

FROM POTENTIAL TO ACTION

**PUBLIC HEALTH  
CORE COMPETENCES  
FOR ESSENTIAL  
PUBLIC HEALTH OPERATIONS**

A MANUAL

MAY 2016 EDITION FOR COMMENTS

Anders Foldspang

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Public Health Core Competences  
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Volume 1: Introduction

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To be accessed at ASPHER's homepage  
<http://aspher.org/repository,12,0,0.html>

Volume 1: Introduction  
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## Foreword

The present text has the intention to seek to create a solid basis for professional discussion of the public health competences necessary to form the basis for good public health practice, as indicated by ASPHER's lists of public health core competences and WHO Europe's Essential Public Health Operations (EPHOs), respectively. I have been lead and co-chair of the complicated process of developing European core competences, since I took the initiative to start it in 2006, in my capacity of President of ASPHER. During the last three years, the continuing development of the lists of competences and their combination with EPHOs has been one of the responsibilities of ASPHER's European Public Health Reference Framework (EPHRF) Council, sustained by Robert Otok, ASPHER's Director.

This booklet and manual is devoted to scrutinizing and mapping the logical relationship between ASPHER's European core competences and WHO Europe's EPHOs. The booklet will be printed and, together with the manual itself, be placed on ASPHER's homepage [www.aspher.org](http://www.aspher.org).

The present edition is hoped to be subject to professional discussion and commenting during the months to come – until start October 2016 – where after the final edition will be produced. I will be grateful for any professional comment and suggestion, thank you. Please write me by mail at [anders.foldspang@gmail.com](mailto:anders.foldspang@gmail.com).

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## Acknowledgement

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We all owe special thanks to José Martin-Moreno and WHO colleagues for developing the chapters and detailed lists of WHO Europe's Essential Public

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Health Operations (EPHOs) and thus shaping the basis for pursuing the aim of this text: systematizing and mapping the relationship between competences and EPHOs.

I also owe special thanks to Dr. Christopher Birt for our close collaboration to refine the original lists of competences, especially during 2008-11, and to Robert Otok, ASPHER's director since 2007, for our continued productive collaboration on the competences lists, their further development, application and communication.

## Why is this important?

In spite of the fact that even if one could wish more resources for public health, the public health discipline actually has developed rapidly over the last century, with considerable added acceleration the last fifty years, to reach at its present stage of dynamics<sup>1,2</sup>. This development has got several parallel, mutually interacting sources, some of the most marked milestones denoting results of the work of the World Health Organization.

Thus, the Health for All by the Year 2000 strategy, launched by WHO in 1977, changed our general thinking about mankind's potential to cope with poor health, by setting up rationally goal-oriented public health strategies<sup>3</sup> and turning the health services focus to the primary rather than secondary health services<sup>4</sup> and, subsequently, to stressing the role of health promotion<sup>5</sup>. These developments have been followed-up by the European Health21 Strategy<sup>6</sup> and, with even more stress on public health, by the likewise European Health 2020 Policy<sup>7,8</sup>, opening for substantial developments of the discipline's potential to meet population health challenges. Moreover, fifty years ago the Association of School of Public Health in The European Region (ASPHER) was founded on the initiative of WHO<sup>2</sup>.

The eradication of smallpox in the late 70'ies constitutes an impressive example of the role of rational strategy making in public health, by WHO, as stated by Henderson, when he underscored the role of epidemiological surveillance in the management process, thus touching on some central conceptual and practical peaks of the comprehensive public health discipline<sup>9</sup>:

*"In conclusion, it seems to me that the most powerful, effective and under-rated tool in communicable disease control is the technique of surveillance. In essence, it represents organically the brain and the nervous system in a management process. As we in preventive medicine begin to understand and employ some of the more modern approaches in management, the surveillance mechanism, I am sure, will assume an increasing if not dominant role not only in monitoring*

*disease incidence but in monitoring the operation of the programme as a whole”.*

Also today we are repeatedly reminded of our responsibility to ensure effective, cost-effective and ethically acceptable preventive strategies based on scientific evidence; combatting the Ebola epidemic is a modern example of such challenge<sup>10</sup>. Rational strategy planning, implementation and follow-up do save human lives, and the tools and indicators are – and should be – subject to continuous development<sup>11</sup>.

The continued development of epidemiology as a theoretical and practical discipline – as demonstrated, one of the classical, indispensable tools in population health surveillance and thus one of the main basic pillars of public health – was spurred in 1960 by the presentation of the relatively complicated model of ‘*web of causation*’ by MacMahon, Pugh & Ipsen<sup>12</sup>. Statistical methods to understand and estimate complex structures and dynamics, such as multiple logistic regression<sup>13,14</sup>, the proportional hazards model<sup>15</sup>, and, more generally, the analysis of categorical data<sup>16</sup> and longitudinal analysis<sup>17</sup> were further developed in the last half of the 20<sup>th</sup> Century together with increasing precision of the logical tools of epidemiology, developed especially by Miettinen<sup>18</sup> and, subsequently, by Rothman, Greenland and Lash<sup>19</sup>. Writing desk solutions for item weighting in public health research could be replaced by more valid, concrete, empirically estimated parameters, e.g., such as developed for clinical as well as public health use by Ipsen & Feigl<sup>20</sup>.

