

Chapter 1

Public Health, Policy Analysis, Risk Assessment, and Impact Assessment

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Introduction

Public health has been defined as “the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals” (Winslow 1920) or as “the art of applying science in the context of politics so as to reduce inequalities in health while ensuring the best health for the greatest number” (WHO 1998). As the challenges of public health have evolved, from sanitary

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surveillance and infectious diseases in the past, to chronic diseases, lifestyle factors, socioeconomic conditions, occupational and environmental health determinants, health reforms and others, so have the methods of assessment advanced by research technologies development. The new health threats and epidemics, such as AIDS, SARS (Severe Acute Respiratory Syndrome), influenza H5N1, or emergencies like natural disasters or bioterrorism, effects of globalization and migration present new tasks to public health governance requiring new working methods.

There is no common consensus on the meaning of public health (Kaiser and Mackenbach 2008) and its future goals (Weil and McKee 1998) and there are different understandings among states about objectives and how public health services are organized (Allin et al. 2004). The new public health can be generally defined as an integrative approach to protect and promote the health status of the individuals and population. New public health focuses especially on disease prevention, health promotion, education and cross-sectoral action, including decisions and activities beyond the health system, well-being and health of society, communities, and individuals (Baum 2007).

The policy of new public health is based on responsibility of national, regional, and local governments, with significant international engagement (e.g., World Health Organization—WHO, European Commission—EC) for the well-being and health of society and self-care by the community and the individual. From European perspective, the new public health policy no longer concentrates on a series of separate or specific condition-oriented programs as it had over the past several years. Currently, the focus has been switched to health status, health determinants and health systems. This is also reflected by the key European health documents such as the EC health strategy (EC 2007).

Terms used to define public health functions are also numerous and develop over time. The most mentioned in core global health policy documents are: monitoring health status of population; identification of main health problems and hazards in the communities; health education; enforcement of laws to protect health; developing policies and plans which support individual and community health; ensuring of professional medical and public health workforce; evaluation of accessibility, quality and effectiveness of health services for individuals and population; supporting research for implementation of best practices and innovative solutions to health problems; and developing community partnerships to protect population health and promote health improvement. The newest public health action must adapt to an ever changing environment, taking into consideration a conjunction of financial, demographic and technological pressures and barriers. Yach highlighted that governments should respect and ensure the structure and sustainable delivery of essential public health functions, because they represent public goods (Yach 1996).

The intersectoral nature of contemporary public health leads to necessity to develop the relations between partners from many sectors. Among them are policy makers, public health experts and practitioners, business representatives, community leaders, media, NGOs, volunteer committees.

The Institute of Medicine in its report highlighted assessment as one of the three key functions of public health as important as policy development and service assurances (IOM 2002). It stated that health data monitoring involves regular assessment of community health status and identification of main health risks.

The assessment process must be conducted on both national and community level. The key aim is to identify potential health hazards and benefits and consider their importance for society.

Although numerous political documents express the inclusion of health considerations into decision making process and policy, e.g., the Amsterdam Treaty of the European Union, article 152 (in Lisbon treaty article 168), mentions protection of human health in all Community policies and activities as a main task, only few impact assessment guidelines give detailed information how to assess health impacts of policies and how to include health experts in decision making processes. The possibility to influence policy making process in other sectors by public health professionals is often limited and the capacity of research institutions to support public health goals and programs is still very weak. The technical capacity to conduct risk assessment is also not adequately developed across Europe (WHO 2012) especially with regard policies.

Essential Public Health Functions (Operations) and Place of Policy Analysis and Impact Assessment

There are different views and understanding of the term “public health” by different countries and cultures. There are countries where public health is equal to health protection and the need to enter the field of policy analysis and impact analysis of policies is not that strongly perceived. The essential public health functions defined first by CDC (<http://www.cdc.gov/nphpsp/essentialservices.html>) and later adopted by WHO (Bettcher et al. 1998) served as a unifying element around the globe on content of public health. Recently WHO Europe modified the terminology to Essential public health operations (<http://www.euro.who.int/en/what-we-do/health-topics/Health-systems/public-health-services/policy/the-10-essential-public-health-operations>) and updated the list. The ten Essential public health operations are as presented in Table 1.1.

The first five operations are considered as core operations and the second five as supportive ones. The issue of policy analysis and impact analysis is clearly linked to operation No. 4 “health promotion including action to address social determinants and health inequity” and also No. 6 “assuring governance for health and well-being.” Both these operations require knowledge of policy cycles, policy making processes, policy analysis, and impact assessment.

