

POLICY SUMMARY 10

Addressing needs in the public health workforce in Europe

Vesna Bjegovic-Mikanovic,
Katarzyna Czabanowska,
Antoine Flahault, Robert Otok,
Stephen Shortell, Wendy Wisbaum,
Ulrich Laaser



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This policy summary is one of a new series to meet the needs of policy-makers and health system managers.

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List of Acronyms

APHEA	Agency for Public Health Education Accreditation
ASPH	Association of Schools of Public Health (USA)
ASPHER	Association of Schools of Public Health in the European Region
CBE	competency-based education
CDC	Centers for Disease Control and Prevention (USA)
CPHA	Canadian Public Health Association
CPD	continuing professional development
CSPH	Centre School of Public Health (Belgrade)
DAAD	German Academic Exchange Service
EC	European Commission
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
EHMA	European Health Management Association
EPHCCP	European Programme of Public Health Core Competences
EPHA	European Public Health Alliance
EPHF	Essential Public Health Functions
EPHO	Essential Public Health Operations
EPHS	Essential Public Health Services
ESCO	European Skills, Competences and Occupations
EU	European Union
EU27	European Union 27 countries
EUA	European University Association
EUPHA	European Public Health Association
FPH-SEE	Forum for Public Health in South Eastern Europe
ICT	information and communications technology
IPH	Institute of Public Health
LEPHIE	Leaders for European Public Health
LLL	lifelong learning
LLP	lifelong learning programme
MHM	Master's in Health Management
MPH	Master of Public Health
MHPM	Master of Health Policy and Management
NCD	noncommunicable diseases
OECD	Organisation for Economic Co-operation and Development
OSI	Open Society Institute
PAHO	Pan American Health Organization
PHA	public health association
PHETICE	Public Health Training in the Context of an Enlarging Europe
SPH	School of Public Health
SWOT	strengths, weaknesses, opportunities, threats
WHO	World Health Organization
WPRO	Western Pacific Regional Office

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Executive Summary

Health systems in Europe face a number of increasingly complex challenges. Globalization, evolving health threats, an ageing society, financial constraints on government spending, and social and health inequalities are some of the most pressing. Such challenges require not only different funding and organizational approaches to health services, but also demand a multidisciplinary public health workforce supported by new skills and expertise. This policy summary aims to outline these needs and to consider measures and options towards meeting them.

First, the aims of the public health workforce in Europe (noting that many elements of this discussion should not be seen as unique to Europe) and the importance of public health are described. The importance of public health professionals who can fill information, prevention, social and regulatory deficits is explained. This is followed by a picture of the current workforce and training provisions. Although the Bologna Process and the WHO Regional Office for Europe's Health 2020 policy provide a conducive backdrop for change and promote positive developments, public health training and education lag behind. Large gaps are apparent in both the numbers of professionals trained and the kind of training that exists. Education is still largely characterized by a traditional and limited public health focus.

The discussion then outlines the importance of understanding the current situation regarding public health in Europe, and of developing and agreeing upon core and emerging competences for a well-equipped workforce. This includes the important role of employers in determining these competences. It has been demonstrated that public health education needs to include a wider range of health-related professionals, including managers, health promotion specialists, health economists, lawyers and pharmacists, etc. If public health professionals are truly to impact upon the health of the population, they will increasingly require enhanced communication and leadership skills, as well as a broad, interdisciplinary focus.

Identified and agreed-upon competences can in turn be translated into competency-based training and education, necessary to equip current public health professionals with the skills required in today's competitive job market.

New developments in public health training, including flexible academic programmes, lifelong learning (LLL) and its importance for employability, and accreditation, are also outlined as key to advancing the practice and profession. The annex contains seven case studies, which represent examples of the current reality and new developments in specific contexts.

Finally, it is illustrated that, in Europe's current climate of extreme funding constraints, the need for stepping up public health training and education is more important than ever. The broad supportive environment and context for change are in place. By focusing on assessment and evaluation of the current context, coordination and joint efforts to promote competency-based education, and support and growth of new developments, a stronger, more versatile and much needed workforce will be formed.

1 Introduction

Member State health systems in the WHO European Region face a myriad complex issues. These include ageing populations, a growing burden of chronic disease, increasing inequalities in health, rising public expectations and the challenge of cost containment (alongside the emergence of new, and often expensive, technologies and the rising cost of medicines). Additionally, the effects of the global financial crisis carry their own impacts for decision-makers. Given such issues, along with other challenges, such as globalization, health threats, and social and health inequalities, a multidisciplinary public health workforce, supported by new skills and expertise, is a crucial requirement in the European Region.

More than ever, public health knows no boundaries. Its internationalization can be dated to the second half of the 19th century stemming from colonial and commercial growth. But now, facilitated by the pressures of globalization, including increasing mass transportation, tourism and commerce, and promoted by modern media such as television, mobile telephones and the Internet, the pressures are even stronger. A major consequence of these changes is the growing public awareness of life-threatening problems common to all of us, such as global warming, global divides (demographic, economic and social inequity) and global security. These concerns are closely interconnected, e.g. global warming is associated with natural and man-made disasters, floods, water shortages and desertification, contributing in turn to (civil) wars and imbalances, all too often resulting in poverty and hunger, and impeding the health of entire populations (Laaser & Epstein, 2010). This chain of consequences flows in both directions, as an acceptable health status also constitutes a prerequisite for economic development, which can reduce the risk of violent conflicts for scarce resources, and of environmental damage (Sachs, 2001).