The dynamic developmental process, as also summarized in comprehensive textbooks, e. g. the classical Oxford Textbook of Public Health<sup>21</sup> and the “*New Public Health*” volume by Tulchinsky & Varavikova<sup>22</sup>, included not only epidemiology and biostatistics but a number of social, behavioural and humanistic disciplines necessary for understanding the dynamics of population health. Some characteristic disciplines within public health are sociology<sup>23-28</sup>, health economics<sup>29,30</sup>, health policy, organizational theory and public health governance<sup>31</sup>, and ethics<sup>32</sup>, which are today natural components of comprehensive public health education and training programmes, besides of course central public health interventions – health promotion: health education, health protection, disease prevention. Principles and systems of teaching and education have been developed<sup>2,33,34</sup> and also adjusted to regional circumstances<sup>35</sup>.

This list is really far from saturated and could be extended to be very long. The scientific and the practically oriented communication has intensified, the number of national and international public health journals has increased,

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and so has the whole educational and research system directed towards public health<sup>1,2</sup>.

Then, sketching the above examples of the wealth of public health disciplines and material and acknowledging the status of public health in these respects, how can a manual on public health competences for essential public health operations, as formed by ASPHER<sup>36</sup> and WHO<sup>7</sup>, respectively, be relevant? What kind of role could it possibly take?

The cross- and multi-disciplinary nature of the public health discipline has often been mentioned. At present, a large number of European university departments and independent schools of public health offer comprehensive public health education and training, i.e., they include and integrate the relevant main sub-disciplines. Most programmes are of the classical Master of Public health (MPH) type, while an increasing number of university departments and schools of public health offer bachelor programmes with their differentiated master degree on top<sup>2,37</sup>. In addition, there exists a multiplicity of educations in public health sub-disciplines with each their concepts and culture, e.g., epidemiology, health promotion, public health leadership<sup>38</sup>. This has created a “*Babylonian*” situation in the public health market place, leaving decision makers in the middle of the road often without advice about how to combine the (sub-)disciplines<sup>2,39,40</sup>. What will professional consensus be, as concerns strategies in face of defined maybe acute population health challenges? Could lack of consensus have serious consequences resulting in, e.g., losing human lives?

Population health constitutes systems, which are not less complex, but still strongly coherent, than the individual human mind and body, taken care of in clinical medicine. Constituent components interact and are mutually dependent. This understanding – and resulting actions – is easily lost in silo-systems like today’s organization of public health services in many countries. Actually, the analysis of the comprehensive and coherent population health situation is an expert task for public health professionals and should not be left to decision makers – at whatever decision level – without a sufficiently comprehensive professional public health background.

One could say that public health is still astonishingly immature in most European countries – a situation, which also to a large extent is a function of our own indecisiveness and disciplinary separatism. Population health necessarily must be considered from a comprehensive, holistic perspective and thus demands a unified profession as its basis. This is one of the main challenges for the effective functioning of public health in our time. No number of specialist experts will suffice, if the glue between components is

missing. – Another challenge is the lack of coherent work environments for the development, implementation and follow-up of comprehensive and coherent public health strategies. Both shortages have got negative influences on the population's health.

And understanding the comprehensive, dynamic systems of population health and on this basis being able to act effectively goal-oriented demands large sets of competences, intellectual as well as practical. And, of course, also knowledge and skills as concerns how to implement the relevant actions.

This has not been mapped before, as a whole and in detail, and this is what the present manual is about – because it is a public health professional prerequisite to know and to discuss how to manage population health. The public health professional shall be responsible – accountable<sup>41</sup> – for population health in defined regions, in front of the population as well as the political and administrative decision makers. It does not suffice to be able to document the misery of conditions and then turn to higher powers asking them to do something. The model person should be an authorised professional with comprehensive knowledge, skills and accountability.

Consequently, the manual itself consists of numerous, large tables concerning the complex relationship between public health competences, ASPHER's lists<sup>36</sup>, and essential public health operations, WHO Europe's EPHOs, as systematised by Martin-Moreno<sup>42</sup>. The table structure is explained in further detail later in this booklet. Moreover, this structure with its categories will be integrated in an IT tool aiming at public health systems human resources planning as well as individual career sustainment.

The tables do not in any way present ex cathedra rules of coherence, but it is the hope that they will lead to sincere discussions in professional forums with expression of agreement as well as disagreement and further constructive development – as just a normal professional activity. This is needed to develop our tools to promote and protect population health and prevent disease - and accordingly for our own professional development. It is a small step forward, and it may seem lengthy at first glance – but we need to take it.

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## The Specific Context

The two basic parts of the public health discipline are (a) population health and (b) man-made strategies, plans and interventions and organisational structures aiming at population health improvement. In order to be successful and ethically acceptable, interventions to improve population health have to be based on scientific evidence and must be developed, implemented and followed-up by public health professionals as well as health professionals – physicians, nurses, other health professionals – with sufficient public health competences achieved through systematic education, training and continuing professional development (CPD).

In 2012, the member states of WHO Europe, in their Regional Committee in Malta, endorsed the lists of core competences for public health professionals and for Master of Public Health (MPH) education initiated in 2006 by the Association of Schools of Public Health in the European Region (ASPHER)<sup>1,2</sup>, and recommended public health education to be based on the lists<sup>3</sup>.

