*(3), 305–315.

World Health Organization. (2011). *Global status report on noncommunicable diseases*. Geneva: World Health Organization.

World Health Organization. (2014). *Noncommunicable diseases country profiles 2014*. Geneva: World Health Organization.

World Health Organization. (2018). *WHO definition of health*. Retrieved from https://www.who.int/suggestions/faq/en/

Wyon, D. P. (1993). Healthy buildings and their impact on productivity. *Indoor Air 93', Thermal Environment, Building Technology, Cleaning, 6*, 3–14.

Xie, H., Clements-Croome, D., & Wang, Q. (2017). Move beyond green building: A focus on healthy, comfortable, sustainable and aesthetical architecture. *Intelligent Buildings International, 9*(2), 88–96.

Zhang, X., Wu, Y., Shen, L., & Skitmore, M. (2014). A prototype system dynamic model for assessing the sustainability of construction projects. *International Journal of Project Management, 32*(1), 66–76.

Chapter 19
Disaster Preparedness in the Community

Noel T. S. Yim and K. K. Lam

Disaster Preparedness

The first and immediate response is crucial for any disasters as well as subsequent rescue and recovery. Apart from the response of government organisations, disaster plan and command in the fields and hospitals have a major impact. In 2000, the Emergency Support Unit of Hong Kong defined an extreme emergency or disaster as “a serious disruption of life, probably arising with little or no warning, that causes or threatens death or injury on a scale exceeding the normal responses required of the public emergency services”. Whether it is a natural disaster or a man-made event of disaster, it will bring unexpected physical and mental harm to the people involved. Especially for the developing countries and vulnerable populations, a comprehensive disaster preparedness plan can effectively reduce the impact of disasters. It is not merely a continuous process, but it requires the cooperation and participation of the community.

Disaster preparedness is one of the significant lessons when facing any extreme emergencies or disasters. The purpose of disaster preparedness is to prepare the response measures and to mitigate the effects of the disaster. According to the International Federation of Red Cross and Red Crescent Societies (2000), nine elements should be included in a comprehensive disaster preparedness strategy, including (i) hazard, risk and vulnerability assessments; (ii) response mechanisms and strategies; (iii) preparedness plans; (iv) coordination; (v) information management; (vi) early warning systems; (vii) resource mobilisation; (viii) public education, training and rehearsals; and (ix) community-based disaster preparedness.

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Disaster Plan in Fields and Hospitals

In the face of mass casualties, disease outbreaks and natural disasters, hospitals play an important role. Therefore, disaster preparedness plans and affordability of the hospitals cannot be ignored. At the hospital level, the disaster preparedness plans in Hong Kong are targeted at receiving mass casualties, outbreak control and hazardous materials preparedness. Each hospital under the Hospital Authority is required to formulate its own contingency plan and update the plan every 3 years (Balsari and Leaning 2017). Each Hospital Authority hospital also needs regular drills which do not include multihospital shutdowns and hospital-wide evacuations.

Disaster plan in the fields requires the capacity of diversion and treating mass casualties with rapid action. Thus, emergency practitioners and specialists should be provided with training on emergency communication and disaster management programme. In order to increase the effectiveness and efficiency, training in emergencies or first aid programme, the public should be trained on disaster classifications such as hazard cause of disasters, onset speed and acts of nature or humans.

Disaster Drills

The disaster plan contains written guidelines for extreme emergency or disaster. However, an armchair strategy is not enough in the face of a sudden disaster. Disaster drills or rehearsals are the most effective methods to practise what is learned from the theory. The focus of the disaster drill is to reallocate manpower and resources rapidly during and after a disaster. Therefore, it requires the collaboration between various government departments, public and private sectors, professional bodies, community institutions, as well as regional and international agencies.

At present, the Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) provide various disaster-related simulation training for the practitioners, for example, “Air Crew Resuscitation Simulation Course”, “Training on Specific Disaster Situations”, “Mass Casualty Incident Simulation Training” and “Hazardous Materials (HazMat) Simulation Training” for the Ambulance Command of the Fire Services Department of Hong Kong. These courses are targeted at the emergency responders and the health care professionals and provide them with opportunities of the field-based drills. In addition to technical practices, the training helps equip members with management skills in handling special mass disasters.

A comprehensive disaster preparedness plan should aim to protect the safety and property of the public. Thus, constant inspection is necessary. For maintaining and improving the levels of disaster preparedness, the guidance for “Hyogo Framework” of the United Nations Office for Disaster Risk Reduction (UNDRR) in 2007 suggested that routine meetings could be held for disaster drills. Due to the gap between theory and the field situation, disaster drills may assist to discover the difficulty on the spot. It also help to explore the inadequacies of the strategy during the meetings, for instance, in considering hospital-wide evacuations and multihospital shutdown drills, which have not yet been included in the Hospital Authority requirements. Optimising disaster drill plans helps all departments and organisations engage in disaster rescues to have prompt communication and effective information transmission, thus achieving optimal disaster relief and reducing or avoiding damages.

Role of Primary Health Care in Disaster Preparedness

When preparing for a disaster plan, decision-makers should regard everyone has access to health care and universal coverage. Primary health care (PHC) had been defined in the World Health Report 2008 as a strategy that promotes social health and organising health system (Redwood-Campbell and Abrahams 2011). It contains the values and principles when developing the health system. Primary health care plays a vital role in disaster preparedness which provides people-centred health service with universal coverage (World Health Organization 2011). Different health departments have the responsibility to promote and improve primary health care services by establishing effective and efficient public health policy.

Health system based on primary health care principles can help the communities to strengthen disaster preparedness and emergency management. According to WHO, there is evidence that the provision of integrated PHC services can significantly reduce disaster-related mortality and morbidity rates (Swathi et al. 2017). Apart from low-income countries, high-income countries also considered PHC as a vital component in health service. Therefore, PHC is included in disaster preparedness and emergency plans.

As Balsari and Leaning (2017) mention, the 2016–2017 Hospital Authority Annual Plan set the goal of strengthening manpower support for disease outbreaks, which do not include any initiative examination. However, providing PHC such as proactive testing can improve community resilience and prevent disease outbreaks. Besides, collaboration with the social sector can promote PHC to the grassroots level, bring primary health service closer to the public and achieve people-centred health services.

Physical and Psychological Support

Instant support is especially important because emergency disasters can cause massive damages both in the physical and psychological aspects. The preparation for chronic diseases is treated as one of the main issues when developing disaster preparedness (Lapčević et al. 2018). People with chronic diseases such as diabetes and hypertension need more resources and attention, particularly during very unusual circumstances such as disasters and emergencies. Moreover, psychological trauma has far-reaching effects than physical injuries in mass casualties. The psychological pressure on each person is different. Similarly, the tolerance of each person is different. Therefore, it is necessary to find the needed support of each individual more accurately.

In order to have a broad assessment of public health, there are some disaster indicators to analyse and evaluate the public health situation. Chronic disease rates and mental health indices are important indicators since disasters have an impact on both physiology and psychology, especially in large-scale disasters. The available number of primary health workers who have received education and psychological training, the number and locations of relief supplies, the status and accessibility of external supports and so on are all information that needs to be received quickly in the event of a disaster.

Education

Disaster is very likely to cause large-scale casualties in a short period of time. External manpower and material resources may not arrive quickly due to road plugs or damaged traffic facilities. In the initial stage, the affected communities may not have external support but have to rely on their own resources to meet their own emergency needs. Cultivating local health professionals is indispensable for disaster relief work as an important measure of disaster preparedness.

There are many institutions providing health care or rescue courses such as the Red Cross, St. John Association and Auxiliary Medical Services. Among the large number of organisations, the Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) is an educational institution specially established in 2014 for disaster preparedness. Apart from the disaster-related simulation training, learning modules at the university level for professional development and cultivation of disaster management leaders are in place. The HKJCDPRI offers diverse educating methods including professional development, online learning, research and policy, community engagement and even international cooperation.

Disaster Medicine Training in the Auxiliary Medical Service

One of the co-authors, an expert in pre-hospital medicine and a specialist in emergency medicine, has been a volunteer doctor serving in the Auxiliary Medical Services (AMS), a government organisation in the Hong Kong Special Administrative Region (HKSAR, n.d.) under the Security Bureau, alongside with the Police and Fire Services (Auiliary Medical Services, n.d.). Lay volunteer members of AMS, who are formally trained in first aid and serve as disaster medicine assistants, are a valuable source of emergency force that supports the regular services during disaster.

Other than rendering first aid service at the disaster scene or in the community, volunteering AMS members can also share their knowledge in handling common emergencies with family members and friends in normal time. Thus, a large number of volunteers can promulgate the first aid and disaster knowledge at the community level in a large scale, hence raising the capacity and capability in dealing with disasters and emergencies at the primary care level of the community.

With formal and continuing training, AMS members have been deployed to assist clinical services in the accident and emergency (A&E) departments or wards of acute public hospitals. They can augment the paramedic services at the disaster site. Moreover, they are also competent in setting up temporary wards in the field or at designated sites around the hospitals during a large-scale major incident. Furthermore, they can help the rehabilitation of injured victims in acute wards and in rehabilitation units. Therefore, trained volunteers play vital roles in secondary and tertiary levels of care in the current health care system. Over the past few years, the AMS A&E department attachment programmes for lay volunteers were arranged regularly. Nurses of AMS guided volunteers in A&E departments to get members to familiarise with the operations, the physical environment and logistic aspects of individual A&E department. With a mutual understanding between the staff of A&E departments and AMS members, lay volunteers can respond and adapt more quickly when they are called to aid in real disasters.

To maintain the standards of paramedic service by AMS members, the Medical Advisory Board on Major Events (MABOME) was instituted to furnish medical opinion to AMS headquarters on the planning and provision of paramedic services. Committee members of MABOME are mostly doctors and nurses of the AMS. Training materials are reviewed and updated regularly by MABOME. The disaster medical assistant (DMA) manual was published in 2007, later revised in 2012, to facilitate training and knowledge transfer in disaster preparedness among members. Important topics such as command, control, communication and coordination, which are “4Cs” at the incident site; triage, treatment and transport at the casualty clearing station; and psychological support have been enriched in the new syllabus.

As lay volunteers come from all walks of life in the community, training is crucial for them to acquire the state-of-the-art knowledge and skills of resuscitation and first aid. The Training Institute was established in 2001 to organise and supervise training of new recruit members and DMA training to the 4000 volunteers. Members who performed well in the DMA courses are selected and trained to be DMA instructors. They in turn help to teach other lay volunteers to become DMAs in different regions of the city in the operation wings of AMS. With sufficient training and regular drills, AMS performed well during the special coverage at the annual Standard Chartered HK Marathon for more than 20 years, plus the World Trade Organization’s sixth Ministerial Conference held in Hong Kong in 2005.

With increasing complexity of first aid and more interdisciplinary collaboration in the management of medical resources at the scene, MABOME was replaced by Medical Professional Committee on Major Events (MPCOME) in 2008. MPCOME members comprise medical, nursing officers, as well as experienced volunteers and full-time officers of AMS headquarters. It is instrumental in the development of enhanced training and the installation of new equipment in the first aid boxes and medical boxes that are shipped to the disaster scenes. With the direction of MPCOME, volunteers are educated in the use of advanced medical equipment such as automated external defibrillators, oropharyngeal airways, bag valve masks and mechanical chest compressors. Members apply these advance techniques and have successfully rescued many victims in cardiorespiratory arrests or heart attacks in the community.

To upgrade the performance of lay members and professional volunteers in the execution of duties, MPCOME also advises on the deployment to the strategic posts to meet the demand of medical or first aid services at the sites of incidents. The strength of volunteers and their skill mix at different sites are reviewed soon after major events, making reference to the statistics of the incidence of injuries and medical illnesses. Doctors and nurses are posted at designated medical stations or sick bays and at the same time supervise DMAs. Stations with doctors on duty are equipped with essential drugs and laryngoscopes for endotracheal intubation. With strategic training and planning, volunteers performed well during major international events such as the Hong Kong Formula ePrix of the International Automobile Federation and Track Cycling World Championship of Union Cycliste Internationale. Lay volunteer members, who are adequately trained to become DMAs, play an important supporting role in disastrous incidents in the community.

Challenges and Recommendations

The HKSAR government and related institutions are facing some challenges when providing emergency services and disaster preparedness plans. When disaster comes, the densely populated Hong Kong suffers a wide impact, and the community has limited ability to cope with. The rapidly increasing public health needs will make the affected communities unbearable. Moreover, the public and even primary care leaders may under-recognise emergency response and preparedness, underestimate the potential impact of future disasters or have misunderstanding, making the preparation for disaster preparedness difficult (Hashikawa and Gold 2018). International cooperation is one of the methods to improve emergency services. Cooperation with countries all over the world helps deliver the latest and most comprehensive disaster preparedness information effectively. In particular, joint disaster simulations and drills can be held regularly with surrounding cities to improve rescue coverage and efficiency.

Disaster response and disaster preparedness knowledge should be fully covered and popularised in the community. Policies should be connected with the community services. As the example of community-based disaster preparedness (CBDP) partnerships in Jamaica, Jamaican National Societies work with local insurance companies and some large hotels to train hotel staff to respond to earthquake emergency response and disaster preparedness (International Federation of Red

Cross and Red Crescent Societies 2000). In this policy, the Red Cross can donate while the hotels can enjoy low insurance premiums, and the insurance companies will reduce the claims, thus achieving the win-win situation. When developing an emergency policy for Hong Kong, cooperating with different organisations and stakeholders in the community should be considered for the benefits of different sectors of the society.

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References

Auxiliary Medical Service. (n.d.). *Home page*. https://www.ams.gov.hk/eng/main.htm

Balsari, S., & Leaning, J. (2017, August). *Improving urban health system disaster preparedness and response in Hong Kong: Lessons from complex disasters*. Hong Kong jockey Club disaster preparedness and response institute. Retrieved from http://www.hkjcdpri.org.hk/download/policy/UrbanHealthSystem.pdf

Emergency Support Unit. (2000). *Emergency Response System: The policy, principles and operation of the Government's emergency response system* (Hong Kong, Security Bureau, Government Secretariat). Hong Kong: The Government of the Hong Kong Special Administrative Region.

Hashikawa, M., & Gold, K. J. (2018). Disaster preparedness in primary care: Ready or not? *Disaster Medicine and Public Health Preparedness, 12*(5), 644–648. https://doi.org/10.1017/dmp.2017.136.

Hong Kong Jockey Club Preparedness and Response Institute. (n.d.). *A journey to excellence (2015–2018)*. Retrieved from http://www.hkjcdpri.org.hk/sites/disaster/files/booklet_final.pdf

International Federation of Red Cross and Red Crescent Societies. (2000). *Introduction to disaster preparedness: Disaster Preparedness Training Programme*. Retrieved from https://www.ifrc.org/Global/Introdp.pdf

Lapčević, Z., Mandić-Rajčević, S., Lepić, M., & Jovanović, M. (2018). Evaluating a primary healthcare Centres preparedness for disasters using the hospital safety index: Lessons learned from the 2014 floods in Obrenovac, Serbia. *International Journal of Disaster Risk Reduction, 34*, 436–442. https://doi.org/10.1101/503557.

Redwood-Campbell, L., & Abrahams, J. (2011). Primary health care and disasters—The current state of the literature: What we know, gaps and next steps. *Prehospital and Disaster Medicine, 26*(3), 184–191. https://doi.org/10.1017/s1049023x11006388.

Swathi, J. M., González, P. A., & Delgado, R. C. (2017). Disaster management and primary health care: Implications for medical education. *International Journal of Medical Education, 8*, 414–415. https://doi.org/10.5116/ijme.5a07.1e1b.

UN Office for Disaster Risk Reduction (UNDRR). (2007). *Hyogo framework for action (2005–2015)*. Retrieved from https://www.unisdr.org/we/coordinate/hfa

World Health Organization. (2011). *Primary Health Care (PHC) approach in emergencies: Report of a regional meeting Dhaka, Bangladesh, 28–30 September 2010*. New Delhi: Regional Office for South-East Asia.

Part IV
Future Development and Education

Chapter 20
Lifelong Education for Health Providers and Community

Vincent Law and Sean H. Y. Hui

Introduction

There is growing awareness of the need to reform the health-care systems (Pruitt and Epping-Jordan 2005). To complement reforms in the health systems, it is imperative to reform the education of health professionals (Nair and Webster 2010). One of the initiatives is to introduce major reforms in the curriculum and innovation in delivering training for health professionals (WFME 1998). An innovative approach in learning for health professionals is the client-centred approach that sets servicing the community as the central goal (Margolis 2000). It is imperative to monitor the educational background of health professionals, to develop a tool for regulating educational capacity as well as to establish and strengthen national accreditation systems (Hans 2008). To attract high-calibre students to the family medicine and community health specialties, health professionals see a need to raise their status via education and learning (Nair and Webster 2010).

Lifelong learning is an essential component of practice-based learning and improvement (Panda and Desbiens 2010). Physicians need to be lifelong learners to provide timely and efficient patient care in a rapidly changing environment (Panda and Desbiens 2010). While traditional lifelong learning cultures can still be found in primary care settings (Boudioni et al. 2007), primary care settings should be developed into learning organisations that present continuous learning chances for individuals (Boudioni et al. 2007). Continuous professional development is important during the lifelong learning process of any professions (Bowen-Chang and Hosein 2019). The public can be protected from incompetent or unethical practices if health professionals are trained through a comprehensive continuous professional development system which assesses competence continuously (Horn et al. 2019).

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Government and responsible regulatory organisations also play vital roles in upholding professional standards to ensure effectiveness and safety of public care (Kennedy et al. 2019). Health practitioners, health service providers and the community need lifelong learning and continuous professional development to maintain individual health, community health and ultimately population health.

Lifelong Learning

Definitions of Learning

Learning is an abstract and broad concept. It is basic to all humans from birth onwards (Young 2015). Learning involves a relatively stable change in stimulus-response relations and is developed as a result of interaction with the functional environment (Lachman 1997). From a functional perspective, learning can be defined as changes in the behaviour that result from regularities in the environment (de Houwer et al. 2013). Interaction between individuals and their environment presents learning opportunities and creates new knowledge (Pype et al. 2014). Learners identify their own learning needs and assume more responsibility (DeSilets and Dickerson 2008). Noteworthily, the preferred mode and pace of learning vary with individuals (Alsop 2013).

From an occupational perspective, workplace learning recognises that working and learning are basic and indivisible (Parboosingh 2002). All works involve learning from experience, while some works are specialised and entail specialised learning (Young 2015). Education and learning develop an individual's ability to be a logical self-directed person who appreciates others via self-reflection (Brownhill 2001). For individuals, in particular professionals, learning is an engine for personal improvement (Prats Monné 2015). Health professionals, including physicians, nurses, therapists and health workers of related disciplines, need to learn for personal development and more importantly interact with the community for betterment of population health.

Definitions of Lifelong Learning

Lifelong learning (LLL) is to keep on learning throughout one's lifetime. LLL supports learners through all stages of life without notice (Alsop 2013), and every aspect of lives confers opportunities for learning. Education and LLL are vital to the long-term prosperity of human societies (Kuenkel and Gruen 2018). From a process perspective, Jarvis (2007) defined LLL as a process for an individual to encounter social experiences which then bring behavioural changes. Others defined LLL as a consortium of learning activities. For example, the European Commission (2001) defined LLL as all learning activities being embarked on during life which aim at improving knowledge, skills and competence within a personal, social and/or job-related perspective. UNESCO (2006) gave a straightforward definition of LLL which focuses on individual gains by defining LLL as all learning activities (whether formal or informal), continuously carried out so as to improve individual knowledge, skills and competence.