At the same time, there are new health threats. Currently, noncommunicable diseases (NCDs) – such as cancer, cardiovascular disease, diabetes, stroke and chronic respiratory disease – are the leading cause of death worldwide. In 2008, 36.1 million people died from NCDs (WHO, 2011), while in the European Region the equivalent figure from 2011 is approximately 7.9 million (WHO, 2013a). Obesity, directly linked to several chronic diseases, has become a major problem worldwide. Before 1980, obesity rates were below 10%, but they have doubled or tripled since then. Currently, in almost half of the Organisation for Economic Co-operation and Development (OECD) countries, 50% of the population is overweight (OECD, 2010). In the European Region, according to the latest data from 2008, the figure is close to 55% (WHO, 2013b).

Additionally, technology is altering the face of health and medicine. People are better informed than ever due to access to the Internet and the wide dissemination of information, and are as a result demanding better, higher quality health care. Simultaneously, technological changes in health care are occurring at an unprecedented pace, also bringing additional cost implications for health systems.

Schools of public health have not kept up with these changes. Although we recognize a 'New Public Health' over the last 20 years (Frenk, 1993) – incorporating issues of universal health care, economics and management of health systems into traditional public health issues of environmental sanitation, hygiene and epidemiology – and are aware of new challenges in public health, we need to go further, modifying our teaching institutions to adequately address these new developments. We need to take into consideration such current issues as globalization, preventable risk factors, the informed patient and technological changes. At the same time, health labour markets are experiencing growing globalization and migration, and we must recognize that traditional approaches to health workforce planning, production and management are no longer sufficient. Such trends result in increasingly inequitable access to public health services, within and between countries (WHO, 2012). To address this, a competent and adequately trained public health workforce is needed. This workforce should consist of multiprofessional, interdisciplinary public health leaders who are willing and able to adapt to change.

The Council of Europe underlines the importance of education and training of health professionals, administrators, managers and policy-makers in value-based good governance in health systems (Council of Europe, 2010). This renewed approach is also in line with the WHO Regional Office for Europe's strategy and framework for health, *Health 2020*, where investing in capacity for public health, change, innovation and leadership constitute key principles. Related to this, a big first step has been taken through the development of the WHO European Action Plan for Strengthening Public Health Services and Capacity (WHO, 2012). Moreover, the European Union's (EU) *Europe 2020* strategy puts knowledge and innovation at the heart of the EU's blueprint for competitiveness. These initiatives recognize the importance of adequate educational offerings for public health professionals to meet pressing educational needs.

This policy summary examines the needs of the public health workforce by underlining the importance of the content of public health training in Europe. It does this by first providing a current picture of the workforce and public health training; second, by outlining what is needed in view of current realities (constraints and challenges); and finally, by describing new developments and stressing that now is a good time to pursue change given a receptive environment.

2 Current picture of the public health workforce and public health training in Europe

2.1 Aims of the public health workforce and its training

In order to examine the aims and functions of the public health workforce in Europe, it is helpful to look at the European Office's Essential Public Health Operations (EPHOs) (WHO Regional Committee for Europe, 2011), and to compare the taxonomies and approaches from elsewhere. Table 1 sets out a comparison of the EPHOs against:

- The WHO Western Pacific Regional Office's (WPRO) Essential Public Health Functions (EPHF) (WHO Regional Office for the Western Pacific, 2003).
- The United States Centers for Disease Control and Prevention's (CDC) Essential Public Health Services (EPHS).
- The Pan American Health Organization's (PAHO) Essential Public Health Functions (PAHO, 2012).

For comparison, the three examples are rearranged to fit as much as possible with the EPHOs. The headline terminology differs in terms of Functions, Operations and Services as well as the total number of items. In addition, the areas listed are not always analogous. However, all four sets start with health monitoring and continue with the identification of priority health hazards in the community as the second item. Similar sets of basic characteristics for improving public health are missing for the African continent and it should be noted that WPRO's EPHF are only based on three countries (Fiji, Malaysia and Vietnam). As can be seen, however, although there is general consensus on the overall role of public health, Table 1 illustrates how difficult it is for different regions to completely agree on these functions.

To fulfil these crucial public health functions, public health professionals are trained. Because the functions are multidimensional, multiprofessionals are needed and health programmes have to be interdisciplinary. When we talk about public health training, we are typically referring to schools of public health (SPH), organized as postgraduate studies, such as a Master's degree in Public Health (MPH). However, public health as an undergraduate study programme, particularly towards a Bachelor's degree, is growing in popularity and can be found in such areas as a Bachelor's in health communication or health management.

Table 1: Comparison of select regional public health functions/operations

WHO Europe's Essential Public Health Operations (EPHO)	Western Pacific Essential Public Health Functions (EPHF)	CDC's Essential Public Health Services (EPHS)	PAHO's Essential Public Health Functions (EPHF)
1. Surveillance of diseases and assessment of the population's health	1. Health situation monitoring and analysis	1. Monitor health status to identify community health problems	1. Monitoring, evaluation and analysis of health status
2. Identification of priority health problems and health hazards in the community	2. Epidemiological surveillance/disease prevention and control	2. Diagnose and investigate health problems and health hazards in the community	2. Public health surveillance, research and control of risks and threats to public health
3. Preparedness and planning for public health emergencies	n.a.	n.a.	11. Decreasing emergencies and disasters in health including prevention, mitigation, preparedness, response and rehabilitation
4. Health protection operations (environmental, occupational, food safety and others)	5. Regulation and enforcement to protect public health	6. Enforce laws and regulations that protect health and ensure safety	n.a.
5. Disease prevention	As part of function 2	n.a.	As part of function 11
6. Health promotion	7. Health promotion, social participation and empowerment	4. Mobilize community partnerships to identify and solve health problems 5. Develop policies and plans that support individual and community health efforts	3. Health promotion
7. Assuring a competent public health and personal health care workforce	6. Human resources development and planning in public health	8. Assure a competent public and personal health care workforce	8. Human resource development and training in public health

