

# Global oral health in the framework of the Global Charter for the Public's Health

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Published online: 12 March 2018  
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**Abstract** Oral diseases are a neglected epidemic affecting all ages globally and can substantially impact overall health and well-being. Even though most oral diseases are preventable and share major risk factors with other non-communicable diseases, integration of oral health into public health systems is still limited in both clinical and health policy perspectives. This Viewpoint aims to highlight oral health from a global health perspective, calling for all public health leaders to advocate for oral health of all. We strongly recommend oral health as an essential part of public health policy and oral health-related activities to be aligned with the Global Charter for the Public's Health Framework.

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**Keywords** Oral health · Global Charter · Universal provision · Disease prevention · Health promotion

## Oral health: a neglected global epidemic

Oral diseases are a neglected epidemic affecting all ages throughout the world. Untreated dental caries has the highest prevalence among 291 conditions studied between 1990 and 2010 in the international Global Burden of Disease Study [1]. Nearly half of the world's population (48%) is affected by oral diseases and suffered disabilities from oral diseases and 2.5 billion people have dental caries on permanent teeth [2]. Globally, 60–90% of school-aged children are affected by dental caries [3] that may cause severe pain, infection, and poor performance in schools. Many studies in different populations have shown that oral health has a substantial influence on quality of life [4–8], through physical, social, and psychological factors. Oral health also has numerous effects on other chronic diseases [9] such as diabetes and cardiovascular disease [10].

Oral health should be integrated into overall health policies using cross-sector and common risk factor approaches for health promotion [11]. Indeed, as oral and general health share common risk factors such as high-sugar diet, substance abuse, hygiene, and trauma [12], the global public health community should coordinate actions as described in the Global Charter for the Public's Health (The Charter) [13]. Many key players in global public health recognize that oral health is a major public health issue considering the prevalence, severity, and impact of oral diseases on overall health and well-being. While the impact of oral diseases can be detrimental to overall health, they are largely preventable through reduction in sugar consumption, diligent oral hygiene practices, and dissemination of evidence-based preventive oral health care as a part of public health systems. Equitable access to preventive measures, sustainable systems, and implemented strategies at the community, national, and international levels should be developed and driven by global public health leaders to achieve the vision of oral health of all [14].

The World Congress on Public Health in 2017 hosted A World Dialogue for Global Oral Health to bring this topic into debate with the broad public health community. In this Viewpoint, we highlight key points of the World Dialogue and propose coordinated global actions to achieve oral health and oral health parity aligning with The Charter [3].

## Universal prevention for dental caries: fluoride

Just as every public health professional acknowledges the importance of prevention in advancing public health, prevention also plays an essential role in dental public health. Fluoride has been known as the key component for preventing the most prevalent dental disease—dental caries. Fluoride is the ionic form of the element fluorine naturally found in the environment and associated with calcified tissues in human [15].

Fluoride is used globally through many means to prevent dental caries. Water fluoridation, salt fluoridation, and fluoridated toothpastes are the most common



measures that do not require clinical resources or health care personnel. Water fluoridation is the most equitable and cost-effective method of fluoride delivery [16], and studies showed reduction in the prevalence of dental caries by an average of 15% in fluoridated areas [17]. By regulating the recommended amount of fluoride in the central water system, areas with water fluoridation can maximize the benefit of caries prevention while minimizing the risk of fluorosis, (a condition caused by overexposure of children to fluoride that may change the appearance of teeth—discoloration or surface irregularities). Salt fluoridation and fluoridated toothpaste are effective vehicles in areas that lack central water systems—often in low-income settings. The effectiveness of salt fluoridation approximates that of water fluoridation if program implementation is adequate [18]. The health message should not encourage salt intake, as it contradicts the general public health message for prevention of hypertension. People may, however, benefit from caries prevention by changing their regular salt in cooking to fluoridated salt. Public health professionals need to map fluoride levels in their regions carefully and regulate the sales of fluoridated salt to prevent excessive fluoride intake from multiple sources.

Health communication is also important, because unlike water fluoridation, the purchase of fluoridated salt depends on the consumers' choices [19]. Both animal studies and human epidemiological analyses have examined possible association between fluoride and cancer through the creation of organic fluorides, and concluded that there is no credible evidence of increased occurrence of cancer with fluoridated water intake [20–24]. One exploratory analysis reported an increased risk of cancer but the follow-up study showed no significant difference in bone fluoride levels between cases and controls [25, 26].

