ASPHER'S EUROPEAN LIST OF CORE COMPETENCES FOR THE PUBLIC HEALTH PROFESSIONAL

5th Edition

Edited by:

Anders Foldspang
Christopher A. Birt
Robert Otok

ASPHER's European List of Core Competences for the Public Health Professional

5th Edition

Edited by:

Anders Foldspang
Christopher A. Birt
Robert Otok

Association of Schools of Public Health in the European Region (ASPHER)
2018

Acknowledgement

The Editorial Committee and the Council of ASPHER's European Public Health Reference Framework (EPHRF) want to express our gratitude to all contributors to the 5th Edition of ASPHER's List of European Core Competences for the Public Health Professional.

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 the WHO European Region, which are collectively concerned with the education and training, and professionalism, of those entering and working within the public health workforce.

This preliminary edition is published in collaboration with the Scandinavian Journal of Public Health. The final edition will be published as a supplementary issue of the Journal.

The Association of Schools of Public Health in the European Region (ASPHER)
Avenue de l'Armée / Legerlaan 10
1040 Brussels, Belgium

E.mail: office@aspher.org

Website: http://www.aspher.org

The list was printed at the printing office SUN TRYK – Aarhus University, based on a donation from the Department of Public Health, Aarhus University, Denmark.

Editorial Committee

Anders Foldspang *(Chair)*
Professor, MD, PhD, DMSc, HonFFPH
Department of Public Health
Aarhus University, Aarhus, Denmark

Christopher Alan Birt
Honorary Clinical Senior Lecturer
Department of Public Health
University of Liverpool, Liverpool, UK

Robert Otok
Director, MSc (Public Health), PCHE, FFPH
ASPHER, Brussels, Belgium

The Council of ASPHER's European Public Health Reference Framework (EPHRF)

Anders Foldspang *(Chair)*
Professor, MD, PhD, DMSc, HonFFPH
Section of Health Promotion and Health Services,
Department of Public Heath, Aarhus University,
Aarhus, Denmark

Roza Adany
Professor of Preventive Medicine
Head of the Department of Preventive Medicine,
Faculty of Public Health, University of Debrecen,
Debrecen, Hungary
President of the Hungarian Training and Research Institutions

Christopher Alan Birt
Honorary Clinical Senior Lecturer
Department of Public Health and Policy,
University of Liverpool, Liverpool, UK

Vesna Bjegovic-Mikanovic
Professor
University of Belgrade, Serbia
Vice-Dean of the Faculty of Medicine,
University of Belgrade
President of the Managerial Board of the National Institute of Public Health «Batut»

Katarzyna Czabanowska
Associate Professor, PhD
Department of International Health, Faculty of Health, Medicine and Life Sciences, Maastricht University,
Maastricht, The Netherlands
Director of the Leadership for European Public Health Continuing Professional Development Programme

Søren Kjærgaard
Associate Professor, PhD
Department of Public Health, Aarhus University,
Aarhus, Denmark

Jørn Olsen
Professor Emeritus, Senior Consultant, PhD
Section of Epidemiology, Department of Public Health,
Aarhus University, Aarhus, Denmark

Robert Otok
Director, MSc (Public Health), PCHE, FFPH
ASPHER, Brussels, Belgium

Mala Rao
Professor of International Health
University of East London, London, UK

Rodolfo Saracci
Professor Emeritus of Epidemiology
International Agency for Cancer Research,
Lyon, France

Carmen Varela
Senior Expert, European Centre for Disease Control (ECDC), Stockholm, Sweden

Miroslaw Wysocki
Professor
National Institute of Health, Warsaw, Poland

Advisory Expert Groups and Individual Advisors

In the order of the themes of the core competences list

Epidemiology and Biostatistics

Individual Advisors

Mary B Codd

Associate Professor of Epidemiology & Biostatistics,
MB, BCh, BAO, MD, MPH, D.Stats, FFPHMI, PhD
Director, UCD Master of Public Health Programmes
Director and Chair, UCD CSTAR (Centre for Support and Training in Analysis & Research), UCD School of Public Health, Physiotherapy & Sports Science, Dublin, Ireland

Anders Foldspang

Professor, MD, PhD, DMSc, HonFFPH
Section of Health Promotion and Health Services,
Department of Public Heath,
Aarhus University, Aarhus, Denmark

Jørn Olsen

Professor Emeritus, Senior Consultant, PhD
Section of Epidemiology, Department of Public Health,
Aarhus University, Aarhus, Denmark

Kim Overvad

Professor, MD, PhD
Section of Epidemiology, Department of Public Health,
Aarhus University, Aarhus, Denmark

Daniel Pope

Senior Lecturer in Epidemiology and Public Health
MD, BSc, MSc, PhD, MFPH
Department of Public Health and Policy,
University of Liverpool, Liverpool, UK

Anita Villerusa

Associate Professor
Head of the Master Programme of Public Health
Department of Public Health and Epidemiology,
Riga Stradins University, Riga, Latvia

Sociology

Advisory Expert Group

Terje Andreas Eikemo *(Chair)*

Professor
Centre for Global Health Inequalities Research (CHAIN),
Department of Sociology and Political Science,
Norwegian University of Science and Technology,
Trondheim, Norway

Christopher Jamil de Montgomery *(Vice Chair)*

Ph.D. student
Danish Research Centre for Migration, Ethnicity and Health (MESU), Department of Public Health,
University of Copenhagen, Copenhagen, Denmark

Clare Bambra

Professor
Institute of Health and Society, Newcastle University,
Newcastle, UK

Piet Bracke

Professor
Department of Sociology, Ghent University,
Ghent, Belgium

Claudine Burton-Jeangros

Professor
Department of Sociology, University of Geneva,
Geneva , Switzerland

Nico Dragano

Professor
Institute of Medical Sociology, Medical Faculty,
University of Düsseldorf, Düsseldorf, Germany

Diana Gil González

Associate Professor
Department of Community Nursing, Preventive Medicine and Public Health and History of Science,
University of Alicante, Alicante, Spain

Tim Huijts

Senior Lecturer
Department of Sociology, University of York, York, UK

Sigrún Ólafsdóttir

Professor
Department of Sociology, University of Iceland,
Reykjavik, Iceland

Environmental Health

Advisory Expert Group

Martin Röösli *(Chair)*
Professor of Environmental Epidemiology, PhD
Head of the Environmental Exposures and Health Unit
The Swiss Tropical and Public Health Institute
Associate Institute of Basel University, Basel, Switzerland

Maria Foraster
Postdoctoral Researcher and Lecturer
MPharm, MPH, PhD
ISGlobal, Barcelona Institute for Global Health,
Barcelona, Spain.
Universitat Pompeu Fabra (UPF), Barcelona, Spain
CIBER Epidemiología y Salud Pública, Madrid, Spain
Blanquerna School of Health Science,
Universitat Ramon Llull, Barcelona, Spain

Maria Feychting
Professor of Epidemiology, PhD
Institute of Environmental Medicine, Karolinska Institutet,
Stockholm, Sweden

Anke Huss
Assistant Professor, PhD
Institute for Risk Assessment Sciences,
Utrecht University, Utrecht, The Netherlands

Health Economics

Advisory Expert Group

Terkel Christiansen *(Chair)*
Professor Emeritus
Department of Business and Economics,
University of Southern Denmark, Odense, Denmark

John Cairns
Professor, MA (Hons)
London School of Hygiene and Tropical Medicine,
London, UK

Emma Frew
Reader in Health Economics, PhD, MSc, BA (Hons)
Institute of Applied Health Research,
University of Birmingham, Birmingham, UK

Tor Iversen
Professor, PhD
Department of Health Management and Health
Economics, University of Oslo, Oslo, Norway

Jan Abel Olsen
Professor, MA, MSc, PhD
Chair of the Health Services Research Unit,
Department of Community Medicine,
University of Tromsø, Tromsø, Norway
Adjunct Professor at Centre for Health Economics,
Monash University, Monash, Australia

Leadership and Systems Thinking

Advisory Expert Group

Katarzyna Czabanowska *(Chair)*
Associate Professor, PhD
Department of International Health, Faculty of Health,
Medicine and Life Sciences, Maastricht University,
Maastricht, The Netherlands
Director of the Leadership for European Public Health
Continuing Professional Development Programme

Tony Smith
Senior Lecturer
Leadership and Organisation Development
Lead, Clinical and Executive Leadership Education,
Centre for Leadership in health and Social Care,
Sheffield Hallam University, Sheffield, UK

John Kawalek
Senior Industry Advisor, European Bank

Nutrition

Advisory Expert Group

Carl Lachat *(Chair)*

Professor, PhD
Department of Food Technology, Safety and Health,
Faculty of Bioscience and Engineering, Ghent University,
Ghent, Belgium.
Member of the Food and Nutrition Section of the
European Public Health Association (EUPHA)

Ines Banjari *(Vice Chair)*

Assistant Professor, PhD
Faculty of Food Technology, University of Osijek,
Osijek, Canada

Christopher Alan Birt

Honorary Clinical Senior Lecturer
Department of Public Health and Policy,
University of Liverpool, Liverpool, UK
President of the Food and Nutrition Section of the
European Public Health Association (EUPHA)

Tatjana Buzeti

Senior Health Advisor to the Minister of Health, Slovenia
Member of the Food and Nutrition Section of the
European Public Health Association (EUPHA)

Sandra Caldeira

Deputy Head of Unit, PhD
Health in Society, Joint Research Centre,
European Commission, Italy

Roger Hughes

Professor
School of Public Health, College of Health,
Massey University, Wellington, New Zealand

Patrick Kolsteren

Professor, PhD
Department of Food Technology, Safety and Health,
Faculty of Bioscience and Engineering, Ghent University,
Ghent, Belgium

Alessandra Lafranconi

Research Fellow and Jean Monnet Professor, MD
Research Centre on Public Health (CESP),
Università Milano Bicocca, Milano, Italy
Member of the Food and Nutrition Section of the
European Public Health Association (EUPHA)

Carla Lopez

Associate Professor
Department of Public Health and Forensic Sciences,
and Medical Education
Associate Researcher, Epidemiology Research Unit
(EPIUnit), Institute of Public Health, University of Porto,
Porto, Portugal

Special acknowledgement:

The work was facilitated by Sara Abassbhay,
University de la Réunion, La Réunion,
during her internship at Ghent University, Ghent, Belgium

Communicable Disease Control

Advisory Expert Group

Carmen Varela *(Chair)*

Head, DVM, MAE
Section Public Health Training,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control
(ECDC), Stockholm, Sweden

Rodrigo Filipe *(Secretariat)*

Expert Instructional Design / E-learning, Eng., MEd.
Section Public Health Training,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control
(ECDC), Stockholm, Sweden

Massimo Ciotti

Head, MD
Section Country Preparedness Support,
Deputy Head,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control
(ECDC), Stockholm, Sweden

Judit Takacs

Seconded National Expert, MA, PhD
Section Country Preparedness Support,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control
(ECDC), Stockholm, Sweden

Carl Suetens

Senior Expert, MD
Healthcare-associated Infections,
Surveillance and Response Support Unit,
European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

Aftab Jasir

Head, MD, PhD
Scientific Coordinator EUPHEM, ECDC Fellowship Programme, Section Public Health Training,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

Ida Czumbel

Expert, MD, PgD
Vaccine-preventable Diseases,
Unit Surveillance and Response Support,
European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

Paul Riley

Senior Expert, BA, PhD
Public Health Emergency Preparedness,
Section Country Preparedness Support,
Unit Public Health Capacity and Communication,
European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

Laszlo Balkanyi

Knowledge Manager and Acting Head, MD, PhD
Section Internal Communication and Knowledge Services,
Unit Resource Management and Coordination,
European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden

Contents

Introduction

Anders Foldspang [1], Christopher Alan Birt [2] & Robert Otok [3]

[1] Department of Public Health, Aarhus University, Aarhus, Denmark; [2] Department of Public Health, University of Liverpool, Liverpool, UK; and [3] Association of Schools of Public Health in the European Region (ASPHER), Brussels, Belgium.