WHO Europe's Essential Public Health Operations (EPHO)	Western Pacific Essential Public Health Functions (EPHF)	CDC's Essential Public Health Services (EPHS)	PAHO's Essential Public Health Functions (EPHF)
8. Core governance, financing and quality assurance for public health	<p>8. Ensuring the quality of personal and population-based health services</p> <p>3. Development of policies and planning in public health</p> <p>4. Strategic management of health systems and services for population health gain</p>	<p>9. Evaluate effectiveness, accessibility and quality of personal and population-based health services</p> <p>7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable</p>	<p>9. Quality assurance in personal and population-based health services</p> <p>5. Development of policies and institutional capacity for planning and managing public health</p> <p>6. Strengthening of institutional capacity for planning and management in public health</p> <p>7. Evaluation and promotion of equitable access to necessary health services</p>
9. Core communication for public health	n.a.	3. Inform, educate and empower people about health issues	4. Social participation in health
10. Health-related research	9. Research, development and implementation of innovative public health solutions	10. Research for new insights and innovative solutions to health problems	10. Research on public health

The general task profile of schools of public health has been described as follows:

- training for research and services
- monitoring population health
- community-oriented interventions
- liaising with public health associations
- consulting with decision-makers (Laaser, 2002).

Based on competences acquired during their studies, public health professionals can be expected to help improve public health deficits in four key areas:

1. *The information deficit:* Public health professionals can provide health surveillance by promoting the development of indicator-based comprehensive health monitoring systems, published as reports to the general public.
2. *The prevention deficit:* Public health professionals can promote healthy behaviour and lifestyles, and reducing risk factors; for example, smoking, alcohol and drug use, sedentary behaviour, unhealthy diet and overeating are examples of poor lifestyle choices that directly affect health.
3. *The social deficit:* Public health professionals can work to help reduce inequity in health. Two objectives have been set for interventions: (1) mortality and morbidity should decline particularly for those causes of death and age groups in which a defined population is lagging behind other populations (*level objective*); and (2) socioeconomic differences in mortality and morbidity should shrink, which requires reductions faster than average among less fortunate groups (*distribution objective*) (Valkonen, Sihvonen & Lahelma, 1997).
4. *The regulatory deficit:* Public health professionals can help to coordinate care among many different players. The decision-making in health care is organized by a regulatory framework, which in most countries is characterized by a continuous shift from the old vertical model to a more horizontal one, with a moderating instead of a directive role for governmental agencies. A number of decision-making centres, acting more or less in parallel, have to be coordinated, but cannot be directed (Laaser, 2001).

2.2 Who are the public health workers in Europe?

Broader public health workforce

The public health workforce can be defined as “a diverse workforce whose prime responsibility is the provision of core public health activities, irrespective of their organizational base” (Beaglehole & Dal Poz, 2003), underlining the broad nature of public health. Increasingly, public health includes the role of

the ‘wider’ workforce: people who are only indirectly involved in public health activities, but whose work can contribute to improving population health (Sim, Lock & McKee, 2007). Whitfield (2004) divides the broader public health workforce into three groups: 1) public health specialists; 2) people indirectly involved in public health activities through their work; and 3) people who should be aware of public health implications in their professional life (Box 1). Although for the purposes of this policy summary we are focusing on public health professionals, represented by the first column below, it is important to consider the relevance and role of the wider public health workforce as well.

Box 1: Potential division of public health professions

1) PH professionals

- Health professionals with specialization in public health
- Health policy-makers
- Epidemiologists
- Environmental health experts
- Health economists
- Health promotion specialists
- Employees at local health agencies

2) Partial PH role

- Physicians
- Nurses
- Dentists
- Pharmacists
- Midwives
- Food inspectors
- Nutritionists
- Fitness instructors
- Psychologists

3) Awareness of PH issues

- Police
- Architects
- Urban planners
- Teachers
- Welfare workers
- Politicians

Source: modified from Whitfield (2004).

Estimating numbers and needs

Within the first category of public health professionals (or specialists), it is difficult to say with precision how many programmes exist in Europe or how many professionals there are. One of the problems is that well-defined comprehensive public health systems do not exist in most European countries, nor is there a clear professional licensing system or formalized career ladder. The United Kingdom is one of the few exceptions (see the UK’s Faculty of Public Health: www.fph.org.uk). For medical doctors specializing in public health, licensing and defined career ladders exist within the framework of national medical systems rather than in public health itself.

The 2005–2008 PHETICE (Public Health Training in the Context of an Enlarging Europe) Project, which has been supported by the European Commission (EC) Directorate General for Health and Consumers (DG Sanco), and performed by four higher education institutions and the Association of Schools of Public Health in the European Region (ASPHER), found that cross-cutting

efforts are rare in many of the current programmes, especially between the Member States and the acceding and Candidate Countries. To prepare future professionals for the European market, it is mandatory to harmonize training and to integrate areas of inequality. One of the first steps has been to make an inventory of the existing study programmes (PHETICE Project 2005–2008). Thus, in spite of collaborative initiatives, such as the European Agency for Public Health Education Accreditation (APHEA) and European Programme of Public Health Core Competences (EPHCCP) – see below – there is still no clear overview of current numbers nor of the academic public health capacity in Europe (Karolinska Institutet, 2008). It should be noted though that a capacity assessment study is currently under way at the University of Maastricht (EAHC/2009/Health/05).