Health promotion including action to address social determinants of health and health inequity simply must include policy development and impact assessment parts. Health inequities are related to inequities in social determinants of health. Low income, low educated people living in poor neighborhoods have less opportunities to pursue healthy lifestyles. Income redistribution policies, social policies, neighborhood planning policies, transportation policies, employment and education policies are all contributing to development of inequities. Health promotion by enhancing responsibility for one’s health and determinants of health includes not

Table 1.1 Essential public health operations

1. Surveillance of population health and well-being
2. Monitoring and response to health hazards and emergencies
3. Health protection including environmental, occupational, food safety, and others
4. Health promotion including action to address social determinants and health inequity
5. Disease prevention, including early detection of illness
6. Assuring governance for health and well-being
7. Assuring a sufficient and competent public health workforce
8. Assuring sustainable organizational structures and financing
9. Advocacy, communication, and social mobilization for health
10. Advancing public health research to inform policy and practice

only the level of individual behavior and community action but also the structural policy level becoming a natural place for policy impact assessment processes.

To ensure governance for health and well-being policies need to be developed and implemented on the way which minimizes any hazard on health status of the population and on the other hand allows for maximum positive health impacts. Mechanisms, guidance's and tools, preferable standardized tools are needed to ensure development of policies to promote health and being able to assess their impact on health.

Largely, but not exclusively these two essential public health operations are to identify policies relevant to be assessed for their health impacts. The task of policy impact assessment is not a new issue. The Ottawa charter (WHO 1986) is often credited with bringing this issue into public health by introducing the term “healthy public policy.”

Healthy Public Policies

Health promotion by its principles goes beyond health care. It aims to put health on the agenda of policy makers in all sectors and at all levels, directing them to be aware of the health consequences of their decisions and to accept their responsibilities for health. This approach builds up the principle of healthy public policies. It is believed that coordinated action on legislation, fiscal measures, taxation and organizational change leads to better health, income and social policies that foster greater equity. The aim must be to make the healthier choice the easier choice for policy makers as well.

Health in All Policies

The principle of building healthy public policies was revised at beginning of twenty-first century and presented by Finland as the “health in all policies” approach. Health in All Policies (HiAP) is the approach of including, integrating or internalizing

health in other policies that shape or influence the determinants of health. These determinants include transport, housing, education, social, tax, and agricultural policies for example. Health in All Policies is more concerned with the structural issues on any level of governance (local, regional, national, and international) and less with individual programs or projects. Relevant issues could also be dispersed in multilevel governance systems. Health considerations should, according to HiAP, be included in the development, implementation and evaluation of policies. This approach requires a new form of governance where there is joined-up leadership within governments, across all sectors and between levels of government (Adelaide Statement 2010).

To implement the HiAP principle in addition to personal capacities, tools and methods to recognize potential hazards of a developed policy on health and conduct an assessment of hazards are necessary. In optimal situation this can be done by public health experts; however in real life scenario it is hard to expect that each sector will have own trained public health experts who are involved in development of new policies. The importance of availability of standardized tools and methods is therefore increasing.

A key question which needs to be answered is at which stage or moment of policy development should the assessment of potential impacts on health be completed. Knowledge of policy development process theories is therefore necessary to estimate the proper timing.

Policy Making Models and Public Health

In most cases the policy cycle is described by needs assessment, policy development, implementation and evaluation. Often, impact assessment procedures are considered best when prospective, so at the stage of policy approval or adoption in between development and implementation. To apply fully the HiAP principle the best choice however is inclusion of policy impact assessment into developmental phase of a policy.

According to the literature, policymaking can take place in several different ways, some more rational than others. There are many different categorizations of the policy making process. The models presented in the following should not be construed as exhaustive but have been selected on the basis of their previously identified relevance in studies of evidence use (Hanney et al. 2003).

It is an ongoing discussion, whether policy is being developed on a rational basis. The rational model for policy making is characterized by the idea of a direct, linear relationship between means and ends. Evidence should be used as a means to achieve a defined goal. The rational model has formed the basis for several modified models of both normative character (The Satisfying Model, The Limited Rational Model, The Extended Rational Model) and positive character (Muddling Through, Mixed Scanning, Garbage Can, Appropriateness Model). These models describe either how policy processes should proceed (normative), or how this is really happening (positive).

Normative Models

A modification of the rational model can be found in the idea of *bounded rationality*. Humans' ability to process information is perceived to be limited, and it is also limited how much information can be taken into account when a decision must be made. The cost of searching for information and exploring alternatives and consequences may outweigh the benefits. In addition, time is a limiting factor since policy processes often runs within a limited time frame (Pedersen 2006; Hanney et al 2003; Nutley and Davis 2007).