Developing the 5th Edition of ASPHER's European List of Core Competences for the Public Health Professional

Population health and health systems change, as do public health practice, theory, terminology and scientific research methods. Thus, a list of public health competences needs to be developed continuously. This 5th Edition of ASPHER's European List of Core Competences for the Public Health Professional has been based on the preceding editions (1,2) by involving a number of international advisory experts – experts within some of the main themes of public health, namely, epidemiology and biostatistics; sociology; environmental health; health economics; leadership and systems thinking; public health nutrition; communicable disease prevention and control. All contributions have been formatted in balance with the full list, with the exception of the sub-discipline of communicable disease prevention and control, which has been additionally represented by an extract of the list of competences developed by the ECDC, Stockholm.

Defining Public Health

In contrast to clinical medicine, public health is accountable for the health of populations rather than that of individuals. Listing a multitude of concrete activities involved and thus highlighting the necessary multi-disciplinary content of a discipline with such an ambitious endeavour, Winslow (3) in his classical, real definition (2,4) stated that:

> *'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'.*

Thus, Winslow's definition lists (a) the main goals of the discipline and (b) the means to achieve these goals, *'organized community efforts …'*. The population perspective remains unmentioned in this early definition of public health but – as the public health student and the professional will know – is an integral prerequisite for the activities proposed. Following the same tradition of definition, Acheson (5) suggested a somewhat shorter version, which also WHO Europe adopted in its Health 2020 policy (6):

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

The UK Faculty of Public Health phrased its definition (7):

> *For us 'public health' is about promoting and protecting the health and wellbeing of people at a population-level. It's a very broad agenda covering everything from tobacco to transport, children's health to climate change, and violence to viruses – pretty much anything, which directly or indirectly impacts on people's health and wellbeing.*

Developing the 3rd edition of ASPHER's European Lists of Core Competences for the Public Health Professional (1), we found that the real definition however missed a nominal basis. We thus expressed a *nominal definition* (2,4), stating that public health is a theoretical and practical discipline in its own right, definable solely on the basis of what it *is* rather than *what it does*. This was based on the bipartite focus of the discipline:

> *Public health is the science and art focussing on:*
>
> 1. *Population health;*
> 2. *Human systems and interventions intended to improve population health.*

The intended – but certainly not necessarily functioning – interaction between these two main components (or dimensions) develops its own identity, with its own characteristics, as demonstrated in numerous scientific trials, and thus can be seen and identified as a third dimension (2).

The main structure of the list

Like its predecessors, the present list of competences is based on as well as restricted by the borders of all of the three aspects of definition mentioned:

1. *Nominal: What public health is.*
2. *Real: What public health intends to reach.*
3. *Real: The organisation and activities of public health.*

The list complements the definitions from the point of view of competences, and, *vice versa*, based on the list, the nature and activities of public health can be derived, aggregated and combined to the level of definition of the discipline. Accordingly, the main structure of the list reflects the main components of the nominal definition plus general methodological and ethical aspects (Table 1).

Table 1. *Main chapters of ASPHER's European List of Public Health Generic Core Competences for the Public Health Professional.*

1. Methods in public health – quantitative and qualitative methods
2. Population health and its social and economic determinants
3. Population health and its material – physical, radiological, chemical and biological – environmental determinants
4. Heath policy; economics; organisational theory, leadership and management
5. Health promotion, health protection and disease prevention
6. Ethics

'Generalist professional in comprehensive public health'

The list is intended to be a list of generic core competences for the *generalist professional and for a public health service system in comprehensive public health* – a person and a system, who and which can be professionally accountable for the health of a defined population, i.e., accountable to the population, which the person and the system serve, and to the political and administrative system, wherein the person and the public health system operate (8). The public health professional and the system, in which s/he works, must hold a large number of competences in order to be accountable. The knowledge and skills needed to be able fully to carry out core professional work duties are complicated; they include activities such as observing and analysing the complex, dynamic patterns of population health and identifying risk groups; they also include identifying targets and selecting target groups for interventions; they are concerned with deciding about and implementing cost-effective interventions with adequate financial allocations and with follow-up and assessment of the effects of interventions. Being responsible for a wide variety of decisions (in parallel to the responsibility of the medical practitioner), the public health professional must be able to read, understand and assess – professionally and critically – research documentation of, for example, population health status and the relevance, cost-effectiveness and ethical acceptability of potential as well as already implemented intervention.

Systems for public health service delivery vary considerably across European countries, and many of these countries still do not have comprehensive nor coherent public health systems but more or less solitary public health services, which do not necessarily interact mutually to form a continuously coherent, strategic whole. A coherent organisation is necessary for the proper development, planning, implementation and follow-up of comprehensive, rationally goal-oriented, evidence-based strategies. Accordingly, the concept of the generalist public health professional is not anchored in the staffing of any concrete public health system but is *generic, based on general public health theory and practice*. One of the main advantages of this is its general cross-border applicability. A disadvantage however is the impossibility of assigning competences to levels of decision in comprehensively defined, coherent public health systems, because such systems are still rare in Europe. It is hoped that this should be remedied in future developmental phases.

Competences are meaningful and interpretable only as long as they are necessary for the public health professional and the public health system to fulfil the mission of accountability for the population's health, i.e., for meeting population health challenges in rational, evidence-based, cost-effective ways. The competences represent a *potential* – aspects of cultural and social capital, in Bourdieu's terminology (9) – to observe, analyse, act, and follow-up the results of the planned and implemented action (2). Thus, the relationship between (a) potential, (b) concrete action and (c) population health challenge denotes a logical chain of an iterative nature:

Competences

Action

Population health

By indicating action by use of WHO's Essential Public Health Operations (EPHOs) (6,10,11), we have termed this relationship the CEC-Chain (Competences-EPHOs-Challenges) (12) and mapped the relationship between competences and EPHOs in relation to the preceding edition (the 4th Edition) of ASPHER's list of public health core competences (2). More complex patterns of action, such as, rationally goal-oriented public health strategies, can also be defined by the competences required for completion of each of the strategic steps (2).

Thus, to be able to fulfil their function in goal-oriented systems, the competences must be interpretable in the framework of action, in this context WHO's EPHOs. There are 10 chapters organised in three main groups (Table 2) (6), namely:

Intelligence EPHOs
Core services delivery EPHOs
Enabler EPHOs

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

Intelligence EPHOs	
EPHO 1	Surveillance of population health and wellbeing
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: (6,11)

Logically, together the competences and the EPHOs will denote a relevant framework for the development and training of an authorised, generalist public health professional in European countries (13). Besides increasing the professional quality as such in European countries, this could support necessary concerted action in many areas of public health, towards a development away from the present 'Babylonian situation' in European public health (13).

The heterogeneous and multi-disciplinary nature of public health is an often-stated fact, indicating that the coherence of the discipline – seen as a comprehensive whole – will be weak both theoretically and in practice. Moreover, as compared to medicine, public health is not overly heterogeneous. Quite logically, both disciplines – whether focussing on individual patients or on whole populations – inevitably have to build on aspects of the natural sciences as well as on aspects of the social and behavioural sciences and philosophy. In other words, comprehensive coherence is accessible – if not easy – in both disciplines. This allows for learning from one another in relation to, for example, scientific research methods and practical observational

methodologies; systems building; professionalisation; authorisation. From an intrinsic perspective, the public heath discipline is not less coherent than medicine – and not less voluminous. Moreover, the interaction between scientific research, practice and education as a potent core developmental dynamic, both disciplines develop their overall comprehensive natures as well as their particular aspects.

In many health systems in Europe, public health is mainly a medical specialty. It is evident that health professionals and others will need considerable investment to comply with the comprehensive number of competences needed in a modern public health context. Winslow phrased his definition a century ago (3) based on the population health reality of that time and place. Many European universities have developed bachelor and matching master programmes in public health, requiring a total of five years of full time study, mainly aiming at the young student section. Besides public health professionals, the public health workforce includes health professionals with certain identifiable selected public health responsibilities, e.g., general practitioners, visiting nurses, physiotherapists, midwives, as well as persons without a health professional background, e.g., teachers, policemen and policewomen, political decision makers, etc. (13). Lists and sets of competences for these groups, whether with or without a health background, should in due course be defined.

The roles of a comprehensive list of public health core competences

As also noted in previous editions of the list, the functions and roles of the list of competences can be identified at various levels (14,15):

1. *Definition of the discipline:* Indicating the content, terminology and methods of the discipline as such.
2. *Potential to act:* Individuals, groups, systems, institutions, countries.

   Education and training

   Development of curricula for education and training;

   Defining entrance and exit competences to be achieved in courses and comprehensive programmes;

   Testing of students' competences;

   Defining competences to be achieved or sustained during Continuing Professional Development (CPD) of professionals;

   System and individual accreditation

   Accreditation of educational and training institutions and systems;

   Certification of professionals;

   Accreditation of public health systems;

   Public health systems development

   Systematic public health workforce planning;

   Analysis of organisational and individual competences profiles *ante* and *post* strategy development, planning, implementation and follow-up.

Moreover, as the list is intended to play crucial roles in the development of the European public health workforce, as indicated in WHO Europe's Health 2020 Strategy (6), ASPHER has also commented on wider policy aspects of the future development of the European public health workforce and systems of public health services, including the role of lists of competences (16,17).

The list aims to be fairly comprehensive, but it is necessary that it should be further developed and updated in the future. In its present form, it will suit a bachelor-and-master programme lasting 5-6 years, with a workload and intensity of best European academic and professional quality and intensity, and with repeated before-and-after observations of the student's competences included in the programme. Aiming lower than the highest standard of university programmes in, for example, medicine, law or economics/political science, is simply not appropriate, when the importance, size and complexity of the public health discipline are taken into account. This may pose a challenge to shorter, comprehensive programmes in public health, like the classical 1-2 year Master of Public Health (MPH) in combination with, a medical degree or a degree in nursing or in some other discipline. This should of course be taken account of in the academic and practical public health environments – committees, etc. – with responsibility for programme and curriculum development.

Networks should be developed between schools of public health/university departments of public health to sustain student, teacher and scientist mobility and mutual support (18), so that a student could take a whole programme at one school or department, or, alternatively, s/he could accumulate individual courses at separate academic and service centres of public health practice. In consequence of the dynamics of interaction in all parts of public health, testing the comprehensive coherence of a student's final public health competences should be a central component of the route towards becoming a public health professional. Such demonstration of appropriate competences can form the basis for subsequent specialisation within sub-disciplines of public health, such as, epidemiology and biostatistics; public health sociology; environmental health; health economics; public health management; public health nutrition; infectious diseases control; health promotion; etc. It is obvious that such specialisation will demand specific lists of competences beyond the perspective of the current list. In this context, we thus found it relevant – in addition to some new, specific competences formatted into the current list – to attach a shortened version of the list of competences for the communicable disease epidemiologist, developed by the experts of the European Centre for Disease Control, Stockholm. This shortened version illustrates the level of the generalist professional, upon which more specific levels can be built. Accordingly, it seems likely that further specialist lists will follow this in subsequent editions.

A few historical notes

Started in 2006, the European Programme on Public Health Core Competences for the Public Health Professional of the Association of Schools of Public Health in the European Region (ASPHER) has involved more than hundred European public health teachers, scientists and practitioners in the development of lists of competences for public health professionals. In the first round, all ASPHER member schools were invited to contribute to six working groups, which lead to the first list of competences (19). Thereafter, European ministries of health were invited to participate, *inter alia,* in a conference at Aarhus University in April 2008, where, in the end, twenty-seven European countries were represented, by decision makers and by teachers and scientists. At the same time the first two in a series of national practitioner-teacher workshops were

performed, in Slovenia and Scotland, respectively (20). This led to the second, enlarged list of competences (21), which was presented in October 2008 at a second European conference in Paris, as part of France's EU Presidency that year. 'Master classes' were organised with involvement of high-level decision makers. The lists were further developed to crystalise concepts and terms and to avoid overlaps – and to demonstrate the whole spectrum of core competences expected of the generalist professional of comprehensive public health (6) as well as the shorter list for master of public health (MPH) education (22).

