CHAPTER 3

What is public health? A definition and essential public health operations in the Netherlands

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ABSTRACT
Public health is an important part of any healthcare system. However, the boundaries of public health are indistinct. The current challenges to public health and medical care require a closer collaboration between public health and medical care. We present the working field of public health to health professionals according to international examples. Our study shows that a general consensus exists internationally on the overall role of public health in terms of scope and core functions. Public health aims at promoting health and reducing inequalities in health, through the organized efforts of society. Based on this aim, we defined the aim and ten essential public health operations (EPHOs) for the Netherlands. The EPHOs go beyond institutional and professional boundaries, are provided within and outside the healthcare system and can be translated into core competencies for public health professionals.

INTRODUCTION
Public health is an essential part of the healthcare system and focuses on the health of populations. Over the past 150 years, public health has made a significant contribution to population health in the Netherlands, and successful public health interventions include collective intervention programmes like the national child immunisation programme, anti-smoking measures, prevention of HIV/AIDS, safety belts in cars, and promotion of healthy workplaces. (1)

Nevertheless, the current state of population health in the Netherlands still presents major challenges for public health and the healthcare system. The future contribution of public health is underlined by several policy documents which advocate for a change in the focus of the healthcare system, i.e. from ‘care for disease and illness’ towards ‘health and healthy lifestyles’. (2,3,4) Recent policy documents on future health developments published by the association of medical specialists ‘The Medical Specialist 2015’ (‘De Medisch Specialist 2015’) and by the association of general practitioners ‘Future Vision for General Practice Care 2022’ (‘Toekomstvisie Huisartsenzorg 2022’) support this trend and advocate for more prevention in the medical sector, including primary care. (5,6)

Although public health and medical care are currently separate sectors, the above-mentioned policy documents suggest there could be a closer collaboration or even integration in the future.

Public health in the Netherlands
During the past centuries, public health has evolved into a broad and diverse working field, focusing on the prevention of disease and health hazards, including the determinants of health both within and outside the healthcare sector. (7) Disciplines included in public health are, for example, preventive youth healthcare, infectious disease control, public health emergency control, environmental public health, and health promotion. The public health services are provided by many different professionals and a wide range of organizations, e.g. local public health services, local municipalities, occupational health services, and national knowledge institutes. Within the group of specifically trained and registered public health physicians different disciplines exist, e.g. occupational health physicians, insurance physicians (‘Verzekeringsgeneeskundigen’), and public health physicians (‘Artsen Maatschappij & Gezondheid’). The wide range of factors influencing health is reflected in the multidisciplinary nature of the public health workforce and is the main reason for the rather indistinct boundaries of the public health sector. A clearly distinguishable workforce for public health has not been defined or formally established, neither in the Netherlands nor in the majority of EU Member States. (8)

As a result, insight in the availability and distribution of the public health workforce in other countries and in the Netherlands is limited. Public health workforce governance is important to support future developments towards more integration of public health,
medical care and long-term care.[9] Insufficient data on both the size and the composition of the public health workforce hampers evidence-based decision-making on public health workforce governance.

**Essential public health operations**
In addition to descriptions of public health in terms of definitions, some countries defined essential public health functions as a framework for public health activities that should be undertaken. The USA did so in 1994. In 2012, the World Health Organisation in Europe (WHO EUR) followed and defined 10 essential public health operations (EPHOs) (10,11). EPHOs describe the main functions of public health. The EPHOs have successfully been used to monitor and evaluate the quality of public health services and to assess the public health workforce. (12,13,14)

In the Netherlands, EPHOs have not yet been defined. Therefore, we analysed international examples of EPHOs and subsequently propose the aims and 10 EPHOs for public health in the Netherlands. We expect that the Dutch EPHOs will contribute to the development of the sector and to the training of public health professionals in the Netherlands.

**METHODS**
We searched the websites of relevant international organisations (e.g. the World Health Organisation (WHO), the Association of Schools of Public Health in the European Region, the European Public Health Association, and national public health organisations) for definitions of public health and for descriptions of essential public health functions; we primarily aimed for white papers, or similar authoritative reports. The reference lists of the identified documents were also scrutinised and further searches were made in Medline, Google Scholar and the internet.