The United Nations (2015) exerts high importance to education and LLL. In one of the sustainable development goals (SDGs), UN urges various countries to promote changes to LLL for all so as to ensure inclusive and fair quality education. LLL plays a key role in promoting a skilled, trained and adaptable workforce (European Commission 2001). LLL fosters nonstop improvement of skills and knowledge for personal accomplishment and employment (Alsop 2013; Jevtic and Bouland 2018) and helps learners cultivate both ability and potential for coping with all aspects of life (Alsop 2013). LLL is wider than maintaining aptitude to carry out professional duties and is broader than CPD (Alsop 2013). LLL requires engagement of both individuals and organisations.

Forms of Lifelong Learning

Over one's lifetime, learning may take various forms, and all kinds of learning help people manage their future life roles (Alsop 2013). LLL is the synthesis of formal, non-formal and informal learning which together build competence for continuous development of the quality of life (Salvia et al. 2018). LLL comprises the whole spectrum of formal, non-formal and informal learning (European Commission 2001). In addition, self-directed learning and interprofessional learning (IPL) are also essential forms of learning among professionals.

Formal Learning

Formal learning refers to learning that the learners have no or limited control on what and how to study (Mocker 1983). For professionals, formal learning supports the start of a professional career before registration (Alsop 2013). Learning which primarily relies on objectives, goals and lectures is relatively ineffective and inadequate for physicians' learning. For health professionals, the context of learning is highly related to the quality of care, but lecturing often merely delivers general knowledge (Leach and Fletcher 2008).

Non-formal Learning

Learners have partial control over the learning process for non-formal learning. While learners can control what to learn, they cannot decide the way to learn. Learners can apply activities which they are interested in, for example, extracurricular activities, but the learning material or ways to learn is organised by the learning service providers (Mocker 1983).

Informal Learning

Similar to non-formal learning, informal learning lets the learners to choose the way to learn but not the learning content (Mocker 1983). Learning which stems from experience is a type of informal learning that takes place in less conscious process than formal education (Alsop 2013). As endorsed by the European Commission (2001), informal learning constructs the foundation for future life and the academic qualifications that constitute the entry prerequisites for more specialised training.

Self-Directed Learning

Self-directed learning (SDL) is a common practice for adults. Learners control the whole learning process which includes the what and how of learning. Learning behaviour such as searching on websites, books or journals belongs to SDL (Mocker 1983). SDL is vital in aiding professionals to stay up to date (Murad et al. 2010). In terms of outcomes, SDL-oriented continuing medical education is effective in improving knowledge, skills, attitudes and performance (Davison and Thomas 2008).

Interprofessional Learning

Interprofessional education (IPE) includes incidental learning underwent by the learners and by participation of the learners in designated educational experiences (Alsop 2013). Academic institutions have been seeking ways to embed IPE within their health professions curricula (Interprofessional Education Collaborative 2016) so that professionals can interact and learn from one another while learning happens spontaneously.

Achieving Lifelong Learning

Lifelong learners possess a curious mind, information literacy and a range of learning proficiencies (Candy 2000). OECD (2001) developed a framework for LLL which comprises five systemic features, namely, (a) enhancing access, quality and equity; (b) warranting foundation skills for all; (c) recognising all forms of learning – including formal or informal learning; (d) mobilising resources and rethinking resource allocation across all sectors and settings and over the life cycle; and (e) assuring cooperation among various partners.

Continuous Professional Development

Definitions of Continuous Professional Development

Continuous professional development (CPD) is a broad concept with a wide range of definitions. It includes a collection of learning opportunities that maintains and enhances one's professional knowledge and skills over time (Webb and Horn 2012). Majid (2004) defines CPD as an orderly approach of learning that leads to enhancement in professional capabilities in a changing work environment. Kumar and Shah (2005) view CPD as a process of individual growth which improves personal capability and realises the full potential of professionals. The International Labour Organization (2012) describes CPD programmes as participatory, emphasis on practice and content, as well as ongoing. The WHO (2010a) offers the most comprehensive definition for CPD by defining it as the wide range of competencies beyond clinical update, research and scientific writing, multidisciplinary context of patient care and suitable attitudinal change to warrant better patient outcomes and satisfaction.

Continuous Professional Development Promotes Professional Standard

Each professional has the responsibility to meet the expected standards (Alsop 2013). CPD helps maintain the professional education, standards and practice (Cossham and Fields 2007), as well as promote professional behaviour (Elman et al. 2005). CPD allows professionals to focus on areas that are beyond knowledge and applied skills, including how to make ethical decisions (Barnett 2009). CPD is important during the life learning course of any profession since it provides the essential skills set at nurturing the process of continuing education, training and cooperation (Bowen-Chang and Hosein 2019). CPD can be greatly enhanced by exploiting the proficiency of staff in other organisations and by employing in interactive learning activities (Leong and Nguyen 2011). Ultimately, CPD brings actual benefits only if learning is voluntary, part of the LLL process and part of the commitment to personal development (Alsop 2013).

Lifelong Learning for Health Practitioners

Medical practice requires the acquisition of three attributes: knowledge, know-how, and how to do (WHO 2010a). Interprofessional Education Collaborative (2016) advises health professionals to develop four competences, namely: (1) work with people of other professions to uphold an atmosphere of mutual respect and shared values; (2) apply knowledge to properly evaluate health-care needs of patients and to advance population health; (3) carry a team approach to promote health and prevention of disease; and (4) perform effectively to provide patient- or population-centred care and population health programmes. The increasing pace of advancement in medicine compels doctors to get prepared for LLL and CPD (WHO 2010a). In essence, LLL and CPD assure professional practice is latest and conducive to improving patient outcomes (European Union 2013).

Commitment to LLL is a professional responsibility of health professionals to uphold and develop individual skills while contributing to the development of the profession (Alsop 2013). To maintain up-to-date knowledge, know-how and professional behaviour, health practitioners are required to be lifelong learners (Mi and Halalau 2016). With the continuously changing health-care delivery system plus innovation and advance in technology, health practitioners can remain updated in knowledge and the health service requirement and expectation from the public (Khan 2012).

Learning without practice is infertile. Through practice, learners will acquire their own skills and become a better learner (Koshy et al. 2017). Training promotes accountability, ethical responsibility, job satisfaction and competency of health practitioners (Filipe et al. 2014). Similar to physicians, nurses must also adopt LLL to lead change, improve health and meet professional and societal expectations (Rishel 2013). Health professionals can adopt a personal development plan to clarify how to fulfil learning objectives so as to ensure positive changes in behaviour (Starke and Wade 2005). Health professionals need to remain competent in their existing work and future work in view of the ever-challenging and ever-changing health-care environment (Alsop 2013).

Medical Curricula

Majority of health professionals receive medical education from universities. Universities serve as an independent platform to design and implement learning and research programmes on interdisciplinary subjects related to sustainability and health (Ng et al. 2018). However, medical education is in a world of contested meaning among the various stakeholders which include the government, community, hospitals, doctors and patients (Howe et al. 2002). The expressed priorities and values of the medical curriculum have been perceived as influencing the espoused identity of the physicians (Howe et al. 2002). Medical curricula are expected to enhance cultural competence of students through primary care education (Bortot et al. 2004).

Continuous Education for Health Professionals

Further learning facilitates an enduring commitment to career and professional development (Alsop 2013). To build professionalism and improve patient care, continuous education for physicians should be related to their daily work, match with individual learning styles and bridge the gap between existing practice and the best practice (Leach and Fletcher 2008). Good continuous education improves the experience of both the physicians and the patients (Leach and Fletcher 2008). Leach and Fletcher (2008) recognise that most physicians need to realise the attitudes, knowledge and skills necessary to achieve personal and professional responsibility via continuous education.

Technologies Facilitate Continuing Medical Education

Traditional classroom or clinical settings fail to prepare medical graduates for the ever-changing environments surrounding the health professionals (Cole and Carlin 2009). Cook et al. (2005), based on a randomised controlled trial, found that residents preferred web-based learning to traditional learning. For physicians who desire to be academics in the future, they benefit from experiential learning which offers active participation in practical research projects (Bortot et al. 2004). A qualitative study on learning of general practitioners (GPs) at Belgium reveals that trainees prefer interactive, practice-based and small group sessions (Pype et al. 2014). Reinforcement of practice enhances the learning outcomes for GPs (Pulsford et al. 2013). Health service providers are able to scrutinise and examine whether technologies and information can be clinically and practically applicable so as to provide the best health care (Rychetnik and Wise 2004).

Health professionals need LLL which adopts the latest technologies not being offered by traditional learning methods. Training on clinical skills may not be perfect, and there may be huge content gaps, under-usage of suitable educational practices and absence of impact evaluation of continuing medical education (CME) on clinical practice (Pype et al. 2012). To fill this gap, digital, social, media and mobile technologies (DSMTs) have been gaining importance for continuing education among health professions (Curran et al. 2017). The use of mobile technologies helps enhance knowledge and skills, improve decision-making capacity and increase productivity of health professional learners (Raman 2015).

Reflective Practices Facilitate Learning

Reflection on the process helps in assimilating new skills and knowledge into later practice (Alsop 2013). Reflective practice for physician learning has been gaining acceptance (Koshy et al. 2017) since it improves physician performance (Marinopoulos et al. 2007). Health professionals gain commitment to learning when adult learning principles and reflection are integrated into the design and evaluation of CPD (Bornman and Louw 2019). Active experiential and reflective learning methods facilitate interprofessional learning (Bottenberg et al. 2013).

Interprofessional Learning for Health Professionals

The WHO (2010b) recognises the importance of interprofessional learning (IPL) for health professionals and developed a framework for action on IPE and collaborative practice. IPL occurs when health service providers from different specialities collaborate in taking care of the same patient (Hammick et al. 2009). IPL brings multiple benefits to the patients, professional and the community since it promotes quality, sustainable and safe health practice (Bottenberg et al. 2013). Medical training may benefit from the practice of other professions in supporting professional development by prioritising the training of the inner person (Howe et al. 2002). IPL also facilitates the socialisation process among different professionals and thus enhances opportunities for medical students to learn jointly and to cooperate effectively (Hosny et al. 2013). IPL can be truly responsive to community health priorities (Jarvis-Selinger et al. 2008). Ultimately, patients benefit from the practice of interprofessional teams (Interprofessional Education Collaborative 2016).

CPD for Health Professionals

CPD has been regarded as a regulatory prerequisite that health professionals sustain their practice up to date (Alsop 2013). In recent years, there is growing importance of providing physicians with CPD for the EU member states (European Union 2013). For health professionals, CPD needs careful planning and execution so as to benefit both the professionals and patients (Kennedy et al. 2019). A more comprehensive system of CPD that centres on continuing assessment of competence during the professional's career can protect the public from incompetent or unethical practitioners (Horn et al. 2019). Educational programmes that emphasise adult learning methods have better potential to improve clinical skills of physicians (Taylor and Hamdy 2013). To achieve the desirable outcomes of CPD, learners may follow a CPD cycle which consists of five sequential steps, namely, self-appraisal, personal development portfolio, implementation, documentation and evaluation (Khan 2012).

Lifelong Learning for Community

To achieve sustainable human development, LLL and education are needed in healthy and sustainable cities (de Almeida and da Silva Carvalho 2018). Public space in the community should be innovative to cater for LLL of individuals (de Almeida and da Silva Carvalho 2018). While LLL is both an individual process and a collective process, it also involves multi-stakeholder collaboration which includes the government agencies and the community (Kuenkel and Gruen 2018). Cities, as part of the safe and healthy environments, are composed of communities that can benefit from LLL at the capacity of both individual and collective levels (Kuenkel and Gruen 2018). With the theme that a learning city promotes LLL for all, UNESCO urges cities to effectively marshal their resources in every segment to promote inclusive learning and rejuvenate learning in the community (UNESCO 2015).

Primary health care (PHC) stems from the community and is related to learning at the community level. PHC workers need to experience for themselves what health meant to the community that they would work with (Marsick 1988). PHC workers need to visualise health from the perspectives of the customers and the service providers (Marsick 1988). Training for PHC workers helps develop specific instrumental skills and capabilities; it also transforms the perspectives of PHC planners and implementors (Marsick 1988). Health professionals can collaborate with other professionals to develop the city and also contribute to a healthier urban environment (Jevtic and Bouland 2018).

Community-Based Education for Health Professionals

Community academic partnerships provide rich learning opportunities for medical students (Cashman et al. 2004). Community participation is a vital element for the implementation and development of community-based education (CBE) programme (Howe 2002; Musal et al. 2003). CBE activities support health services at primary health-care units and secondary-level hospitals (Musal et al. 2003). CBE is also beneficial to students who learn during actual practice to deliver care at health-care facilities of the community (Hosny et al. 2013).

For physicians under training, engagement in a community project is an effective way to fairly measure the accomplishment of specific capabilities (Bortot et al. 2004). Other than formal training in teaching hospitals, medical students gain much from learning in other clinical sceneries and community-based medical education (Morrison 2006). Community-based programmes provide a more unified learning environment for medical students who enjoy robust personal and professional learning experience (Morrison 2006). As compared with faculty settings, community settings offer medical students with equally effective or even better training regarding clinical skills in history taking and examination (Murray et al. 1997). Students who have engaged with vulnerable groups would exert higher comfort level and future willingness to work with the communities (Kuthy et al. 2005).

Service Learning Links Professionals with the Community

Medical students, the academic institutions, health facilities, and the community will be benefited by the partnerships of service learning (SL) between academic institutions and health-care facilities (Cashman et al. 2004). SL has been suggested as an experiential and transformative educational approach to meet identified community needs and define student learning outcomes (Mc Menamin et al. 2014). SL enhances the gratitude of the social determinants of health and fosters a sense of social responsibility, empathy, and caring for others (Azer et al. 2013). Moreover, SL raises students' awareness of community health needs and the responsibility to tackle health inequities in marginalised populations (Saffran 2013).

Conclusion

Education and learning for health professionals and the community are important considerations of the health-care system. Learning happens to all people throughout their life span. Lifelong learning involves all learning activities which aim at improving individual knowledge, skills and competence. In view of the ever-challenging and ever-changing health environments, health practitioners should be lifelong learners to remain updated in knowledge and meet public expectations. Continuous professional development involves a wide range of competencies beyond clinical update, multidisciplinary context of patient care and attitudinal change for better patient outcomes. Continuous professional development helps maintain professional education, standards and practice, but it needs careful planning and execution for the benefits of the health professionals and patients.

To maintain and further upgrade knowledge, skills and attitude of health professionals, lifelong learning and continuous professional development are two vital initiatives that help achieve the desirable outcomes, as well as ensure that professional practice is current and conducive to improving patient outcomes. Health professionals can collaborate with other professionals and the community to learn together in building a healthier urban environment. Overall speaking, health practitioners, health service providers and the community need lifelong learning and continuous professional development to maintain individual health, primary care, community health and ultimately population health.

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References

Alsop, A. (2013). *Continuing professional development in health and social care: Strategies for lifelong learning* (2nd ed.). Chichester: Wiley-Blackwell.

Azer, S. A., Guerrero, A. P., & Walsh, A. (2013). Enhancing learning approaches: Practical tips for students and teachers. *Medical Teacher, 35*(6), 433–443. https://doi.org/10.3109/0142159X.2013.775413.

Barnett, J. (2009). Mandatory continuing education, competence and ethical practice. *Independent Practitioner, Summer*, 137–140.

Bornman, J., & Louw, B. (2019). Personal commitment statements: Encouraging the clinical application of continuing professional development events for health practitioners in low- and middle-income countries. *Journal of Continuing Education in Health Professions, 39*(2), 86–91. https://doi.org/10.1097/CEH.0000000000000248.

Bortot, A. T., Culberson, J. W., Modak, I., Becan-McBride, K., & Nieman, L. Z. (2004). Assessment of competencies in physicians-in-training through the delivery of a community-based health curriculum using distance learning. *Medical Teacher, 26*(7), 615–620. https://doi.org/10.1080/01421590400006580.

Bottenberg, M. M., DeWitt, J. E., Wall, G. C., Fornoff, A., Stelter, N., Soltis, D., & Eastman, D. K. (2013). Assessment of interprofessional perceptions and attitudes of health professional students in a simulation laboratory setting. *Currents in Pharmacy Teaching and Learning, 5*, 167–174. https://doi.org/10.1016/j.cptl.2012.12.004.

Boudioni, M., McLaren, S. M., Woods, L. P., & Lemma, F. (2007). Lifelong learning, its facilitators and barriers in primary care settings: A qualitative study. *Primary Health Care Research & Development, 8*(02), 157–169. https://doi.org/10.1017/S1463423607000187.

Bowen-Chang, P., & Hosein, Y. (2019). Continuing professional development of academic librarians in Trinidad and Tobago. *Global Knowledge, Memory and Communication, 68*(1), 91–111. https://doi.org/10.1108/GKMC-08-2018-0072.

Brownhill, B. (2001). Lifelong learning. In P. Jarvis (Ed.), *The age of learning education and the knowledge society* (pp. 69–79). London: Kogan Page.

Candy, P. C. (2000). Reaffirming a proud tradition: Universities and lifelong learning. *Active Learning in Higher Education, 1*(2), 101–125.

Cashman, S., Hale, J., Candib, L., Nimiroski, T. A., & Brookings, D. (2004). Applying service-learning through a community-academic partnership: Depression screening at a federally funded community health center. *Education for Health (Abingdon, England), 17*(3), 313–322. https://doi.org/10.1080/13576280400002486.

Cole, T., & Carlin, N. (2009). The art of medicine: The suffering of physicians. *The Lancet, 374*(9699), 1414–1415. https://doi.org/10.1016/S0140-6736(09)61851-1.

Cook, D. A., Dupras, D. M., Thompson, W. G., & Pankratz, V. S. (2005). Web-based learning in residents' continuity clinics: A randomized, controlled trial. *Academic Medicine, 80*(1), 90–97.

Cossham, A., & Fields, A. (2007). Balancing individuals' expectations and organizational requirements for continuing professional development. *Library Review, 56*(7), 573–584.

Curran, V. R., Matthews, L., Fleet, L., Simmons, K., Gustafson, D. L., & Wetsch, L. (2017). A review of digital, mobile and social media technologies in health professional education. *Journal of Continuing Education in the Health Professions, 37*(3), 195–206. https://doi.org/10.1097/CEH.0000000000000168.

Davison, I., & Thomas, H. (2008). Lessons from the higher professional Education scheme for general practice training. *Education for Primary Care, 19*(6), 605–614. https://doi.org/10.1080/14739879.2008.11493739.

de Almeida, R., & da Silva Carvalho, P. G. (2018). Healthy people living on a healthy planet – The role of Education of consciousness for integration as an instrument of health promotion. In U. M. Azeiteiro et al. (Eds.), *Lifelong learning and education in healthy and sustainable cities* (World Sustainability Series) (pp. 299–326). https://doi.org/10.1007/978-3-319-69474-0_18.

de Houwer, J., Barnes-Holmes, D., & Moors, A. (2013). What is learning? On the nature and merits of a functional definition of learning. *Psychonomic Bulletin & Review, 20*(4), 631–642. https://doi.org/10.3758/s13423-013-0386-3.

DeSilets, L. D., & Dickerson, P. S. (2008). Recommendations for improving health care through lifelong learning. *The Journal of Continuing Education in Nursing, 39*(3), 100–101.

Elman, N. S., Illfelder-Kaye, J., & Robiner, W. N. (2005). Professional development: Training of professionalism as a foundation for competent practice. *Professional Psychology, Research, and Practice, 36*(*4*), 367–375. https://doi.org/10.1037/0735-7028.36.4.367.