The 3rdedition (2011) (1,15,22) was printed, sent to all ministries of health in Europe, and finally, in September 2012, was endorsed by all European WHO member states to form the basis for public health education, as expressed in WHO's European Action Plan for Strengthening Public Heath Capacities and Services (6, p. 19):

> *'National governments should make efforts to ensure that the core competences for public health, recently revised by the Association of Schools of Public Health in the European Region (ASPHER), are being taken into account in national and subnational educational and training programmes for the public health workforce'.*

The wider process related to the development of the lists of competences has been described elsewhere (15), and a review of broader perspectives related to the development and use of lists of competences has been analysed and commented on (14).

The 4th edition of the list was published in 2016 together with mapping of the theoretical connection of competences to action, as indicated by WHO Europe's Essential Public Health Operations (EPHOs) (2,6,11). In parallel, an IT-based tool is being developed in the repository of the EPHRF (12). The tool includes competences and EPHOs offered by ASPHER members departments and schools of public health and is intended to form the basis for individual career planning as well as for systems planning (12). Moreover, considering the competences and EPHOs profiles offered by the departments and schools of public health (23), they should be encouraged to work together in networks in order to be able to cover the comprehensive public health curriculum at the relevant quality level across Europe; such real collaboration could thus become more than a theoretical possibility (18).

Table 3. *Editions of ASPHER's European List of Public Health Generic Core Competences for the Public Health Professional.*

2008	1st Edition	Based on contributions from about 100 European teachers and scientists.
2008	2nd Edition	With contributions from European conferences and practitioner-teacher workshops.
2011	3rd Edition	Concepts crystallised. Endorsed by WHO Europe member states (2012).
2016	4th Edition	Mapping of the competences-EPHOs relationship.
2018	5th Edition	With advisory contributions from expert groups within: epidemiology and biostatistics; sociology; environmental health; health economics; leadership; nutrition; communicable disease prevention and control.

Since 2015, groups of international experts have been organised within parts of the list's themes, and the 5th edition (2018) thus includes adjustments suggested by experts within: epidemiology and biostatistics; sociology; environment; health economics; leadership; nutrition; infectious disease prevention and control.

Organisation

The Council of ASPHER's European Public Health Reference Framework (EPHRF) is accountable for the development of the list of competences and for the IT tool as well as for the development of plans for implementation of the list. Moreover, it is of course a crucial challenge to keep the list updated continuously, so that, at any time over the years, it will represent the best of our knowledge and practice in the comprehensiveness of the public health discipline. The list shall form a solid, comprehensive and coherent academic foundation stone for public health education, training, research and practice – and thus for the development of a sufficient and competent public health workforce (6) and, specifically, a public health profession in European countries (13).

As also described in reference (15), the programme would not have been possible without the support of colleagues all over Europe as well as that of other public health organisations and associations, such as, WHO Europe, EUPHA, EuroHealthNet, PHA, EHMA. During 2013-16 ASPHER participated in chairing WHO's working group on EPHO 7, The development of a sufficient and competent public health workforce in European countries.

Since its start in 2006 the programmes has been chaired by Professor Anders Foldspang, Aarhus University, Denmark, now Past President of ASPHER and Chair of the EPHRF Council. The programme was during 2008-2012 co-chaired by Dr Christopher Alan Birt, Liverpool University, UK, then member of ASPHER's executive board and thereafter EPHRF Council member. Since 2008, the administrative part of the programme has been managed by ASPHER's Director, Robert Otok, who is also member of the EPHRF Council and main editor of the IT born tool based on the list.

The present edition is edited by Anders Foldspang, Christopher Alan Birt and Robert Otok and confirmed by the EPHRF Council as well as by the advisory experts. The Editorial Committee is however responsible for the final content, composition and format of the list.

References

1. Birt C, Foldspang A. European Core Competences for Public Health Professionals (ECCPHP). ASPHER's European Public Health Core Competences Programme. ASPHER Publication No. 5. Brussels: ASPHER, 2011.
2. Foldspang A. From Potential to Action. Public Health Core Competences for Essential Public Health Operations. A Manual. Vol. I, II, III. Brussels: ASPHER, 2016.
3. Winslow CEA. The Untilled Fields of Public Health. Science, New Series 1920; 51:23-33.
4. Locke, J. (1689). *An Essay concerning Human Understanding*. Oxford: Oxford University Press, 1975. Cited in Gupta A. Definitions. Palo Alto: Stanford Encyclopaedia of Philosophy, 2015. http://plato.stanford.edu/entries/definitions/. Accessed 14 April 2018.

5. Acheson D. Public Health in England. The Report of the Committee of Inquiry into the Future Development of the Public Health Function. London: HMSO, 1988.
6. European Action Plan for Strengthening Public Health Capacities and Services. Copenhagen: WHO Regional Office for Europe, 2012.
7. Faculty of Public Health; http://www.fph.org. Extracted the 23rd May 2018.
8. Fukuyama F. The Origins of Political Order. London: Profile Books, 2011.
9. Bourdieu P. The Forms of Capital. In: Richardson J. Handbook of Theory and Research for the Sociology of Education. Westport, CT: Greenwood, 1986.
10. Martin-Moreno JM, Harris M, Jakubowski E, Kluge H. Defining and Assessing Public health Functions. Ann Rev Public Health 2016;37:335-55.
11. Martin-Moreno JM. Self-assessment tool for the evaluation of essential public health operations in the WHO European Region. Copenhagen: WHO Europe, 2014. Accessible at: www.euro.who.int
12. Foldspang A, Otok R. Competences based individual career and workforce planning in public health. Eurohealth 2016;22:21-6.
13. Foldspang A. Towards a public health profession: the roles of essential public health operations and lists of competences. Editorial. Eur J Public health 2015;25:361-2.
14. Birt C, Foldspang A. The Developing Role of Systems of Competences in Public Health Education and Practice. Public Health Rev 2011;33:134-47.
15. Birt C, Foldspang A. Philosophy, Process, and Vision. ASPHER's European Public Health Core Competences Programme. ASPHER Publication No. 7. Brussels: ASPHER, 2011.
16. Foldspang A, Otok R. ASPHER's position paper concerning: The new European policy for health – Health 2020 (Draft 2), and The European Action Plan for Strengthening Public Health Capacities and Services (17.02.2012). Brussels: ASPHER, 2012.
17. Foldspang A, Otok R, Czabanowska K, Bjegovic-Mikanovic V. Developing the Public Health Workforce in Europe. The European Public Health Reference Framework (EPHRF): It's Council and Online Repository. Concept and Policy Brief. Brussels: ASPHER, 2014.
18. Otok R, Czabanowska K, Foldspang A. Public health educational comprehensiveness: The strategic rationale in establishing networks among schools of public health. Scand J Public Health 2017:45:720.22.
19. Foldspang A (Ed.). Provisional Lists of Public Health Core Competencies. European Public Health Core Competencies Programme (EPHCC) for Public Health Education. Phase 1. ASPHER Series No. 2. Brussels: ASPHER, 2007.
20. Whittaker PJ, Pegorie M, Read D, Birt C, Foldspang A. Do academic competences relate to 'real public health practice'? A report from two exploratory workshops. Eur J Public Health 2010;20:8-9.
21. Foldspang A (Ed.). Provisional lists of public health core competencies. European Public Heath Core Competencies Programme (EPHCC) for Public Health Education. Phase 2. ASPHER Series No. 4. Brussels: ASPHER, 2008.
22. Birt C, Foldspang A. European Core Competences for MPH Education (ECCMPHE). ASPHER's European Public Health Core Competences Programme. ASPHER Publication No. 6. Brussels: ASPHER, 2011.
23. Otok R, Foldspang A. Main competences and skills to perform Essential Public Health Operations, offered by Schools of Public Health in four European countries: a short pilot report. Int J Public Health 2016;61:633-9.

ASPHER's European List of Core Competences for Public Health Professionals

5th Edition

Contents

ASPHER's European List of Core Competences for Public Health Professionals

Competences definition

The knowledge capacity and the ability to demonstrate appropriate action for the attainment of set goals.

Competences may be defined for individuals and for groups as well as organisations and systems. The present list presents competences defined for individuals – professionals in comprehensive public health.

A. Methods in Public Health

Definitions

Health

In 1948, WHO in its constitution defined health *'a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity'* (www.who.int).

There are many definitions of health in the literature, none of which seem to be completely satisfactory. Many models of health have been described and identification of just three of these may illustrate some aspects of the discussion about concepts of health:

a. The medical model sees health as the absence of disease; so health is viewed as a steady state from which an individual falls off, when s/he becomes ill.

b. The behavioural model refers to the ability of an individual to fulfil the behavioural expectations of society regarding the functional capacities expected of an individual of that age, gender, etc.; thus an individual fulfilling all society's expectations in these respects is seen as enjoying health.

c. The control model envisages health as the extent to which the overall environment can be controlled and improved so as to promote health and wellbeing.

Public Health

In the current context, public health will be considered as the science and art, which focuses on:

- Population health,
- Human systems and interventions made to improve health, and
- Interactions between these two systems.

Population health includes involvement with all social, economic, political, physical, chemical and biological conditions that influence or interact with the health of the members of the population.

Human systems and interventions made to improve health include all types of health services, social services, and all interventions and policies intended to improve health, whether private or public. Public health focuses on health promotion, health protection and disease prevention.

The concept of interaction refers to influences of human systems on population health.

Please consult the Introduction for other definitions of public health.

Epidemiology

Epidemiology is the science focusing on the occurrence of health phenomena in populations.

Epidemiology is the study of the distribution and determinants of health-related states or events, including disease.

Demography

Is the science focusing on populations, especially with reference to size and density, fertility, mortality, growth, age distribution, and migration, and the interaction of all of these with social and economic conditions.

Statistics

Is the science of collecting, summarising, analysing, and interpreting numerical information that is subject to chance or systematic variation.

Quantitative research methods

Methods, which use statistical techniques to map and analyse numerical data while applying formal probabilities when studying structure and when inferring causality and effect.

Qualitative research methods

Methods, which use interpretative and reflexive techniques to analyse verbal, visual and experiential data without applying formal probabilities when studying structure or when inferring causality and effect.

Sociology

The science focusing on the structure and dynamics of human groups, population or institutions, their mutual interactions, and their mutual relationships with individuals' behaviours and attitudes.

Social psychology

Is the science focussing on the psychological and psychosocial aspects of the structure and dynamics of human groups or populations and on their mutual interactions.

Anthropology

Is the science focussing on the cultural, religious, psychological and social aspects of the structure and dynamics of human groups or populations and on their mutual interactions.

Economics

Is the science of how scarce resources are used to produce and distribute goods and services to meet human needs and wants.

Competences

A.1. Intellectual competences: The public health professional shall know and understand:

A.1.1. Health

A.1.1.1.	Basic definitions, models and concepts of health and disease.
A.1.1.2.	Concepts of mental and somatic diseases and their practical implications, including diagnostic systems and diagnoses and the role of such systems in the assessment of community health status, diagnosis, and prioritization of interventions.
A.1.1.3.	The contested nature of definitions, models and concepts of health and disease.

A.1.2. Public health

A.1.2.1.	Major definitions of public health.
A.1.2.2.	Significant aspects of the history of public health theory and practice.

A.1.3. Philosophy of science

A.1.3.1.	Major definitions of philosophy and philosophy of science.
A.1.3.2.	Essentials of philosophy of science as relevant to public health.
A.1.3.3.	Basic theories in philosophy and philosophy of science, and concepts of importance for public health science and practice, e.g. concepts such as hypothesis, theory, explanation, understanding, objectivity, evidence, method, deduction, induction, utilitarism, qualitative and quantitative studies, observations and operationalisation.

A.1.4. Epidemiology, demography and biostatistics

A.1.4.1.	Major definitions of epidemiology as a science.