International definitions of public health and operations were then clustered, arranged according to common topics, and analysed with regard to differences and commonalities. Based on the outcomes, the generic set of public health operations that we developed was extrapolated to public health in the Netherlands. Whether or not the public health operations were actually delivered in the Netherlands was assessed according to the Dutch Public Health Act, existing professional profiles, policy documents and existing practice guidelines (e.g. the basic duties package ‘Basistakenpakket’) for preventive youth healthcare. (15,16,17,18,19)

**RESULTS**

**International documents**
The search yielded 7 international definitions of public health and associated descriptions of EPHOs (Table 1); three from the WHO and one each from Australia, New Zealand, the UK and the USA. In the USA some individual states defined their own public health operations, but we did not include these as they were derived from the overall USA document. The most recent set of public health operations was defined in 2012 by WHO Europe (WHO EUR). All documents consist of a definition or aim of public health and include a range of 5-11 public health operations.

Although the countries from which the selected documents originated have different healthcare systems, the definition of public health and the essential public health operations (EPHOs) were highly comparable (Table 1). Commonalities between the definitions of public health were: 1) focus on population health, 2) focus on prevention, and 3) a collective approach towards interventions to address risk factors and causes of disease.

The public health operations of the different documents could be divided into nine main topics, see Table 1, first column. Five of these topics could be clustered as core operations: monitoring health status, disease prevention and control, health promotion/empowering communities, health protection and public health emergency response. The remaining four could be clustered as enabler operations: healthy public policies, research and development, a competent workforce and quality assurance of public health services. The latter four operations more or less support the delivery of the core operations.

In some documents, some of the operations were not addressed as a specific operation. For example, ‘public health emergency response’ was defined as a separate operation in two of the documents, whereas in the USA this particular operation was part of ‘disease prevention and control’. The USA document was the only document that mentioned ‘Link people to needed personal health services and assure the provision of health care when otherwise unavailable’ as an EPHO, was mentioned as a public health operations. Therefore we did not label this operation as a generic operation.

In four of the international documents, reducing inequalities in health was explicitly addressed as an operation or integrated in the aim of public health. The UK addressed the topic ‘reduce inequalities’ in three of the EPHOs, and the WHO EUR in one of the operations. The WHO Western Pacific region and New Zealand included ‘reduction of inequalities in health/health disparities’ within the aim of public health.

To summarise, the aims and EPHOs reported in the seven international documents were very similar. In these seven examples, we used the commonalities, i.e. the generic EPHOs derived from the international examples, as a framework to propose the aims and public health operations for the Netherlands.
Table 1  International systems of definitions or aims of public health and essential public health operations

<table>
<thead>
<tr>
<th>Generic operations</th>
<th>Essential public health services</th>
<th>Core functions for public health</th>
<th>Scope of a modern public health system</th>
<th>Essential public health functions</th>
<th>Core public health functions</th>
<th>Essential public health operations</th>
</tr>
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<tbody>
<tr>
<td><strong>1. Monitor health status</strong></td>
<td>Monitor health status to identify community health problems</td>
<td>Assess, analyze and communicate population health needs and community expectations</td>
<td>Health surveillance, monitoring and analyses</td>
<td>Monitoring, evaluation, and analysis of health status</td>
<td>Health situation monitoring and analysis</td>
<td>Health assessment and surveillance and surveillance of population health and well-being</td>
</tr>
<tr>
<td><strong>2. Disease prevention and control</strong></td>
<td>Diagnose and investigate health problems and health hazards in the community</td>
<td>Prevent and control communicable and non-communicable diseases and injuries through risk factor reduction, education, screening, immunization and other interventions</td>
<td>Investigation of disease outbreaks, epidemics and risks to health</td>
<td>Preventive interventions</td>
<td>Epidemiological surveillance/disease prevention and control</td>
<td>Disease prevention, including early detection of illness</td>
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<td><strong>3. Health promotion, empowering communities</strong></td>
<td>Inform, educate, and empower people about health issues</td>
<td>Promote and support healthy lifestyles and behaviours through action with individuals, families, communities and wider society</td>
<td>Establishing, designing and managing health promotion and disease prevention programs</td>
<td>Health promotion</td>
<td>Health promotion, social participation and empowerment</td>
<td>Health promotion including action to address social determinants of health inequity</td>
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<td><strong>Mobilize community partnerships to identify and solve health problems</strong></td>
<td>Promote, develop, support and initiate actions which ensure safe and healthy environments</td>
<td>Enabling and empowering communities and citizens to promote health and reduce inequalities</td>
<td>Social participation in health</td>
<td>Advocacy, communication and social mobilisation for health</td>
<td>Disease prevention, including early detection of illness</td>
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USA, 1994  
Vision: what we, as a society, do collectively to ensure the conditions in which people can be healthy (healthy people in healthy communities)  
Mission: to promote physical and mental health and prevent disease, injury, and disability