European Commission. (2001). *Making a European area of lifelong learning a reality*. Retrieved from http://viaa.gov.lv/files/free/48/748/pol_10_com_en.pdf

European Union. (2013). *Executive Agency for Health and Consumers (EAHC): Study concerning the review and mapping of continuous professional development and lifelong learning for health professionals in the EU*. Final Report. Contract no 2013 62 02. Retrieved from https://ec.europa.eu/health/sites/health/files/workforce/docs/cpd_mapping_report_en.pdf

Filipe, H. P., Silva, E. D., Stulting, A. A., & Golnik, K. C. (2014). Continuing professional development: Best practices. *Middle East African Journal of Ophthalmology, 21*(2), 131–141. https://doi.org/10.4103/0974-9233.129760.

Hammick, M., Olckers, L., & Campion-Smith, C. (2009). Learning in interprofessional teams: AMEE Guide no 38. *Medical Teacher, 31*(1), 1–12.

Hans, K. (2008). International recognition of basic medical education programmes. *Medical Education, 42*(1), 12–17. https://doi.org/10.1111/j.1365-2923.2007.02907.x.

Horn, J., DeMers, S. T., Lightfoot, S., & Webb, C. (2019). Using continuing professional development to improve maintenance of professional competence: A call for change in licensure renewal requirements. *Professional Psychology: Research and Practice, 50*(2), 120–128. https://doi.org/10.1037/pro0000233.

Hosny, S., Kamel, M. H., El-Wazir, Y., & Gilbert, J. (2013). Integrating interprofessional education in community-based learning activities: Case study. *Medical Teacher, 35*(Suppl 1), S68–S73.

Howe, A. (2002). Twelve tips for community-based medical education. *Medical Teacher, 24*(1), 9–12. https://doi.org/10.1080/00034980120103423.

Howe, A., Billingham, K., & Walters, C. (2002). In our own image--a multidisciplinary qualitative analysis of medical education. *Journal of Interprofessional Care, 16*(4), 379–389. https://doi.org/10.1080/1356182021000008328.

International Labour Organization. (2012). *Handbook of good human resource practices in the teaching profession*. Retrieved from http://www.ilo.org/wcmsp5/groups/public/%2D%2Ded_dialogue/%2D%2D-sector/documents/publication/wcms_187793.pdf

Interprofessional Education Collaborative. (2016). *Core competences for interprofessional collaborative practices: 2016 Update*. Retrieved from *https://nebula.wsimg.com/2f68a39520b03336b41038c370497473?AccessKeyId=DC06780E69ED19E2B3A5&disposition=0&alloworigin=1*

Jarvis, P. (2007). *Globalisation, lifelong learning and the learning society* (2nd ed.). New York: Routledge.

Jarvis-Selinger, S., Ho, K., Lauscher, H. N., Liman, Y., Stacy, E., Woollard, R., & Buote, D. (2008). Social accountability in action: University-community collaboration in the development of an interprofessional aboriginal health elective. *Journal of Interprofessional Care, 22*(Suppl 1), 61–72. https://doi.org/10.1080/13561820802052931.

Jevtic, M., & Bouland, C. (2018). Sustainable development goals as a framework of Education for healthy cities and healthy environments. In U. M. Azeiteiro et al. (Eds.), *Lifelong learning and education in healthy and sustainable cities* (*World Sustainability Series*) (pp. 283–298). https://doi.org/10.1007/978-3-319-69474-0_17.

Kennedy, M.-C., Reast, A., Morrow, K., Bourke, F., Murphy, C., Arnett, R., & Bradley, C. (2019). Reviewing competence in practice: Reform of continuing professional development for Irish pharmacists. *Pharmacy, 7*(2), 1–13. https://doi.org/10.3390/pharmacy7020072.

Khan, A. W. (2012). Continuing Professional Development (CPD): What should we do? *Bangladesh Journal of Medical Education, 1*(1), 37–44. https://doi.org/10.3329/bjme.v1i1.12857.

Koshy, K., Limb, C., Gundogan, B., Whitehurst, K., & Jafree, D. J. (2017). Reflective practice in health care and how to reflect effectively. *International Journal of Surgical Oncology, 2*(6), 1–3. https://doi.org/10.1097/IJ9.0000000000000020.

Kuenkel, P., & Gruen, A. (2018). Co-creation for sustainability as a societal learning journey. In U. M. Azeiteiro et al. (Eds.), *Lifelong learning and education in healthy and sustainable cities* (*World Sustainability Series*) (pp. 377–393). https://doi.org/10.1007/978-3-319-69474-0_22.

Kumar, S., & Shah, L. (2005). Evaluating effectiveness of CPD and measuring returns on investments: A case study of UGC refresher courses (India). In P. Genoni & G. Walton (Eds.), *Continuing professional development – Preparing for new roles in libraries: A voyage of discovery, sixth world conference in continuing professional development and workplace learning for the library and information professions* (pp. 226–236). Munich: K. G. Saur.

Kuthy, R., Mcquistan, M., Riniker, K., Heller, K., & Qian, F. (2005). Students' comfort level in treating vulnerable populations and future willingness to treat: Results prior to extramural participation. *Journal of Dental Education, 69*(12), 1307–1314.

Lachman, S. J. (1997). Learning is a process: Toward an improved definition of learning. *The Journal of Psychology, 131*, 477–480. https://doi.org/10.1080/00223989709603535.

Leach, D. C., & Fletcher, S. W. (2008). Perspectives on continuing Education in the health professions: Improving health care through lifelong learning. *Chest, 134*(6), 1299–1303. https://doi.org/10.1378/chest.08-1022.

Leong, J., & Nguyen, L. H. (2011). Continuing professional development for RMIT international university Vietnam library staff: Adding value through an international partnership: A case study. *The International Information and Library Review, 43*, 169–175.

Majid, S. (2004). Continuing professional development (CPD) activities organized by library and information study programs in Southeast Asia. *Journal of Education for Library and Information Science, 45*(1), 58–70.

Margolis, C. Z. (2000). Community-based medical education. *Medical Teacher, 22*(5), 482–484. https://doi.org/10.1080/01421590050110759.

Marinopoulos, S. S., Dorman, T., Ratanawongsa, N., Wilson, L. M., Ashar, B. H., Magaziner, J. L., Miller, R. G., Thomas, P. A., Prokopowicz, G. P., Qayyum, R., & Bass, E. B. (2007). *Effectiveness of Continuing Medical Education*. Evidence Report/Technology Assessment No. 149 (Prepared by the Johns Hopkins Evidence-based Practice Center, under Contract No. 290-02-0018.) AHRQ publication no. 07-E006. Rockville, MD: Agency for Healthcare Research and Quality.

Marsick, V. J. (1988). Proactive learning in primary health care: An adult education model. *International Journal of Lifelong Education, 7*(2), 101–114. https://doi.org/10.1080/0260137880070202.

Mc Menamin, R., Mc Grath, M., Cantillon, P., & Mac Farlane, A. (2014). Training socially responsive health care graduates: Is service learning an effective educational approach? *Medical Teacher, 36*(4), 291–307. https://doi.org/10.3109/0142159X.2013.873118.

Mi, M., & Halalau, A. (2016). A pilot study exploring the relationship between lifelong learning and factors associated with evidence-based medicine. *International Journal of Medical Education, 7*, 214–219. https://doi.org/10.5116/ijme.576f.a2ca.

Mocker, D. W. (1983). Lifelong learning: Formal, nonformal, informal, and self-directed. *Adult Education, 33*(4), 260–260. https://doi.org/10.1177/0001848183033004009.

Morrison, J. (2006). Learning in teaching hospitals and the community: Time to get the balance right. *Medical Education, 40*(2), 92–93. https://doi.org/10.1111/j.1365-2929.2005.02362.x.

Murad, M. H., Coto-Yglesias, F., Varkey, P., Prokop, L. J., & Murad, A. L. (2010). The effectiveness of self-directed learning in health professions education: A systematic review. *Medical Education, 44*(11), 1057–1068. https://doi.org/10.1111/j.1365-2923.2010.03750.x.

Murray, E., Jolly, B., & Model, M. (1997). Can students learn clinical method in general practice? A randomised crossover trial based on objective structured clinical examinations. *British Medical Journal, 315*(7113), 920–923. https://doi.org/10.1136/bmj.315.7113.920.

Musal, B., Aksakoğlu, G., & Uçku, R. (2003). Community-based education programme of Dokuz Eylül School of Medicine. *Education for Health, 16*(2), 218–221. https://doi.org/10.1080/1357628031000116880.

Nair, M., & Webster, P. (2010). Education for health professionals in the emerging market economies: A literature review. *Medical Education, 44*(9), 856–863. https://doi.org/10.1111/j.1365-2923.2010.03747.x.

Ng, A. W., Fong, B. Y. F., & Leung, T. C. H. (2018). Health and sustainability: Reinforcing public and private engagement through tertiary institutions. In U. Azeiteiro, M. Akerman, W. L. Filho, A. Setti, & L. Brandli (Eds.), *Lifelong Learning and Education in Healthy and Sustainable Cities* (*World Sustainability Series*) (pp. 169–186). Cham: Springer. https://doi.org/10.1007/978-3-319-69474-0_10.

OECD. (2001). *Lifelong learning for all policy directions*. Retrieved from http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DEELSA/ED/CERI/CD(2000)12/PART1/REV2&docLanguage=En

Panda, M., & Desbiens, N. A. (2010). An “Education for Life” requirement to promote lifelong learning in an internal medicine residency program. *Journal of Graduate Medical Education, 2*(4), 562–565. https://doi.org/10.4300/JGME-D-09-00068.1.

Parboosingh, J. (2002). Physician communities of practice: Where learning and practice are inseparable. *Journal of Continuing Education in the Health Professions, 22*, 230–236.

Prats Monné, X. (2015). What is learning for? The promise of a better future. *European Journal of Education, 50*(1), 17–20. https://doi.org/10.1111/ejed.12106.

Pruitt, S. D., & Epping-Jordan, J. E. (2005). Preparing the 21st century global healthcare workforce. *British Medical Journal, 330*(7492), 637–639. https://doi.org/10.1136/bmj.330.7492.637.

Pulsford, D., Jackson, G., O’Brien, T., Yates, S., & Duxbury, J. (2013). Classroom-based and distance learning education and training courses in end-of-life care for health and social care staff: A systematic review. *Palliative Medicine, 27*, 221–235.

Pype, P., Stes, A., Wens, J., Van den Eynden, B., & Deveugele, M. (2012). The landscape of postgraduate education in palliative care for general practitioners: Results of a nationwide survey in Flanders, Belgium. *Patient Education and Counseling, 86*, 220–225.

Pype, P., Symons, L., Wens, J., Van den Eynden, B., Stes, A., & Deveugele, M. (2014). Health care professionals’ perceptions towards lifelong learning in palliative care for general practitioners: A focus group study. *BMC Family Practice, 15*(36), 1–11.

Raman, J. (2015). Mobile technology in nursing education: Where do we go from here? A review of the literature. *Nurse Education Today, 35*, 663–672.

Rishel, C. J. (2013). Professional development for oncology nurses: A commitment to lifelong learning. *Oncology Nursing Forum, 40*(6), 537–539.

Rychetnik, L., & Wise, M. (2004). Advocating evidence-based health promotion: Reflections and a way forward. *Health Promotion International, 19*(2), 247–257. https://doi.org/10.1093/heapro/dah212.

Saffran, L. (2013). Dancing through cape coast: Ethical and practical considerations for health-related service-learning programs. *Academic Medicine, 88*(9), 1212–1214. https://doi.org/10.1097/ACM.0b013e31829ec9f2.

Salvia, A. L., Brandli, L. L., & Frandoloso, M. A. L. (2018). Prerequisites for energy sustainability in municipalities in Rio Grande do Sul, Brazil. In U. M. Azeiteiro et al. (Eds.), *Lifelong learning and education in healthy and sustainable cities* (*World Sustainability Series*) (pp. 595–609). https://doi.org/10.1007/978-3-319-69474-0_34.

Starke, I., & Wade, W. (2005). Continuing professional development – Supporting the delivery of quality healthcare. *Annals Academy Medicine Singapore, 34*(11), 714–716. Retrieved from http://www.annals.edu.sg/pdf/34VolNo11200511/V34N11p714.pdf.

Taylor, D. C. M., & Hamdy, H. (2013). Adult learning theories: Implications for learning and teaching in medical education: AMEE guide no. 83. *Medical Teacher, 35*(11), e1561–e1572. https://doi.org/10.3109/0142159X.2013.828153.

UNESCO. (2006). *Classification of Learning Activities – Manual*. Retrieved from http://www.uis.unesco.org/StatisticalCapacityBuilding/Workshop%20Documents/Education%20workshop%20dox/2010%20ISCED%20TAP%20IV%20Montreal/NFE_CLA_Eurostat_EN.pdf

UNESCO. (2015). *UNESCO Institute of Lifelong Learning (UIL)*. UNESCO Global Network of Learning Cities*:* Guiding Documents. Retrieved from https://uil.unesco.org/fileadmin/key-documents/LifelongLearning/learning-cities/en-unesco-global-network-of-learning-cities-guiding-documents.pdf

United Nations. (2015). General assembly. *Resolution: Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1*. Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

Webb, C., & Horn, J. B. (2012). Continuing professional development: The regulatory perspective. In G. J. Neimeyer & J. M. Taylor (Eds.), *Continuing professional development and lifelong learning: Issues, impacts and outcomes* (pp. 135–153). Hauppauge: Nova Science Publishers.

World Federation for Medical Education (WFME). (1998). International standards in medical education: Assessment and accreditation of medical schools'–educational programmes. A WFME position paper. The Executive Council, The World Federation for Medical Education. *Medical Education, 32*(5), 549–558.

World Health Organization (WHO). (2010a). Regional Guidelines for Continuing Medical Education (CME)/Continuing Professional Development (CPD) Activities. Retrieved from http://apps.who.int/iris/handle/10665/205767

World Health Organization (WHO). (2010b). *Framework for action on interprofessional education and collaborative practice* (WHO/HRH/HPN/10.3). Geneva: Department of Human Resources for Health, WHO. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/70185/WHO_HRH_HPN_10.3_eng.pdf?sequence=1.

Young, M. (2015). What is learning and why does it matter? *European Journal of Education, 50*(1), 17–20. https://doi.org/10.1111/ejed.12105.

Chapter 21
Development and Application of Mobile Technology and the Internet of Things to Aid Primary Care

Adam K. L. Wong

Introduction

The World Health Organization (WHO) has developed a cohesive definition of primary health care (PHC) based on three components as listed below (World Health Organization 2019):

1. meeting people's health needs through comprehensive promotive, protective, preventive, curative, rehabilitative, and palliative care throughout the life course, strategically prioritising key health care services aimed at individuals and families through primary care and the population through public health functions as the central elements of integrated health services;
2. systematically addressing the broader determinants of health (including social, economic, environmental, as well as people's characteristics and behaviours) through evidence-informed public policies and actions across all sectors; and
3. empowering individuals, families, and communities to optimise their health, as advocates for policies that promote and protect health and well-being, as co-developers of health and social services, and as self-carers and care-givers to others.

Following this definition, primary health care (PHC) is not just about curative needs to be met by medical professional at clinics and hospitals but also about "prevention" using the "broader determinants of health", which includes "empowering individuals, families and communities to optimize their health". It is also common to focus on physical health only. However, WHO also stated that the efforts on PHC should also include "the comprehensive and interrelated aspects of physical, mental and social health and wellbeing" (World Health Organization 2019). This chapter

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focuses on the use of the mobile phone and Internet of things (IoT) for empowering individuals to achieve prevention of physical and mental illness.

Mobile phones have become more essential than the watch and even the wallet when one leaves home. It is a common scene to see commuters looking at nothing but their mobile phones on trains and buses. Most people will appreciate the use of the mobile phone for communications, social networking as well as searching for information and directions quickly. However, the smart mobile phone today is actually a portal computer with processing power, internal memory and networking capabilities that rival personal computers just a few years ago. With the right applications installed, the connection to the Internet and, in some cases, hardware adapters, smart mobile phones can achieve all tasks in the three components of primary health care as defined by WHO. Due to its ubiquity, the mobile phone can empower individuals, families and communities for better primary health care. Therefore, this chapter aims to increase the awareness of the doctors, patients and their caretakers about the use of the mobile phones in protection, prevention and promotion of health.

Deliver Primary Health Care in Remote Areas Using Mobile Phones

Smart mobile phones can act more than just a communication device. It is a portable microcomputer with multiple sensors that can help health practitioners to quickly and accurately carry out tasks previously were completed by specially trained personnel using expensive and hospital-based equipment. Malaria is a common disease in African countries like Uganda. Overall, as much as 50% of the world's population are at risk of malaria. In the remote areas of underdeveloped nations such as Nigeria and Uganda, as much as 90% of the population are vulnerable to malaria (Stoevelaar 2017). The majority of people in these African countries lack adequate access to proper medical services. In rural clinics, there is not enough personnel and equipment to provide correct diagnosis and prescribe the right medication. This results in long waiting, incorrect diagnosis and unaffordable medical expenses. The problem can be much alleviated if there is an inexpensive, quick and reliable way for these clinics to quickly diagnose common diseases. The traditional manual microscopy for diagnosis of malaria is very slow and expensive. It also needs to be performed by specially trained medical personnel such as nurses. However, in Uganda, there are only 6 nurses per 100,000 patients, which is far less than the 2.5 nurse to 1000 patient ratio recommended by the World Health Organization (WHO) (Van Ackeren et al. 2018).

In fact, malaria is one of the main causes of illness in underdeveloped nations. Malaria is caused by parasites found in the blood, and it may be fatal unless the parasites in the blood are detected early for proper treatment and medication. In Nigeria, more than half of the outpatient visits are related to malaria. However, due to the lack of low-cost mobile equipment, accurate diagnostics cannot be carried out, and therefore, drugs cannot be administered without prescription. There is a need to prevent incorrect diagnostics which results in overtreatment and drug resistance. In remote areas of developing countries, trained medical personnel are in short supply. They have to work under constant pressure which often results in human errors and incorrect judgement. What makes the matter worse is that in those remote areas, there is no reliable electricity and Internet access, rendering deployment of medical equipment or telemedicine infeasible.

The Excelscope is a low-cost, easy-to-assemble microscope which provides better primary care for malaria. The Excelscope can be assembled quickly by fitting a smartphone into a 3D-printed casing. The casing consists of a ball lens and a custom printed circuit board (PCB). The PCB contains all necessary parts which include a backup battery, LEDs, SD slot and buttons (Stoevelaar 2017). The Excelscope allows simple operations without specialist knowledge. Before using the Excelscope, the blood sample is stained using Giemsa in accordance with the procedure recommended by the WHO. The stain will cause the malaria-causing parasites within blood cells to turn purple. The casing contains a ball lens. The ball lens allows the identification of objects, such as parasites, as small as 1 μm in blood samples. The casing can also hold the blood sample in a system that allows three-dimensional movements, and the system can move the blood sample in steps as small as 100 μm. This mechanism can take 800 views of an 8 mm blood sample, which is the WHO's recommendation for malaria screening. The system will use an algorithm that runs on the phone to analyse the views and search for malaria-causing parasite based on the colour and shape revealed by the Giemsa. The photos of the views are automatically saved to an SD card (Van Ackeren et al. 2018). The Excelscope is a way to move from manual microscopy involving professional microscopes to automated microscopy using affordable microscope. This is achieved with reduction in time and cost but without sacrificing accuracy. Overall, the Excelscope can provide affordable, accessible and automatic diagnosis for malaria.

In summary, the Excelscope can be used in places where there is no stable electricity, no connection to the Internet and a lack of well-trained health practitioners. It can be used in primary health-care centres, medicine stores or medical outreaches (Stoevelaar 2017).