Lists of intellectual (knowledge) and practical (skills) public health core competences must develop continuously to meet current and forecasted dynamics of population health over time and across borders, and they should reflect developments in public health practice brought forward by scientific research and technology. Professional competences profiles should be interpretable in practice and transferable to it<sup>4</sup> and expectedly must reflect employers' expectations<sup>5</sup>. Competences profiles denote characteristics not only of individuals but also of professional groups – thus demarking the public health profession<sup>6,7</sup> – and organizational structures<sup>8</sup>, whether they offer education, public health services, research, knowledge brokering and giving advise, or all of these. Thus, the development of lists of professional public health core competences, whether encompassing the public health profession or the health professions, or stating objectives for education and training at successive levels, should have the nature of an iterative process including multiple stakeholders in various sectors and at various levels of planning, decision making and acting.

As part of WHO Europe's Health 2020 policy<sup>9</sup> and as a tool in the implementation of the European Action Plan<sup>3</sup>, WHO Europe in 2014 published a volume of what has been termed Essential Public Health Operations (EPHOs)<sup>10</sup>, denoting a comprehensive list of public health actions with associated organisational structures. In parallel to competences, EPHOs can be assigned to individuals as well as public health systems and education and training programmes. As they indicate action, the performance of EPHOs demands a potential in terms of both intellectual and practical competences. Thus, competences and EPHOs constitute two of the links in what we have termed "*the CEC model*", consisting of public health Competences, EPHOs and population health Challenges<sup>11</sup>. The rationale is that a certain population health situation – e.g., a communicable disease outbreak (consider the recent Ebola epidemic<sup>12</sup>) or a developing non-communicable disease situation (e.g., diabetes mellitus) – demands professional action, as indicated by the EPHOs. Relevant competences denote a prerequisite, making possible professional situation analysis, intervention selection, strategy making, implementation, follow-up, and repeated situation analysis (*'the strategic algorithm'*). Inspecting the logical structure of the relationship between the three links of the CEC model thus seems fundamental to understanding the basic logical structure of the striving of the public health discipline itself.

In 2014, ASPHER founded the European Public Health Reference Framework (EPHRF) with a council responsible for the continued development of lists of competences and for mapping and analysis of the knowledge and skills necessary for public health practice and research, to be included in a comprehensive European Public Health Core Competences System<sup>11</sup>. The system is intended to further define theoretical and practical core competences to be achieved in bachelor, master and PhD education as well as in continuing professional development (CPD)/lifelong learning, first of all for public health professionals.

Where are we now? We have got two logically structured systems – one for the *potential for action* (lists of competences) and one for *actual action* (EPHOs), and we are at a stage, where scrutinizing and mapping the systematic, goal-oriented relationship between competences and action seems a crucial challenge for the practical and academic discipline.

This could easily be shown in a half-page table without demanding a volume of explanation and complicated lists, but just superficially inspecting the matter soon reveals a need for more complicated models – and that is what this introductory booklet and the succeeding voluminous EPHO-competences tables are about. Moreover, these tables, combining EPHOs

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and competences, will be included into the corresponding IT system to be situated at ASPHER's homepage. Additional information planned to be included in the IT system is data on population health challenges – corresponding to the CEC model – as well as educational and training programmes in public health in European countries, so that the system can serve as a basis for systems planning as well as individual career planning

This is all a matter of a continuing and, over the years, increasingly intensive professional discussion<sup>13</sup>, and that is exactly what has been the intention of this booklet and its two volumes of lists and tables: to stimulate the professional discussion about what the population health and systems challenges are for public health – and how best to meet these challenges.

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## Defining Public Health

Discussions about the definition of the public health discipline are not new - it may even seem a lengthy and never ending process. There is not only a single cause of this, one being the relationship to clinical medicine and clinical nursing and the resulting theoretical and practical need for stressing public health self-identification and thus for stating demarcation lines between the disciplines. Another cause is the obviously necessary multi- and cross-disciplinarity of the public health discipline, which may seem overwhelming and ‘*Babylonian*’<sup>1</sup>. Actually, overall the multitude of public health sub-disciplines is not more outspoken, but still of another nature, than the multi-disciplinarity of clinical medicine and nursing – or for that sake of another close relative: political science.

It is not the intention to lead a thorough discussion here about the definition of public health. It suffices to state that mostly, what John Locke termed *real definitions*<sup>2</sup>, listing what public health does, have been prevalent, as for instance Winslows definition of 1920<sup>3</sup>, also cited by Martin-Moreno et al. in their discussion about and presentation of various systems for considering essential public health operations<sup>4</sup>:

*“Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health”.*

This line was followed-up by Acheson<sup>5</sup> in his somewhat shorter definition, subsequently applied also by WHO in, e.g., its Health 2020 policy<sup>6</sup>:

*“Public health is the science and art of preventing disease, prolonging life and promoting health through the organized efforts of society”.*

When developing the European lists of competences, we found that the real definition missed a nominal basis. We thus chose to state a *nominal definition*<sup>2</sup>, stating what public health is rather than what it does, based on the bipartite focus of the discipline, indicating the population perspective as one of the two basic pillars, as also reflected in the structure of the lists of competences<sup>7</sup>:

*“Public health is the science and art focussing on: (i) Population health; (ii) Human systems and interventions intended to improve population health”.*

The intended – but certainly not necessarily functioning – interaction between the two main components mentioned above is of its own nature, as demonstrated in numerous scientific trials, and thus could rightly be added as a third dimension, for professional if not for public use.