Nevertheless, a rough estimate of needs can be provided by making use of an analysis from the United States (ASPH, 2008). For a projected population of 325 million in 2010, a total of 715,000 professionals working in the area of public health is calculated, corresponding to 220 health professionals per 100,000 population. Recalculated for the population of the 27 EU Member States of 501 million (January 2010), this results in a workforce of 1.1 million public health workers using the same ratio. Given an average attrition rate of around 2% per year, up to 22,000 professionals would have to finish some education in public health each year in order to fulfil these needs.

Instead, there appears to be a dearth in the numbers of public health professionals. A recent survey among European Schools of Public Health (participation 66/81 = 81.5%) (Bjegovic-Mikanovic et al., 2012) found an average of 43 graduates per institution per year (all programmes of the Bologna cycle – see below – and equivalents) and 98 students certified in average for successful continuing education per institution per year (although many institutions did not indicate any continuing education programme). Using the figure of 43 graduates, approximately 512 institutions would be required in order to produce 22,000 graduates per year. To provide sufficient capacity for continuing education, 224 institutions would be needed for short courses alone. Others count 467 schools or departments of public health worldwide, out of which only 86 are in Europe (including Russia) (Frenk et al., 2010). ASPHER has 81 member institutions, including those outside the EU. This represents a huge shortfall according to estimated needs. However, as stated earlier, because we do not have good data on the subject and due to the complexity of the definition of 'public health professional' to begin with, this number may actually be inflated.

2.3 The Bologna Process

Harmonizing Europe's higher education systems

The framework for the European development of education and training is set by the *Bologna Process*, most relevant also in the field of capacity building for public health. The Bologna Process was inspired by the Magna Charta Universitatum, signed in 1988, and the Sorbonne Joint Declaration, signed 10 years later. The aim of harmonizing Europe's higher education systems was stated in the Bologna Declaration, accepted by 29 countries at the end of the 20th century. The fundamental principles of autonomy and diversity remain respected until today. Currently, 47 countries are committed to joint action for strengthening a European Higher Education Area (EHEA), which aims to build "... on our rich and diverse European cultural heritage, [in developing a] EHEA based on institutional autonomy, academic freedom, equal opportunities and democratic principles that will facilitate mobility, increase employability and strengthen Europe's attractiveness and competitiveness" (Ministers responsible for Higher Education in the countries participating in the Bologna Process, 2007).

Table 2: Dedication of higher education institutions in Europe to strengthening the European Higher Education Area (EHEA)

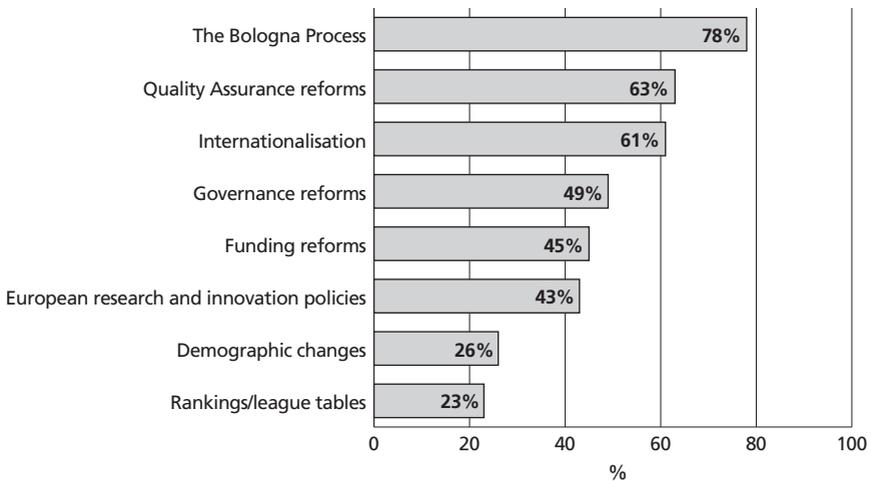
Year	Most important documents and priorities	Number of countries
1988	Bologna Magna Charta Universitatum signed by 80 rectors of European universities on the occasion of the celebration of the oldest university in Europe (900th Anniversary of the Alma Mater)	
1998	Sorbonne Joint Declaration: Joint Declaration on Harmonisation of the Architecture of the European Higher Education System by the four ministers in charge for France, Germany, Italy and the United Kingdom	4
1999	Bologna Declaration – Joint Declaration of the European Ministers of Education: <ul style="list-style-type: none"> • adoption of a system of easily readable and comparable degrees • adoption of a system essentially based on two main cycles: undergraduate and graduate • establishment of a system of credits, such as in the European Credit Transfer and Accumulation System (ECTS) • promotion of mobility by overcoming obstacles to the effective exercise of free movement • promotion of European cooperation in quality assurance • promotion of the necessary European dimensions in higher education 	29
2001	Prague Communiqué: <i>Towards the European Higher Education Area</i>	
2003	Berlin Communiqué: <i>Realising the European Higher Education Area</i>	33–40
2005	Bergen Communiqué: <i>The European Higher Education Area – achieving the goals</i>	40–45

Year	Most important documents and priorities	Number of countries
2007	London Communiqué: <i>Towards the European Higher Education Area: Responding to challenges in a globalised world</i>	46
2009	Leuven/Louvain-la-Neuve Communiqué: <i>The Bologna Process 2020 – The European Higher Education Area in the new decade:</i> <ul style="list-style-type: none"> • social dimension: equitable access and completion • lifelong learning • employability • student-centred learning and the teaching mission of higher education • education, research and innovation • international openness • mobility • data collection • multidimensional transparency tools • funding 	46
2010	Budapest–Vienna Declaration on the European Higher Education Area	46–47
2012	The continuation in Bucharest	

After a decade of the Bologna Process, 95% of higher education institutions in Europe have degree structures in most academic fields, based on either two or three main cycles (Master, Bachelor, PhD). While 77% of institutions adapted their academic programmes to the new structure of degrees, 88% reported using the European Credit Transfer and Accumulation System (ECTS) for credit accumulation for all Bachelor and Master programmes, and 90% reported using ECTS for credit transfers. However, the application of ECTS varies both among and within countries, and its application at the doctoral level is less frequent as it is considered difficult to assess original research by credits. Strategies for lifelong learning in higher education are developed usually as professional development courses for those in employment (87%), continuing education for adults (83%) or distance learning courses (62%).