Disease Management and Wellness Optimisation Using Mobile Phones and the Internet of Things

One future direction of development of health technology in primary care is the use of the smart mobile phones for disease management and health optimisation. Smart mobile phones are used for the monitoring of certain illnesses and self-management for better wellness. As more and more electronic devices are equipped with sensors and networking capabilities, the term medical Internet of things (mIoT) is used to describe autonomous communication between devices without human intervention for medical purposes. It is estimated that by 2020, 40% of IoT-related technology will be health-related. The mIoT will be a US$117 billion market (Dimitrov 2016). Besides being a lucrative market, the mIoT can reduce costs, improve efficiencies and save lives. mIoT can be used in primary health care by connecting different devices with the smart mobile phones.

Schizophrenia is a mental disorder with symptoms such as strange behaviour, abnormal speech and the lack of ability to comprehend reality. It is usual for schizophrenia patients to have other mental conditions including anxiety. Information Technology Aided Relapse Prevention Programme in Schizophrenia (ITAREPS) is a mobile phone application developed for the prevention of relapse of schizophrenia. In a user case of ITAREPS, the user's home has a telemonitoring system running on a personal computer which is connected to a mobile phone. When the telemonitoring system detects prodromal symptoms of relapse, the system will send an alert using mobile phone Short Message Service (SMS). This allows the patient's family members to take appropriate steps without resorting to the costly and stressful step of hospitalisation (Kalem and Turhan 2015).

Asthma is a common and potentially lethal illness. Many asthma deaths can be avoided if medical assistance is sought in time. However, it has also been found that almost 70% of asthmatic patients do not seek regular medical consultations. It is therefore suggested that peak flow meter should be used as a self-monitoring device for patients with severe asthma (Drummond et al. 1994).

A study was conducted by combining the smart mobile phone with handheld electronic peak flow meter which monitors for 9 months. The participants were patients between 12 and 55 years old and receiving treatment with regular inhaled steroids and bronchodilators. The follow-up survey showed that close to 70% of the participants found the combination of the mobile phone with the handheld peak flow meter marked as “satisfied” or “very satisfied.” About three-quarters of the participants agreed that the system helped them to manage their symptoms. The survey also showed that the feedback screens on the mobile phone and ease of use were the main attractive features of this telemedicine system. A potential enhancement to the system is to allow the mobile phone application to upload peak flow meter data to a server in real time. Then the server can analyse the data and provide feedback to the patient within seconds and alert the doctor if necessary (Kalem and Turhan 2015).

The mIoT enables patients to connect directly to their doctors in real time, thus creating “health selfie”. For example, patients can use the “myo”, which was originally a motion controller for games, to monitor their progress in physical exercise after a fracture. The angle of movement can be captured by the device and reported to the doctors automatically (Dimitrov 2016). The Zio Patch is an innovative, single-lead electrocardiographic (ECG), lightweight, Food and Drug Administration-approved adhesive patch monitor. It can continuously record ambulatory adhesive patch monitor suitable for detecting cardiac arrhythmias in patients referred for ambulatory ECG monitoring (Barrett et al. 2014). Johnson & Johnson is planning to develop wearable devices such as blood pressure monitors with Philips. Novartis is working with Google on sensor technologies for a wearable device to measure blood glucose levels. There is a plethora of wearable devices such as Garmin and Fitbit that can capture pulse, steps and sleep pattern (Dimitrov 2016).

Using the Mobile Phone and IOT to Encourage Performing Physical Activities

The Importance of Physical Activities

Good health is important to carry out one's work and avoid financial loss due to sick leaves and medical expenditures. Better health will reduce the burden on the society due to the time and effort in caretaking. The youth stage has a crucial impact on the health in adulthood. Unhealthy lifestyle at the youth stage is likely to continue into adulthood (Lee and Loke 2005). Youngsters who do not have healthy lifestyles will put their health at risk in later stages of their lives. Fu et al. (2012) reviewed 164 health fitness studies conducted among Hong Kong residents from 2005 to 2011. They discovered that the quality of life and physical fitness (PF) levels across all age groups were declining during the period. More than 60% of the sampled population did not exercise for 30 min per week or walk 8000 steps a day. Interventions carried out in these fitness studies produced only non-encouraging results. Therefore, there is a need to explore intervention methods that can prevent relapses.

With the permission from the Hong Kong Amateur Athletic Association, the author collected 190 questionnaires from the runners in the 10 K race at the finishing line of the Standard Chartered Hong Kong Marathon 2017. The results show that 55% of the runners practised only two times or less per week. Also, more than half of the runners ran less than 10 kilometres in total per week. About one-third of the runners did not even keep track of their mileage. This shows that one-time sports events may attract a lot of participants but they fail to cultivate a positive attitude towards and healthy habit in physical activities. There is a need to design a way which encourages students to develop and sustain the habit of stair climbing.

Physical activities (PA) have been proved to prevent obesity and positively associated with better health. The WHO defines PA as "any bodily movement produced by skeletal muscles that requires energy expenditure" (World Health Organization 2017). The lack of PA is estimated to be responsible for about "21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of ischaemic heart disease burden" (WHO 2017). The lack of PA is of particular concern among students in Hong Kong. Hui et al. (2015) did a cross-cultural comparison research on PA and PF on 12,590 adolescents aged 12–15 years in eight major Asian cities. They found that adolescents in Hong Kong spent the least amount of time (125 min per week) in moderate to vigorous PA (MVPA) than all the other seven Asian cities. This amount is less than half of the amount of time (350 min per week) spent by the Tokyo adolescents who ranked the top. However, all the eight Asian cities did not achieve the WHO's PA guideline for youth (420 min of MVPA per week).

This finding is consistent with another research on Hong Kong adolescents. In 2016, the Chinese University of Hong Kong published the first Hong Kong Report Card on Physical Activity for Children and Youth. The report was based on studies or reports in 10 years, and the data source covered "approximately 74,000 children and adolescents aged 6 to 17 years and more than 400 schools" (Huang et al. 2016, p. 170). The report stated that "the majority of children and youth in Hong Kong do not meet the recommended PA levels and excessive screen time is one of the public concerns". Regular physical education (PE) lessons only make students achieve certain skills (e.g. to be able to serve a volleyball) or level of PA (e.g. to swim 50 metres unassisted and without the use of floatation device). There are no measures to encourage students to develop the habit of performing PA regularly.

Relationship Between PA and Academic Performance

There is plenty of research that proved the positive correlation between PA and academic performance. Researches published in the Academic Search Premier via EBSCOHost were reviewed, and 15 recent studies were found related to PA of students. Although these researches proved the benefits of various types of PA, there were a number of issues. Firstly, these studies mainly used sports-related PA such as running, curl ups and shuttle runs (Correa-Burrows et al. 2014; de Groot et al. 2015; Edwards et al. 2011; Fox et al. 2010; So 2012). These PA are vigorous and difficult to be integrated in the everyday lives of students. Some studies also proved the positive effect of active commuting on students, but the conditions for active commuting are hard to control (Martínez-Gómez et al. 2011). Secondly, none of these researches include elements that can motivate students to form the habit of doing PA regularly. Thus, students may be just following "orders" from their teachers to perform PA in these researches. In fact, Fu et al. (2012) reviewed 164 health fitness studies conducted among Hong Kong residents from 2005 to 2011. The students may lack positive attribute and, therefore, cannot maintain the habit of regular PA.

Based on these researches, it is noted that PA requires special equipment, venue, partners or sportswear. In addition, there is a lack of study on how to motivate students to perform regular PA.

Stair Climbing

Stair climbing (SC) can be considered as a form of vigorous PA. It uses nearly 10 times the energy of the resting state (Eves et al. 2012). It consumes more calories per minute than jogging or rowing. Ascending (climbing upstairs) is the preferred PA for health because ascent consumes two to three times the energy of descent. Just like many other sports, stair climbing can bring benefits to the cardiorespiratory system and improve one's lipoprotein profiles. However, unlike other sports, stair climbing is a PA for all. Staircases are available in almost all schools. To do SC, one does not have to be part of a team, possess special equipment or wear sports outfit. It can even be performed without others knowing that one is exercising.

There is a need to encourage students to do stair climbing. SC requires no special skills or equipment. It is more likely to be maintained by an individual throughout the lifetime than any other vigorous PA. The WHO recommends stair climbing as a PA that can be done 5 days per week to improve and maintain health (WHO 2017). It is possible to use the Internet of things (IoT) technologies to create an infrastructure as a sustainable way of measuring and encouraging students to do SC in the long term. For example, awards for healthy life and green living can be given to students who have achieved certain level of SC.

To motivate students to perform SC regularly, it is necessary to have a mechanism that accurately and automatically tracks the level of SC activities performed by each participant over time. When such a mechanism is available, suitable motivations can then be provided to students according to the level of SC they have performed. The following sections review different technologies that can implement such a mechanism.

Motion Detection Using Infra-red Counters

The infra-red counter consists of an infra-red transmitter-receiver pair and a low-cost calculator. It works on the principle that when an infra-red ray from the emitter is interrupted from reaching the receiver, a count will be recorded. They are commonly installed at the entry points of venues to automatically count the total number of entering people. They are commonly used at railway stations or museums. The infra-red device is easy to install and inexpensive. Eves et al. (2012) used the infra-red counter to implement a stair climbing promotional campaign targeting calorific expenditure for worksites. There are two problems in using the infra-red counter for motivational purposes. The first problem is that counting using infra-red counter is inaccurate when a group of people move between the transmitter and receiver (Eves et al. 2012). The second problem is that the identity of the people walking pass the counter is unknown. Both problems make it impossible to reward the individual who has reached a desired level of SC.

Using QR Codes with Mobile Phones

The QR code is inexpensive and easy to install. It is possible to have QR codes installed in the staircase of each floor. The SC activities of students will be recorded when they use their mobile phones to scan the QR code. Also, it is possible to identify the students because they are using their mobile phones. However, there are many drawbacks in using QR codes. Firstly, they can be rescanned repeatedly from a stored image. Users can pretend to have performed the PA (Guan 2016). Secondly, like infra-red, the scanning of the QR code also requires line of sight, which requires the user to stop for a few seconds in order to scan the code. This makes it impractical when a large group of students scan the QR code at the same time.

Using NFC Tags with Mobile Phones

It is also possible to embed near-field communication (NFC) tags into posters. NFC tags are flat and light computer chips that can be embedded into cards or posters. The tags can emit radio-frequency signals when mobile phones with NFC capabilities are placed within their range, which is usually a few centimetres. There, it is possible that posters with embedded NFC tags be placed in the staircase. Then students can put their mobile phones near the NFC-embedded poster to record their SC activity. However, this approach requires the use of NFC-equipped phones, which are more expensive and unlikely to be owned by all students. Furthermore, the range of passive NFC tags embedded in the poster is only a few centimetres. This means that the students have to stop for a few seconds and place their mobile phones near the poster in order to record their SC activity. Again, it is inconvenient for large groups of users.

Using Bluetooth Low Energy Beacons with Mobile Phones

The Bluetooth Low Energy (BLE) beacons can be configured to send their signals from a zero to half a metre (immediate), to two metres (near), to over 30 metres (far). The mobile phone application can detect where it is within the immediate, near or far zone of the beacon. Most mobile phones have Bluetooth capability. The BLE beacons are waterproof and wall-mounted and operate for up to a few years between battery changes (Onyx Beacon 2017).

BLE is one of the more promising new technologies in enabling the IoT (Want et al. 2015). BLE is a wireless personal area network technology. It is possible to install BLE emitters, called BLE beacons, along the staircases. The beacons will broadcast data frames which contain its universally unique identifier (UUID) using Bluetooth 4.0 Low Energy. As a student walks through a series of beacons, the application can calculate the number of steps the student has ascended or descended on the staircase. The data will be sent to the central server for further calculation and analysis. The current state-of-the art standard is the Eddystone standard. It is an open beacon format developed by Google that can be detected by both Android and iOS devices. This format also supports encryption to prevent unauthorised access (Google 2017).

BLE beacon is preferred to other technologies such as infra-red, QR code and NFC. The infra-red counters cannot track the SC of individuals. Counting is inaccurate when a group of people move between the transmitter and receiver (Eves et al. 2012). Both the QR code and NFC tags are inexpensive and easy to install. However, the QR code can be rescanned repeatedly from a stored image. Besides, scanning the QR code requires line of sight, which requires the student to stop for a few seconds in order to scan the code. For NFC tags, the user needs to put an NFC-equipped phone within a few centimetres of the tag in order to get the signal. On the other hand, the BLE beacons can be configured to send their signals from a zero to half a metre (immediate), to two metres (near), to over 30 metres (far). And the mobile phone application can detect whether it is within the immediate, near or far zone of the beacon. Besides, many mobile phones do not have NFC capability but have Bluetooth capability.

With the accurate data captured using BLE and mobile phones, it is up to the organisation, such as schools, to devise appropriate incentive schemes to motivate students by rewarding them according to their levels of SC activity.

Using the Mobile Phone for Telemedicine

The use of ICT in providing health care is also known as telehealth or telemedicine. However, there is a difference in the scope between telehealth and telemedicine. Telemedicine can be defined as “the use of telecommunications to diagnose and treat disease and ill-health”, which means it targets the use of medical applications. Telehealth has a broader scope which covers “surveillance, health promotion and public health functions” (Wilson and Maeder 2015).

Telemedicine can provide online doctor visits round the clock, 7 days a week, at a cost typically lower than face-to-face consultations. By visiting a website or using a smart mobile phone app, a patient can consult with a doctor. The doctor will provide a diagnosis, treatment suggestions and prescriptions when necessary. Telemedicine is suitable for general, urgent but non-emergency illnesses only which include flu, pink eye and urinary tract infections (Hurst 2016).

In a typical telemedicine phone application, the user can select a doctor from a list. The application may allow the user to shortlist the doctors using the following criteria:

- Location
- Languages spoken
- Gender
- Education
- Experience
- Specialisation

Then the application will ask the users to answer a few questions on their ailment. The users can also upload images, such as those showing rash or lab results. The advanced features of some applications may allow the users to choose their pharmacies in case prescription is given. Lastly, the application will ask for insurance and payment information. When all information is given, the patient can talk to the doctor via the application. The patient and the doctor can see each other via the camera of the mobile phone. The online doctor should not be seen as a substitute for your regular family doctor. It should only be used in urgent but non-emergency situations when it is not convenient to your regular doctor. Also, the online doctor is not supposed to prescribe controlled substances like narcotics or muscle relaxants (Hurst 2016).

One of WHO's components of primary health care is "empowering individuals, families, and communities to optimize their health" (World Health Organization 2019). The online doctors in telemedicine can also give advice on improving individuals' health by dealing with hypertension, allergies and gout. The use of telemedicine means patients that are unfit for travel or do not know how to use a smartphone application can get medical consultations with the help of family members or caretakers.

Telemedicine can save patients' time and costs. The typical telemedicine consultation described in the previous paragraphs will last for about only 10 min. With the widespread use of 4G mobile networks and broadband Internet, this means telemedicine is available to most people living in areas where there is cellular network coverage. The physical visit to the doctor's office can be eliminated. There are several advantages of this approach over the traditional face-to-face consultation approach. Firstly, it reduces the burden of the patients' caretaker and the patient in commuting to and from the doctor's office. Secondly, it avoids the risk of cross infection with other patients when visiting clinics or hospitals. Finally, it increases the availability of doctors because they are no longer limited by office hours and physical locations. It can be thought of as the Uber in the medical sector, in which patients can see doctors that are available at the time of their call. For example, myvirtualdoctor.com allows the user to login to their website using mobile phones, tablets or computers. Then a licensed physician will contact the user in under 20 min. Medical opinions, treatment options and, if necessary, a prescription can be given over the phone.

Besides saving time and costs, another benefit of telemedicine is the increase of the compliance rate in annual examinations. In primary health care, it is important for patients with existing illness to complete annual examinations. The degree to which patients actually follow this procedure is known as the "compliance rate". It is calculated as the number of patients with a completed examination divided by the total number of patients. It is estimated that there are more than 90 million patients with diabetic retinopathy (DR) around the world. DR is one of the main causes of blindness in well-developed countries. Annual diabetic eye examination is an effective way to screen high-risk patients for early treatment to prevent blindness. In the East Baltimore Medical Center (EBMC) of the United States, which is a primary care clinic, a study was conducted to improve the compliance rate for annual diabetic eye examination through the use of telemedicine technology. It was found that the compliance rate of diabetic patients for their annual diabetic eye examination increased from 48% to over 78% after telemedicine was used (Hatef et al. 2017).

In 1998, a group of doctors piloted tele-geriatrics to a group of local residential care homes for elderly in HKSAR. However, the project did not develop further due to the lack of government support. Chan et al. (2005) verified the feasibility and acceptability of using telemedicine on a group of elderlies with type 2 diabetes mellitus. They proved that using telemedicine for the elderly was technically feasible. Telemedicine has advanced in recent years, and thus, governments may consider incorporating telemedicine as a pillar in primary health care. The government should work with doctors, pharmacists, elderly homes and other stakeholders to formulate policies to protect the welfare and rights of patients when telemedicine is used.

However, while most users have a smartphone that is capable of video conferencing using high-speed mobile networks, there are some main issues that need to be addressed. The procedure for verifying the identities of the patient and doctor must be clearly defined. The doctors and caretakers at elderly homes should be trained and certified how to use telemedicine properly. The existing doctors' directories have to be modified to include hyperlinks for providing telemedicine. There should be rules specifying what types of patients are suitable for telemedicine. For example, only adult patients who have at least one prior face-to-face consultation are allowed to use telemedicine.

The government should clarify whether it is legal for a doctor to provide telemedicine services to patients outside the jurisdiction. Telemedicine involves the transmission and storage of data such as photos, video, the patients' vitals and geolocation. There should be rules regarding security and privacy such as data encryption and permissions granted to mobile applications. There should be guidelines on the role of telemedicine in terms of sick leave claims, insurance claims and evidence in court. Furthermore, since there will be no hard copy of doctor's prescription, there has to be guidelines to pharmacists as to what electronic evidence is acceptable for prescription-only medicines (POM).

Using Big Data and Artificial Intelligence

As sensors and mobile phones are collecting data continuously, even when the patients are on sleep, vast amounts of data are streamed and uploaded to servers constantly. This allows government health services to discover trends in health issues and come up with timely counter measures. Also, the vast amount of data can help improve knowledge about diseases with the use of big data and artificial intelligence (AI). While there is no universally accepted definition for the term "big data," many people usually refer to the "three Vs" that characterise big data. The first V stands for volume, which means there must be vast amounts of data such as those generated by sensors and mobile phones. The second V stands for variety, which means the data collected are not just text or numbers, but images, voice or even videos that are used to describe the patient's health issues. The final V stands for velocity, which means that the data should be available for doctors and data scientists without long waits. A typical situation will be a doctor making a diagnosis for a patient using a video call on a smart mobile phone with 5G cellular network access and AI programmes. The doctor's mobile phone application can access the patient's electronic health records and previous laboratory reports from a central database; an AI programme will "understand" the patients' voice and convert them into symptoms and then come up with possible causes and treatment suggestions for the doctor to choose from.

However, there are two main barriers to be overcome before achieving the perfect scenario stated above. Firstly, there must be a balance between sharing of data and privacy protection of the patients according to regulations such as the European Union (EU) data protection and privacy legislation. For example, the patient can authorise their wearable devices and mobile phones to upload their personalised data to a trusted database, from which their doctors can access their medical history, lab reports and data captured from the devices and mobile phone. At the same time, the data can be anonymised for big data analytics to advance the knowledge on disease management, prevention and treatment. Secondly, there should be a common protocol for the various devices to communicate with one another. Currently, each device uses a proprietary protocol specific to the manufacturer. It is suggested that a future-proof standard be used so that devices manufactured today can understand the data received in future. One possible candidate of such a standard is the eXtensible Markup Language (XML).