Also in the present context, the above nominal definition has been applied as the basis, delineating the frame of the work field by indicating what public health is. Real-type components can then be added to meet the need for defining the discipline.

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## ASPHER's European Public Health Competences

As previously indicated, ASPHER's programme for the development of European lists of public health core competences was initiated in 2006<sup>1,2</sup>, and developmental process has had the nature of a combined bottom-up and top-down process.

About 100 public health researchers and teachers from all over Europe participated, and, while categorizing suggestions in six chapters of theoretical and practical competences, mainly respecting suggestions as they were phrased, the material was published in 2007<sup>3</sup>. This list of competences – with its mutually overlapping concepts – was discussed by representatives of European Ministries of Health and ASPHER member schools, in total representing 27 countries, at the first European conference on core competences in public health, at Aarhus University, in April 2008. This formed the basis for the next list<sup>4</sup>, to be discussed at a conference on competences and infectious diseases in Paris, October 2007, organized by Professor Antoine Flahault, and authorised by the French State as one of its EU presidential activities that year. Later, ASPHER's membership in repeated Delphi rounds gave the development of lists of competences highest priority, and numerous presentations and workshops followed, including one-day practitioner-academic workshops arranged by Christopher Birt<sup>5</sup>. After thorough scrutiny we were in 2011 able to publish concentrated lists<sup>6,7</sup> with non-overlapping categories, for public health professionals and for MPH education, in 2012 endorsed by WHO' European member states<sup>8</sup>. As mentioned, since 2013 the lists have been subject to minor revisions by ASPHER's EPHRF Council. The creation and development process and its philosophies and concrete circumstances have previously been described in detail<sup>1</sup>. The study of lists from individual countries, e.g. the UK<sup>9</sup>, other parts of the world, e.g., the US<sup>10</sup>, and also from the European Centre for Disease Control<sup>11</sup> have continuously constituted important sources of inspiration.

In general, the competences concept itself has been used over centuries in various contexts, in our time not least in management and in education and training. From the etymological point of view, the word *competence* originates from latin: *com*, with, and *petere*, ask for, strive for, combinable to

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form *competentia*, suitability, fitness, which in turn originates from *competere*: be suitable, be fit for<sup>12</sup>.

In business, core competences of a firm may be defined as<sup>13</sup>:

*“A narrowly defined field or task at which a company excels. A firm’s core competencies are difficult for its competitors to mimic, allowing the company to differentiate itself. Most core competencies to a wide range of business activities, transcending product and market borders”.*

Naylor characterised core competences in business life this way, among which especially the first three are of interest in the context of public health competences<sup>14</sup>:

*“They provide a set of unifying principles for the organization and they are pervasive in all strategies.  
They provide access to a variety of markets.  
They are critical in producing end products.  
They are rare or difficult to imitate”.*

It is worth stressing that competences denote *potential* rather than actual behaviour, performance, as expressed in a text, e.g., on childhood development<sup>15</sup>:

*“It is important to make a distinction between the knowledge and skills a child possesses called competence, and the demonstration of that knowledge in actual problem-solving situations, called performance”.*

In ASPHER’s public health core competences programme, the public health competences concept is defined as *the intellectual and/or practical potential or ability to perform defined public health activities or operations*<sup>6</sup>. Thus, by definition competences are linked to the activities or operations, for which they are needed. The theoretical nature of this linkage itself forms the specific focus of this book: individual competences have to be combined to form the basis for the performance, for which they are necessary.

The competences themselves have been subdivided into *knowledge* and *skills*. Further subdivision is applied based on the components of the bi-partite main structure of the discipline, as previously defined, involving the fundamentally cross-disciplinary nature of public health related to population health and interventions targeting population health.

Table 1. Levels of learning.

<i>Level</i>	<i>Objectives</i>	<i>Outcome</i>
Informative	Information, skills	Experts
Formative	Socialisation, values	Professionals
Transformative	Leadership attributes	Change agents

Source: (16).

It should be mentioned that attitudes are not among the competences listed for the public health discipline itself. The discipline can be defined in its own right – for practice as well as research – without any consideration of attitudes. Knowledge and skills in ethics and its various philosophies and positions still constitute important parts of the discipline as such, irrespective of the student’s personal attitudes. Like in other scientific contexts, no type of political, religious, profession-related or other correctness should be invited to disturb the logical thinking. Moreover, applying the terminology of Frenk et al<sup>16</sup> for levels of learning, this is true for the informative level with its outcome in terms of experts (Table 1). In turn, on top of the expert level a profession can be shaped including socialisation with values and attitudes. Leadership knowledge and skills are among the comprehensive set of public health core competences assigned to the expert level, so that, in public health, transformation and leadership attributes transcend all levels, due to the overall systems orientation of the discipline. Contrastingly, this is not necessarily the case when looking at the roles of health professionals in performing particular public health field tasks, e.g., informing individual patients about the dangers of smoking, as part of an overarching, systematic public health programme. Health professionals will in general have their own, defined levels of learning also including the professional socialisation<sup>17,18</sup>. Summing up, attitudes – however important they may be for public health practice – will not, and should, not be considered in the present context, whereas it is adequate to do so in the process of defining and shaping a public health profession with clearly expressed, authorised ethical standards.