In the near future, new challenges in response to the Bologna Process will be oriented towards student-centred learning, modularization and learning outcomes. In addition to the Bologna Process, there are other developments at national level and the importance of these is presented in Figure 1.

Figure 1: The importance of different developments in strategies of European higher education institutions



Source: Sursock & Smidt, 2010.

Schools of public health

In general, schools and departments of public health in the EU are aiming to use the strategic framework for European cooperation in education and training (*ET 2020*), with its four well-established strategic objectives related closely to the whole Bologna Process (EU, 2009), these being:

- making lifelong learning and mobility a reality
- improving the quality and efficiency of education and training
- promoting equity, social cohesion and active citizenship
- enhancing creativity and innovation, including entrepreneurship, at all levels of training.

Achievement of these strategic objectives is supported by performance standards in the field of education, namely reference levels for European average performance in general education (“European benchmarks”) (EU, 2009). Out of five benchmarks, two are particularly important for SPH:

- Adult participation in lifelong learning
 - by 2020, an average of at least 15% of adults (25–64 years old) should participate in lifelong learning.

- Tertiary level attainment
 - by 2020, the share of 30–34-year-olds with tertiary educational attainment should be at least 40%.

Following the Bologna Process, schools and departments of public health train their students to be able to develop, organize, manage, evaluate and adjust interventions around the promotion of health and towards the reduction of present and predicted public health challenges.

Under these guidelines, and despite significant differences, schools and departments of public health are improving their performance in relation to: education; research and innovation; competition and cooperation; impact on institutional leadership and governance; and funding. They are integrating a range of measures affecting teaching and learning in education, in order to enhance: the student experience and learning outcomes; employability; mobility; quality; and internationalization at all three levels:

- Bachelor level (180–240 ECTS credits, usually awarding a Bachelor's degree in 2–3 years), according to European University Association (EUA) 2010 trend analysis: "with the stress on greater and wider access, student-centred learning and flexible learning paths, with its attendant impact on student support services".
- Master level (90–120 ECTS credits, with a minimum of 60 credits and usually awarding a Master's degree in 1–3 years), according to EUA 2010 trend analysis: "with the significant development of the Master's as a new separate qualification level (and often more flexible degree) across Europe in the last decade"; and
- Doctoral level (no ECTS range is given, although it usually comprises 180 ECTS), according to EUA trend analysis "with more attention paid to the supervision and training of doctoral students".

Recent mapping of public health education within the PHETICE Project 2005–2008 has shown new trends (Karolinska Institutet, 2008). New and flexible lists of competences in various fields of practice have been reported, including emerging areas such as informatics, communication, genomics, preparedness for public health emergencies, global health leadership and management, public health ethics, policy and law, cultural diversity, and searching for excellence in practice-based and applied learning of public health. The PHETICE Project also pointed to necessary instructional innovations in public health education, such as supportive learning, peer learning or student-centred learning approaches, combined with problem based-learning and distance learning.

In addition, over the years, ASPHER has been devoted to strengthening public health education, building on the rich and diverse European cultural heritage

and inspired by the Bologna Process. Within the ASPHER family of schools and departments agreement is sought, especially on a standardized list of competences. Moreover, it is recognized that education and training for public health must be continually evaluated and updated, using performance measurement in everyday public health practice. It should be noted that, thus far, schools and departments of public health have been less involved than public health institutes, non-governmental or voluntarily networks in the worldwide and European discussions about public health performance. Public health practitioners are expected to be effective in different environments, and to work with many different partners and paradigms. A harmonized education, continuing training and lifelong learning within schools and departments of public health provide competences, which predict behavioural actions and, in turn, job performance outcome.

The need for partnership in strengthening the institutional and organizational capacity for public health workforce development is important, and is most significant in countries with a heritage of less well-adapted traditional structures. At the same time, there is growing experience with efforts to reform public health systems in these countries. Exchange of experience and best practice among countries and different professional organizations can provide a starting point for capacity building.

It is widely accepted in Europe that the education and training of public health professionals should include "not only the long recognized five core components of public health (i.e. epidemiology, biostatistics, environmental health, health services administration, and social and behavioral sciences) but also eight critical new areas: informatics, genomics, communication, cultural competence, community-based participatory research, policy and law, global health, and ethics" (Gebbie, Rosenstock & Hernandez, 2003, p.1). The ethical basis of the New Public Health approach and professional education are equity, solidarity, subsidiarity, sustainability, participation, efficiency, justice and peace (Laaser et al., 2002). In addition, these values provide a strategic orientation of public health education and training in Europe.

It is very important for SPH to reflect this changed vision. Although, as noted, the broader conceptual framework is in place with the Bologna Process and with the recognition of the need for a vast, far-reaching public health approach, training of the workforce has yet to catch up with these developments. Instead, courses are driven by the strengths and capacities of teachers and staff rather than by actual need. Old epidemiological models prevail, together with traditional administrative and management approaches to health care. Little focus is placed on needs analysis with respect to required competences and skills, especially at the level of continuous professional education.