Concluding Remarks

With the continuous development of processing power of smart mobile phones; reduction in size, weight and energy consumption of sensors; and increased connectivity with the use of the 5G network, it will not be too long before many people will rely on their mobile phones or smartwatches to meet their primary health-care needs. With the mIoT, the patient's doctors and family members get real-time data about the patient automatically.

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References

Barrett, P. M., Komatireddy, R., Haaser, S., Topol, S., Sheard, J., Encinas, J., et al. (2014). Comparison of 24-hour Holter monitoring with 14-day novel adhesive patch electrocardiographic monitoring. *The American Journal of Medicine, 127*(1), 95. e11-95. e17.

Chan, W. M., Woo, J., Hui, E., Lau, W. W., Lai, J. C., & Lee, D. (2005). A community model for care of elderly people with diabetes via telemedicine. *Applied Nursing Research, 18*(2), 77–81.

Correa-Burrows, P., Burrows, R., Orellana, Y., & Ivanovic, D. (2014). Achievement in mathematics and language is linked to regular physical activity: A population study in Chilean youth. *Journal of Sports Sciences, 32*(17), 1631–1638. https://doi.org/10.1080/02640414.2014.910606.

de Groot, R. H. M., van Dijk, M. L., & Kirschner, P. A. (2015). Cohort profile of the GOALS study: A large-scale research of physical activity in Dutch students. *British Journal of Educational Technology, 46*(5), 947–952. https://doi.org/10.1111/bjet.12284.

Dimitrov, D. V. (2016). Medical internet of things and big data in healthcare. *Healthcare informatics research, 22*(3), 156–163.

Drummond, N., Abdalla, M., Beattie, J., Buckingham, J., Lindsay, T., Osman, L., et al. (1994). Effectiveness of routine self monitoring of peak flow in patients with asthma. *BMJ, 308*(6928), 564–567.

Edwards, J. U., Mauch, L., & Winkelman, M. R. (2011). Relationship of nutrition and physical activity Behaviors and fitness measures to academic performance for sixth graders in a Midwest City School District. *Journal of School Health, 81*(2), 65–73. https://doi.org/10.1111/j.1746-1561.2010.00562.x.

Eves, F. F., Webb, O. J., Griffin, C., & Chambers, J. (2012). A multi-component stair climbing promotional campaign targeting calorific expenditure for worksites; a quasi-experimental study testing effects on behaviour, attitude and intention. *BMC Public Health, 12*(1), 423.

Fox, C. K., Barr-Anderson, D., Neumark-Sztainer, D., & Wall, M. (2010). Physical activity and sports team participation: Associations with academic outcomes in middle school and high school students. *Journal of School Health, 80*(1), 31–37. https://doi.org/10.1111/j.1746-1561.2009.00454.x.

Fu, F. H., Guo, L., & Zang, Y. (2012). An overview of health fitness studies of Hong Kong residents from 2005 to 2011. *Journal of Exercise Science & Fitness, 10*(2), 45–63.

Google. (2017). Eddystone format. *Google Developers.* Retrieved from https://developers.google.com/beacons/eddystone

Guan, Y. Y. (2016). *Understanding the role of financial incentives in motivating physical activity in Singapore.* Dissertation, National University of Singapore.

Hatef, E., Alexander, M., Vanderver, B. G., Fagan, P., & Albert, M. (2017). Assessment of annual diabetic eye examination using telemedicine technology among underserved patients in primary care setting. *Middle East African Journal of Ophthalmology, 24*(4), 207.

Huang, W. Y., Wong, S. H. S., Wong, M. C. S., Sit, C. H.-P., Sum, R. K. W., & He, G. (2016). Results from Hong Kong's 2016 report card on physical activity for children and youth. *Journal of Physical Activity and Health, 13*(11 Suppl 2), S169–S175.

Hui, S. S.-C., Suzuki, K., Naito, H., Balasekaran, G., Song, J. K., Park, S. Y., et al. (2015). How fit and active in Asian Youth? The Asia-fit study: 3412 Board# 173 May 30, 8: 00 AM–9: 30 AM. *Medicine & Science in Sports & Exercise, 47*(5S), 922.

Hurst, E. J. (2016). Evolutions in telemedicine: From smoke signals to mobile health solutions. *Journal of Hospital Librarianship, 16*(2), 174–185.

Kalem, G., & Turhan, Ç. (2015). Mobile technology applications in the healthcare industry for disease management and wellness. *Procedia-Social and Behavioral Sciences, 195*, 2014–2018.

Lee, R. L., & Loke, A. J. (2005). Health-promoting behaviors and psychosocial Well-being of university students in Hong Kong. *Public Health Nursing, 22*(3), 209–220.

Martínez-Gómez, D., Ruiz, J. R., Gómez-Martínez, S., Chillón, P., Rey-López, J. P., Díaz, L. E., et al. (2011). Active commuting to school and cognitive performance in adolescents: The AVENA study. *Archives of Pediatrics & Adolescent Medicine, 165*(4), 300–305.

Onyx Beacon. (2017). *World premiere: large scale iBeacons network guides visually impaired people to use the public transportation service*. Retrieved from http://www.onyxbeacon.com/world-premiere-large-scale-ibeacons-network-guides-visually-impaired-people-to-use-the-public-transportation-service/

So, W. Y. (2012). Association between physical activity and academic performance in Korean adolescent students. *BMC Public Health, 12*(1), 258–264. https://doi.org/10.1186/1471-2458-12-258.

Stoevelaar, J. (2017). *A roadmap for development of a smart malaria diagnostic device: Use and acceptance of the Excelscope by healthcare professionals in Nigeria*. Netherlands: Delft University of Technology.

Van Ackeren, J. S., Jonge, L., Rajagopal, K.T., Thiruvengadam, K., Bolanos, J., de Fazio, F., & Boer, G. (2018), *EXCELSCOPE 2.0, a semi-automated, smart Malaria diagnostic device.* Accessible on https://www.jamesdysonaward.org/2018/project/excelscope-20-1/

Want, R., Schilit, B. N., & Jenson, S. (2015). Enabling the internet of things. *Computer, 48*(1), 28–35.

WHO. (2017). *Global strategy on diet, physical activity and health*. Retrieved from http://www.who.int/dietphysicalactivity/factsheet_myths/en/

Wilson, L. S., & Maeder, A. J. (2015). Recent directions in telemedicine: Review of trends in research and practice. *Healthcare Informatics Research, 21*(4), 213–222.

World Health Organization. (2019). *Primary health care*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/primary-health-care

Chapter 22

A Happy University Initiative in Hong Kong

Elsa K. Y. Chan and Ben Y. F. Fong

Introduction

Happiness is a growingly hot topic in research agenda of economics. While happiness means different things to different people, studies on self-reported life satisfaction or happiness are worth undertaking, and increasing investigations has been reported in the past years (Kahneman and Krueger 2006). Crocker (2002) explains that the well-being of modern society is dependent not only on traditional capital and labour but also on the knowledge and ideas possessed and generated by individual workers. Education is the primary source of this human capital in the community. Notably, it is important to find out what influences most in students' levels of satisfaction or happiness in university education. Understanding the main factors behind student satisfaction can be of value to educational policy planners in enabling better learning outcomes, cost-efficient public education and a highly motivated future workforce. Investigations to quantify the determinants of happiness in university students are therefore important (Mangeloja and Hirvonen 2007).

What is a happy university? According to the Cambridge Dictionary (2017a, b), happy means "feeling, showing or causing pleasure or satisfaction"; university means "a place where people study for an undergraduate (first) or postgraduate (higher level) degree." If students are studying in the university with pleasure or a sense of satisfaction, the likelihood of having happy university life will be greatly increased, and the university is thus regarded as a happy university. The findings by Mangeloja and Hirvonen (2007) reveal that the most important influences on

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students' levels of satisfaction are social relationships, resources and the educational environment, achieving personal goal and extra-curricular activities. Research conducted by Chan et al. (2005) has revealed that the significant explanatory variables that increase satisfaction levels at universities are related to satisfaction with academic work, good relationships formed, good time management, good reputation of the university and resources provided by the university.

What about university students in Hong Kong? The first decade of the twenty-first century witnessed several fundamental changes in Hong Kong's higher education. New policies and practices related to quality assurance, university governance, funding mechanism, private universities, community colleges and internationalisation were introduced. Higher education, which comprises public and private universities together with self-financed community colleges, is an important component of the education in Hong Kong (Lee 2014). However, universities in Hong Kong may fail to be entitled as "happy university." The determinants of local university students' happiness are investigated in this study.

Background and Objectives

What makes university students dissatisfied? Research suggests that the satisfaction of students from self-financing education in Hong Kong is not particularly high. Career services, articulation and financial aid obtain highest gap scores which reveal that students are dissatisfied with these three elements in university and may lead to less happiness in university life (Mak and Chan 2006).

Measuring mental well-being also reflects the happiness level. Cheung et al. (2016) have conducted a study of anxiety, depression and stress symptoms on baccalaureate nursing students in Hong Kong universities, and the psychological morbidity among university students is high.

Apart from the mental wellness, research suggests social relationship is also essential for student's happiness (Elmi 2014). Academic work can adversely influence the relationship built in university. Academic overload and high expectation of academic performance are commonly seen in university. Socialisation may decrease due to the less time for gathering and being ridiculed by schoolmates; the social relationship and support deteriorate consequently. Poorer social support in schools may induce the frequency of helpless and stressful situation. More failures of academic achievement may happen. This academy-induced vicious cycle turns to the deterioration of social relationship (Ng et al. 2016).

To provide a happy university life to student, this study bases on a self-financing tertiary institute in Hong Kong (i.e. School of Professional Education and Executive Development (SPEED) under the Hong Kong Polytechnic University) and tries to find the ways towards a happy university with the objectives of (i) identifying the institute-related factors influencing student's mental status, (ii) evaluating the possible impacts on students, (iii) reviewing the practicality of current higher education system in Hong Kong whether it can equip students to get rid of the future difficulties and live happily, and (iv) promoting the happy university in Hong Kong by providing re-articulating university values and reaching-out supportive programmes.

Methodology

Study Design

There is no study to investigate the university-related factors and the influence of education systems to students' happiness in Hong Kong. A cross-sectional study was adopted in this study. Existing questionnaires found by the authors were adopted to analyse the relationship between the happiness of students and school-related factors (Mangeloja and Hirvonen 2007). This study also focused on the significant factors associated with happy university life and the influence of health literacy.

Instrument

The survey questionnaire was designated to explore student's internal and external factors in a self-financing tertiary institute (i.e. PolyU SPEED) influencing their happiness and negativity level and whether students had happy university life. To examine the reliability of response to the statement about happy university life, similar statement about happy life was included in the questionnaire. Self-estimated health condition, mental issues, time management, financial concern as well as satisfaction with school supports and environment and the current program they are undertaking were assumed to influence the happiness level of university life, attributing positively to a happy university (Mangeloja and Hirvonen 2007).

Likert scale was used in measuring the attitude; several researches on happiness of people such as Oxford Happiness Index Questionnaire were adopting the Likert scale as well. There were 18 questions in total (see Appendix). The questions required participants to indicate the level of agreement and disagreement with the statements (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree).

Recruitment of Subjects

Questionnaires were passed out to SPEED students who studied in the Hong Kong Polytechnic University West Kowloon Campus online and delivered by hand in the Hong Kong Polytechnic University Hung Hom Campus. Participants were randomly selected, and the questionnaire was administered by the researchers. The approximate time students took to finish the questionnaire was 5–10 min.

Ethical Consideration

Participants were informed about the purpose of the study, and the questionnaire was finished without personal identifiers. The participation was voluntary, and participants could choose to join or quit when they were invited. In addition, confidentiality and privacy were emphasised.

Analysis and Findings

Statistical Analysis

The data were analysed with the Statistical Package for the Social Sciences (SPSS). Chi-test was used to investigate the significance of associations among happy life, happy university life and their correlations. To identify the contribution of the correlations to the happy life and happy university life, single regression was performed.

Demographic Information

194 students participated in the study. Forty had finished the questionnaire via the internet and 154 by handout. Among them, 42.3% were male and 57.7% were female. Participants were classified into health-related (45.9%) and non-health-related programs (54.1%). Programmes that participants are currently undertaking ($p > 0.005$) were found insignificantly correlated to happy life and happy university life.

Effects of Academic Work

Academic Anxiety

A minority of students (5.7%) studied has no anxiety. 17% students were with neutral stand. More than seven in ten students (76.8%) had suffered from the anxiety induced by academic work. The score of workload-induced anxiety was 3.92, and the standard deviation was 0.814. Anxiety induced by academic work ($p > 0.005$) was found statistically not strongly associated with happy life or happy university life.

Academic Stress

Only a few students felt stressful with the academic work. 12.4% were neutral to the statement. However, more than eight in ten of them (82.0%) claimed to have academic stress. The score of workload-induced stress was 4.01, and the standard deviation was 0.814. Again, there was insignificant association among happy life, happy university life and the stress induced by academic work ($p > 0.005$).

Academic Hopelessness

Less than 20% of students had no hopelessness induced by academic work. 38.1% remained neutral. 34.5% of students admitted hopelessness. 10.3% of students had suffered severely from academic hopelessness. The score of workload-induced hopelessness was 3.36, and the standard deviation was 0.94. The association between happy life and the hopelessness induced by academic work ($p = 0.000$) was statistically significant, but association between the hopelessness induced by academic work and happy university life ($p > 0.005$) was found to be insignificant. 14.9% of the between-subject differences in happy life could be explained by differences in the hopelessness induced by academic work.

Satisfaction of Academic Result

Around a quarter of the students (25.8%) were dissatisfied with their academic result. 37.1% remained neutral. 33.0% of students were satisfied with their academic result. A very few students (4.1%) were highly satisfied with their academic result. The score of the satisfaction of academic result was 3.1, and the standard deviation was 0.949. Satisfaction of academic result was associated with happy life and happy university life ($p = 0.000$). 11.1% and 15.3% of the between-subject differences in happy life and happy university life could be explained by differences in the satisfaction of academic result, respectively.

Workload Amount

Over a quarter (27.3%) of students disagreed that the workload they had was moderate. More than four in ten (42.3%) remained neutral. Three in ten (31.4%) had moderate workload. The score of workload evaluation was 3.03, and the standard deviation was 0.866. Workload amount was associated with happy life ($p = 0.001$) and happy university life ($p = 0.000$). 6.8% and 23.4% of the between-subject differences in happy life and happy university life could be explained by differences in the workload amount.

Students' Health

Accessibility of Health-Care Services

More than one in ten students did receive available timely health-care services in university. 44.3% remained neutral. 44.3% of participant students agreed with having promptly health-care services in university. The score of accessibility of health-care services was 3.34, and the standard deviation was 0.813. Insignificant association was found between accessibility of health-care services and happy life and happy university life ($p > 0.005$).

Relationship Built in Tertiary Institute

Greater than ten percent of students did not consider that the relationships built within the tertiary institute would make them feel happy. 35.6% were neutral. More than half of them (52.5%) thought the relationships make them happy. In those, 8.2% of them strongly agreed with the statement. The score of relationship was 3.46 and the standard deviation was 0.882. There was an association between the relationship built within the tertiary institute and happy life and happy university life ($p = 0.000$). 8.6% and 23% of the between-subject differences in happy life and happy university life could be explained by differences in the relationship within the tertiary institute.

Health Conditions

13.9% of students counted themselves as unhealthy. Less than one-third remained neutral. More than half of them (51.5%) considered themselves as healthy, with 3.1% of them strongly agreed. The score of student health condition was 3.42 and the standard deviation was 0.806. Association among student health condition, happy life and happy university life was statistically significant ($p = 0.000$). 22.0% and 22.9% of the between-subject differences in happy life and happy university life could be explained by differences in the student health condition.

Supportive Services

8.3% had failed to seek supportive services promptly. 45.4% were neutral. More than four in ten (46.4%) students were able to receive timely supportive services at the university. The score of university supportive services was 3.4, and the standard deviation was 0.757. There was insignificant association between supportive services at the university and happy life ($p > 0.005$) and between supportive services at the university and happy university life ($p = 0.000$). 14.2% of the between-subject differences in happy university life could be explained by differences in the supportive services at the university.

Career Preparedness

Regarding career preparedness, nearly twenty percent (19.0%) of the students did not consider the programmes would prepare them well for their career. More than four in ten (42.8%) remained neutral. Nearly half of the students (48.2%) believed their studying programmes would benefit their career path. The score of career preparedness was 3.2, and the standard deviation was 0.803. There was an association among career preparedness, happy life and happy university life ($p = 0.000$). 9.0% and 14.8% of the between-subject differences in happy life and happy university life could be explained by differences in the career preparedness respectively.

Financial Concerns

Nearly one-third (32.9%) of the students worried about their daily expenditure. Another one-third (37.1%) were neutral. Approximately three in ten participants (30.9%) had no financial concern. The score of financial concern is 2.88 and the standard deviation is 1.078. Association among financial concern, happy life and happy university life was found ($p = 0.000$). 11.8% and 13.9% of the between-subject differences in happy life and happy university life could be explained by differences in the financial concern respectively.

Time Management

Resting Time

More than one-third (34.6%) of the students did not have adequate time to rest. 36.1% were with neutral stand. Less than a third of the students had enough resting time. The score of resting time management was 2.9, and the standard deviation was 1.002. There was no significant association between resting time management and happy life ($p > 0.005$), but the relation was significant between time management and happy university life ($p = 0.000$). 12.8% of the between-subject differences in happy university life could be explained by differences in the resting time management.

Extra-Curricular Activities

Less than 10% (7.7%) of the students had inadequate time for participation in extra-curricular activities. Nearly three in ten held neutral stand. Around two-thirds (62.9%) had adequate time to join the activities. The score of extra-curricular activities time was 3.72, and the standard deviation was 0.836. There was no significant association between the extra-curricular activities time and happy life ($p > 0.005$), but the relation was significant between the time for extra-curricular activities and happy university life ($p = 0.000$). 13.0% of the between-subject differences in happy university life could be explained by differences in the time of extra-curricular activities.

Satisfaction of Time Management

Around 30% (30.4%) of the participants were dissatisfied with their time management. One-third remained neutral. More than three in ten (36.6%) were satisfied with their time management. The score of satisfaction with time management was 3.05, and the standard deviation was 0.983. There was no significant association among the satisfaction with time management, happy life and happy university life ($p > 0.005$).

University Environment

16.5% of students were dissatisfied with the university environment. One-third (33.0%) remained in neutral opinion. Approximately half of the participants were satisfied with the university environment. The score of university environment was 3.37, and the standard deviation was 0.896. Association among university environment, happy life and happy university life was found ($p = 0.000$). 11.8% and 19.9% of the between-subject differences in happy life and happy university life could be explained by differences in the university environment respectively.

Association Between Relationship and Mental Issues

There were statistically significant association of the students' attitudes towards relationship, stress, anxiety and hopelessness ($p = 0.000$). Anxiety adversely influenced the attitudes towards relationship to the largest extent than stress and hopelessness.

Discussion

Life satisfaction of young adults is not only determined by health or wellness status but also the university life and academic achievement. Hence, there is a close relationship between happy life and happy university life (Athay et al. 2012). Students who believe in having happy life are more likely to have happy university life which is highly modified by the current education systems. As happiness is closely correlated to life satisfaction, the following discussion will be interpreted in terms of the factors and life satisfaction to happiness determinants of students as well as influence of the current education systems.