In accordance with the above considerations, the public health workforce can be categorized with three categories<sup>2,19,20,21,22</sup>:

*Public health professionals*, defined by a bachelor or masters degree in comprehensive public health or specialization in comprehensive public health on the basis of a degree in medicine or nursing.

*Health professionals*, mainly physicians and nurses;

*All other*, including political and administrative decision makers as well as policemen in the street and teachers in the classroom.

Lists of public health competences can denote a natural basis for the definition of an authorized public health profession when combined with WHO's list of EPHOs<sup>2,19,20</sup>.

As stated in the description of the development of ASPHERs lists of competences<sup>1,3,4</sup>, besides delineating a profession, at the individual and group levels the use of lists of competences are relevant for:

- Standard setting and curriculum development of public health education;
- Standardization of public health training and practice across Europe;
- Use as indicators of completion of stages of training;
- Role definition and standardization of public health job descriptions;
- Matching candidates to public health job vacancies;
- Easing mobility of public health professionals across borders;
- Policy, strategy and intervention programme development.

Public health competency profiles are not solely attributes of individuals but can describe the knowledge and action potential of individuals and groups of individuals, preferably public health professionals and health professionals; public health systems and systems of public health delivery; geographical regions whether constituting political/administrative units or not<sup>23</sup>.

So far, two European lists of public health competences have been produced – one for public health professionals<sup>6</sup> and one for master of public health education<sup>7</sup>. The MPH list represents selected parts of the list for professionals. In the present context, we will deal with the comprehensive list for professionals.

Inevitably, the development of the lists of competences and their relationship to concrete operations in the end must be based on the profession's own discussions and analyses as well as demands expressed by institutional employers and political leaders – bottom-up and top-down approaches, respectively, in a continuing process:

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*“Taken as a whole, competences profiles and thus lists of competences should reflect, in a transparent manner, both the type of challenges that the community expects members of the profession to be able to meet, and thus also the corresponding functions which they will be expected to be able to perform in a developed public health system, at any particular location and point in time”<sup>6</sup>.*

The logical structure of ASPHER’s list of competences represents the main components of the definition of the discipline:

*Population health:*

- Population health and its social and economic determinants;
- Population health and its material environmental determinants;

*Interventions and structures aiming at the improvement of population health:*

- Health policy economics; organisational theory, management and leadership;
- Health promotion: health education, health protection, disease prevention -

- besides:

*Methods in public health, and:*

*Ethics.*

Numerous competences are listed in each of the chapters. The 2011 lists have been adjusted, so that now each single competence has got its unique identification number in order to increase the precision of use, including the electronic implementation. A few extra competences have been added, the intention being, as previously stated, to conduct a further specification process hereafter. As previously outlined, the list of competences will be included in the IT tool under development. The detailed list of competences is shown in Volume 2 and its combination with EPHOs is mapped in Volume 3.

It should be noted that the competences are not distributed by level of decision making in a system, as they are in the UK “Knowledge and skills framework”<sup>9</sup>. The reason for not doing so rests on the fact that systems for delivering public health services vary considerably internationally across Europe and within countries as well, depending on the type of service. Thus, the coherent and comprehensive system in the UK is rather unique. In most European countries, public health services are scattered among separate

providers, not offering a uniform job structure and leaving less potential for strategy and policymaking. Thus, the lists provide statements of competences needed in general for public health professionals and MPH education, without assigning job levels.

The present situation concerning the implementation of lists of competences among European schools of public health is still characterised by considerable variation, leading to advice from ASPHER to combine in networks in order to be able to cover the comprehensive curriculum well<sup>2,24</sup>. Likewise, employers' expectations are not uniform<sup>25</sup>. Not unexpectedly, there exists an implementation challenge.

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## WHO's European List of Essential Public Health Operations (EPHOs)

WHO's Regional Office for Europe has since the 1990's worked to develop, refine and update lists of, what was first known as 'essential public health functions' and later termed Public Health Operations (EPHOs), to reflect the field of modern public health in the 53 Member States in the WHO European Region<sup>1</sup>. This has been developed based on the original list, which had:

*"...a strong foundation in traditional public health services: disease prevention, surveillance and control; environmental protection; occupational health; and health promotion all featured prominently"<sup>1</sup>.*

Parallel processes have taken place in other parts of the world and resulted in similar and to some extent rather parallel concepts and lists<sup>2</sup>.

The work and the professional discussions to follow over more than a decade deepened the understanding of public health and the distinction between the essential public health operations (EPHOs) and the functions of the health system as such. In the context of Health 2020 and its European Action Plan, among other things the "health in all policies" and "whole-of-society approaches" were introduced<sup>3</sup>. Accordingly, the 10 EPHOs were approved by WHO Europe member states in 2012, at the time when also ASPHER's lists of public health core competences were endorsed. For further understanding of the development of the EPHOs, it is advised to consult the original documents<sup>1,2</sup>.