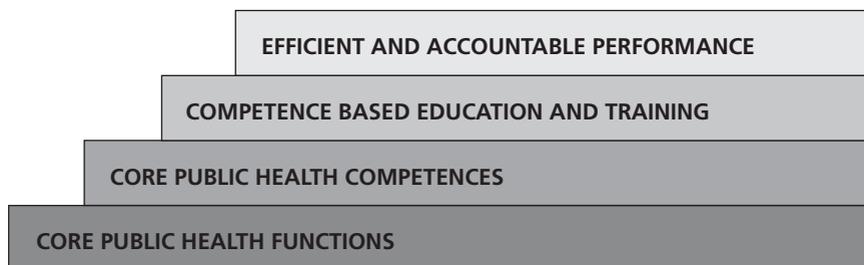
Taking into account the current economic situation, the main weaknesses and threats to public health education and training are primarily around funding, as public authorities cannot finance the full expenditures of education and research. Because of funding constraints, the need for assessment and evaluation, coordination, joint efforts and outside partners is more important than ever to improve the public health workforce and, in turn, better tackle current health challenges.

3 What is needed in the public health workforce?

The discussion has so far shown that there is a move away from the traditional public health worker and a specialist physician model, to a more generic worker who will be expected to work across organizational boundaries with a vast array of professionals to promote the public health agenda. The Bologna Process and the WHO Regional Office's *Health 2020* policy support these changes. New emphasis has been placed on further developing public health systems, capacities and functions, and on promoting public health as a key function in society (Jakab, 2010). To do this, public health education needs to include a wider range of health-related professionals, including managers, health promotion specialists, health economists, lawyers, pharmacists etc. (Frenk et al., 2010). In the future, public health professionals will increasingly require interdisciplinary and interagency team-working and communication skills if they are truly to impact upon the health of the population. But how do we get there? How can this need and the favourable supportive context actually be translated into a better-equipped public health workforce in Europe?

First, the public health community needs to work together in order to better understand the current situation (as described above). Next, core and emerging competences for a well-equipped workforce require development and consensus. Then, these competences can be translated into competency-based training and education. Finally, public health performance needs to be addressed in order to determine progress. The steps in Figure 2 summarize this process.

Figure 2: From core public health functions to core competences, teaching curricula and public health performance



3.1 Core and emerging competences and competency-based education

Section 2 showed that consensus is difficult regarding core public health functions. It is also complicated with respect to core public health competences. Nevertheless, there is increasing recognition of the need for determining and agreeing upon these competences.

The importance of core and emerging competences

Public health competences may be defined as a "...unique set of applied knowledge, skills, and other attributes, grounded in theory and evidence for the broad practice of public health" (Calhoun, et al., 2008, p.1599). WHO defines competence even more precisely as the combination of technical knowledge, skills and behaviours. There is growing recognition that to adequately prepare public health students to meet current challenges, training in the traditional areas, while still necessary, is not sufficient for effective public health practice today as it does not equip students with the contextual and integrative competences required to adapt to the new challenges they will face in practice. In recent years, growing interest in competence-based medical education can therefore be observed, due to its focus on outcomes; emphasis on abilities; de-emphasizing of time-based training; and promotion of a learner-centred approach (Frank et al., 2010). This method trains graduates in problem-solving skills applied to reality-based situations and real-time problems, in cooperation with institutions in the field (Steele, 2000).

Competency-based education (CBE) is organized around competences, or predefined abilities, as outcomes of the curriculum. "Competences" have become the units of medical educational planning (Leung, 2002; Albanese et al., 2008; Frenk et al., 2010). CBE has also been introduced in public health training and education to close the gap between teaching methods and the competences required in practice. Educators can make sure that every graduate is prepared for practice in every domain of their future practice. A first step in CBE is the identification of key competences that graduates need in order to perform adequately when entering the public health labour market. Box 2 identifies a number of key areas around competence development.

The professional development of public health leaders requires competence-based instruction to increase their ability to address complex and changing demands for critical services (Wright et al., 2000). Determining necessary competences provides a foundation for standards development that can be used to operationalize teaching objectives and design impact, and outcome evaluation methods. Measuring programme outcome and impact satisfies all stakeholders: providers, practitioners, consumers and other relevant bodies. Clusters of competences, aptitudes or ability achieved may be indicative of the potential for future achievement. Public health workforce development has resulted in pressure for competence-based programming and performance measurement to demonstrate quality and accountability.

Box 2: Recommendations on competence development

1. Agree on common definitions, concepts and approaches related to competences, competence standards and CBE.
2. Review the existing lists of public health competences with the aim of finding synergies, common understanding, universality or individual health care system specificity, as well as selecting best practice examples.
3. Agree on the underpinning quality criteria.
4. Develop a Public Health Educational Competence framework, comprising core and emerging defined competences (which could be accepted by educators and public health professionals worldwide, irrespective of the system they work in), values and convictions – similar to the Bellagio Quality Improvement Framework for General Practice or the “Quality Chasm” (Institute of Medicine, 2011).
5. Ensure that adequate training is provided and help to develop the workforce in terms of career progression, staff recruitment and retention through such a framework. This should include quality assurance and solid accreditation mechanisms (Foldspang, 2008a).
6. Carry out studies on CBE (a limitation of these studies thus far is that they mainly use qualitative approaches, like Delphi group rounds, panel studies and focus groups. While these approaches are very useful in identifying the perceptions of key competences, they preclude firm conclusions and have limited representativeness) (Biesma et al., 2008). Based on the developed lists of competences, surveys should be given to public health employers, graduates and educators to prioritize key competences and their level of importance.
7. Use simple and comprehensive language, and define competences as measurable units.
8. Make training and research relevant to practice and community service to revitalize the key role of SPH in this endeavour (Foldspang, 2008a; Paccaud, 2011).
9. Study the effects of CBE on public health practice to make it evidence-based and assess whether it makes a difference.