Health

Without health, people can do nothing. Health is a shared factor of happy life and happy university life. Health in terms of physical, mental and social dimensions cross-interacts with happy life (Sabatini 2014). Emotional reactions to life events can potentially damage or benefit people physiologically. For example, healthy students would have fewer opportunities to deal with bad life events. They can minimise the chance of psychological distress and happiness reduction in their life. Health supports students to engage in various university activities. With more engagement in school, students have intensive ability to deal with different negative events such as academic stress. Students who are healthy are more likely to have positive emotions and thoughts towards university and their life (Padela and Heisler 2010). In the Bhutan's Gross National Happiness (GNH) report, psychological well-being is one of the GNH indices. It points out that students with negative emotion affect their positive emotion and happiness (Centre for Bhutan Studies and GNH Research 2016). Mental disorders account for more economic costs than chronic somatic diseases, which will eventually affect the GDP and slow down the development of cities and countries (Trautmann et al. 2016).

Education systems partly serve social functions. Hence, they are interpreted as an essential determinant of students' health. Current education systems offer social subsystems, including universities, to young adults to meet their social and health needs. Students will be socialised in the university by working together to achieve goals such as finishing academic assessments and different university activities. Campus-based activities and competitions between students can sharpen social skills and strengthen characters to fit them into the university and society norms. Since social and interpersonal skills can be nurtured in the university, students are thus able to enrich and maintain their social health (Education and Manpower Bureau 2005). The health triangle, physical, mental and social, is rigorously connected. Students' health condition can be either adversely or positively influenced by the education systems, depending on their control of socialisation in the university.

The study has found that the relationships built in the university are influential. Social relationship developed in schools determines the students' satisfaction of university life (Mangeloja and Hirvonen 2007; Chan et al. 2005). Quality of the social circle is a key contributor to happiness. Students can share their feelings and seek assistance in academic work to release negative feelings with friends and through other social supports. More importantly, relationships help keep students away from mental issues. Sabatini (2014) studied about social relationships and well-being across the age and discovered that social network plays the most significant impact on young population from 20 to 45 years old. People are happy when being surrounded by happy people and tend to have happy social network and happy life. Good relationships attribute to an induction of happiness (Fowler and Christakis 2008). The higher the level of support that a student receives from his or her schoolmates or friends in school, the happier university life he or she obtains.

If students lack social supports, they are easier to suffer from mental issues. From findings of the study, relationships and mental issues were found closely related. In addition, several researches suggest that negative relationship exists between happiness and mental health (Bahrami et al. 2011). People with mental issues tend to have lower physical activities and social interaction. These would greatly hinder social supports (Ono et al. 2011). The poorer the quality of students' relationships built in the institute, the easier students would suffer from mental issues and the less enjoyable university life is for them.

A good interpersonal relationship induces happiness, but this is not universal in universities. Universities become competitive within the current education systems. Competitions among students are more intensive than before, because outstanding students will get better preparation for career prospect (Lee 2014). The nature of competition is an effective way to motivate students to perform the tasks better and to learn from the competitors and own mistakes. However, the current systems exacerbate competition and turn it into destructive means to accentuate the existing social hierarchy and ability levels, marginalising less skilled students inevitably. The interpersonal relationship of weaker students is thus adversely influenced (Shindler 2010).

Academy

Academic workload is one of the causes that students do not feel happy with and influences the happy university. The issue of academic overload has been frequently discussed since academic overload results in less leisure time and has increased academic stress among university students (Ng et al. 2016). This unhappy contributor is similar to the unhappy contributor in the Bhutan's GNH report. In the report, excessive amount of time spent in working makes people feel unhappy. People feel they do not have enough time with their family and to finish their work which makes them feel negative. This influences adversely their happiness level (Centre for Bhutan Studies and GNH Research 2016). Happiness is always paired with positive feeling and absence of negative feeling (Machado et al. 2015).

As studying is the major task to university students, they will spend most of the time on it during their university life. And so their daily emotional encounters will be largely affected by school factors. Although this study showed no significant association between academic stress and student's happiness, academic overload is linked with academic stress which interferes with students' daily life. The feeling encounters in normal life will be overwhelmed by negative feelings and greatly decreases the happiness level of students (Chraif 2015).

What causes the academic workload overwhelming in university life? In order to pursue a higher ranking and reputation of university, the University Grants Committee (UGC) of Hong Kong is authorised by the government to promote the quality of local UGC-funded universities in terms of academic performance and research via quality assurance reviews. For universities which are found to have reduction of quality, the funding received from UGC may be reallocated (University Grants Committee 2017).

For instance, a university was recommended to foster the achievement of desired graduate attributes. An integrated plan was developed in response to the recommendations from UGC and emphasised on their learning outcomes in terms of the means of maintaining teaching and learning quality. To equip students with the desired graduate attributes and to ensure students' function as an entry-level professional within a semester, several assessments such as examinations, individual assignment and group project were carried out (The Hong Kong Polytechnic University 2012). Throughout the assessments, students were requested to repeatedly practice what they learnt from lectures and tutorials to consolidate knowledge and skills, so as to reach the course goals. This results in increased academic workload.

Academic hopelessness is another indicator that adversely influences students' happiness. According to Bahrami et al. (2011), there is a significant and negative association between feeling happiness and mental problems among university students. People with positive feelings are more likely to face and get rid of feeling despair. As mental health and wellness are necessary to achieve happier and better life, mental health and happiness have already been linked together. Hopelessness expresses the probability of personal expectation towards the future. The constant belief in increased adversities of the future may lead students to mental disorders and cultivate suicidal ideas more easily (Huen et al. 2015). On the other hand, happiness is one of the dimensions of mental influence, while the severity of academic hopelessness is negatively and strongly correlated to the happiness of students. In Asian societies, students care about their academic performance, as higher grading is linked with better career, higher income and higher social status. Students can easily get into the vicious cycle, and as academic hopelessness grows, mental issues will develop (Lo et al. 2018).

In order to improve the reputation and ranking of a university, students' academic achievement is one of the main indicators. With growing competitions among the global universities, the current education systems emphasise on academic success and that school performance is important. This is a challenge to some students, and it overwhelmingly influences student's life (Lee 2014). The education system modifies the moral value of academic success and life achievement, so that students prioritise academic success in life and become vulnerable when they fail in school work. When students fail to perform with excellence in academic work, they may find it hopeless in their life as they may be impossible to achieve their goals and success in life (Kwan 2010). Therefore, students' hopelessness is commonly accompanied with academic failure and mental status.

Difference in Health Literacy

Studying in health-related studies is assumed to cultivate a higher health consciousness. However, from this study, there are insignificant differences among health literacy, happy life and happy university life. The result is incoherent to those of other studies that people with higher health literacy are more likely to be happier and healthier. There may be some unfound reasons that cause the inherent association among mental health, lifestyle and health literacy. It is important to find out these factors as health is a major contributor to happiness. If students cannot maintain their health well, they may find it hard to reach the happiness in their university life.

Recommendations

Re-articulating University Values

Since the significant factors are all related to health, students should be taught to prioritise health and wellness in their university life, not just the academic achievement. The tertiary educational institutions should not be industrialised in blindly tracing the academic achievements only and neglecting the health of students, so as to earn more funding from different organisations and enhance the reputation by increasing the output of academic works (Rosenzweig 1999). The core value of the university is to encourage students to strive for knowledge and to apply it in life by providing holistic supports to students. However, the core value of Hong Kong universities is different from the traditional, and they emphasise on academic achievements. With such "core" value, the moral value of students may be changed consequently. Learning with competitions and looking for the academic achievements, students are less likely to develop healthy interpersonal relationships, to maintain mental health and to cultivate a positive attitude towards the future. Therefore, university values should be re-articulated.

Among the various studies on the university students' happiness, university students are happy with their school life in Finland and Australia. It might be due to the values of academic achievements. Participants did not care about their university grading. Other factors in the study are similar to other researches, but they do not lead to dissatisfaction of Finland students (Mangeloja and Hirvonen 2007). Therefore, re-articulating university values may be the way out of the "unhappy university" to Hong Kong universities.

The Hong Kong Government had launched Health Promoting University Project with focuses on food and exercise and sports, mental well-being and health in 2000. In addition, health education activities, smoking cessation and physical activities had created an atmosphere of health, but were not efficient as excepted (Lee 2002). To be a happy university in Hong Kong, educational institutions should promote students' well-being by other means.

Social and mental issues have significant and negative impacts on students' happiness level. Although countless supportive schemes have been carried out, mental issues of students are still getting worse. This may have resulted from the difficulties in identifying students who are emotionally disturbed, especially while they are more likely to be reluctant to seek help (Mental Health America 2017). To deal with the mental issues and to improve social relationships of university students, reaching-out supportive programmes have been suggested. As hopelessness is one of the significant factors influencing happy university life and relationship, the reaching-out supportive programmes should be prioritised on depression. As everyone is potentially affected by depression, a campus-based depression screening day is suggested for all university students (World Health Organization 2017).

Web-based screening instruments for mental and social issues have been widely implemented in different health-care settings and have received acceptable outcomes (Farvolden et al. 2003). There is a study to examine the practicality of online screening and psychiatric consultations with university students as well as to find positive experience among students. Online screening is convenient as students can do it everywhere, followed by consultation for students with mood problems. Despite reluctance to seek help, unawareness of problem recognition and needs and financial constraints may lead to delayed appointment (Williams et al. 2014).

Students will only need to take few minutes to complete the depression questionnaire online and wait for the result. For students with positive results, consultation will be provided by school social support teams. Through this internet intervention to actively approach the mental disturbed students and to provide timely consultations, the current situation will be improved.

Limitations

The questionnaire employed referencing to the "what makes university student happy" which solely analyses the university-related factors. The research questions are also evidence-based designed to apply multiple regression of the suggested factors which only contributed around half of students' happiness. When compared to other researches, the result may be inherent with different studies about happiness due to the different assessment criteria in data collection. The result may not interpret the comprehensive situation among university students.

Furthermore, delivering the questionnaire at the beginning of the semester may contribute to underestimated result of mental issues in the research, which has results inconsistent with other research. For example, people will face acute stress when they experience stressful situations such as deadline at time, but this stress is brief and might lead to chronic stress; therefore, this important condition may not be revealed in the questionnaire (Australian Psychological Society 2012).

Conclusion

The study has assessed happiness of student in university and identified the significant association between happy university and happy life, academic workload and social relationship. Although countless efforts have been spent on enhancing happiness of students, there are rooms for improvement for the current educational systems, so as to give a happy university life to the students. Re-articulating university values and introducing reaching-out supportive programmes such as online screening are recommended to deal with the happiness gap among university students.

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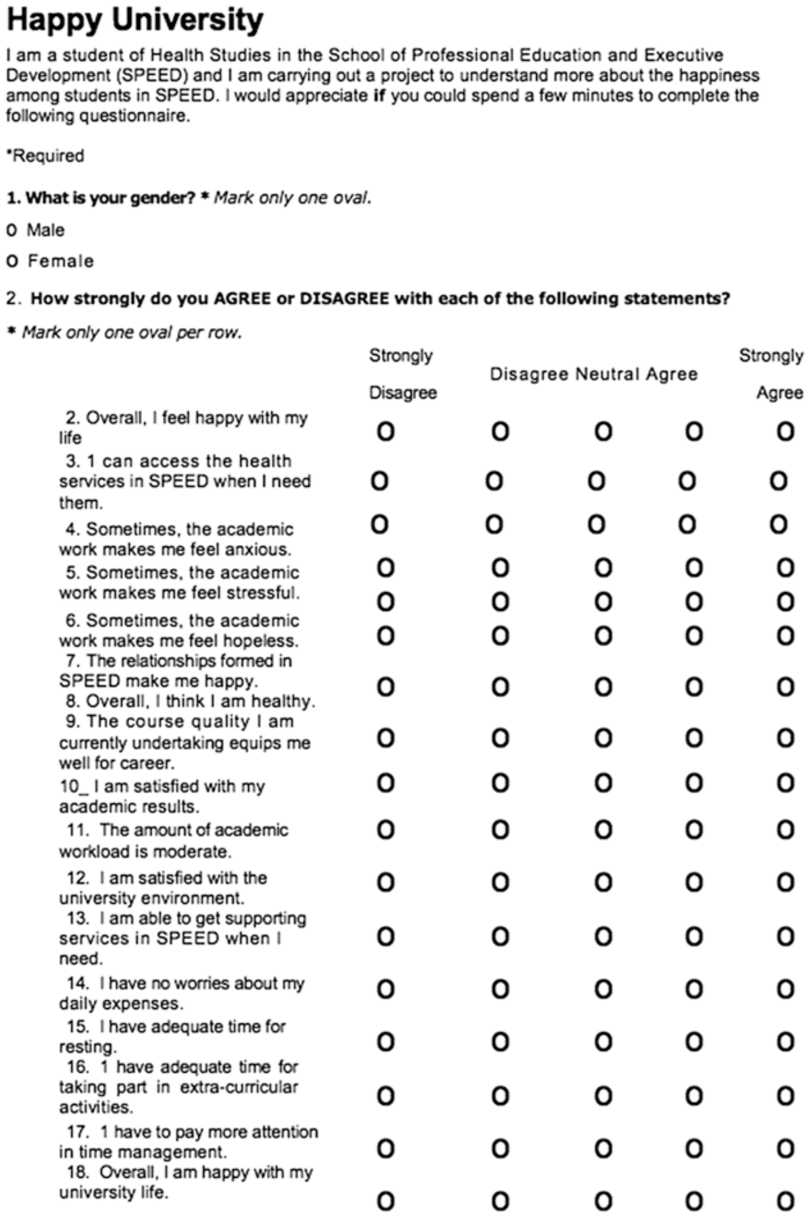
Appendix

Questionnaire



Happy University

I am a student of Health Studies in the School of Professional Education and Executive Development (SPEED) and I am carrying out a project to understand more about the happiness among students in SPEED. I would appreciate **if** you could spend a few minutes to complete the following questionnaire.

*Required

1. What is your gender? * *Mark only one oval.*

○ Male

○ Female

2. **How strongly do you AGREE or DISAGREE with each of the following statements?**

* *Mark only one oval per row.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2. Overall, I feel happy with my life	○	○	○	○	○
3. 1 can access the health services in SPEED when I need them.	○	○	○	○	○
4. Sometimes, the academic work makes me feel anxious.	○	○	○	○	○
5. Sometimes, the academic work makes me feel stressful.	○	○	○	○	○
6. Sometimes, the academic work makes me feel hopeless.	○	○	○	○	○
7. The relationships formed in SPEED make me happy.	○	○	○	○	○
8. Overall, I think I am healthy.	○	○	○	○	○
9. The course quality I am currently undertaking equips me well for career.	○	○	○	○	○
10_ I am satisfied with my academic results.	○	○	○	○	○
11. The amount of academic workload is moderate.	○	○	○	○	○
12. I am satisfied with the university environment.	○	○	○	○	○
13. I am able to get supporting services in SPEED when I need.	○	○	○	○	○
14. I have no worries about my daily expenses.	○	○	○	○	○
15. I have adequate time for resting.	○	○	○	○	○
16. 1 have adequate time for taking part in extra-curricular activities.	○	○	○	○	○
17. 1 have to pay more attention in time management.	○	○	○	○	○
18. Overall, I am happy with my university life.	○	○	○	○	○

References

Athay, M. M., Kelley, S. D., & Dew-Reeves, S. E. (2012). Brief multidimensional students' life satisfaction scale—PTPB version (BMSLSS-PTPB): Psychometric properties and relationship with mental health symptom severity over time. *Administration and Policy in Mental Health and Mental Health Services Research, 39*(1–2), 30–40.

Australian Psychological Society. (2012). *Understanding and managing stress.* Retrieved from https://www.psychology.org.au/assets/files/stresstipsheet.pdf

Bahrami, S., Rajaeepour, S., Ashrafi Rizi, H., Zahmatkesh, M., & Nematolahi, Z. (2011). The relationship between students' study habits, happiness and depression. *Iranian Journal of Nursing and Midwifery Research, 16*(3), 217–221.

Cambridge Dictionary. (2017a). *Happy.* Retrieved from http://dictionary.cambridge.org/dictionary/english/happy

Cambridge Dictionary. (2017b). *University.* Retrieved from http://dictionary.cambridge.org/dictionary/english/university

Centre for Bhutan Studies & GNH Research. (2016). *2015 GNH Survey Report*. Retrieved from https://www.grossnationalhappiness.com/

Chan, G., Miller, P., & Tcha, M. (2005). Happiness in university education. *International Review of Economics Education, 4*(1), 20–45.

Cheung, T., Wong, S. Y., Wong, K. Y., Law, L. Y., Ng, K., Tong, M. T., et al. (2016). Depression, anxiety and symptoms of stress among baccalaureate nursing students in Hong Kong: A cross-sectional study. *International Journal of Environmental Research and Public Health, 13*(8), 779.

Chraif, M. (2015). Correlative study between academic satisfaction, workload and level of academic stress at 3rd grade students at psychology. *Procedia-Social and Behavioral Sciences, 203*, 419–424.

Crocker, R. K. (2002). *Learning outcomes: A critical review of the state of the field in Canada*. Ottawa: Canadian Education Statistics Council.

Education and Manpower Bureau. (2005). *The New Academic Structure for Senior Secondary Education and Higher Education- Action Plan for Investing in the Future of Hong Kong.* Retrieved from http://www.edb.gov.hk/attachment/en/curriculum-development/cs-curriculum-doc-report/about-cs-curriculum-doc-report/report_e.pdf

Elmi, M. (2014). Analyzing the explaining factors of social happiness among Islamic Azad University students in Tabriz: Due to sense of distributive justice, social relative deprivation and Social alienation. *Bulletin of Environment, Pharmacology and Life Sciences, 3*(Spl issue II), 104–111.

Farvolden, P., McBride, C., Bagby, R. M., & Ravitz, P. (2003). A web-based screening instrument for depression and anxiety disorders in primary care. *Journal of Medical Internet Research, 5*(3), e23.

Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham heart study. *BMJ, 337*, a2338.

Huen, J. M., Ip, B. Y., Ho, S. M., & Yip, P. S. (2015). Hope and hopelessness: The role of hope in buffering the impact of hopelessness on suicidal ideation. *PLoS One, 10*(6), e0130073.

Kahneman, D., & Krueger, A. (2006). Developments in the measurement of subjective Well-being. *Journal of Economic Perspectives, 20*(1), 3–24.

Kwan, Y. K. (2010). Life satisfaction and self-assessed health among adolescents in Hong Kong. *Journal of Happiness Studies, 11*(3), 383–393.

Lee, S. (2002). Health promoting university initiative in Hong Kong. *IUHPE – Promotion & Education, 9*(Suppl 1), 15.

Lee, H. M. (2014). Hong Kong higher education in the 21st century Hong Kong. *Teachers' Centre Journal, 13*, 15–34.

Lo, S. M., Wong, H. C., Lam, C. Y., & Shek, D. T. (2018). Common mental health challenges in a University context in Hong Kong: A study based on a review of medical records. *Applied Research in Quality of Life, 15*, 1–12.

Machado, L., Tavares, H., Petribú, K., Zilberman, M., Torres, R. F., & Cantilino, A. (2015). Happiness and health in psychiatry: What are their implications? *Archives of Clinical Psychiatry (São Paulo), 42*(4), 100–110.

Mak, P. M. N. C. K., & Chan, P. W. J. K. (2006). Factors affecting student satisfaction and performance gap in relation to the model of strategic enrolment, graduation and articulation (SEGA): The case of self-financing higher education in Hong Kong.

Mangeloja, E., & Hirvonen, T. (2007). What makes university students happy? *International Review of Economics Education, 6*(2), 27–41.

Mental Health America. (2017). *National depression screening Day*. Retrieved from http://www.mentalhealthamerica.net/conditions/national-depression-screening-day

Ng, K. C., Chiu, W., & Fong, B. Y. F. (2016). A review of academic stress among Hong Kong undergraduate students. *Journal of Modern Education Review, 6*(8), 531–540.