In 2014, WHO launched a comprehensive self-assessment tool for registration of EPHOs in member states<sup>1</sup>. The list of 10 EPHOs contained in the self-assessment tool is broadly identical to the list approved in Malta. The lists of subsections and sub-operations have been exhaustively reviewed and detailed also in the light of comments from member states and experts. Collection of information on member states' EPHOs started in 2015 based on the self-assessment tool as completed by professionals working in the areas under assessment.

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Table 2. Main categories of WHO's Essential Public Health Operations (EPHOs).

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*Intelligence EPHOs*

- EPHO 1 Surveillance of population health and well-being
- EPHO 2 Monitoring and response to health hazards and emergencies

*Core services delivery EPHOs*

- EPHO 3 Health protection, including environmental, occupational and food safety and others
- EPHO 4 Health promotion including action to address social determinants and health inequity
- EPHO 5 Disease prevention, including early detection of illness

*Enabler EPHOs*

- EPHO 6 Assuring governance for health
  - EPHO 7 Assuring a competent public health workforce
  - EPHO 8 Assuring organizational structures and financing
  - EPHO 9 Information, communication and social mobilization for health
  - EPHO 10 Advancing Public Health research to inform policy and practice
- 

Source: (1).

The self-assessment tool represents a unique development in the understanding of public health activity in Europe. As stated by WHO, the list currently constitutes the most systematic approach to defining and evaluating national public health services in the WHO European Region<sup>1</sup>. The list in itself "*constitutes a comprehensive package of public health services that all Member States should aim to provide to their populations*".

The EPHOs work together in complex patterns, their mutual roles indicated by the sub-headings: EPHOs 3-5 constitute core services delivered in public health, made possible by the relevant information (EPHOs 1 and 2) and the necessary resources in terms of governance, competent workforce, organization and financing, communication, and research (EPHOs 8-10). Each of the 10 EPHOs includes numbers of sub-sections and sub-operations, detailing the content considerably as indicated.

In relation to public health competences – representing potentials for action – the EPHOs indicate action itself, aiming at meeting population health

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challenges. Each of the two dimensions thus constitutes an indispensable link in the Competences-EPHOs-Challenges chain, the “CEC model”<sup>4</sup>.

A more detailed list of EPHOs is shown in Volume 2. WHO’s EPHOs are used to indicate action to meet population health challenges, and the connection between competences and EPHOs is systematized and mapped in Volume 3, which also includes a level two of detailing of the EPHOs.

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## From Potential to Action in Public Health

The focus of public health is the aimed-at development of population health in positive terms. In order for population health developments to be predictable and not left to mere chance, systematic knowledge and systematic skills are *sine qua non*, in terms of both general, collectively shared knowledge and action potentials and particular potentials assigned to organisations and to individuals. Like other applied professional disciplines, public health thus includes systematic theory as well as systematic practice, developed over not only decennia but, in the case of public health, actually over centuries, in modern times increasingly sustained by systematic, scientific documentation of the nature and concrete representation of the challenges to the population's health, and of the effect to be expected, when systematic, evidence-based interventions are implemented.

The dynamic system of interactions between population health challenges and planned interventions may be illustrated by a rational, goal-oriented strategic algorithm consisting of progressive steps of qualitatively distinct nature (Table 3)<sup>1</sup>. The process is iterative by nature, so that the forward-oriented movement from each single level will be dependent on considering the balance with preceding levels as well as successive levels, with relevant adjustment. Each single step is necessary – they are all qualitatively different – so that if just one step is missing, the chain will no longer be rationally goal-oriented; the activities will consequently lack coherent forward-orientation and just represent individual, more or less un-related actions, and goal achievement will be left to chance.

Each level can be characterised by the type of systematic documentation specifically needed at this level to promote rational, goal-oriented planning and action. Moreover, at each step there is interplay between general, scientific evidence and concrete, particularistic documentation. This interplay affects decisions about the production of concrete systematic documentation and concerning concrete actions to be taken.

Table 3. The strategic algorithm and the systematic, scientific documentation needed at each strategic level.

<i>Strategic level</i>	<i>Documentation needed</i>
Situation analysis Population health Intervention systems ↓↑	Epidemiologic studies; surveillance Organisational studies; monitoring
Development of targets and choice and identification of target groups ↓↑	Balancing the results of the situation analysis and the choice of intervention
Choice of intervention ↓↑	Effect and cost-effectiveness studies
Implementation ↓↑	Organisational studies; monitoring
Follow-up, with evaluation of results of the concrete implementation as regards achievement of targets (→ Situation analysis)	Surveillance and monitoring

Source: Adjusted from (1).

The algorithm indicates the fields of work of the public health discipline and their mutual logical dependency and coherence required for understanding and affecting complex structures and dynamics. At each level, a potential for systematic analysis and action can be identified to be necessary for relevant action to be taken, defined by the nature of the strategic level and its role in the dynamic, iterative process.

With this background, this publication scrutinises the nature of the interplay of *concrete*, rational, goal-oriented action with the *potential* to analyse and act rationally in public health. In doing so it applies indicators of potential as well as indicators of action.