Australia, 2000  
The science and art of promoting health, preventing disease, prolonging life and improving quality of life through the organized efforts of society

UK, 2001  
"Public health is an organized effort by society, primarily through its public institutions, to improve, promote, protect and restore the health of the population through collective action."

PAHO/WHO, 2002  
The key principles of Public Health are:  
a) focusing on the health of communities rather than individuals,  
b) influencing health determinants,  
c) prioritising improvements in Maori health,  
d) reducing health disparities,  
e) basing practice on the best available evidence,  
f) building effective partnerships across the health sector and other sectors,  
g) remaining responsive to new and emerging health threats.

WHO, WPRO, 2003  
"Public health is the science and art of preventing disease, prolonging life and improving quality of life through the organized efforts of society"  
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Healthy public policy</td>
<td>Develop policies and plans that support individual and community health efforts</td>
<td>Strengthen communities and build social capital through consultation, participation and empowerment</td>
<td>Promote, develop and support actions to improve the health status of Aboriginal and Torres Strait Islander people and other vulnerable groups.</td>
<td>Creating and sustaining cross-governmental and inter-sectoral partnerships to improve health and reduce inequalities</td>
<td>Development of policies and institutional capacity for public health planning and management</td>
<td>Development of policies and planning in public health</td>
<td>Assuring governance for health and well-being</td>
</tr>
<tr>
<td>5. Health protection</td>
<td>Enforce laws and regulations that protect health and ensure safety</td>
<td>Promote, develop and support healthy public policy, including legislation, regulation and fiscal measures</td>
<td>Ensuring compliance with regulations and laws to protect and promote health</td>
<td>Strengthening of public health regulation and enforcement capacity</td>
<td>Regulation and enforcement to protect public health</td>
<td>Health protection</td>
<td>Health protection including environmental, occupational, food safety and others</td>
</tr>
<tr>
<td>6. Research and development</td>
<td>Research for new insights and innovative solutions to health problems</td>
<td>Research, development, evaluation and innovation</td>
<td>Research in public health</td>
<td>Research, development and implementation of innovative public health solutions</td>
<td>加紧</td>
<td>Advancing public health research to inform policy and practice</td>
<td></td>
</tr>
<tr>
<td>7. Competent workforce</td>
<td>Ensure a competent public health and personal health care workforce</td>
<td>Plan, fund, manage and evaluate health gain and capacity building programs designed to achieve measurable improvements in health status, and to strengthen skills, competencies, systems and infrastructure</td>
<td>Developing and maintaining a well-educated and trained, multi-disciplinary public health service</td>
<td>Human resources development and training in public health</td>
<td>Public health capacity development</td>
<td>Assuring a sufficient and competent public health workforce</td>
<td></td>
</tr>
<tr>
<td>8. Quality assurance of public health services</td>
<td>Evaluate effectiveness, accessibility, and quality of personal and population-based health services</td>
<td>Quality assuring the public health function</td>
<td>Evaluation and promotion of equitable access to necessary health services</td>
<td>Strategic management of health systems and services for population health gain</td>
<td>Assuring sustainable organizational structures and financing</td>
<td></td>
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</tr>
</tbody>
</table>
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In Table 2, the first column presents the generic EPHOs that resulted from the comparison of the international examples; the second presents the proposal for EPHOs in the Netherlands, the third gives examples of these tasks in daily practice and the last column shows organisations that deliver those services.