Studies show that people frequently act from experience and new knowledge is understood from what is already known. Knowledge that contradicts current assumptions can be rejected, while knowledge that confirms these assumptions are chosen. Moreover, a satisfying solution is many times chosen over an optimal solution. This leads to the concept of *the administrative man*, who is not rational, but limited rational. Limited rationality can be characterized by (Pedersen 2006; Hanney et al 2003; Nutley and Davis 2007; Jacobsen and Thorsvik 2002):

- Goals are unclear and changeable
- Only selected solutions and their impact is assessed
- Solutions are evaluated sequentially, as there is capacity to assess them
- The first satisfying solution is chosen

Positive Models

It has long been recognized that policymaking is a complex process. The process may involve evidence as well as a series of other factors such as different interests, values, personal ambitions of policy makers etc. In the policy process, evidence must also "compete" with other sources of knowledge derived from common sense, general knowledge, empirical data etc. Incremental models of policy making allow different stakeholders a role in the policy debate and use many sources of information that may influence policymakers (Hanney et al 2003; Nutley and Davis 2007).

Incrementalism is a part of the decision-making model called "Muddling Through." According to this model, the order of the policy making process is not necessarily that of the perfect rational model. In the analysis of alternative solutions and their consequences new targets can be discovered. For this reason, it is not possible to formulate policies in a straightforward manner. Furthermore, analysis of alternatives and consequences is incomplete and thus incremental decisions are taken. This process is in contrast with the rationality assumption, since policy makers do not necessarily have clear goals, and they can return to goal formulation later in the policy process (Jacobsen and Thorsvik 2002).

Another model of the positive nature of policy making is "garbage can" model. This model suggests that solutions not previously used still are present in the policy-making system. When other problems occur later, these solutions can be

used. Kingdon (Kingdon 1984, 1995) has developed a model for the policy process inspired by the garbage can model. He envisions three independent streams: a problem stream, an alternative stream, and a political stream. At various times these streams are brought together. A problem becomes urgent, and then a solution from alternative stream is chosen, which then is fed into the policy stream. The probability that the three streams meet depends on whether there is an opening, a so-called window of opportunities. This calls for specific solutions when one suddenly sees an opportunity and exploits it (Pedersen 2006; Hanney et al 2003; Nutley and Davis 2007). Models such as the garbage can model highlight the way in which policy making can be seen as a “sloppy” process more than a process that systematically follows several relevant processes (Hanney et al 2003; Nutley and Davis 2007).

These models for policy making are all important for different policy processes within public health (Nutley and Davis 2007) and public policy making.

Do any of the presented policy making models favor the use of impact assessment? Is there a higher chance to employ policy risk assessment by any of the presented models? Answers to these questions are not yet known.

Principles of Risk Assessment and Application of Them for Policies

Risk assessment is a scientific method to establish information about the hazards usually related to a single concrete chemical, biological or physical substance or mixture of substances. It consists of well-defined steps and usually leads to establishment of numerical, quantitative information about a hazard. The standard steps of risk assessment are described more in depth in following Chap. 2.

The application of principles of risk assessment to policies is not a simple task. The reasons are highly variable;

- Standard risk assessment deals with concrete subject (usually a chemical substance), e.g., in public health language a concrete risk factor.
- Although cumulative risk assessment deals with mixtures of substances it still rather rarely considers social risk factors in assessment.
- Policies mostly influence the distribution of such risk factors. An example could be given on air pollution. Risk assessment allows us to establish limit values for PM₁₀, SO₂, NO_x, and other chemicals in air, but an energy policy of a country is influencing via selection of power generation means which of these pollutants and at what extent are expected to be present in ambient air over coming years.
- Projects and programs can be banned based on established limit values; policies however are rather rarely banned. They might be modified or updated but in most of cases they are applied. An example can be given based on DDT use. DDT as single substance is banned from use due to its long-term toxic effect. But by policy of WHO this substance is still allowed to be used under specific circumstances if there is no other chemical available to prevent against mosquitoes and malaria. Another example can be on traffic injuries, the risk of fatal traffic injuries

is usually expressed in number of fatalities compared to overall volume of traffic. But humans are not banning traffic; we modify policies to decrease the risk, but do not ban traffic.

Due to these differences in case of policy related risk assessment it seems to be more appropriate to speak about policy health impact assessment as direct risk assessment.