Table 4. *Public Health Core Competences  
by Essential Public Health Operations.*

<i>EPHOs</i>	<i>Competences Chapter 1. Methods</i>	<i>Competences Chapter 2. Population: health; Social determinants</i>	<i>Competences Chapter 3. Population health: Material determinants</i>	<i>Competences Chapter 4. Policy; economics; organisation; management</i>	<i>Competences Chapter 5. Health protection and education; disease prevention</i>	<i>Competences Chapter 6. Ethics</i>
<i>1. Surveillance</i>						
<i>2. Monitoring</i>						
<i>3. Health protection</i>						
<i>4. Health promotion</i>						
<i>5. Disease prevention</i>						
<i>6. Governance</i>						
<i>7. Public health workforce</i>						
<i>8. Organization and financing</i>						
<i>9. Communication</i>						
<i>10. Research</i>						

Mapping the interplay between public health competences and public health operations could seem to be just the establishment of a relatively simple two-dimensional matrix like the one shown in Table 4. Scrutinizing the

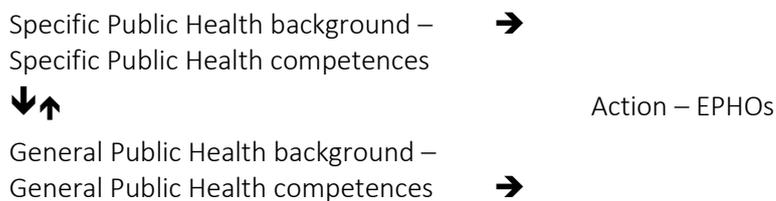
relationship will however show that two dimensions do not suffice. It is evident, for instance, that mapping population health by use of epidemiological surveillance of, e.g., cardiovascular disease (EPhO 1) demands knowledge and skills in epidemiology, biostatistics and computer handling (relatively specific methodological competences needed for surveillance) besides knowledge and skills in communication and group work in order to be able to transfer and discuss findings (more general competences), so that they can function in a system and relate to, e.g., the strategic algorithm for consideration of need for action.

This brings the need, e.g., for identification of target groups for action into the picture (strategic level 2, balancing with levels 1 and 3), demanding a broader horizon of competences. More detailed individual data on population members will be needed, at the very least demographic data, and some living conditions data – social and maybe even economic data – selected based on knowledge on population health determinants in general and, in particular, determinants of cardio-vascular disease (a mixture of more general and rather specific competences). The following example originates from my own research and will support the words with a little more concrete experience<sup>2</sup>:

*One of my PhD students studied the occurrence of acute coronary syndrome (ACS) in 138,290 male and female residents of the Municipality of Aarhus, Denmark, aged 30-69 years, followed 12 months. Study group members were identified in the Danish population register and assigned social data from other population registers. ACS incidence was predicted by use of multiple logistic regression. Relatively precise identification of high-risk groups could be achieved by estimation of rather complicated prediction models for the two respective genders. These findings may be classified as general achievements in disease epidemiology. In order to strengthen applicability in public health practice, we however then removed all registry information not available in Danish municipalities' administration. Comparison with the first, more complicated, regression models showed little loss of precision, and high risk could then be predicted simply, among males, by age 50 and over, combined with single living, and 60 years and over, also combined with single living, in females. They constituted only 7.7% and 5.4% of the source population, respectively, but accounted for 62.4% and 34.3% of ACS patients dying within 30 days. This identification of groups with these rather excessive risks could have formed the basis for choosing and implementing culturally more precise health promotion measures for*

*the now identified target groups and also for more valid and more efficient sampling of groups for intervention research. The publication history in this example went through refusal at three international cardio-vascular journals (based on the lack of biomedical measurements, e.g., blood pressure, serum cholesterol and fatty acids), until we agreed to try a public health journal, which quickly accepted the manuscript and communicated well to the public, resulting in comments in the New York Times and the BBC World.*

Table 5. *The Logical Structure of the Overall Public Health Competences-EPHOs Relationship.*



The type of data handling and analysis outlined in the ACS example and the decision to communicate with the high-risk groups identified would have been a natural activity to include among the services offered by a local, comprehensive public health system with district population health accountability. It demands methodological knowledge and skills often considered specialist characteristics – but the specialist consideration ought not continue to be the case. Some bachelor programmes in public health aim at such a competency profile – and all programmes should do so. These intellectual and practical analytic competences are necessary in order to be able to reach at the right understanding of population health dynamics. In other words, *population health* should not be treated less professionally than the individual patient, handled by medical doctors, who are experts in methods for diagnosing illnesses in the *individual patient*.

The level of population health and its development is, in general, crucially dependent on the dynamics of levels of living in a population<sup>3</sup>. The relevant professional background for comprehending this will be found in the social and behavioural sciences, including, e.g., sociology, anthropology, social psychology, economics. These sciences contribute with relatively general competences as well as competences tailored for the specific public health challenge, e.g. identification of local risk groups. Thus, evidence-based public

health has to be built also on academic education in these sciences – and not solely on, e.g., mono-dimensional scales of socio-economic status level.