A.1.4.2.	Definition of demography as a science.
A.1.4.3.	Major aspects of the history of epidemiology.
A.1.4.4.	Basic demographic and epidemiological aspects, such as:
A.1.4.4.1.	Population;
A.1.4.4.2.	Population pyramid;
A.1.4.4.3.	Population at risk;
A.1.4.4.4.	Duration;
A.1.4.4.5.	Time at risk;
A.1.4.4.6.	Case vs. non-case;
A.1.4.4.7.	Rate;
A.1.4.4.8.	Fertility;
A.1.4.4.9.	Migration;
A.1.4.4.10.	Health and measurement of health and quality of life;
A.1.4.4.11.	Disease and measurement of disease;
A.1.4.4.12.	Incidence (number; rate; proportion);
A.1.4.4.13.	Prevalence (number; proportion);
A.1.4.4.14.	Mortality (number; rate; proportion);
A.1.4.4.15.	Lethality/fatality (number; rate; proportion);
A.1.4.4.16.	Specific mortality parameters (age, gender, disease, other);
A.1.4.4.17.	Survival and life expectancy (general and specified by, e.g., age);
A.1.4.4.18.	Demographic transition;
A.1.4.4.19.	Relative risk (incidence rate-ratio; prevalence proportion ratio; relative risk; cumulative relative risk ratio; other);
A.1.4.4.20.	Odds ratio;
A.1.4.4.21.	Population attributable risk;
A.1.4.4.22.	Preventive fraction;
A.1.4.4.23.	Etiological fraction for exposed/for population;
A.1.4.4.24.	Observational design;
A.1.4.4.25.	Longitudinal study and longitudinal design;
A.1.4.4.26.	Cross-sectional design including population health surveys;
A.1.4.4.27.	Case-cohort design;
A.1.4.4.28.	Fixed cohort design;
A.1.4.4.29.	Dynamic cohort design;
A.1.4.4.30.	Case-referent design;
A.1.4.4.31.	Case-control design;
A.1.4.4.32.	Case-base design;
A.1.4.4.33.	Case cross-over design;
A.1.4.4.34.	Quasi-experimental design;
A.1.4.4.34.1.	Before-and-after quasi-experimental design;
A.1.4.4.34.2.	Contemporary quasi-experimental design;

A.1.4.4.35.	Experimental design;
A.1.4.4.35.1.	Randomised controlled trial (RCT);
A.1.4.4.36.	Scaling up health interventions;
A.1.4.4.37.	Ecological study;
A.1.4.4.38.	Implementation research approach;
A.1.4.4.39.	Multicentre study;
A.1.4.4.40.	Systematic reviews/meta-analyses (meta-regression);
A.1.4.4.41.	Measurement error;
A.1.4.4.42.	Validity;
A.1.4.4.43.	Reliability;
A.1.4.4.44.	Bias (selection bias; information bias, differential misclassification; lead time bias; length bias; confounding);
A.1.4.4.45.	Inference.
A.1.4.5.	The concepts of test sensitivity, specificity and the predictive value of a positive and a negative test result.
A.1.4.6.	The concepts of health, disease, handicap and death, both as comprehensive entities and in terms of identifiable components, i.e. physical, mental and social dimensions.
A.1.4.7.	The structure, main content and applications of standard authorised health classification systems in common use in Europe, such as:
A.1.4.7.1.	International Classification of Diseases (ICD);
A.1.4.7.2.	International Classification of Functioning, Disability and Health (ICF);
A.1.4.7.3.	Interna8ional Classification of Health Interventions (ICHI);
A.1.4.7.4.	International Classification of Mental and Behavioural Disorders (DSM);
A.1.4.7.5.	Other systems.
A.1.4.8.	The principles, main content, validity and applications of standardised data collection instruments for measuring health outcomes, e.g. KAP, QOL, SF36, GHQ, FINBALT.
A.1.4.9.	The concept of epidemiological surveillance.
A.1.4.10.	Basic principles, methods, types and components of:
A.1.4.10.1.	Epidemiological surveillance systems;
A.1.4.10.2.	Health services monitoring systems.
A.1.4.11.	Major national and European population surveys and surveillance systems and the application of their results.
A.1.4.12.	Major definitions of statistics as a science.
A.1.4.13.	Basic statistical concepts, such as:
A.1.4.13.1.	Inference;
A.1.4.13.2.	Parameter;

A.1.4.13.3. Probability;
A.1.4.13.4. Random sampling;
A.1.4.13.5. Probability sampling;
A.1.4.13.6. Stratified sampling;
A.1.4.13.7. The normal distribution;
A.1.4.13.8. The binominal distribution;
A.1.4.13.9. The Poisson distribution/negative binominal distribution;
A.1.4.13.10. Statistical power;
A.1.4.13.11. Point estimate;
A.1.4.13.12. Interval estimate;
A.1.4.13.13. Confidence interval;
A.1.4.13.14. Association;
A.1.4.13.15. Confounding;
A.1.4.13.16. Interaction;
A.1.4.13.17. Correlation;
A.1.4.13.18. Significance;
A.1.4.13.19. Statistical test;
A.1.4.13.20. Parametric vs. non-parametric test;
A.1.4.13.21. Student's t-test;
A.1.4.13.22. Chi-square test (X^2);
A.1.4.13.23. Non-parametric tests, such as Kruskall-Wallis test and other tests;
A.1.4.13.24. Predictor;
A.1.4.13.25. Stratified analysis (Mantel-Haenszel and other stratified analysis methods);
A.1.4.13.26. Standardisation;
A.1.4.13.27. Direct standardisation;
A.1.4.13.28. Indirect standardisation (standardised mortality ratio);
A.1.4.13.29. Survival analysis (Kaplan-Meir, life tables);
A.1.4.13.30. Regression, additive and multiplicative models;
A.1.4.13.30.1. Linear regression;
A.1.4.13.30.2. Logistic regression;
A.1.4.13.30.3. Binomial regression;
A.1.4.13.30.4. Poisson regression;
A.1.4.13.30.5. Cox regression;
A.1.4.13.31. Randomisation;
A.1.4.13.32. Factorial study design;
A.1.4.13.33. Bias analysis;
A.1.4.13.34. Basic methods of forecasting developments in population health, incl. Bayesian methods.

A.1.4.14. Causation:

A.1.4.14.1. Theories of causation, evolution over time;
A.1.4.14.2. Epidemiologic triad;
A.1.4.14.3. Web of Causation, multi-causality;
A.1.4.14.4. Component, causal criteria, necessary and sufficient cause;
A.1.4.14.5. Establishing causation through scientific investigation.

A.1.5. Qualitative methods

A.1.5.1. Main approaches to, and concepts of, qualitative methods frequently applied in public health concerning population groups as well as organisations.

A.1.5.2. Qualitative main concepts, terms, theories, methodologies, approaches, data collection methods and methods for data analysis, such as:

A.1.5.2.1. Grounded theory;
A.1.5.2.2. Structuralism;
A.1.5.2.3. Phenomenology;
A.1.5.2.4 Symbolic interactionism;
A.1.5.2.5. Constructivism;
A.1.5.2.6. Ethnographic research;
A.1.5.2.7. Qualitative interview;
A.1.5.2.8. Focus groups;
A.1.5.2.9. Case study;
A.1.5.2.10. Observation and participant observation;
A.1.5.2.11. Consensus methods (Delphi);
A.1.5.2.12. Thematic analysis, document, content and discourse analysis;
A.1.5.2.13. Concept mapping;
A.1.5.2.14. Action research;
A.1.5.2.15. Virtual ethnography approach.

A.1.5.3. Methods to assure the validity of qualitative research, e.g., triangulation.

A.1.6. Sociology, social psychology and anthropology

A.1.6.1. Major definitions of sociological and anthropological science.

A.1.6.2. Significant aspects of the history of social science.

A.1.6.3. Sociological, social psychological and anthropological main theories and concepts, e.g. material levels of living, social group, social network, social system, identity, culture, religion, social status, interest and power, conflict, attitude, behaviour.

A.1.6.4. Sociological, social psychological and anthropologic main empirical methods of documentation, including:

A.1.6.4.1. Main designs;
A.1.6.4.2. Questionnaire design and other main data collection methods;
A.1.6.4.3. Main analytic methods.

A.1.6.5. Basic concepts of classification and scaling.

A.1.7. IT handling

A.1.7.1. General aspects of IT functioning, including, e.g.:
A.1.7.1.1. Data protection techniques;
A.1.7.1.2. Data transfer protocols;
A.1.7.1.3. Internet uses for public health.

A.1.8. Literature search and evaluation

A.1.8.1. The existence of the most important literature databases and their main fields, within health sciences, social sciences, and natural sciences, for the identification of:
A.1.8.1.1. Theoretical literature;
A.1.8.1.2. Original empirical studies;
A.1.8.1.3. Reviews and meta-analyses of quantitative research and meta-synthesis of qualitative research.

A.2. Practical competences: The public health professional shall be able to:

A.2.1. Philosophy of science

A.2.1.1. Identify the lines of thinking of philosophical main streams in a concrete piece of text.

A.2.2. Epidemiology, demography and biostatistics

A.2.2.1. Estimate basic demographic and epidemiological parameters, such as:
A.2.2.1.1. Population projection;
A.2.2.1.2. Time at risk;
A.2.2.1.3. Probability;
A.2.2.1.4. Incidence (number; rate; proportion);
A.2.2.1.5. Prevalence (number; proportion);
A.2.2.1.6. Mortality (number; rate; proportion);
A.2.2.1.7. Lethality/fatality (number; rate; proportion);
A.2.2.1.8. Specific mortality parameter (age, gender, disease other);
A.2.2.1.9. Survival and life expectancy (general and specified by, e.g., age);

A.2.2.1.10 Relative risk (incidence rate-ratio; prevalence proportion relative risk; other);

A.2.2.1.11. Odds ratio;

A.2.2.1.12. Population attributable risk;

A.2.2.1.13. Preventive fraction;

A.2.2.1.14. Etiological fraction;

A.2.2.1.15. Validity;

A.2.2.1.16. Reliability;

A.2.2.1.17. Bias (selection bias; information bias; analytical bias).

A.2.2.2. Estimate simple statistical parameters, such as:

A.2.2.2.1. Point estimate;

A.2.2.2.2. Interval estimate/confidence interval;

A.2.2.2.3. Statistical power;

A.2.2.2.4. Strength of association;

A.2.2.2.5. Interaction parameters.

A.2.2.3. Apply basic epidemiological concepts in a concrete but simple empirical setting, such as:

A.2.2.3.1. Self-controlled case study;

A.2.2.3.2. Cross-sectional design;

A.2.2.3.3. Longitudinal design;

A.2.2.3.4. Cohort design;

A.2.2.3.5. Fixed cohort design;

A.2.2.3.6. Dynamic cohort design;

A.2.2.3.7. Case-referent design;

A.2.2.3.8. Case-control design;

A.2.2.3.9. Case-base design;

A.2.2.3.10. Quasi-experimental design;

A.2.2.3.11. Randomised controlled trial (RCT);

A.2.2.3.12. Before-and-after quasi-experimental design;

A.2.2.3.13. Contemporary quasi-experimental design;

A.2.2.3.14. Correction for confounding at design and analysis stages.

A.2.2.4. Apply basic statistical concepts in a concrete but simple empirical setting, such as:

A.2.2.4.1. Assessment of sample size requirements;

A.2.2.4.2. Random sampling;

A.2.2.4.3. Probability sampling;

A.2.2.4.4. Stratified sampling;

A.2.2.4.5. Cluster sampling;

A.2.2.4.6. Student's t-test;

A.2.2.4.7. Chi-square test (X^2);

A.2.2.4.8. Non-parametric tests, such as Kruskall-Wallis test and other tests;

A.2.2.4.9. Stratified analysis (Mantel-Haenszel and other methods for stratified analysis);

A.2.2.4.10. Confounder correction in design;

A.2.2.4.11. Confounder correction in analysis;

A.2.2.4.12. Direct standardisation;

A.2.2.4.13. Indirect standardisation;

A.2.2.4.14. Logistic regression in simple form;

A.2.2.4.15. Correlation and linear regression in simple form;

A.2.2.4.16. Binomial regression in simple form;

A.2.2.4.17. Poisson regression/negative binomial regression in simple form;

A.2.2.4.18. Randomisation;

A.2.2.4.19. Estimation of statistical power.