To support competence-based medical education, many frameworks have been developed, including: CanMEDS (Frank, 2005; Frank & Danoff, 2007, Horsley, Grimshaw & Campbell, 2010), and the Outcome Project of the (US) Accreditation Council for Graduate Medical Education (Swing, 2007). These frameworks form the basis of training for the majority of medical learners in the Western world (Frank et al., 2010). However, based on the results of a systematic literature review, Frank et al. observe that competence-based medical education still needs to identify and clarify controversies, and propose

definitions and concepts that could be useful to educators across various educational systems (Albanese et al., 2008). Little is known about approaches to CBE in public health, its effectiveness and efforts made for educational quality assurance. Therefore, it is important to explore future directions for this approach to prepare health professionals. Among the current challenges facing SPH is how best to translate these competences into specific learning objectives with measurable outcomes.

The role of employers in determining competences

In order to ensure that the SPH adequately address the skills needs of the employment market, close partnerships are needed between employers and educators, both of which are essential components of a “knowledge triangle” based around the interaction of education, research and innovation (European University–Business Cooperation, 2009). Many of the competences valued by employers are really enduring qualities, and the need is to find new and better ways for educators to develop them in students so that they can then be applied in modern workplaces. In fact, the most important skill that Europe’s workers will need in order to adapt to the demands of the future is the ability to be lifelong learners irrespective of the discipline.

To determine competences, it is of utmost importance to ask public health employers. Specifying competences needed by the public health labour market can result in a benchmark approach to CBE. The selected competences serving as benchmarks can standardize the criteria for change in the education of public health professionals. The benchmarks are relevant because there is a need for a rapid reform of the educational system as a result of economic and political changes as well as previous failures to meet employment market needs. Moreover, the benchmarks will provide a framework for evaluating the effects of various educational strategies on CBE, requiring that competence requirements be specified for different types and levels of public health employers.

Thus, the question arises as to what employers consider to be most important. Some studies suggest that employers value tacit knowledge, generic skills and work-based attitudes more than academic or technical knowledge, which they take for granted when employing graduates holding an MPH degree (Biesma et al., 2008). They look for employees who are motivated, take responsibility and are willing to learn. In view of the contemporary public health employment market worldwide, it is important to acquire the right mix of general and specific skills that fit a certain job. Further distinction can be made between “hard skills” and “soft skills”. The former refers to the more technical, knowledge-related skills (European Commission, 2010), while the latter includes competences such as communication and teamwork (European Commission, 2010). These “people skills” are essential in order to make the workforce more

adaptable as they not only prepare people for change emotionally and mentally but also allow an easier time adapting to a new environment. “People skills” seem to matter in both daily private life and at work; for example, it was found that nurses have higher levels of patient satisfaction than doctors because of their better interpersonal skills (Dubois, McKee & Nolte, 2006). The results of the study conducted by the European Commission (2010) on several sectors resulted in collecting a set of general skills that will be of high importance regardless of the field of work.

Identification of competences in the United States and Europe

There is growing consensus in the United States and Europe on the key competence areas in academic public health curricula. Influential documents have been produced by the Public Health Foundation, i.e. the Tier 1, Tier 2 and Tier 3 Core Competences for Public Health Professionals (adopted 3 May 2010) (Public Health Foundation, 2010). The following key public health competences are stated: epidemiology and biostatistics; environmental health sciences; health policy, management of health services and health economics; health promotion and education; and orientation to public health. Additionally, generic competences, like analytical skills, communication skills, financial planning and management skills, and cultural skills are recognized as important for every academic public health professional. In the United Kingdom, a Public Health Skills and Career Framework (Rao, 2008) has been developed, which is an attempt to define competences for seven levels of public health employment.

In addition, through a year-long process, ASPHER developed six main domains of public health competences (Foldspang, 2007; Foldspang, 2008b; Birt & Foldspang, 2011a, b, c). There are also many other projects worldwide that aim at the development of more specific lists of competences, e.g. Core Competences Framework for Health Promotion (Dempsey et al., 2011), Core Competences for Public Health Epidemiologists (ECDC, 2008), and competences in the area of public health leadership. The latter, especially, are of pivotal importance given the need to develop strong leadership skills in public health professionals (Jakab, 2010).

Table 3 illustrates the main emerging competences identified by the European Commission for 19 economic sectors. As can be seen, these represent skills related to innovations (e-skills, green skills), people skills (intercultural skills and team work) and management (entrepreneurship, intercultural management). Moreover, it is emphasized that multiskilling and a skill-mix of these factors will be common and necessary.

Table 3: Emerging competences

Social/cultural	Technical	Managerial
<ul style="list-style-type: none"> • Intercultural skills • Team work • Self management • Entrepreneurship and innovativeness 	<ul style="list-style-type: none"> • ICT and e-skills (both at user and expert level) • Skills/knowledge related to new materials and new processes • Health and green skills (related to health and climate and environmental solutions) 	<ul style="list-style-type: none"> • Intercultural management • International value chain management • International financial management • Green management (implementing and managing climate and environmentally friendly policies and solutions).

Source: modified from European Commission (2010).

In addition, a set of “cross-cutting” competences has been developed by the ASPH in the United States. These include: 1) Communication and Informatics; 2) Diversity and Culture; 3) Leadership; 4) Professionalism; 5) Programme planning; and 6) Systems thinking (ASPH, 2006).