These understandings can be generalised to the model shown in Table 5 and is reflected in the structure of the competences-EPHOs tables in Volume 3 of this report. The structure and the tables will be implemented in ASPHER's IT based public health repository<sup>4</sup>. There are competences, which are necessary for all EPHOs, and there are groups of shared competences within an EPHO chapter, as well as very specific competences. Some competences considered especially important for a specific EPHO may represent repetitions from the lists of shared competences. All in all, if the competences had not been grouped, this listing would not have been as informative, and there would be extremely long repetitions of lists. This is not a problem for a computer programme – but it will be so on the screen and especially on paper.

Based on the addition of information on population health challenges, it is the ambition to develop the Competences-EPHOs-Challenges chain, the "*CEC Model*"<sup>4</sup>, in the IT system to aim at planning of human resources in systems as well as individual career planning in public health, with the possibility of starting from the competences as well as the population health challenge position (Tables 6 and 7).

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Table 6. *Principles of Systems and Individual Career Planning based on the Competences-EPHOs-Challenges relationship.*

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*Systems planning – What is needed to meet population health challenges?*

- |                                     |   |   |
|-------------------------------------|---|---|
| 1. <i>Select</i>                    | ➔ | Population health challenge               |
| 2. <i>Output: Identification of</i> | ➔ | EPHOs needed to meet challenge            |
|                                     |   | ➔ Types and associated human capacity     |
|                                     |   | ➔ Organisation                            |
|                                     |   | ➔ Economy                                 |
|                                     |   | ➔ Management                              |
| 3. <i>Output: Identification of</i> | ➔ | Competences needed to perform EPHOs       |
|                                     |   | ➔ Types                                   |
|                                     |   | ➔ Human capacity needed to meet challenge |

*Systems planning – What challenges can be met by prevalent human capacity?*

- |                                     |   |  |
|-------------------------------------|---|--|
| 1. <i>Identify</i>                  | ➔ | Prevalent human capacity:<br>No. of staff with competency profiles                   |
| 2. <i>Output: Identification of</i> | ➔ | EPHOs that can be performed<br>by prevalent human capacity<br>with these competences |
|                                     |   | ➔ EPHO types, numbers and amounts  |
| 3. <i>Output: Identification of</i> | ➔ | Population health challenges<br>that can be met by existing human capacity           |

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Source: (4).

Table 6. *Principles of Systems and Individual Career Planning based on the Competences-EPHOs-Challenges relationship (continued).*

*Individual career planning – Specialist training programmes to prefer  
– based on interest in population health challenge – and on job possibilities*

- |                                     |   |                                     |
|-------------------------------------|---|-------------------------------------|
| 1. <i>Select</i>                    | ➔ | Population health challenge         |
| 2. <i>Output: Identification of</i> | ➔ | EPHOs needed to meet challenge      |
|                                     | ➔ | Types, numbers and amounts          |
|                                     | ➔ | Organisation                        |
|                                     | ➔ | Economy                             |
|                                     | ➔ | Management                          |
| 3. <i>Output: Identification of</i> | ➔ | Competences needed to perform EPHOs |
| 4. <i>Output: answer</i>            | ➔ | Types                               |
|                                     | ➔ | Education/training programme        |
|                                     | ➔ | Job possibilities                   |

*Individual career planning – Specialist training programmes to prefer  
– based on interest in EPHOs – and on job possibilities.*

- |                                     |   |                                       |
|-------------------------------------|---|---------------------------------------|
| 1. <i>Select</i>                    | ➔ | EPHO(s) of interest                   |
| 2. <i>Output: Identification of</i> | ➔ | Competences needed to perform EPHO(s) |
| 3. <i>Output: answer</i>            | ➔ | Types                                 |
|                                     | ➔ | Training programme                    |
|                                     | ➔ | Job possibilities                     |

Source: (4).

Table 6. *Principles of Systems and Individual Career Planning based on the Competences-EPHOs-Challenges relationship (continued).*

*Education and training: curriculum planning*

- |                              |   |   |
|------------------------------|---|---|
| 1. Select                    | ➔ | Population health challenge             |
| 2. Output: Identification of | ➔ | EPHOs needed to meet challenge          |
| 3. Output: Identification of | ➔ | Competences needed to perform EPHOs     |
| 4. Conclusion for curriculum | ➔ | Curriculum structure, content and goals |
|                              | ➔ | Thematic components                     |
|                              | ➔ | Teaching and learning methods           |
|                              | ➔ | Competences to be achieved              |

Source: (4).

Table 7. *Repository cell structure.*

<i>Challenges – examples</i>	<i>EPHOs</i>	<i>Competences</i>
Childhood obesity	EPHO1 – Surveillance	Methods
	EPHO4 – Health Promotion	Methods Health Promotion
	EPHO9 – Advocacy	Health Promotion
Food poisoning	EPHO1 – Surveillance	Methods
	EPHO3 – Health protection	Population health and its material environmental determinants
Public Health systems development	EPHO6 – Governance EPHO7 – PH Workforce EPHO8 – Organizational structure, financing	All: Health policy, economics, organisational theory, leadership, management

Source: (4).



The Association of Schools of Public Health in the European Region (ASPHER) is the key independent European organisation dedicated to strengthening the role of public health by improving education and training of public health professionals for both practice and research. ASPHER is a membership organisation of institutions, spread across EU and wider across WHO European Region, which are collectively concerned with the education and training, and professionalism, of those entering and working within the public health workforce.

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