A.2.2.5. Design and implement a protocol applying:

A.2.2.5.1. An ad hoc questionnaire based on classification theory;

A.2.2.5.2. Extraction of data from antecedent documents and databases or surveillance systems.

A.2.2.6. Design and carry out a health needs assessment and draw appropriate conclusions.

A.2.2.7. Design and implement a monitoring system for health service interventions and structures, including for adverse events and serious untoward incidents.

A.2.2.8. Develop and apply a list designed to assess the quality of scientific publications in public health; the list should include aspects of:

A.2.2.8.1. Aims and hypotheses/study questions;

A.2.2.8.2. Design;

A.2.2.8.3. Participant recruitment;

A.2.2.8.4. Data collection;

A.2.2.8.4.1. Primary data and secondary data;

A.2.2.8.5. Data analysis;

- and accordingly:

A.2.2.8.6. Selection validity and bias;

A.2.2.8.7. Information validity and bias;

A.2.2.8.8. Analytical validity and bias.

A.2.2.9. Assess the level of evidence produced by scientific publications in public health.

A.2.2.10	Use a statistics software programme to perform the above statistical analyses.

A.2.3. Qualitative methods

A.2.3.1.	Identify main types of qualitative empirical methods in literature.
A.2.3.2.	Plan, organise, carry out, analyse and report on:
A.2.3.2.1.	Grounded theory;
A.2.3.2.2.	Structuralism;
A.2.3.2.3.	Phenomenology;
A.2.3.2.4	Symbolic interactionism;
A.2.3.2.5.	Constructivism;
A.2.3.2.6.	Ethnographic research;
A.2.3.2.7.	Qualitative interview;
A.2.3.2.8.	Focus groups;
A.2.3.2.9.	Case study;
A.2.3.2.10.	Observation and participant observation;
A.2.3.2.11.	Consensus methods (Delphi);
A.2.3.2.12.	Thematic analysis, document, content and discourse analysis;
A.2.3.2.13.	Concept mapping;
A.2.3.2.14.	Action research;
A.2.3.2.15.	Virtual ethnography approach.
A.2.3.3.	Observe, describe and analyse a phenomenon such as, e.g., an organisation, a health programme or policy, a social group, a culture.

A.2.4. Sociology, social psychology and anthropology

A.2.4.1.	Develop, plan and implement a simple sociological, social psychological or anthropological empirical study with special reference to population health.

A.2.5. IT handling

A.2.5.1.	Make use of the most common IT functions.

A.2.6. Literature search and evaluation

A.2.6.1.	Plan a search profile involving the most important literature data bases.
A.2.6.2.	Develop a search profile and conduct a literature search based on it.
A.2.6.3.	Systematise the results of an empirical literature search, based on:
A.2.6.3.1.	Main characteristics of design;
A.2.6.3.2.	Findings/results;

- and on this basis produce a review table.

A.2.6.4. Present, systematise, and apply important quality criteria for empirical studies on identified literature.

A.2.6.5. Define the concepts of meta-analysis and meta-synthesis and present an overview of strengths and weaknesses of meta-analyses and meta-syntheses.

A.2.6.6. Summarise the findings of empirical studies through meta-analysis and meta-synthesis.

A.2.7. Project development, implementation, evaluation and reporting

A.2.7.1. Develop a public health research project protocol outlining the main sections, which will include:

A.2.7.1.1. Title page;

A.2.7.1.2. Introduction;

A.2.7.1.3. Aims and hypotheses;

A.2.7.1.4. Methods and material/resources;

Á.2.7.1.5. Results and discussion, including assessment of implications for public health actions and possible hypotheses for developing such actions;

A.2.7.1.6. References based on an accepted referencing system, such as the Vancouver or Harvard systems.

A.2.7.2. Conduct a public health project according to protocol.

A.2.7.3. Write a scientific report with the main sections based on the project:

A.2.7.3.1. Title page;

A.2.7.3.2. Abstract;

A.2.7.3.3. Introduction;

A.2.7.3.4. Aims and hypotheses;

A.2.7.3.5. Material and methods;

A.2.7.3.6. Results;

A.2.7.3.7. Discussion;

A.2.7.3.8. Conclusion;

A.2.7.3.9. References based on an accepted referencing system, such as the Vancouver or Harvard systems.

B. Population Health and Its Social, Economic and Political Determinants

Definitions

Social, economic and political environment

This consists of the external social, economic and political elements and conditions, which surround, influence, and affect the life and development of an organism or of a population.

Social, economic and political determinant

This may be any social, economic or politically definable entity that causes changes in population health; from a statistical viewpoint, such a factor will be associated with, or provide an index relating to, a health outcome.

Competences

B.1. Intellectual competences: The public health professional shall know and understand:

B.1.1. Population health

B.1.1.1.	The level and trends of main population health indicators in European countries:
B.1.1.1.1.	Disability indicators;
B.1.1.1.2.	Mortality indicators:
B.1.1.1.2.1.	Crude mortality;
B.1.1.1.2.2.	Cause-specific mortality, especially cardio-vascular and cancer mortality and mortality caused by mental disease;
B.1.1.1.2.3.	Age- and gender-specific mortality (e.g., infant mortality; before 5 years of age; after 60 years).
B.1.1.2.	Disease indicators, especially concerning cardiovascular diseases, cancer and other chronic non-communicable diseases and mental health:
B.1.1.2.1.	Indicators of occurrence and time (incidence, prevalence, duration);
B.1.1.2.2.	Disease-specific occurrence indicators.
B.1.1.3.	Health expectancy indicators:
B.1.1.3.1.	Life expectancy (mean; median) at birth and at later ages;
B.1.1.3.2.	Population survival curves;
B.1.1.3.3.	Disease-free life years;

B.1.1.3.4. Disability-adjusted life years (DALYs);
B.1.1.3.5. Potential years of life lost (PYLL);
B.1.1.3.6. Preventable cause of death.

B.1.2. Socio-economic determinants

B.1.2.1. Basic concepts of the social sciences, i.e. the following sociological concepts:

B.1.2.1.1. Gender;
B.1.2.1.2. Family structure;
B.1.2.1.3. Housing;
B.1.2.1.4. Education;
B.1.2.1.5. Occupation;
B.1.2.1.6. Employment;
B.1.2.1.7. Working conditions;
B.1.2.1.8. Economy;
B.1.2.1.9. Individual and society;
B.1.2.1.10. Social environment/context;
B.1.2.1.11. Social structure, social processes;
B.1.2.1.12. Social group;
B.1.2.1.13. Social network;
B.1.2.1.14 Kinship;
B.1.2.1.15 Social cohesion/social support;
B.1.2.1.16. Social capital;
B.1.2.1.17. Socio-economic status;
B.1.2.1.18 Social behaviour;
B.1.2.1.19 Social learning;
B.1.2.1.20 Violence;
B.1.2.1.21. Social mobility;
B.1.2.1.22 Social exclusion;
B.1.2.1.23 Discrimination;
B.1.2.1.24 Deviance;
B.1.2.1.25 Social control;
B.1.2.1.26. Under-privileged groups;
B.1.2.1.27. Socio-economic inequality;
B.1.2.1.28 Life course and generations;
B.1.2.1.29. Mass phenomena;
B.1.2.1.30. Urbanisation.

B.1.2.2. The level and trends of main population socio-economic indicators in European countries, such as:

B.1.2.2.1. Family structure;

B.1.2.2.2. Culture and ethnicity;
B.1.2.2.3. Housing;
B.1.2.2.4. Education;
B.1.2.2.5. Occupation;
B.1.2.2.6. Employment;
B.1.2.2.7. Working conditions;
B.1.2.2.8. Economy/income/poverty;
B.1.2.2.9. Socio-economic status;
B.1.2.2.10. Socio-economic inequality;
B.1.2.2.11. Under-privileged groups;
B.1.2.2.12. Hard to reach populations and hidden populations.

B.1.2.3. The level and trends in indicators of health behaviour development, such as:

B.1.2.3.1. Exercise activity;
B.1.2.3.2. Dietary behaviour;
B.1.2.3.3. Alcohol use and abuse;
B.1.2.3.4. Drug abuse;
B.1.2.3.5. Tobacco use;
B.1.2.3.6. Sexual behaviour;
B.1.2.3.8. Technology addiction;
B.1.2.3.9. Sleep patterns;
B.1.2.3.10. Oral health behaviour;
B.1.2.3.11. Participation in health care;
- in European populations and population subgroups, e.g.:

B.1.2.3.11.1. Children;
B.1.2.3.11.2. Adolescents;
B.1.2.3.11.3. The elderly;
B.1.2.3.11.4. Males and females;
B.1.2.3.11.5. Ethnic groups;
B.1.2.3.11.6. The socially disadvantaged;
B.1.2.3.11.7. Persons with disabilities;
B.1.2.3.11.8. Those discriminated against because of sexual orientation;
B.1.2.3.11.9. Migrants;
B.1.2.3.11.10. Other socially, culturally and/or religiously distinct groups;
B.1.2.3.11.11. Any combination of the above (intersectionality).

B.1.3. Population health and social, economic and political determinants

B.1.3.1. The burden of disease, injury and fatality associated with social and economic determinants in national and European populations.

B.1.3.2. Models concerning social determinants of health, especially:

B.1.3.2.1.	Material pathways, e.g. poverty, income inequality, neighbourhood deprivation;
B.1.3.2.2.	Psycho-social pathways (social stressors and protective factors related to work, family life and other circumstances, e.g. social work, social cohesion, social anomie, social support);
B.1.3.2.3.	Behaviour pathways, e.g. healthy lifestyle, sociological and psychological models of behaviour change;
B.1.3.2.4.	Life course pathways (accumulation, fundamental causes, path dependency);
B.1.3.2.5.	Political economy pathways, e.g. role of key institutions of the welfare state, labour market, democracy, type of welfare capitalism.
B.1.3.3.	The level and trends of associations in Europe between population health indicators – especially concerning cardiovascular diseases, cancer and other chronic non-communicable diseases and mental health - and various background indicators, such as:
B.1.3.3.1.	Socio-economic, including social inequality;
B.1.3.3.2.	Social environment (cultural, material, psychosocial, behavioural);
B.1.3.3.3.	The level and trends of associations in Europe between populations' nutritional indicators and nutritional-related diseases, and indicators of socio-economic status and social environment;
B.1.3.3.4	Basic concepts of building effective partnerships (especially with industry and essential stakeholders), e.g. in the food supply chain;
B.1.3.3.5.	General policy and health policy;
B.1.3.3.6.	Social capital;
B.1.3.3.7.	Culture;
B.1.3.3.8.	Community dynamics;
B.1.3.3.9.	Economy;
B.1.3.3.10.	Social exclusion;
B.1.3.3.11.	Discrimination;
B.1.3.3.12.	Gender relations;
B.1.3.3.13.	Political institutions.
B.1.3.4.	Social and economic health implications of globalisation.
B.1.3.5.	Major European research programmes focussing on population health and its social and economic determinants, e.g. North Karelia Project, HiNews, and research contributing to the Marmot reviews, etc.

B.2. Practical competences:
The public health professional shall be able to:

B.2.1. Population health and social, economic and political determinants

B.2.1.1. Based on information from epidemiological surveillance systems (e.g. national systems; WHO's Health for All (HFA) database; ESS Rotating Module on the Social Determinants of Health; other internet based systems) accessible from, e.g., the Internet:

B.2.1.1.1. Produce epidemiological and statistical documentation (analyses, tables, figures, etc.) on the relationships between the socio-economic environment and the health of European populations and population groups;

B.2.1.1.2. Produce forecasts for the development of health status of European populations and population groups, taking into account social, economical and political conditions;

B.2.1.1.3. Identify, retrieve and analyse major trends of social change with special reference to demography, social structure, and economic, political and technological development;

B.2.1.1.4. Identify population groups with elevated health risks, and recognise their health needs, e.g. children, elderly, adults both within and outside the labour market, immigrants, people with physical, mental and learning disabilities, and under-privileged groups.