A recent systematic review summarized the literature on fluoridated toothpaste published from 2002 to 2008 and concluded: there is "... strong evidence that daily use of fluoride toothpaste has a significant caries-preventing effect in children compared with placebo, preventing 24%" [27]. Meta-analysis of economic evaluations of caries prevention indicates significant cost effectiveness of fluoridated toothpaste [28]. The World Health Organization (WHO) recommends making efforts to ensure availability of affordable fluoridated toothpaste in developing countries [29]. Despite ample evidence of the effectiveness of fluoride in caries prevention, members of poor and marginalized communities, especially in low-income countries may, due to the cost burden, not have access to these simple preventive measures. Thus, WHO calls for reduction or removal of taxes on fluoridated toothpaste plus increased taxes on high-sugar beverages and foods [30]. Policymakers need to work together with public and private entities to make preventive interventions for dental caries available and affordable for people at all income levels.

## Universal provision of safe dentistry

Universal Provision of Safe Dentistry, appropriate and timely oral health care, is an essential goal in public health. The quality and safety of such care must be assured to achieve the basic principle of health care: do no harm. Changes in the workforce and in care delivery vehicles have, in the recent past, been introduced rapidly. It is



crucial that we diligently assure both the quality and safety of innovative care models.

Infection prevention and control can break down when proper sterilization and monitoring fail. In 2003 and again in 2016, the United States (US) Centers for Disease Control and Prevention (CDC) recommended infection control practices in dental offices to guide the public, dental health care personnel, and policymakers nationally and globally [31, 32].

While these knowledge resources are available and free to use online with mobile apps and other communication tools, studies have shown that current infection control and prevention practices vary widely across countries—from dry heat and autoclave sterilization with biomarkers to boiling water sterilization without individual pouches and multiple re-use of disinfectant [33]. Policymakers need to work with both private and public partners to ensure safe and affordable dental treatments for people at all income levels. To respond to the urgent need for improving oral health, in 2017 the World Federation of Public Health Associations (WFPHA) adopted a policy resolution, “Exempt Tax on Dental Supplies and Equipment for Infection Control and Prevention” [34] to advance financing policies for procurement and suggesting tax exemption or subsidies as incentives for new investments to promote infection control and prevention in dental settings. WFPHA also presented an effective financing model for health ministers and organizations in a resolution to the 70th World Health Assembly [35].

### **Implementation strategy: maximizing existing and new health care workforce to improve oral health**

When scientific studies show the efficacy of preventive interventions, the key question becomes: how best to organize the workforce in a system to deliver them? A traditional dental team consists of dentists, dental hygienists, and dental assistants. In some countries, dental therapists and dental nurses participate in dental care teams providing critical oral health services, both preventive and restorative. Recently, the role of non-dental professionals such as pediatricians, family medicine doctors, nurses, and pharmacists has become more important in promoting and protecting oral health. As part of efforts to integrate oral health into primary health care, interdisciplinary team care is gaining attention. Dental and non-dental, current and new workforce models may elicit useful collaborations to achieve the best health outcome for the patient, community, and nation, empowering each individual to take ownership of his or her health, including oral health.

Primary health care providers can recognize oral health symptoms for referral to dental personnel and examine risk factors for individuals and communities for common oral health diseases such as dental caries or periodontal disease. Smoking, sugar consumption, and lack of fluoridated water remain potential risk factors for common oral health problems. Primary care practitioners can educate patients in daily dental hygiene and lifestyle modifications to promote good oral health and work closely with dental team members to improve the overall health of patients.



Once having acknowledged oral health as an integral part of overall health and well-being, WHO recommends reorientation of oral health systems based on the Ottawa Charter’s Primary Health Care Concept, built upon the Declaration on Primary Health Care at Alma-Ata and the Jakarta Declaration [36]. In communities with limited access to doctors and dentists, other public health workers—pharmacists, community health care workers, care navigators, health educators, and social workers—play vital roles in preventing health problems and promoting health for all members of the community.

Small changes in primary care practice and dental practice can make important and lasting differences in the health of individual patients as well as for communities. If primary care physicians examine a patient’s mouth before checking the throat—this becomes an immediate opportunity to assess oral health and overall health conditions where symptoms and signs manifest in the oral cavity.

**Implementation Strategy: community empowerment and relationship-centered care**

Basic and applied science has demonstrated the efficacy of major preventive interventions for dental caries, but the challenge to implement them in communities worldwide remains. A community-empowerment model in Indonesia offers one way to tackle this challenge: use of a “Dental Immunization” approach in conjunction with the “Irene Donut” online caries risk assessment tool (Fig. 1) [37]. In communities where they work, oral health educators prepared to make use of the “dental immunization” concept can perform caries risk assessment using the online tool. Then they can customize preventive interventions, based on the immunization model, in partnership with medical and dental workforces. The dental Immunization