Ono, E., Nozawa, T., Ogata, T., Motohashi, M., Higo, N., Kobayashi, T., et al. (2011). Relationship between social interaction and mental health. In *2011 IEEE/SICE International Symposium on System Integration, SII 2011* (pp. 246–249). [6147454]). https://doi.org/10.1109/SII.2011.6147454.

Padela, A. I., & Heisler, M. (2010). The association of perceived abuse and discrimination after September 11, 2001, with psychological distress, level of happiness, and health status among Arab Americans. *American Journal of Public Health, 100*(2), 284–291.

Rosenzweig, R. M. (1999). Universities change, core values should not. *Issues in Science and Technology, 16*(2), 59–64.

Sabatini, F. (2014). The relationship between happiness and health: Evidence from Italy. *Social Science & Medicine, 114*, 178–187.

Shindler, J. (2010). *Transformative classroom management*. Los Angeles: Jossey Bass/Wiley Press.

The Hong Kong Polytechnic University. (2012). *Learning outcomes for PolyU Graduates at Undergraduate Degree Level: Policy and Guidelines*. Retrieved from http://edc.polyu.edu.hk/papers/CTL/Learning%20Outcomes%20for%20PolyU%20Graduates%20at%20Undergraduate%20Level%20(2012).pdf

Trautmann, S., Rehm, J., & Wittchen, H. U. (2016). The economic costs of mental disorders. *EMBO Reports, 17*(9), 1245–1249.

University Grants Committee. (2017). *Roles and Functions*. Retrieved from http://www.ugc.hk/eng/ugc/about/overview/roles.html

Williams, A., LaRocca, R., Chang, T., Trinh, N. H., Fava, M., Kvedar, J., & Yeung, A. (2014). Web-based depression screening and psychiatric consultation for college students: A feasibility and acceptability study. *International Journal of Telemedicine and Applications*, *2014* 580786.

World Health Organization. (2017). *Campaign essentials*. Retrieved from http://www.who.int/campaigns/world-health-day/2017/campaign-essentials/en

Chapter 23
District Health Systems and Capacity Building

Albert Lee and Peter K. K. Poon

Background for District Health

After reading Chap. 2 (Lee 2019), we should realise that majority of health problems have their origins in the community (Green et al. 2001). If we cannot manage those problems well in the community setting (primary health care), they will soon become more complicated and serious and inevitably escalate to hospital care, i.e. secondary and tertiary care. The implication is long waiting time of accident and emergency (A&E) services and appointment time at specialist out-patient department (SPOD) and also overcrowding of in-patient wards. Many health conditions are not curable, but if they can be identified at an early stage in the primary care setting, the clinical conditions at that juncture are more amiable for better control with fewer complications and hence more effective tertiary prevention. If primary health care lacks the resources and support to provide comprehensive, holistic and co-ordinated care, it will end up only providing episodic care. Our citizens will then have immediate desire to have more clinical services from hospital setting for treatment, and they might not perceive the important significance of primary health care.

The key philosophy is to invest in developing a systematic primary care which enables hospital services to sustain the high quality of care. It is not an extension of hospital care to community but to fulfil the gaps of services in community. The model should focus on how to equip the patients and the carers with support to manage their illnesses in the home environment so their clinical conditions would

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be more stable to avoid unnecessary hospital and/or A&E admission. One should aim to focus on their day-to-day living rather than another conventional medical care model.

What Is District Health?

In Hong Kong, the 2017 policy speech of the Hong Kong Special Administrative Region Government (HKSAR) announced the establishment of District Health Centre (DHC) to be first started in Kwai Tsing District (K&T). The HKSAR Food and Health Bureau invited tender proposal in 2018 (HKSAR-FHB 2018). The aim is to establish the DHC in K&T (K&T DHC) through public-private partnership and medical-social collaboration in providing primary health-care services, catering for the needs and characteristics of the local population and enhancing public awareness of disease prevention and skills in self-management of health. However, the concept is not new as the concept of a District Health System first emerged in the Working Party Report on Primary Care in 1990 (Working Party on Primary Care, 1990) with 102 recommendations including the establishment of Primary Health Care Authority. It recommended delivering quality and efficient preventive services and continuing, comprehensive and whole-person medical care to individuals. The pilot models of District Health System were also recommended but not implemented.

A District Health System is an establishment of infrastructure in the local district which oversees and monitors the delivery of community-based care in the locality. Lee (2014) has developed a conceptual framework of district health with inputs sought from primary health-care physicians in the locality for medical diagnosis and treatment and the multidisciplinary community health-care team by redeploying nurses and other allied health professionals from the Hospital Authority (HA) and the Department of Health, teaming up with relevant community services provided by non-governmental organisations (NGOs) within the locality for supportive long-term care (Fig. 23.1).

For the successful implementation of district-based primary care, there should be different tiers of services with different sets of skills. There should be a team of health-care professionals with experience and expertise in primary care such as family doctors, community nurses, community physiotherapists, community occupational therapists, community pharmacists, social workers and community dental practitioners at district level for clinical management and decision-making according to the philosophy of primary health care described in Chap. 2. Patient-centred care is needed to support patients adopting behaviours across a wide range of lifestyle factors for the management of their underlying conditions rather than the "assess-and-advise" model of care. The team should navigate patients accessing to professional inputs from different disciplines including the non-health sectors at different stages of clinical pathway according to their needs and clinical circumstances.

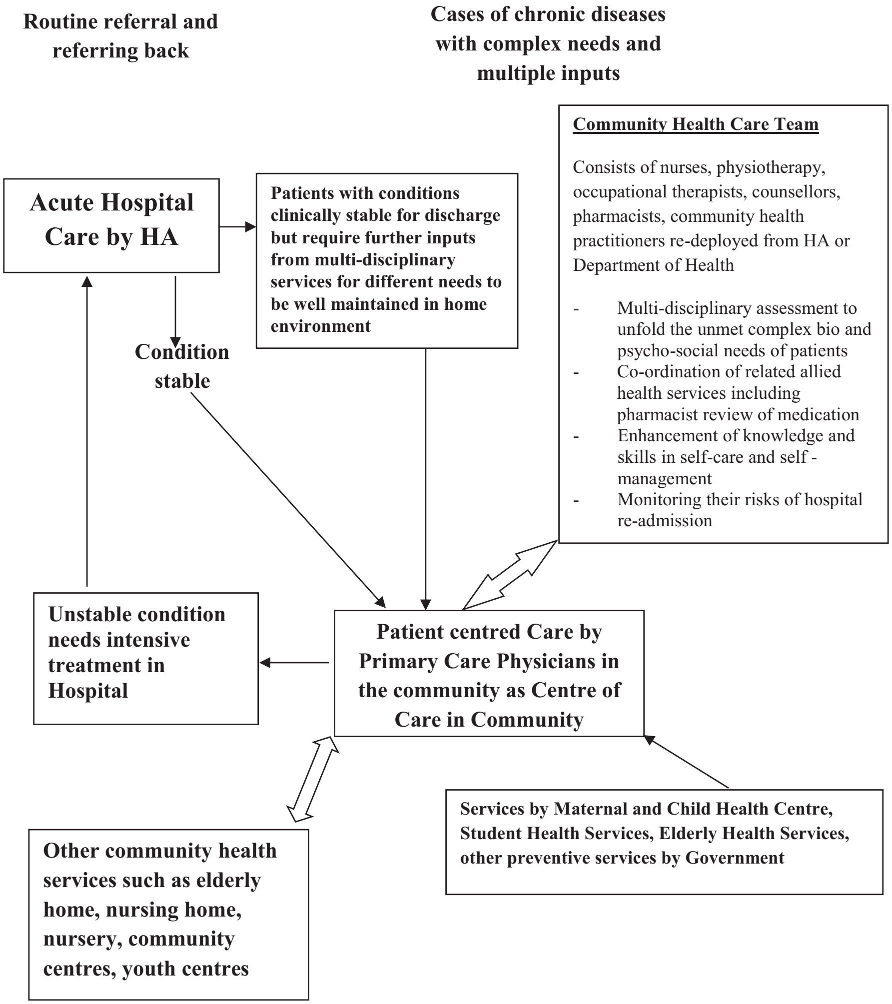

Fig. 23.1 District Health System for the operation of local primary health-care team. (Simplified version from Figure 6. Model of Local Primary Health Care System. Lee 2014)

For effective and efficient management of multiple health conditions in the community and minimisation of hospital and/or A&E admissions, the skills of carers and patients in self-care and self-management need to be enhanced. Another tier of health practitioners, junior primary care practitioners or community health practitioners are needed, supervised by the senior primary health-care professionals. The community health practitioners are those with post-secondary education in health-related studies such as public health, community health practice, nutrition and health sciences to support the local residents to maintain health and be alert for early changes of health status. They would then seek advice from senior primary health-care professionals accordingly for further management or referral if needed.

They also have another important role of intensive co-ordination of different types of services, not limiting to health services and other community resources, to enable stabilisation of chronic conditions. Patients with chronic illnesses can be at different stages of their clinical conditions with diverse health needs, and the merit of district-based primary care is to map out their needs and co-ordinate for the services according to their needs. Otherwise, not only there will be duplication of services and hospitals will then become their safety net for conditions not requiring hospitalisation. For effective operation of the district-based primary health care, the organisations need to have competencies as follows (Lee 2019):

- Knowledge of local health needs
- Experience in community engagement and partnership
- Ability to formulate a multidisciplinary community-based care team with different tiers of health-care practitioners
- Expert inputs (professionals and academics) in primary health care
- Good working relationship and partnership with hospitals in localities
- Capacity and capability of outreaching services in the district
- Expertise in utilisation of “Medical-Welfare-Community” model to address the physical and psychosocial needs of local residents with chronic conditions
- Evaluation and audit of care for continuous quality improvement

How Should District Health Operate?

District health should be one-stop professional services hub for better health covering primary, secondary and tertiary prevention and also quandary prevention (Lee 2018). The focus of different tiers of prevention can be as follows.

Primary Prevention

1. To enhance community action and capacity to avoid exposing to health risks
2. To enhance community action and capacity to positive health
3. Well-trained health promotion practitioners to empower and monitor health behaviours of citizens and actions of community

Secondary Prevention

1. Screening to detect clinical conditions at early stage such as Pap smear and screening for risk factors strongly linked to diseases later on in life such cardiovascular risk factors
2. To conduct health promotion activities and basic assessment on population base for potential risk factors such as tobacco and alcohol use and physical inactivity
3. To identify those with chronic illnesses at risk of hospital admission, i.e. uncontrolled hypertension and diabetes mellitus

Tertiary Prevention

1. Rehabilitation – To prevent further deterioration of condition and restore usual functional capacity as far as possible
2. Empowerment for self-care and self-management

Quandary Prevention

1. Prevention of adverse effects of health intervention

Those residents without risk factors can be invited to periodic basic assessment according to needs based on preventive guidelines for general practice and primary care. If there are well-established preventive services for certain client groups such as student health services for children and adolescents and maternal and child health for infants and young children and married women, they should be encouraged to visit those centres to empower them to make use of preventive services available. For those screened to have high risk but not yet developing the diseases, professional counselling can be provided by the primary health-care professionals and co-ordination among different health-care professionals for appropriate health promotion programmes to minimise their risks. Those detected with health conditions will be referred to primary care physicians for further diagnosis and treatment, and planned shared care will be formulated to prevent complications and maintain functional status as well as monitor the side effects of treatments. Figure 23.2 provides an example of patient journey of a fictitious case, John, with multiple health problems and co-morbidities.

Kwai Tsing Safe Community and Healthy City Association has successfully applied to be the operator of the K&T DHC in early 2019. The Association has adopted the *Healthy Setting approach*[1] to develop a district-based health system linking and coordinating "safe and healthy homes," "safe and healthy estate," "safe and healthy elderly homes," "safe and healthy schools" and "safe and healthy workplaces" to become a "safe and healthy community". This has laid down the key elements of primary health care through collaboration among public and private hospitals in Kwai Tsing and Tsuen Wan, other NGOs and related academic institutions (Chow 2018). Supported by the "Signature Project Scheme" of the District Council, the Association established the "Medical-Welfare-Community Collaborative" model to capitalise on the intersectoral partnership and

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[1] The *Health Setting* has a long history of being organised around settings such as schools, communities and workplaces. Its approaches such as *health-promoting school*, *health-promoting workplace*, *health-promoting health-care organisation* and *healthy city* provide the "social structures" to reach the defined population and delivery of health promotion activities in the context of their daily lives. It has the ability of translation into language to fit the context of that particular setting. This approach is an ecological model of health promotion in which health is determined by a complex interaction of environmental, organisational and personal factors. The *Healthy Setting* approach can facilitate the *rights to health* as it argues for investment in social systems in which people spend their daily lives to address the multifactorial determinants for health.

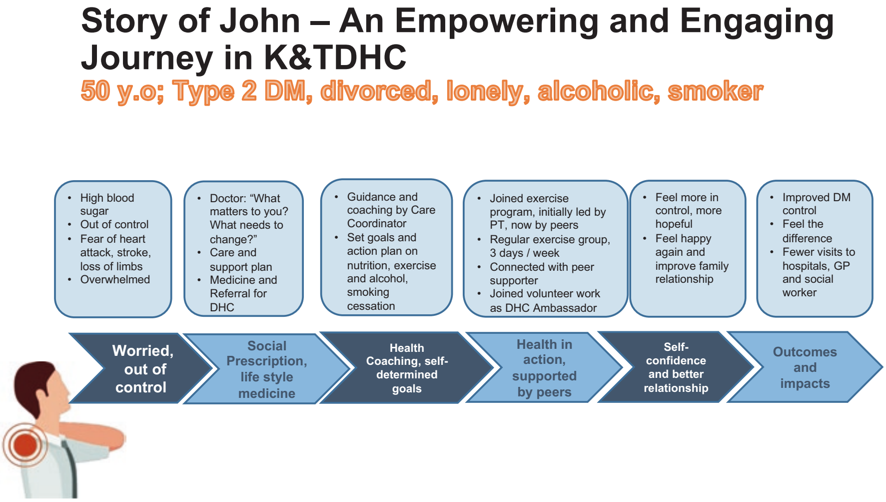

Fig. 23.2 Patient journey. (Source: Peter Poon)

multidisciplinary platform to build a sustainable, safe and healthy community in K&T (Chow 2018; Lee and Wei 2018; Lee 2018). The model has adopted patient-centred care to provide a more effective way of improving health care for the residents, especially those with chronic diseases. The concept was put forward in the proposal for the basis of operating K&T DHC. The main aims of the provided services are:

1. Covering different tiers of prevention (primary, secondary and tertiary)
2. Personalising patient management in addressing the complexity of their health conditions/issues
3. Meeting patients' needs with desired outcomes
4. Preventing and delaying disease or disease progression through individual and population-based approaches

Scopes of Services

1. Individual consultation and shared group consultation
2. Self-management and empowerment training, activities to maintain health and well-beings
3. Case management approach as required

The K&T DHC started operation in September 2019. It consists of a core centre (CC) and five satellite centres (SCs). The CC is used exclusively for the purpose of the K&T DHC scheme operation, while the SCs will be set up as the neighbourhood first contact points for the K&T DHC services in the Kwai Chung and Tsing Yi districts (Fig. 23.3), outreaching to the local community. The primary health-care professionals of K&T DHC will map out the scope of services to be delivered at CC

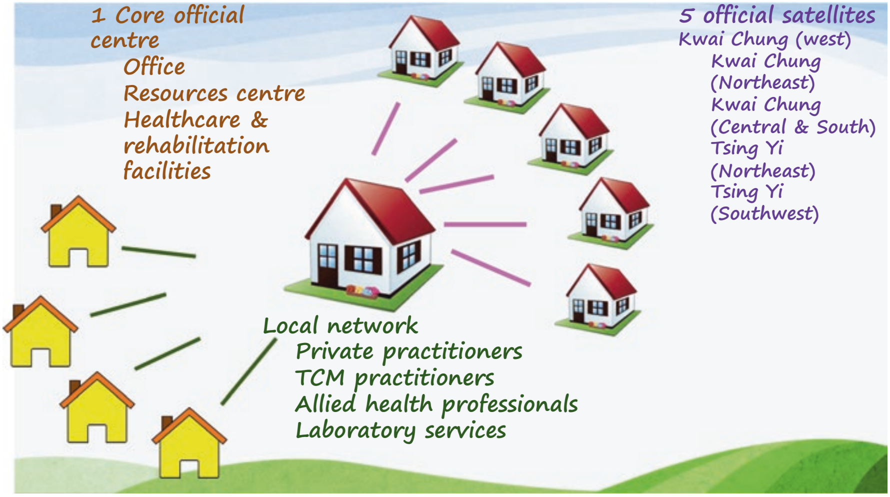

Fig. 23.3 Basic infrastructure of K&T DCH. (Source: Lee and Wei 2018)

and SCs, taking into account of the population in different sub-districts of K&T. They will plan the facilities to meet the service needs at CC and SCs.

Capacity Building for Operating District Health Centre

Acute Care vs Community Care

In acute care, patients have unstable clinical conditions and marked deterioration of bodily functions. Patients usually receive closely supervised and monitored medical interventions. Once the acute phase is passed, they will be discharged back home and receive guidance and instruction from primary care providers on treatment but not so closely monitored as in acute setting. They might have suboptimal control of their clinical conditions without severe disturbance of their bodily function. They might also have barriers in seeking help for their health problems and also in compliance to treatment and advice. In other words, patients might be “living up” with their health problems or “bearing” the risks.

The diverse needs of community-based care suggest additional multidisciplinary supporting services for quality care in community. Patients with chronic diseases have complex biopsychosocial needs. If their complex needs are unmet, this would have impact on their health-seeking behaviours, compliance to medical advice and treatment and clinical presentation of their health problems. Primary health care has the potential for early intervention of diseases, but supporting services from other disciplines will be very much needed to handle a wide range of health issues from physical, psychological, social and ecological perspectives. The Hospital Admission Risk Programme (HARP) in Australia would help to meet the complex needs of patients during early discharge phase as well as existing patients at risk of hospital admission by proving services over a period of 3–6 months (Victoria 2013). The primary health-care providers at DHC should build up their capacity like their counterpart of HARP team in the following areas:

- Multidisciplinary assessment to unfold the unmet complex needs of patients.
- Intensive co-ordination of necessary services (including referral to allied health services and further medical inputs within HARP team for specific cases requiring fine-tuning of treatment).
- Equip the patients and carers with knowledge and skills of self-care and self-management (including home monitoring) of their illness.
- Support patients during the process of titration of medication and/or initiation of new medication (e.g. initiation of insulin treatment for diabetic patients).
- Patient empowerment to promote health independency.
- Patient-centred action plan for patients and reference for GPs.

Although there are some services in supporting patients with chronic diseases implemented through the HA in Hong Kong such as medical social services, outreaching community nursing and various allied health services, the services are limited and lagging behind the complex needs and demands (Poon et al. 2014). The recent HA initiatives such as Risk Factor Assessment and Management (RAMP), Nurses and Allied Health Clinics (NAHC) and Patient Empowerment Programme (PEP) have only limited scope and are unable to fit in the comprehensive picture as in Fig. 23.1.

The successful management of chronic conditions is done with self-responsibility in their daily lifestyle, preventive actions such as taking medications and adjustment of lifestyles. Structured self-management programmes have demonstrated their effectiveness in improving quality of life and reduction of health-care costs for wide range of chronic conditions (Wagner et al. 2001). The Stanford Chronic Disease Self-Management Programme (CDSMP) was developed by Dr. Kate Lorig and colleagues at the Stanford University Patient Education Research Centre with the contents and structural design from patients' perspectives which shift the focus of outcomes from predominately biomedical markers such as HbA1c for diabetic patients to provision of help to patients in day-to-day living with chronic conditions, e.g. choosing healthy food and managing pain (Lorig et al. 2012). Table 23.1 contrasts self-management approach vs traditional approach.