C. Population Health and Its Material - Physical, Radiological, Chemical and Biological – Environmental Determinants

Definitions

Environment

This consists of the external elements and conditions, which surround, influence, and affect the life and development of an individual or of a population.

Environmental Health

Is the science of controlling or modifying those physical, radiological, chemical and biological conditions, influences, or forces, which surround human communities, with the purpose of preventing disease and promoting, establishing, and maintaining health.

Competences

C.1. Intellectual competences: The public health professional shall know and understand:

C.1.1. Significant aspects of the history of environmental health

C.1.2. Basic concepts of the natural sciences, especially:

C.1.2.1.	Chemistry;
C.1.2.2.	Biology;
C.1.2.3.	Physics including radiation;
C.1.2.4.	Microbiology;
C.1.2.5.	Genetics;
C.1.2.6.	Toxicology;
C.1.2.7.	Microbiology;
C.1.2.8.	Radiation;
C.1.2.9.	Immunology.

C.1.3. Basic concepts and terminology of empirical scientific disciplines that analyse the impact of the physical, radiological, chemical and biological environment on health, e.g. toxicology, epidemiology, exposure assessment, exposome, etc.

C.1.4. The basic concepts, principles and methods of environmental risk estimation

C.1.5. The level and trends of main physical, radiological, chemical and biological exposures in European countries, and their relationship to health

C.1.6. The variation by age, gender, socio-economic background, and arena of exposure to physical, radiological, chemical, and biological exposures, e.g. in the context of:

C.1.6.1.	Indoor and outdoor air pollution;
C.1.6.2.	Noise;
C.1.6.3.	Carcinogens;
C.1.6.4.	Neurotoxins;
C.1.6.6.	Ionizing radiation;
C.1.6.7.	Occupational exposures;
C.1.6.8.	Climate;
C.1.6.9.	Green space;
C.1.6.10.	Water pollutants;
C.1.6.11.	Soil pollutants;
C.1.6.12.	Contaminated sites;
C.1.6.13.	Biological pollutants (e.g., microorganisms, allergens, antibiotic resistance carrying micro-organisms);
C.1.6.14.	Natural and man-made disasters;
C.1.6.15.	Pesticides;
C.1.6.16.	Endocrine disruptors (e.g., Bisphenol-A);
C.1.6.17	Persistent organic pollutants.

C.1.7. Population health consequences of these main physical, chemical and biological exposures (health impact assessment)

C.1.8. Genetic, physiological and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards

C.1.9. The burden of disease, injury and fatality associated with physical, radiological, chemical and biological environmental exposures in national and European populations

C.1.10. Population health consequences of climate change

C.1.11. Basic principles of measurement and monitoring of environmental components in air, water or soil, e.g. water, indoor air, microorganisms

C.1.12. National and European policies, legislation, standards, systems and organisations for the monitoring and control of the physical, radiological, chemical and biological environment

C.1.13. Major stakeholders in environmental health, e.g. industry emitting pollutants, industry for reducing pollutants, insurance companies, injury prevention programmes, accident and emergency services, non-governmental organisations

C.1.14. Environmental and infectious disease surveillance systems, databases and early warning systems, as developed by ECDC and in individual European countries

C.1.15. Basic principles of and major approaches to preventing and controlling environmental hazards that pose risks to human health and safety

C.1.16. The complex interaction between land use and environmental exposures and the role of land use for long-term mitigation strategies incl. the environmental health implications of globalisation

C.1.17. The basic concepts, principles, determinants and methods applicable to both food safety and food security (with knowledge of significant European examples)

C.1.18. The basic principles of dietary assessment methods

C.1.18.1. The basic concepts and determinants relevant for dietary risk assessment, including knowledge of important agents, which may facilitate environmental changes.

C.1.19. The general principles of emergency planning and of how to manage major incidents of various kinds, such as those caused by flooding, by a fire, by a train crash, or by a bomb:

C.1.19.1. Threats of chemical origin;

C.1.19.3. Threats of mechanical origin;

C.1.19.4. Threats of biological origin;

- C.1.19.4.1. Biotoxins and other harmful biological agents;
- C.1.19.4.2. Antimicrobial resistance and healthcare associated infections;
- C.1.19.4.3. Foodborne diseases;
- C.1.19.4.4. Zoonotic diseases;
- C.1.19.4.5. Waterborne diseases;
- C.1.19.4.6. Other communicable diseases;
- C.1.19.4.7. Threats of unknown origin.

C.1.20. Major European research programmes focussing on population health and environmental risks, e.g. research carried out over the last three decades in various European countries on improved road design; the association between alcohol consumption and road traffic accidents (RTAs); air pollution and health in children and adults

C.2. Practical competences: The public health professional shall be able to:

C.2.1. Monitor and interpret environmental exposures as to its potential consequence on health on individual and population level

C.2.2. Perform risk and health impact assessment associated with components of the physical, radiological, chemical and biological environment, including the effects of climate change

C.2.3. Perform appropriate population dietary assessments, including data collection, analysis and interpretation

C.2.4. Develop public health strategies, including risk management programmes, based on evidence from empirical environmental studies

C.2.5. Based on data from epidemiological research and epidemiological surveillance systems (e.g. national systems; WHO's Health for All (HFA) database; other internet based systems):

C.2.5.1.	Produce epidemiological and statistical documentation (analyses, tables, figures, etc.) on the relationship between physical, chemical and biological environmental exposures and the health of European populations and population groups;
C.2.5.2.	Produce forecasts for the development of health status of European populations and population groups, taking into account physical radiological, environmental exposures, and also the effects of climate change;
C.2.5.3.	Identify population groups with elevated health risks and recognise their health needs, e.g. children, groups living in areas of particular environmental stress (such as in areas suffering from industrial pollution), people working in risky occupations and their families, people living in areas at risk of natural disasters, etc.

C.2.6. Design, conduct, analyse and report on a study or an intervention or an observational study, concerning relationships between the material environment and health

C.2.7. Transfer insights from population based studies to individuals suffering from environmental health problems

D. Health Policy; Economics; Organisational Theory, Leadership and Management

Definitions

Economics

The science of how scarce resources are used to produce and distribute goods and services to meet human needs and wants.

Policy

A course or method of action selected usually by a public or private body, at international, national or local level, from among alternatives to guide and determine present and future decisions.

Organisation

A collective structure for the purpose of systematising activities for a particular goal, including the planning and management of programmes, services, and resources.

Leadership

The ability to recruit and keep followers in pursuing common goals, taking into consideration the person's individual competences and attitudes, his/her position, his/her ability to obtain results, and the process to reach the designated goals.

Management

The process of strategy identification and implementation by motivating people together to accomplish desired goals efficiently and effectively. Is often used – erroneously – as being synonymous with the concept of leadership.

Strategy

This consists of a formerly planned set of actions designed to deal with a problem or problems, including the following stages, which are cyclical in principle:

1. Problem identification/community analysis/situation analysis;
   a. Population health;
   b. Intervention system;
2. Selection of targets and identification of target groups;
3. Selection of intervention;
4. Implementation of intervention;
5. Follow-up and evaluation.

Competences

D.1. Intellectual competences: The public health professional shall know and understand:

D.1.1. Significant aspects of the modern history of the disciplines of health policy, health economics, organisational theory, leadership and management – and thus the main developments relating to national, EU, European and international:

D.1.1.2. Health policy;

D.1.1.3. Social policy;

D.1.1.4. Health services;

D.1.1.5. Social services;

D.1.1.6. Legislation affecting health and health services in at least one European country;

D.1.1.7. NGOs, Global Health Initiatives and Philanthropic funders and foundations operating in the public health arena.

D.1.2. The basic philosophies and concepts of:

D.1.2.1. Social scientific theories and methods utilised within public health: organisational theory, systems thinking, health economics (normative and positive economics; micro- and macroeconomics) and leadership and management theory, and their application in public health strategy-making and in health systems development and management.

D.1.3. Important concepts, including:

D.1.3.1. Wealth and budgets:

- D.1.3.1.1. Gross National Product and Gross Domestic Product;
- D.1.3.1.2. Public budgets.

D.1.3.2. Basic economics models:

- D.1.3.2.1. Market provision and market failure;
- D.1.3.2.2. Government provision and government failure;
- D.1.3.2.3. Principal-agent (PA) relationship (at individual and organisational level).

D.1.3.3. Basic economic concepts:

- D.1.3.3.1. The concept of scarcity and opportunity costs;
- D.1.3.3.2. Cost concepts (marginal and average costs);
- D.1.3.3.3. Inputs, processes, output and outcomes;
- D.1.3.3.4. Efficiency and effectiveness;
- D.1.3.3.5. Production possibility curve;

D.1.3.3.6. The concept of demand;
D.1.3.3.7. Need and demand;
D.1.3.3.8. Elasticity of demand;
D.1.3.3.9. Market interventions.

D.1.3.4. Sources of finance:

D.1.3.4.1. Private health insurance, social health insurance, taxation;
D.1.3.4.2. Co-payment;
D.1.3.4.3. Welfare gains from insurance;
D.1.3.4.4. Moral hazard problems;
D.1.3.4.5. Remuneration systems;
D.1.3.4.6. Fixed budgets;
D.1.3.4.7. Capitation;
D.1.3.4.8. Financial incentives;
D.1.3.4.9. Activity based payments based on DRGs and Fee-for-service;
D.1.3.4.10. Pay for performance;
D.1.3.4.11. Supplier induced demand.

D.1.3.5. Costs and health effects or health utility:

D.1.3.5.1. Cost of services;
D.1.3.5.2. Health benefits or value of health improvements;
D.1.3.5.2.1. Quality adjusted life years (QALYs); Years of Life Lost (DALYs).

D.1.3.6. Inequality in health; equity in health care delivery;
D.1.3.7. Opportunity cost;
D.1.3.8. Cost analysis related to health:
D.1.3.8.1. Cost of service;
D.1.3.8.2. Years of life lost;
D.1.3.8.3. Theories of justice.

D.1.3.9. Operational management and coordination of activities (logistics);
D.1.3.10. The best known leadership theories and styles;
D.1.3.11. Collaborative leadership;
D.1.3.12. Leadership and emotional intelligence;
D.1.3.13. The best known models of change;
D.1.3.14. The learning organisation and organisational development;
D.1.3.15. Organisational governance;
D.1.3.16. The theory and dynamics of intersectorial collaboration:
D.1.3.17.1. How to identify suitable partners;

D.1.3.17. The theory and dynamics of team-working;

D.1.3.18 The principles of systems thinking:

D.1.3.18.1. The structure of a system;

D.1.3.18.2. The control function within a system.

D.1.3.19. Programme implementation;

D.1.3.20. SWOT analysis (Strengths-Weaknesses-Opportunities-Threats);

D.1.3.21. Austerity.

D.1.4. Main budgeting and accounting principles

D.1.5. Main principles for the organisation of health systems and for ensuring their resilience

D.1.6. Within the context of the health services and social services in at least one European country, the main:

D.1.6.1. Components, structure and organisation;

D.1.6.2. Economics;

D.1.6.3. Functioning;

D.1.6.4. Legal aspects;

D.1.6.5. Regulation;

D.1.6.6. Management;

D.1.6.7. Human resources;

D.1.6.8. Decision processes;

D.1.6.9. Production/outputs;

D.1.7. Main principles and methods of development, planning, implementation and evaluation of public health policies, strategies, programmes, and institutions – for evaluation including:

D.1.7.1. Effect evaluation;

D.1.7.2. Process evaluation;

D.1.7.3. Health economic evaluation;

D.1.7.3.1. Cost-effectiveness analysis including:

D.1.7.3.1.1. Incremental Cost-Effectiveness Ratio (ICER) and acceptability curves;

D.1.7.3.1.2. Cost-benefits analysis;

D.1.7.3.1.3. Cost-utility analysis;

D.1.7.3.1.4. Cost-consequence analysis;

D.1.7.3.1.5. Budget impact analysis.