**A Global Movement toward Universal Provision of Oral Health**

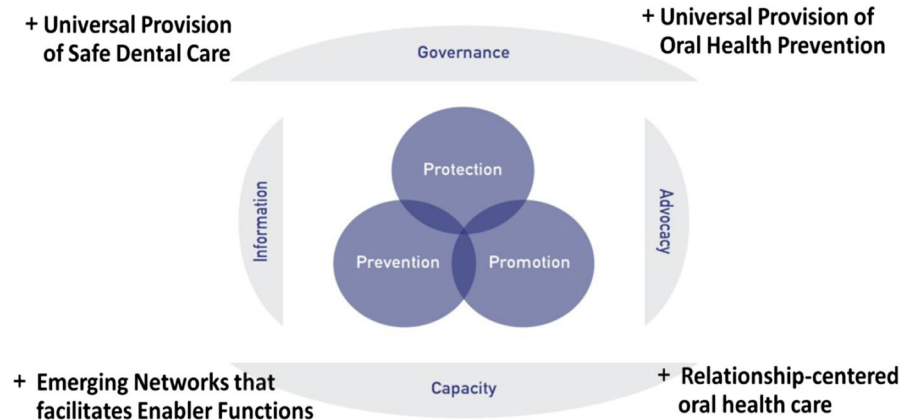


Fig. 1 Global Charter and oral health. Source WFPHA



model focuses on empowering communities and building ownership for dental programs in school-based settings. Marrying individual assessment of dental caries with the immunization paradigm makes the program more understandable to community members. In this way, governments become willing to secure resources for dental immunization activities in the budget along with other vaccination programs. In 2016, the Ministry of Health of Indonesia adopted this approach plus a formal policy to improve timely dental care and prevention for all school-aged children in Indonesia. Indonesia's government became willing to secure resources for dental immunization activities in the budget along with other vaccination programs.

Irene's Donut software for caries risk assessment [www.iredonut.com](http://www.iredonut.com) is widely used in Indonesia by dental professionals in their clinical practices.

Another important aspect of improving care is "person-centered care." This facilitates appropriate care for health problems along with other needs, based on understanding of people and their living contexts [38]. With diversity in values and decision-making criteria around the globe, it is important for health care providers to understand each person's unique priorities and interests in health outcomes, in clinical settings and beyond. Because optimal oral health depends on behavior modification and oral hygiene practice outside of clinic, it is essential to have each person's views and capacities in mind in designing prevention and treatment plans.

### **Next step: systems changes in global oral health and the global charter**

To achieve lasting system changes to improve oral health for all, DentaQuest, the largest dental benefit administrator in the United States, especially for low-income populations, proposed a framework. It consists of four core "systems": CARE, FINANCING, POLICY, and COMMUNITY. DentaQuest has shown that oral health can be improved by understanding structural, environmental, and human interactions that lead to optimal oral health. This requires addressing the context of poor oral health and oral health disparities among individuals and communities. It depends on active public health networks that connect people, information, and services. Networks replace organizations and identify key stakeholders in communities who can guide design of systems to achieve desired health outcomes. Information and knowledge are not contained with a certain institution, but viewed as collective resources to combine into effective strategies and systems for specific populations.

The Charter provides a broader lens through which oral health is easily and rightly addressed to improve health globally. It can be used to promote oral health and make a substantial impact on oral health advocacy, governance, and leadership worldwide (Fig. 1). WFPHA calls for all global public health leaders to advocate for oral health as an essential part of overall health in public health policy:



## The way forward

We advocate the following steps:

- (1) Integrate oral health within national policies, service planning, and primary health care personnel training increasing capacity.
- (2) Make available and affordable oral disease prevention and safe dentistry:
  - (a) Coordinate efforts to achieve infection control in dental settings, especially those in remote and marginalized communities.
  - (b) Exempt from taxation both dental supplies and equipment for infection control and prevention—globally and with a special focus on low-income settings.
- (3) Assure evidence-based and effective oral health messages and campaigns.
- (4) Advocate for public health system models that best integrate oral health into public health while maximizing existing resources and potential partnerships.
- (5) Establish partnerships among local and national governments, international organizations, and public and private entities to provide practical resources to health care facilities that provide dental services.

**Acknowledgements** We would like to thank Irene Adyatmaka, Senior Researcher Faculty of Public Health, University of Indonesia, Marsha Butler, Vice President, Global Oral Care of Colgate-Palmolive, Michael Covey, Vice President & Managing Director, Henry Schein Halas, Ralph Fuccillo, Senior Advisor, DentaQuest, and Bruce Summons, National Convenor of the Oral Health Special Interest Group of the Public Health Association of Australia. These oral health experts presented at the 2017 World Congress on Public Health—World Dialogue for Global Oral Health and provided meaningful insight and expertise that greatly assisted this perspective paper.

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