Self-Efficacy for Chronic Disease Management

CDSMP focuses on enhancement of self-efficacy and mutual help through peer learning and sharing. Self-efficacy is defined as people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performances (Bandura 1992). Therefore, the sources of self-efficacy include the following:

Table 23.1 Traditional approach vs self-management approach

Traditional approach	Self-management approach
Paternalistic – professional centred	Participatory – patient centred
Information giving focusing on knowledge and instruction	Problem-solving skills focusing on attitudes and behavioural changes
Instructional	Making healthy choice easy choice
Focus on curative perspective and act upon problems	Focus on preventive and anticipatory approach to avoid complications
Enhancement of technical skills in disease management	Enhancement of self-efficacy

- Physiological information
  - Correct misconceptions
  - Relieve stress
- Verbal persuasion
  - Anxiety
  - Lack of confidence
- Vicarious experience
  - Learning by observing ➔ similarity to the models
  - Self-identification by sharing personal skills and methods
- Performance accomplishment
  - Structured situations that will succeed easily
  - Break down into small, feasible steps

Transdisciplinary Approach for Community-Based Care Programme

The community-based programmes are designed and delivered by team of professionals from different disciplines including social workers, registered nurses, physiotherapists and occupational therapists. This would enable sharing and transferring of knowledge and skills across disciplinary boundaries with patient-centred approach. All relevant professionals are involved in the initial planning and design, and only a few members provide the service in the end with all professionals accountable for areas related to their disciplines. This would help to meet the multifaceted needs of patients with holistic care having patients at the centre of the care team.

Each profession would contribute its expertise in designing the relevant part in the programme. The physiotherapists would design the content of physical therapy. The social workers would provide services on psychosocial perspectives such as skills in management of stress and anxiety and positive thinking. Occupational therapists would help patients to adopt to usual daily activities and back to work if possible. The nurses would focus on day-to-day care of the chronic conditions including self-monitoring of symptoms and signs. The dieticians would focus on nutrition. Community health practitioners would help in co-ordination and assess what skills have been transferred to patients. The presence of community health practitioners would help to overcome the existing professional boundaries.

Case Management for Chronic Conditions

Case management can be a dynamic process of delivering care to people with multiple needs associated with disability (Lou 2014). From static perspectives, it is a process of co-ordination and management of care across different systems both formal and informal (Lee et al. 1998). The dynamic process includes assessment, individual care plan, care plan implementation, evaluation and monitoring, replanning and readjustment of care delivery (Lou 2014). Changes can be induced by changing conditions of patients, changing environment, and changing family circumstances. Case managers need to manage cases under both formal and informal system. The formal system includes co-ordination with professionals and related professionals from the health-care system such as doctors, nurses, allied health professionals, health administrators and social care system such as social workers, social security officers, housing department officials, rehabilitation service providers, volunteer services and emotional support services. The informal system covers family members, domestic helpers, neighbours, etc.

Which Discipline Should Take Up the Role of Case Manager at Initial Stage?

Case managers should come from a particular discipline which meets more needs of that particular patient at initial stage. For example, a diabetic patient with poor control as a result of diet would need a dietician as case manager, and if the diabetic case requires intensive monitoring and supervision of medication, a nurse would be the case manager. If a young stroke patient is recovering from disability and planning to return work, the patient requires home modification and support of carers in home care; occupational therapist would be the case manager. For patient with chronic obstructive airway diseases, he/she requires pulmonary rehabilitation; physiotherapist would be the case manager. Whoever is the case manager at the initial stage, the community health practitioners should become the case manager once the condition is stablished to allow the professionals to care for new cases. Figure 23.4 outlines the flow of case manager, putting the professional staff as case manager at the initial stage and community health practitioner as co-ordinator once the condition is stabilised.

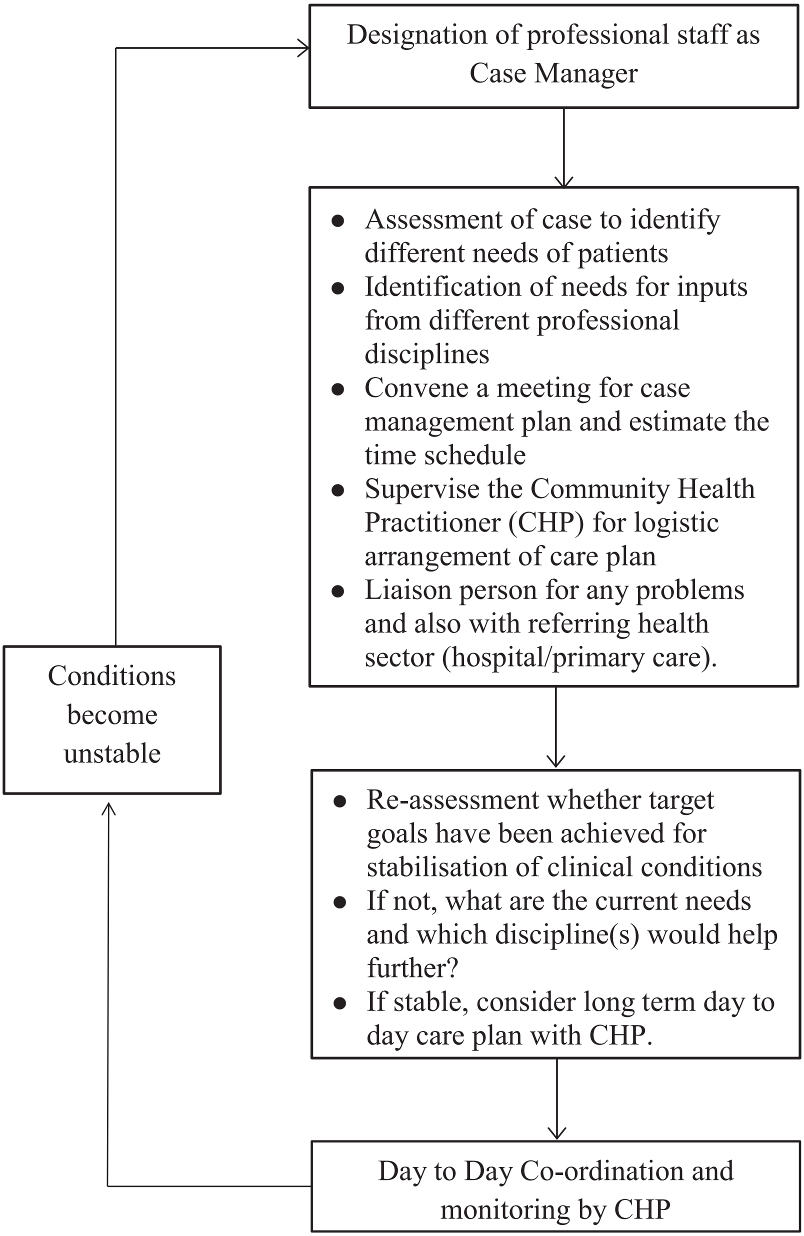

Fig. 23.4 Flow of case management

Self-management programmes need to grasp the psychosocial and emotional needs involved in making a meaningful life with chronic illness (Kennedy et al. 2014; Walker et al. 2003), and this might explain the small improvement in health outcomes of many lay or peer-led programmes in the past (Lorig et al. 2001) and the call for new approach – the expert patient (Tattersall 2002). Practitioners working at DHC need to equip themselves in adopting this new approach in delivering community-based care.

The Way Forward

The society needs a "new" ladder of health-care team for district-based primary health care. We need to maximise the health-care manpower so that patients would be managed by different levels of health-care practitioners according to their needs and avoid the heavy burden of our current hospital services. The mission should be broader and visionary to evolve a District Health System to fulfil the gaps of primary health-care services that are being accessible, available and affordable and assurance of quality primary health care, delivering holistic, comprehensive and whole-person care. District Health System should be considered as the way forward and not just a District Health Centre.

References

Bandura, A. (1992). Self-efficacy mechanism in psychobiologic functioning. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action* (pp. 355–394). Washington, DC: Hemisphere.

Chow, Y. H. (2018). *Kwai Tsing health system – enhancement of community health care*. Hong Kong: Kwai Tsing Safe Community and Healthy City Association.

Green, L. A., Fryer, G. E., Jr., Yawn, B. P., Lanier, D., & Dovey, S. (2001). The ecology of medical care revisited. *New England Journal Medicine, 344*, 2022.

HKSAR-Food and Health Bureau. (2018). *Tender invitation for District Health Centre*. Retrieved from https://www.info.gov.hk/gia/general/201809/12/P2018091200866.htm

Kennedy, A., Rogers, A., Chew-Graham, C., Blakeman, T., Bowen, R., Gardner, C., Lee, V., Morris, R., & Protheroe, J. (2014). Implementation of a self-management support approach (WISE) across a health system: A process evaluation explaining what did and did not work for organisations, clinicians and patients. *Implementation Science, 9*, 129. https://doi.org/10.1186/s13012-014-0129-5d.

Lee, A. (2014). Family medicine and community health care. In K. Fong & K. W. Tong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions*. Hong Kong: City University of Hong Kong Press.

Lee, A. (2018). *Primary health care development: Do not wait for another 3 decades.* Invited keynote lecture. Symposium on "Primary health care in Hong Kong: Visions and challenges". Organised by The Hong Kong Polytechnic University, 3 October 2018, Hong Kong.

Lee, A. (2019). Family physician and district health system. Editorial. *HK Practitioners, 41*(3), 57–59.

Lee, A., & Wei, R. (2018). *District-level primary care in Hong Kong: "Current practice and future development in Kwai Tsing"*. Hong Kong: Community Care Conference organised by Caritas Institute of Higher Education and The Open University of Hong Kong.

Lee, D., MacKenzie, A., Dudley-Brown, S., & Chin, T. (1998). Case management: A review of the definitions and practices. *Journal of Advanced Nursing, 27*(5), 933–939.

Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M. (2001). Effect of s self-management program on patients with chronic disease. *Effective Clinical Practice, 4*(6), 256–262.

Lorig, K., Holman, H., Sobel, D., et al. (2012). *Living a healthy life with chronic conditions; 4th edition: Self-management of heart disease, arthritis, diabetes, depression, asthma, bronchitis, emphysema & other physical & mental health conditions*. Boulder: Bull Publishing.

Lou, V. W. (2014). Case management in community-based long-term care: Good practices and challenges in Hong Kong. In K. Fong & K. W. Tong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions*. Hong Kong: City University of Hong Kong Press.

Poon, P. K. K., So, A., & Loong, E. L. C. (2014). Self-management in community-based rehabilitation programmes for persons with chronic disease. In K. Fong & K. W. Tong (Eds.), *Community care in Hong Kong: Current practices, practice-research studies, and future directions*. Hong Kong: City University of Hong Kong Press.

Tattersall, R. L. (2002). The expert patient: A new approach to chronic disease management for the 21st century. Department of Health, United Kingdom. *Clinical Medicine, 2*(3), 227–229.

Victoria State Department of Health. (2013). *The hospital admission risk program (HARP)*. Victoria: Department of Health.

Walker, C., Peterson, C., & Millen, N. (2003). A proposal for a new model of chronic illness. In C. Walker, C. Peterson, & N. Millen (Eds.), *Chronic illness: new perspectives and new directions* (pp. 17–35). Croydon CM: Tertiary Press.

Wargner, E. H., Austin, B. T., Davis, C., Hindmarsh, M., Schaefer, J., & Bonomi, A. (2001). Improving chronic illness care: Translating evidence into action. *Health Affairs, 20*(6), 64–78.

Working Party on Primary Care. (1990). *Health for all, the way ahead: Report of working party on primary care*. Hong Kong: Government Printer.

Epilogue

Interdisciplinary Team Approach in District Health Systems

Interdisciplinary District Health Team and Tasks

For the successful implementation of District-based Primary Care, there should be different tiers of services with different sets of skills, supported by an interdisciplinary team (the Team) of health care professionals with experience and expertise in primary care, including family doctors, community dental practitioners, community nurses, community physiotherapists, community occupational therapists, community pharmacists, community dietitians, health social workers, community health practitioners, community relations officers and administrators. The interdisciplinary district health team aims at accomplishing the following principal tasks and programmes in serving the local community in the health and psychosocial perspectives:

- Basic health risk assessment
- Health consultation, counselling and referral
- Non-communicable disease (NCD) management and support
- Healthy lifestyle workshop
- Wellness and exercise programmes
- Community rehabilitation
- Community mental wellness
- Eat Smart/healthy diet initiatives
- Community links and resources
- Community first aid training

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Roles and Interactions Members of the District Health Team – Community Health Providers

Family Doctors/Physicians

- Care provider: conducts basic health risk assessment on individuals; makes referrals to secondary care when appropriate.
- Consultant: acts as the health consultant to the primary care services.
- Capacity builder: teaches, mentors, supports and develops other district health practitioners.
- Leader of clinical governance: leads the Team in improving quality of care; recommends initiatives and strategies to the District Health Board and the Government.
- Champion of community-oriented primary care: engages with the community served, with competency in being able to work clinically.
- Supervisor: provides supervision to trainee doctors, interns and medical students.
- Interaction with Team members: particularly community nurses, community dental practitioners, community pharmacists, community dietitians, community clinical psychologists, health social workers and community health practitioners.

Community Dentists/Dental Practitioners in Health

- Care provider: provides essential dental services to manage common dental conditions and to improve individual's appearance and self-confidence.
- Health advocate: designs and implements programmes on oral hygiene in the community, based on assessment of dental health needs of the local population.
- Capacity builder: teaches, mentors and supports other district health practitioners in the promotion and education of dental health.
- Leader of clinical governance: leads the Team in improving quality of care by working closely with family doctors; recommends initiatives and strategies in dental health to the District Health Board and the Government.
- Champion of community-oriented dental public health: engages with the community served.
- Interaction with Team members: particularly family doctors, community dietitians and community nurses.

Community Nurses

- Care provider: acts in the important role as case managers in most instances in overseeing and providing care and services in health assessment, screening and nurse counselling to individuals in the community.

- Health co-ordinator: works with the family doctors in the planning and implementation of community health programmes; connects the health and non-health disciplines, and the District Health Service Network providers.
- Capacity builder: teaches, mentors and supports nurses, community health practitioners and community relations officers in the promotion and education of community health.
- Leader of clinical governance: leads the Team in improving quality of care by working closely with family doctors and dentists; recommends initiatives and strategies in community health to the District Health Board and the Government.
- Champion of community health: engages with the community served, particularly in health education and promotion.
- Interaction with Team members: particularly family doctors, community dentists, community clinical psychologists, community physiotherapists, community pharmacists, community dietitians, community occupational therapists, community health practitioners, health social workers and community relations officers.

Community Clinical Psychologists

- Care provider: conducts psychological assessment and initiate appropriate psychological services to individuals in the community.
- Health co-ordinator: works with the family doctors in the planning and implementation of community health programmes; connects the health and non-health disciplines, and the District Health Service Network providers.
- Capacity builder: teaches, mentors and supports nurses, community health practitioners and community relations officers in the promotion and education of community mental health.
- Champion of community health: engages with the community served, particularly in community mental health education and promotion.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, health social workers and community relations officers.

Community Physiotherapists

- Care provider: provides clinical and rehabilitation services to individuals in the community; may act as case manager.
- Health co-ordinator: develops group work, training, health promotion and education in wellness and rehabilitation programmes that aim to enhance self-care and self-management skills of individuals.
- Capacity builder: teaches, mentors and supports nurses, community health practitioners and community relations officers in community rehabilitation and weight management.

- Champion of community health: engages with the community served, particularly in community rehabilitation and physical exercise.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, community occupational therapists, community dietitians and community relations officers.

Community Occupational Therapists

- Care provider: provides rehabilitation services, help and information about equipment and home adaptations to individuals in the community, including home visits to give instruction on use of equipment and proposal of adaptations to improve home environment; may act as case manager.
- Health co-ordinator: develops rehabilitation programmes and, health and safety projects that promote mental and physical health and wellness, adopting recovery-oriented approaches.
- Capacity builder: teaches, mentors and supports nurses, community health practitioners and community relations officers in community rehabilitation.
- Champion of community health: engages with the community served, particularly in helping the clients to be as independent as possible with daily living tasks and supporting the carers to accomplish this task, leading to meaningful and productive life roles.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, community physiotherapists, health social workers and community relations officers.

Community Pharmacists

- Care provider: provides clinical pharmacy, drug counselling and related services to individuals in the community.
- Health co-ordinator: develops health promotion activities and patient empowerment programmes with the community stakeholders; ensures the correct and safe supply of medical products to the individuals in the community, based on legal and ethical guidelines.
- Capacity builder: teaches, mentors and supports nurses, community health practitioners and pharmacy support staff in the practice of community pharmacy.
- Champion of community health: engages with the community served, particularly in providing advice and information on drug use, instructing people on the safe use of medicines and medical appliances, and advising individuals on the treatment of minor ailments.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, community clinical psychologists, community dietitians and community relations officers.

Community Dietitians

- Care provider: offers dietetic advice, consultations and counselling services to individuals in the community.
- Health co-ordinator: develops health promotion activities and patient empowerment programmes with the community stakeholders; produces healthy menu and related health education materials about food and nutrition; organises health promotion activities with local restaurants.
- Capacity builder: teaches, mentors and supports nurses and community health practitioners in healthy eating habits, principles of ideal nutrition and weight management.
- Champion of community health: engages with the community served, particularly in conducting cooking classes to promote healthy diet and food selection.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, community physiotherapists, community clinical psychologists, community pharmacists and community relations officers.

Health/Community Social Workers

- Care provider: conducts psycho-social assessment, formulates holistic treatment plans, medical and rehabilitation services and, counselling; offers practical assistance in financial needs, accommodation, medical appliances, job placement and home help services, aiming at reintegration into the society of individuals in the community.
- Health co-ordinator: integrates the social services, and volunteer and community development based on an “Integrated Approach”; coordinates home care, medical equipment rentals, transportation; develops health promotion activities and patient empowerment programmes with the community stakeholders.
- Capacity builder: teaches, mentors and supports nurses and community health practitioners in achieving quality of life and whole-person wellness through enhancement of personal potential and self-help capacity of the individuals.
- Champion of community health: engages with the community served, particularly in the organization of educational, supportive, self-help and therapeutic groups and programmes, and mobilization of community resources.
- Interaction with Team members: particularly family doctors, community nurses, community health practitioners, community clinical psychologists, community dietitians and community relations officers.

Community Health Practitioners

- Care provider: supports the nurses and allied health professionals in case management, supports the operation of professional counselling and treatment sessions.

- Health co-ordinator: develops health promotion activities and patient empowerment programmes with the community stakeholders.
- Capacity builder: teaches, mentors and supports junior community health practitioners in the practice of quality care to the individuals.
- Champion of community health: engages with the community served, particularly in the organization of health promotion campaigns and rehabilitation exercise classes.
- Interaction with Team members: particularly family doctors, community nurses, community physiotherapists, community occupational therapists, community clinical psychologists, community pharmacists, community dietitians, health social workers and community relations officers.

Community Relations Officers

- Project co-ordinator: co-ordinates the pro-bono services provided by community health providers, service partners, institutions and professional bodies.
- Capacity builder: communicates and liaises with the network medical and health care practitioners, community organizations and self-help groups.
- Champion of community health: steers public relations (PR) functions and media communication of the project.
- Interaction with Team members: particularly family doctors, community nurses, community clinical psychologists, health social workers and community health practitioners.

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