D.1.7.3.2. Cost-of-illness studies;

D.1.7.3.3. Quality assurance and quality development.

D.1.7.4. Organisational evaluation;

D.1.7.5. Health technology assessment;

D.1.7.6. Financial management in general and with regard to investment decisions in health care and public health organisations;

D.1.7.7. How resources – including capacity and capability – may be assessed, secured, prioritised and allocated to achieve optimal impact on population health and wellbeing;

D.1.7.8. Evaluation of comprehensive strategies;

D.1.7.9. How global and national communicable disease policy is developed and implemented, for example, Ebola, pandemic influenza control.

D.1.8. Main principles underlying health impact assessment

D.1.9. Limitations of market principles in the finance and organisation of health care

D.1.10. Partnership building – how to communicate the vision and strategic direction for policies, strategies and interventions, and how strategic alliances and partnerships can be built and sustained

D.1.11. The role of national and international organisations in the development of public health, such as:

D.1.11.1. WHO;

D.1.11.2. EU;

D.1.11.3. NGOs;

D.1.11.4. Global health initiatives;

D.1.11.5. Philantropic funders and foundations;

D.1.11.6. UN;

D.1.11.7. World Bank;

D.1.11.8. IMF.

D.1.12. National, EU, European, international and global public health strategies, e.g.:

D.1.12.1. WHO's strategies, e.g. HFA2000, Health21, Health2020, Ottawa Charter and their successors;

D.1.12.1.1. WHO's International Health Regulations (2005), its core capacities and its technical areas of work.

D.1.12.2. EU's strategy, e.g. Together for Health - A Strategic Approach for the EU 2008-13, the Europe 2020 Strategy, and their successors;

D.1.12.2.1.	Decision No 1082/2013/EU of the European Parliament and of the Council 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC.
D.1.12.3.	The public health strategy of at least one European country;
D.1.12.4.	The Sendai Framework for Disaster Risk Reduction 2015-2030.

D.1.13. The role of national and international commerce in supporting or hindering the development of public health interventions to improve population health, and how to balance the interests of organisational, political and multi-agency agendas, for example:

D.1.13.1.	The tobacco industry;
D.1.13.2.	The alcohol industry;
D.1.13.3.	The farming and food industries;
D.1.13.4.	The pharmaceutical industry;
D.1.13.5.	The military industry;
D.1.13.6.	Behavioural economics (choice architecture or nudges);
D.1.13.7.	Insurance companies;
D.1.13.8.	Life sciences industry.

D.2. Practical competences: The public health professional shall be able to:

D.2.1. Develop and implement a public health policy/strategy/intervention based on standard public health methods and guidelines, including e.g.:

D.2.1.1.	Vision and mission;
D.2.1.2.	The identification of systematic scientific evidence to support the public health policy/strategy/intervention;
D.2.1.2.	Observable and attainable goals;
D.2.1.3.	The identification of stakeholders and establishment of potential partnerships for potential inter-sectorial joint working;
D.2.1.4.	Plans for longer-term sustainability of the strategies;
D.2.1.5.	Analysis of the process and outcomes of policy implementation;
D.2.1.6.	Communicate effectively and motivate people to engage in change in the organisation and support learning and development of staff.

D.2.2. Perform an organisational, managerial and financial analysis concerning:

D.2.2.1.	Organisational entities within the health and social services;
D.2.2.2.	Public health strategies and policies.

D.2.3. Perform a simple, health economic assessment of a given procedure, intervention, strategy or policy, and critically appraise health economic assessment e.g.:

D.2.3.1. Cost-effectiveness assessment;

D.2.3.2. Cost-utility assessment;

D.2.3.3. Cost-benefit assessment.

D.2.4. Perform a health impact assessment of a given proposed development, e.g. planning a new airport or a new park in a city

D.2.5. Model and project the impact of the introduction of new services, technologies, health promotion interventions, and treatments

D.2.6. Plan, develop and manage activities in the health system by application of systematic guidelines

D.2.7. Perform a SWOT analysis of a programme, an institution or a procedure

D.2.8. Perform budgetary forecasts for a programme, an institution or a procedure, under varying resource assumptions

D.2.9. Perform programme planning, implementation and evaluation, translating policy into public health practice, e.g. by applying the principles of Intervention Mapping

D.2.10. Identify relevant documentation needs and sources for the development of a public health strategy to meet a population health challenge

D.2.11. Apply important leadership theories and styles under various organizational circumstances

D.2.12. Manage change using appropriate models

D.2.13. Apply and implement inter-sectorial collaboration when appropriate:

D.2.13.1. Identify and link appropriate stakeholders in various sectors;

D.2.13.2. Build alliances, partnerships, and coalitions;

D.2.13.3. Inspire and motivate others to work towards agreed common goals.

D.2.14. Promote effective team-working:

D.2.14.1. Contribute to team and organisational learning.

D.2.15. Translate strategies into practical programmes

D.2.16. Apply systems thinking to the solution of practical problems:

D.2.16.1. Apply systems technical processes to achieve social progress through organizational change.

E. Health Promotion, Health Protection and Disease Prevention

Definitions

Health promotion

As an umbrella concept, health promotion consists of activities to improve or protect health and to prevent disease. As a more narrow concept, the main component of health promotion is health education.

Health education

Activities designed to increase awareness and to influence favourably attitudes and knowledge relating to the improvement of health on both a personal and on a community basis.

Health protection

Consists of policies and activities based on legislative or other means designed to promote healthier environments, within which healthy choices are easier to make.

Disease prevention

This includes all measures taken to prevent diseases or injuries.

Competences

E.1. Intellectual competences: The public health professional shall know and understand:

E.1.1. Significant aspects of the history of health promotion theory and practice, including main health promotion charters, e.g. Ottawa

E.1.2. The definitions of:

E.1.2.1.	Health education;
E.1.2.2.	Health protection, including preparedness against acute and emerging public health threats;
E.1.2.3.	Disease prevention.

E.1.3. The definitions of types of disease prevention:

E.1.3.1.	Primary prevention;
E.1.3.2.	Secondary prevention;

E.1.3.3. Tertiary prevention.

E.1.4. Central concepts applied in health promotion, e.g.:

E.1.4.1. Behavioural change;
E.1.4.2. Motivational interviewing;
E.1.4.3. Empowerment;
E.1.4.4. Holism;
E.1.4.5. Community development;
E.1.4.6. Participation;
E.1.4.7. Capacity building;
E.1.4.8. Social marketing;
E.1.4.9. Health advocacy;
E.1.4.10. Salutogenesis;
E.1.4.11. Health assets;
E.1.4.12. Health literacy.

E.1.5. Major social, behavioural and biomedical theories and models underlying:

E.1.5.1. Health education, including behaviour change, e.g.:
- E.1.5.1.1. Stages of change theory;
- E.1.5.1.2. Social-psychological theory;
- E.1.5.1.3. Diffusion theory;
- E.1.5.1.4. Socialization theory.

E.1.5.2. Health protection systems, e.g.:
- E.1.5.2.1. Communicable disease control;
- E.1.5.2.2. Environmental health management;
- E.1.5.2.3. Accident prevention systems.

E.1.5.3. Disease prevention, including:
- E.1.5.3.1. Primary prevention;
- E.1.5.3.2. Secondary prevention;
- E.1.5.4.3. Tertiary prevention.

E.1.6. The basic theories underlying communication skills – the basic principles of:

E.1.6.1. Learning processes;
E.1.6.2. Strategic communication;
E.1.6.3. Marketing;
E.1.6.4. Target group specific communication.

E.1.7. Health promotion: Basic principles and methods applied in the development, implementation, management and effectiveness evaluation of health promotion programmes in populations and population subgroups (e.g. adolescents, the elderly, males and females, ethnic groups, the socially disadvantaged, other socially, culturally and/or religiously distinct groups, etc.):

E.1.7.1. Theoretical models of behaviour change as applied to the general population and to high risk and hard-to-reach groups;

E.1.7.2. Health education, including information on methods for behavioural modification relating to:

- E.1.7.2.1. Environmental health management;
- E.1.7.2.2. Common risk factors;
- E.1.7.2.3. Common factors improving health, including consumer behaviour, determinants of food choice and selection, adoption of healthy lifestyle;
- E.1.7.2.4. Relevant use of health services.

E.1.7.3. Health protection, including e.g.:

- E.1.7.3.1. Communicable disease control;
- E.1.7.3.2. Environmental health management;
- E.1.7.3.3. Accident prevention systems;
- E.1.7.3.4. Occupational hazards protection and appropriate health promotion.

E.1.7.4. Primary prevention programmes, including:

- E.1.7.4.1. Prevention of infectious disease, e.g. immunisation programmes;
- E.1.7.4.2. Prevention of non-communicable diseases and of intentional and unintentional injuries.

E.1.7.5. Secondary prevention programmes (screening), including the criteria to be satisfied before a screening programme is set up;

E.1.7.6. Tertiary prevention.

E.1.8. The general principles of emergency planning and managing a major incident

E.1.9. The relative importance of individual and societal health promotion policies

E.1.10. The effectiveness and cost-effectiveness of major health promotion programmes as documented by scientific methods (evidence of effect and costs)

E.1.11. The existence and developmental trends of major health promotion programmes in at least one European country, targeting:

E.1.11.1. Unselected populations as well as:

E.1.11.2. Specific population groups (e.g. children, adults, single parents, elderly, socially disadvantaged, ethnic groups, etc.) and:

E.1.11.3. Special settings (e.g. the workplace, the home, the hospital, institutions, etc.).

E.1.12. Major national and international organisations and their cultures and resources to bring about health improvement activity

E.1.13. Major national and international health policies and strategies:

E.1.13.1. WHO's Health 2020 policy and its European Action Plan with the Essential Public Health Operations (EPHOs);

E.1.13.2. Major health policies and strategies in at least one European country.

E.1.14. National and European legal frameworks in disease prevention and health protection, including IHR 2005 and EU legislation

E.2. Practical competences: The public health professional shall be able to:

E.2.1. Identify population health challenges relevant for health promotion at various levels of social and political organisation, from global to local

E.2.2. Communicate effectively public health messages – including risk analysis and priority-setting issues - to lay, professional, academic and political audiences, by use of modern media, e.g. written media, audio-visual techniques and internet-based social media tools

E.2.3. Apply community development theory to strengthen community participation

E.2.4. Play an active role in engaging the public in meeting its own health challenges, e.g. by effective asset management

E.2.5. Lead and evaluate the investigation of an infectious disease outbreak/chemical hazard incident and its management, including:

E.2.5.1. Conduct risk assessment;

E.2.5.2. Draw lessons learnt from outbreak investigations and simulation exercises;

E.2.5.3. Design, monitor and evaluate a preparedness plan;

E.2.5.4. Write a full report.

E.2.6. Apply knowledge of food composition to relevant aspects of policy development and practice

E.2.7. Design, implement, manage and evaluate a health promotion strategy and a community development programme for a defined population and a defined community, using standard public

health tools and taking into account issues of power and politics, providing a business case for the chosen intervention option

E.2.8. Write a policy proposal, including:

- E.2.8.1. Title page;
- E.2.8.2. The concrete health challenge;
- E.2.8.3. Scientific background and consequential policy options;
- E.2.8.4. Policy recommendations;
- E.2.8.5. Communication plan;
- E.2.8.6. References.

F. Ethics

Definition

Ethics, or moral philosophy, is the discipline concerned with what is morally good and bad, right and wrong. The term is also applied to any system or theory of moral values or principles.

Competences

F.1. Intellectual competences: The public health professional shall know and understand:

F.1.1. Significant aspects of the history of ethics, including historical examples of misuse of public health principles for political ends

F.1.2. Major ethical theories and concepts relevant for public health, e.g.:

F.1.2.1.	Utilitarianism;
F.1.2.2.	Egalitarism;
F.1.2.3.	Theory of rights;
F.1.2.4.	Theory of duty (deontology);
F.1.2.5.	Autonomy/self decisiveness;
F.1.2.6.	Paternalism;
F.1.2.7.	Uninvited intervention;
F.1.2.8.	Responsibility;
F.1.2.9.	Respect;
F.1.2.10.	Acceptability and acceptance;
F.1.2.11.	Non-discrimination;
F.1.2.12.	Human rights.