We compared the generic EPHOs with the Dutch Public Health Act and the existing practice guidelines of preventive youth healthcare and infectious disease control, to assess the validity for the Netherlands. We also used existing professional profiles and the position paper of public health physicians that was published in 2012. [25] These comparisons showed that the generic EPHOs are also valid for the Netherlands. The main operations provided by Dutch public health professionals fitted within the framework of generic operations, as did the organisations that deliver these operations. However, one public health service did not fit within the framework, i.e. providing a ‘health safety net’ is an important operations of Dutch local public health services but did not appear in the generic operations that emerged from the comparison of the international examples. However, it does fit with the USA operation ‘Link people to needed personal health services and assure the provision of health care when otherwise unavailable’. ‘Providing a health safety net’ includes the care for vulnerable and fragile groups who are not reached by regular healthcare services or for whom regular health services are difficult or impossible to access; an example of this operation is the care for homeless people. Therefore, we extended the generic operations with the additional operation ‘providing a health safety net’.

Table 2 (fourth column) provides an overview of organisations that provide the public health operations. It is noteworthy that some operations are also provided by organisations outside public health: e.g. operation 2, ‘disease prevention’, is also carried out by general practitioners when, for example, they provide the yearly influenza vaccinations. EPHO 3, ‘health promotion’, is also provided by e.g. midwives who promote a healthy lifestyle among pregnant women. Some operations are delivered in collaboration with medical care, for example preparedness for a public health emergency. Although local public health services are basically responsible for this service, in case of emergencies there is close collaboration with, for example, general practitioners, ambulance services, and emergency departments of hospitals.

In view of these results, the question remains: what is the overall definition or aim of public health? The Dutch Public Health Act defines public health as: ‘health protection and health promotion activities addressing the population or parts of the population, including disease prevention. This definition contains two of the three common elements of the aim of public health that resulted from the international analysis: a population focus and disease prevention. However, because the collective approach is missing, we propose to add this element to the definition.

Continuation of Table 1

|-----------|----------------|---------|----------------|----------------|----------------|----------------|

* PAHO/WHO: Pan American Health Organisations/ World Health Organisation
** WHO WPR: World Health Organisation in the Western Pacific Region

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**Table 2: Public health in the Netherlands, in Nederland: kerntaken en werkveld**

<table>
<thead>
<tr>
<th>Generic EPHOs</th>
<th>Proposed EPHOs for the Netherlands</th>
<th>Examples in the Netherlands (1)</th>
<th>Organisations providing the EPHOs (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Monitor health status</td>
<td>Monitoring population health and wellbeing; to feed information to health needs assessments, health impact assessments and planning for health services</td>
<td>Surveillance systems and registries for (non) communicable diseases</td>
<td>Local public health services, occupational health services, youth health organisations, National institute for public health and the environment (RIVM)</td>
</tr>
<tr>
<td>2 Public health emergency response</td>
<td>Public health emergency response; in order to monitor health hazards so that risks can be assessed.</td>
<td>Preparing for emergencies like prevention of health effects of heat-waves</td>
<td>Local public health services, general practitioners, ambulance care, emergency care department hospitals</td>
</tr>
<tr>
<td>3 Health protection</td>
<td>Health protection; to protect health from diseases and environmental risks and hazards.</td>
<td>Legislation for assessing food safety</td>
<td>National government, Ministry of Health, Welfare and Sport, Ministry of Social Affairs and Employment, The Netherlands Food and Consumer Product Safety Authority</td>
</tr>
<tr>
<td>4 Health promotion, empowering communities</td>
<td>Health Promotion including empowering communities; to promote population health and well-being</td>
<td>The development, implementation and evaluation of policies to promote healthy diets and to prevent overweigt and obesity, or improving health literacy and health status of individuals and populations.</td>
<td>Local public health services, occupational health services, health promoting institutes, midwives</td>
</tr>
<tr>
<td>5 Disease prevention and control</td>
<td>Disease prevention and control, including early detection of disease; to prevent disease through preventive actions.</td>
<td>Provide vaccination programmes, organised screening programmes</td>
<td>Local public health services, occupational health services, youth health care organisations, National institute for public health and the environment (RIVM), general practitioners, hospitals, screening organisations</td>
</tr>
<tr>
<td>6 Healthy public policy</td>
<td>Healthy public policies and to ensure that public health services are well governed and maintain accountability, quality and equity.</td>
<td>Mobilizing action for health and health equity in local policies</td>
<td>Local governments, national government, local public health services</td>
</tr>
<tr>
<td>7 Competent workforce</td>
<td>Assuring a sufficient and competent public health workforce; to ensure that there is a relevant and competent public health workforce sufficient for the needs of the population.</td>
<td>Education, training, development and evaluation of the public health workforce.</td>
<td>Universities, public health training institutes, associations of professionals, Capaciteitsorgaan / VWS</td>
</tr>
<tr>
<td>8 Quality of health services</td>
<td>Enforcement of the quality of public health services and assuring sustainable organisational structures; to ensure sustainable organisations and financing for public health to provide effective, accessible, and qualitative services.</td>
<td>Effective enforcement of the quality of health services by the health care Inspectorate</td>
<td>Health care Inspectorate, associations of professionals, local organisations</td>
</tr>
<tr>
<td>9 Research and development</td>
<td>Advancing public health research to inform policy and practice; to ensure that research findings are used to improve evidence-informed policy and practice.</td>
<td>Development of new research methods or innovative solutions in public health</td>
<td>Universities, research institutes, local public health services</td>
</tr>
<tr>
<td>10 Added: health safety net</td>
<td>Providing a health safety net</td>
<td>Health care for homeless people</td>
<td>Local public health services</td>
</tr>
</tbody>
</table>