These examples lead to the need to apply the full chain principle while doing policy risk assessment. In contrary to a single or mixed substance hazards policies usually influence a set of determinants of health which are leading to changes in distribution and prevalence of risk factors (the “single substances”) and they in turn influence prevalence and distribution of health outcomes. This approach we call further in book the “full chain approach.” In scientific literature as well as in practice risk assessment (including cumulative risk assessment) deals with relation of a concrete hazard (or mix of hazards) and health effect; the full chain approach aims to analyze also factors influencing presence and distribution of hazards. In public health literature the “causes of causes” approach (CSDH 2008) or causal diagrams (Joffe and Mindell 2006) are described mostly in relation to either the social determinants of health or to health impact assessment. When constructing the full impact chain the hardest issue is to distinguish between determinants of health and risk factors. This is a general issue within public health and there are several explanations description including terminology. The Commission on social determinants of health of WHO following work of Rose (Rose 1992) introduced the term “causes of the causes” (CSDH 2008), Keleher is using the term proximal and distal determinants of health (Keleher and Murphy 2004) and the term “wider determinants of health” is also used in public health literature (Bambra et al 2010). For Risk Assessment from Policy to Impact Dimension (RAPID) project which provides background for this book and for the RAPID guidance we understand determinants of health those structural determinants which are directly linked to policies and represent the two upper levels of the Dahlgren & Whitehead model of health (Dahlgren and Whitehead 1991). Risk factors are on other hand directly linked to concrete population at risk and are direct outcome of changes in determinants of health.

Does policy risk assessment differ from policy evaluation? Yes, it does! Policy evaluation can be better defined as a process by which general judgments about quality, goal attainment, program effectiveness, impact, and costs can be determined. In essence, policy evaluation is the process used to determine what the consequences of public policy are and what has and has not been achieved (Theodoulou and Kofinis 2003). Policy evaluation consists of process, outcome, impact, and cost–benefit evaluation and it is mostly done retrospective, e.g., after a policy is implemented.

Impact Assessment of Policies

Impact assessment (IA) is a process aimed at structuring and supporting the development of policies. It identifies and assesses the problem at stake and the objectives pursued. It identifies the main options for achieving the objective and

Table 1.2 Review of impact assessments

Impact assessment	Determinants of health targeted	Differences
Environmental impact assessment (Barker and Wood 1999)	Environment	Focus on environmental determinants of health, mostly on physical environment on local, regional, or national level
Strategic environmental impact assessment (WHO 2005)	Environment on international and strategic level	Focus on environmental determinants of health, mostly on physical environment on international, trans-boundary level
Social impact assessment (WHO 2005)	Social	Focus on social determinants of health
Economic impact assessment (Rushton et al. 1999)	Economic	Focus on economic determinants of health, cost–benefit, and other types of economic analysis
Health technology assessment (Douma et al. 2007)	Health technologies	Focus on health care technologies used within health sector
Health system impact assessment	Health system	Focus on impact of policies, plans, projects on health system of a country
Health impact assessment	All	Includes all determinants and focuses on impact on health of the population

analyzes their likely impacts in the economic, environmental, and social fields. It outlines advantages and disadvantages of each option and examines possible synergies and trade-offs (http://ec.europa.eu/governance/impact/index_en.htm accessed 19/04/2013).

There are several impact assessment methods; Table 1.2. summarizes different impact assessments and describes differences compared to Health Impact Assessment (HIA) and target areas in terms of the determinants of health.

All mentioned impact assessment aims to assess impacts of policies, plans, projects on usually a single determinant of health or group of determinants of health. Health impact assessment (HIA) as defined by Gothenburg consensus paper (WHO 1999), aims to assess future impacts of recent plans, policies, projects, and programs on health and determinants of health. As HIA aims to inform and influence decision making process it is preferably used *prospectively* (before the decision is made), but it could be applied also as concurrent (during implementation of a decision) or retrospective (after a decision is implemented; in this case it helps to develop capacities and prepare for future updates of a decision). As given by Kemm (Kemm et al. 2004) it targets decision making both in non-health and within health sectors. Health impact assessment picks up the information from all sectors and aims to assess their impact on determinants of health and if possible directly on health. By doing so, it provides information to decision makers both in non-health and health sectors to make decision which have a potential to harm human health.

Not all of mentioned impact assessments are dealing with impacts of policies.

Conclusion

Risk assessment, impact assessment, and understanding policy making are crucial issues of contemporary public health. The following chapter is going to discuss more in depth the principles of risk assessment and health impact assessment and their application specifically on policies.

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