F.1.3. Good epidemiological practice and good clinical practice ('best practice'), including ethical aspects of data handling, confidentiality, informed consent, security, privacy and disclosure

F.1.4. Ethical dimensions of:

F.1.4.1.	Public health strategy making, including the ethical challenges of each individual stage of a strategy;
F.1.4.2.	Professionalism in relation to the implementation of responsibilities and in the context of accountability in an institutional context;

F.1.4.3. The ethical aspects involved in choosing between utilitarian and egalitarian alternatives in public health strategy making and in health care planning in broad;

F.1.4.4. Ethics committee systems and requirements for ethical approval of public health research in at least one European Country.

F.1.5. The ethical aspects of individual versus societal intervention policies in, e.g., health promotion

F.1.6. The ethical aspects of and national and international rules for data protection and data storage

F.2. Practical competences: The public health professional shall be able to:

F.2.1. Identify ethical aspects of concrete public health interventions, strategies and policies:

F.2.1.1. Identify, what the ethical issues are, and how to deal concretely with them, when confronted with the design of a Public health investigation and/or proposed intervention, all the more if this arises in emergency circumstances (a flu epidemics).

F.2.2. Ensure the implementation of basic ethical principles in public health strategy making, such as a non-discriminatory approach to target populations and in human resources management:

F.2.2.1. Leading and supporting the ethical management of policy, communities and individuals.

F.2.3. Respect and adhere to ethical principles regarding data protection and confidentiality regarding any information obtained as part of professional activities

F.2.4. Prepare an application to the ethics committee system within the context of appropriate research governance as determined in one particular country

F.2.5. Adhere to general principles for authorship when writing and publishing in the scientific literature context, e.g. respecting intellectual property rights and avoiding plagiarism

Annexes

Core Competences for Public Health Professionals on Communicable Disease Prevention and Control

Contents

ANNEX I Vaccine preventable diseases

Specific links to the full list, especially: E.1.7.3.1., E.1.7.4.1.

The immune system and vaccines

1. Understand the basics of vaccine preventable diseases;
2. Understand the components of the surveillance systems and how these work;
3. Ability to set up priorities based on medical evidence;
4. Understand how vaccines work.

Vaccine logistics management

5. Understand the immunisation calendar at national level;
6. Demonstrate knowledge on vaccine resource management;
7. Demonstrate knowledge on vaccine logistics (general knowledge on how to ensure optimal quantity of vaccines based on the population data);
8. Be able to advice on organisational aspects of vaccination activities (principals of organizing vaccination campaigns);
9. Understand the importance of proper documentation (paper or e-records), keep them secure and confidential.

Communication and behaviour science related to vaccine preventable disease and immunisation

10. Demonstrate capability to cooperate with multidisciplinary institutions during a VPD Public health event (vaccination campaigns, outbreak investigation e.g human, veterinary and local administration);
11. Demonstrate capability to communicate to public, scientific community and decision makers.

Research and science

12. Understand the importance to monitor and assess the results.

Extracted from: https://ecdc.europa.eu/en/publications-data/vaccine-preventable-diseases-and-immunisation-core-competencies

ANNEX II Public health emergency preparedness

Specific links to the full list, especially: C.1.19. - C1.19.4.6., E.1.8., E.2.5.3.

Detection and Assessment

1. Understand and evaluate the implications of national or international public health alerts for own Member State;
2. Perform a risk assessment and continuously review as further information becomes available;
3. Communicate the results and implications of risk assessments to the relevant stakeholders;
4. Understand international disease reporting requirements;
5. Understand the impact of control strategies.

Policy development, adaptation, and implementation

6. Periodically assess existing policies, plans and measures and communicate changes to relevant actors;
7. Communicate the necessity of measures to mitigate personal risks for the public health professionals;
8. Periodically assess the legal frameworks and address gaps;
9. Periodically assess the need for changes in strategies and plans, and action plans, standard operating procedures (SOPs) for implementing them;
10. Periodically review recommended triggers for key decisions during responses (keeping in mind that triggers may need to be modified to fit specific situations).

Health services

11. Ensure that a plan is in place for the storage, stockpiling and distribution of medical and non-medical countermeasures.

Coordination and communication

12. Periodically practice and test the ability to make decisions under uncertainty;
13. During the response, anticipate resource needs on an ongoing basis and communicate them to relevant decision makers;
14. During the response, communicate with political decision makers to mobilize needed resources, communicate current knowledge and uncertainties, and solicit guidance;
15. Before the response, establish trust with healthcare providers through feedback loops and ongoing two-way communication;
16. Develop a common understanding of roles, resources and planning with key partners.

Emergency risk communication (ERC)

17. Proactively work with communication experts to address the needs of media and the people (including rumours and social media);

18. Manage and assess situational information received by the organisation;
19. Understand and implement the principles of risk communication;
20. Identify strategies to engage with government leaders in integrating government priorities with community interests and concerns during the emergency response.

Extracted from: https://ecdc.europa.eu/en/publications-data/public-health-emergency-preparedness-core-competencies-eu-member-states

ANNEX III Public health epidemiologists working in communicable disease surveillance and response

Public health science

1. Be familiar with the epidemiology of communicable diseases in order to guide public health policy.

Public Health Policy
Specific link to the full list, especially: D.1.7.

2. Be able to use epidemiological findings to plan public health programmes.

Risk assessment
Specific link to the full list, especially: E.2.5.1

3. Understand risk analysis frameworks, with the elements of risk assessment, risk management and risk communication.

Surveillance
Specific link to the full list, especially: A.1.4.11.

4. Be familiar with laws on surveillance and reporting of communicable diseases at national, EU level and globally (International Health Regulations);
5. Perform descriptive analysis of public health surveillance data;
6. Interpret results and trends from public health surveillance data analysis, including time series;
7. Understand the relevance and tools for early detection of public health threats.

Outbreak investigation
Specific link to the full list, especially: E.2.5. – E.2.5.4.

8. Be familiar with the steps of an outbreak investigation;
9. Describe an outbreak in terms of person, place and time in order to generate hypothesis about its cause or risk factors;
10. Use evidence based methods to identify and recommend control and preventive measures to control an outbreak.

Epidemiological studies
Specific link to the full list, especially: A.2.5.

11. Conduct an epidemiological study, including writing a study protocol, conducting data management, reporting and presenting the results and recommending evidence-based interventions to decision makers;
12. Interpret the diagnostic and epidemiological significance of reports from laboratory tests.

Infectious diseases

13. Be familiar with transmission dynamics and spatial spread of infectious diseases.

Public health guidance in communicable diseases

14. Develop evidence based guidelines for surveillance, prevention and control of communicable diseases and other acute public health events.

Risk communication
Specific link to the full list, especially: E.2.2.

15. Apply the basic principles of risk communication, adjusting the message when presenting results of an investigation to different audiences: media, general public, professionals and policy makers.

Extracted from: https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/training-core-competencies-EU-public-health-epidemiologists.pdf

ANNEX IV Public health microbiology

Applied microbiology and laboratory investigations

1. Describe the added value of public health microbiology for public health;
2. Understand functions of a public health microbiology laboratory;
3. Understand concepts of virology, bacteriology, parasitology/mycology and immunology to the public health disciplines;
4. Recognise the use and limitation of diagnostic and typing methods and their interpretation in patient diagnosis, outbreak investigations, surveillance and epidemiological studies;
5. Recognise the specific issues with the use of laboratory and epidemiological methods in investigations of rare and emerging diseases;
6. Understand the principle of safe specimen sampling strategies for disease surveillance and for outbreak detection and control, both in humans and animals;
7. Relate combined microbiological and epidemiological knowledge in outbreaks, surveillance, or unusual events;
8. Understand the role of laboratory surveillance systems.

Quality management

9. Describe quality assurance principles;
10. Assess and experience different standards;
11. Apply the concepts of external quality assurance.

Biorisk management

12. Understand national, European and World Health Organization (WHO) rules and regulations regarding biosafety and biosecurity and understand how these may influence response to an outbreak;
13. Identify appropriate decontamination strategies/personal protection and their applicability in field situations;
14. Determine the need for quality management, biosecurity management, and crisis response as core elements of management of a public health microbiological laboratory.

Extracted from:
https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/microbiology-public-health-training-programme.pdf

ANNEX V Infection control and hospital hygiene

Specific link to the full list, especially: C.1.2.4., C1.2.9., C.1.5., C.1.6.13

Programme management

1. Be aware of the importance of healthcare-associated infections (HAIs) as a crucial element of patient safety and highlight their potential human, economic and reputational burden to the decision-makers of the healthcare organization.

Quality improvement

2. Contribute to the integration of infection control activities within the healthcare organisation's quality promotion and patient safety programmes.

Surveillance and investigation of healthcare associated infections (HAIs)

3. Advocate HAI surveillance activities and gather the opinions of appropriate professionals in order to rank priorities and formulate objectives;
4. Identify national and international recommendations, regulations and standard definitions to design HAI surveillance activities, ensuring all aspects and the need for consistency in applying definitions.

Infection control activities

5. Collect and analyse the relevant documentation for the development of an infection control procedure;
6. Contribute to set a policy for the implementation and revision of infection control guidelines and recommendations according to the Standard Operating Procedures (SOPs): roles and responsibilities of supervisor, trainers, link professionals;
7. Promote the importance of prevention and control of antimicrobial resistance (AMR), including antibiotic prophylaxis;
8. Highlight the human, economic and wider public health burden of AMR.

Extracted from:
https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/infection-control-core-competencies.pdf

ANNEX VI Competences relevant for communicable disease prevention and control, from domains common to different public health professions

Interdisciplinary collaboration
Specific link to the full list, especially: D.1.3.2.5.

1. Understand the importance of multidisciplinary collaboration during epidemiological studies and outbreak investigations, including the one-health approach in zoonoses;
2. Promote partnerships to accomplish epidemiology programme objectives;
3. Develop community partnerships to support epidemiological investigations.

General public health management
Specific links to the full list, especially: D.1.7., D.2.9.

4. Apply principles of scientific communication to peers, stakeholders and media/public;
5. Identify public health priorities in complex emergency situations;
6. Recognise security issues;
7. Know the role of different agencies;
8. Identify elements of stress management;
9. Identify interdisciplinary needs between health-care professionals and front-line responders;
10. Implement lessons learned from planned exercises;
11. Plan and implement infection control processes within field studies.

Team Building and negotiation
Specific links to the full list, especially: D.1.3.11., D.1.3.14.

12. Be an effective team member, adopting the role needed to contribute constructively to the accomplishment of tasks by the group;
13. Promote collaborations, partnerships and team building to accomplish public health microbiology;
14. Build up multidisciplinary partnerships to support microbiological investigations;
15. Mutually identify those interests that are shared, opposed or different with the other party to achieve good collaboration and conflict management.

Ethics and integrity
Specific link to the full list: Section F.

16. Adhere to ethical principles regarding human welfare when planning studies, conducting research, and collecting, disseminating and analysing data;
17. Apply relevant laws to data collection, management, dissemination and use of information;
18. Adhere to ethical principles regarding data protection and confidentiality regarding any information obtained as part of professional activity;

19. Handle conflicts of interests;
20. Asses risks to respond to a potential health threat;
21. Understand the roles and responsibilities of local, national and international organisations involved in infectious disease control;
22. Coordinate response using communication mechanisms and other tools;
23. Communicate effectively with persons from a multidisciplinary background, authorities, the public and the media in the form of publications, reports, interviews, and oral presentations.

Teaching
Specific links to the full list, especially: A.2.4., A.2.5., D.1.3.15.

24. Identify training needs, planning and organising courses;
25. Moderate case studies, give lectures and perform pedagogical teaching;
26. Design/create a case study.

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.

www.aspher.org