We also propose to add a focus on ‘inequalities in health’. Health inequalities have traditionally always been a major concern of public health. For example, in the 19th century Virchow (in Prussia) and Sarphati (in Amsterdam) were well-known public health figures who addressed the social determinants of health and the resulting health inequalities. (26,27) Although population health status has dramatically improved since then, large differences in health still exist between people with a high or a low educational level, which supports the need to add an extra focus on health inequalities, as in other international examples. (28,29) Therefore, we propose the following definition as the aim of public health in the Netherlands: ‘To promote health and an equal distribution of health through population-based interventions aimed at protecting and promoting health and preventing disease’.

DISCUSSION

The international comparison revealed many similarities between the aims and EPHOs in different countries. This implies that these core functions are largely independent of the health system or country in which they are performed. Therefore, we can use it to formulate a definition and core functions for public health in the Netherlands. Important principles of public health include the population-oriented, prevention-oriented and collective approach. The international framework was useful to describe public health in the Netherlands but we added the provision of a ‘health safety net’ function. In line with the international examples we also propose to include the aim ‘equal opportunities in health’ in the definition of public health in the Netherlands.

EPHOs are independent of the position of public health in the healthcare system, and of the professional who performs them and raises the question as to who may best perform these EPHOs. Our study showed that the answer to this question extends beyond the traditional boundaries of the field of public health and supports that there is an inherently strong association between public health and medical care physicians, i.e. their work aims at the realisation of (partly) the same tasks. (30) General practitioners who comply with the guidelines of cardiovascular risk management can serve as an example. Therefore we emphasise the importance of adequate attention being paid to public health during medical education, so that all healthcare professionals are sufficiently trained in the content and tasks of public health.

Our approach also had some limitations. For example, in the international comparison we may have missed some goals and/or examples of core tasks. However, due to the considerable degree of similarity between the different systems and the large number of countries represented in the WHO documents, this is not likely to have an important impact on our results.

Because of our background in the working field of public health physicians [artsen maatschappij & gezondheid], the examples provided in this paper were mainly derived from the working field of public health physicians, however, the definition and essential operations of public health are also applicable to the working field of insurance- and occupational health physicians. [Verzekerings- en Bedrijfsartsen]

CONCLUSIONS

We presented a definition of public health and of essential public health operations for The Netherlands. Public health focuses on promoting population health, an equal distribution of health, and is based on collective interventions. The EPHOs extend beyond the recognised institutions or professional domains, e.g. EPHOs are also provided by professionals working in medical care. EPHOs provide a basis for the development of public health in the Netherlands, and support the provision of adequate public health operations and the training of sufficient numbers of adequately trained professionals to deliver them.

ACKNOWLEDGEMENTS

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