In regard to *Communication and Informatics*, it is important that graduates have an understanding of and ability to use the newly emerging information technologies and social media tools (e.g. Facebook, Twitter, etc.) in designing and implementing health interventions and communicating messages. These tools will become even more important in developing greater public health preparedness to deal with natural disasters, continuing infectious disease outbreaks and the ongoing threat of bioterrorism. On a different but related note, they are also central to reaching new groups of potential public health professionals through online and distance learning technologies.

Providing training in the competences associated with *Diversity and Culture* is particularly germane to addressing the continued inequalities in health by socioeconomic status and race/ethnicity both within and across countries, and for addressing the health issues associated with increased migration. Such skills are essential to understanding and empowering communities to improve health and to adapting public health interventions to local cultures and contexts.

It is becoming increasingly evident that in public health, as in other areas of public service and the private sector, leadership matters. The fundamental understanding is that no public health problem in history has been successfully met with technical skills alone. While many public health students may not think of themselves as leaders and may not aspire to leadership positions, they should be exposed to different approaches and skills associated with

exerting leadership whenever and wherever their careers may take them. Investment should be made in the development of innovative and creative management and leadership programmes informed by systems thinking, information science and transformational change principles to strengthen public health leadership. Moreover, the particular type of leadership required is not of a traditional command and control variety, but rather akin to what has been termed “adaptive” leadership: leading in contexts where there is considerable uncertainty and ambiguity. These environments often contain imperfect evidence and an absence of agreement about both the precise nature of the problem and the solutions to it. In the future, much of the authority of public health leaders will come not from their position in the health system but rather from their ability to win over and convince others through influence rather than control (WHO, 2012).

More SPH are emphasizing the development of leadership competences. For example, the University of California at Berkeley School of Public Health has developed a Center for Health Leadership. The Center provides didactic and experimental leadership opportunities for students, including making awards for up to a dozen Leadership Fellows who receive in-depth training throughout their two years of education.

In sum, the importance of cross-cutting core and emerging competences for adapting and adequately equipping academic programmes in SPH in Europe merits further exploration. Clearly, these competences will need to be adapted to local contexts associated with different historical, cultural, political and economic circumstances. Understanding the different settings involved is of great importance for accountable performance in public health. Public health practitioners are expected to be effective in different environments. Effective public health practitioners have to work with many different partners and paradigms.

3.2 Development of a strategic plan

Along with determining core and emerging competences in order to develop CBE in public health, it is important to make an overall strategic plan for public health training and education. As an example, Box 3 outlines a strategic framework for capacity building in public health training and education based on needs, with concrete objectives and targets.

Box 3: Strategic Framework for Capacity Building in Public Health Education and Training

1. An initial strengths, weaknesses, opportunities and threats (SWOT) analysis is required to define specific capacity building objectives and targets (with a minimum set of indicators for monitoring and evaluation), which will be linked to European public health needs as well as to the new European policy *Health 2020* and European Public Health Operations as a public health framework for action (WHO, 2012).
2. The targets for a strategy to strengthen public health education and training should cover all areas of current conceptual models of public health capacity building within the Bologna Process as follows: organizational development and resource allocation; degree and curriculum reforms; quality assurance; qualification frameworks; international recognition of degrees and mobility within the EHEA and the rest of the world; policies on widening access to and increasing participation in higher education; attractiveness of European higher education; and the global dimension of the Bologna Process.
3. Workforce development in public health should be considered among the highest priorities at national and European levels.
4. Perspectives on public health and expectations in public health from representatives of other sectors and policy areas should be included to enrich capacity building and lay out a basis for health in all policies.
5. “Public Health Identity” needs to be strong, reflecting the diversification of professional functions in public health and reconciling them with a shared identity:
 - both public health generalists and specialists are needed, as well as “horizontal” public health workers who consider health issues in other key sectors and policy areas;
 - education and training of public health professionals focused on health incorporated into development policies and tackling the socioeconomic determinants of health;
 - public health education and training requests to be recognized and developed in other key sectors; public health topics, views and experiences should be included in medical studies and spread through curricula from the very beginning – as an example: 10–15% proportion of overall medical teaching should become a target.
6. The strategy for capacity building in public health education and training needs to consider both horizontal and vertical aspects: it must address all levels of government and administration (supranational to local), as well as in other domains (private, civil society, public, etc.).
7. The pace of strategy development for capacity building in public health education and training must fit with the national and international context, and ought to proceed in a measurable way.

4 New developments in public health education and training

The articulation of and consensus on core and emerging competences can inform competency-based education and training, leading to a better-equipped public health workforce. At the same time, several areas are emerging in the field of public health in Europe:

- 1) development of broader, more flexible academic public health programmes, based on mobility of students and professionals in the European Higher Education Area;
- 2) expansion of lifelong learning (LLL), which involves extending knowledge and gaining skills (the acquisition of competences) in the SPH, and the application of innovation in training, particularly with regard to information technology (Internet and mobile technologies, OpenCourseWare on selected topics, and supportive elements of distance learning in general); and
- 3) increased potential of higher education programmes, based at all levels on state-of-the-art research, fostering changes by innovation and creativity.

Although touched upon elsewhere in this policy summary, each of these topics merits separate review.

4.1 Broader, more flexible academic public health programmes

Although public health has always been “global”, under the rubric of “international health”, recent efforts have been underway to redefine “international” health as “global health” and to think of it as a new and somewhat different field. This movement is being led primarily by medical schools, arguing that the new global health challenges require skills and approaches not typically found in “traditional” schools of public health (Koplan et al., 2009) and pointing to the need for greater problem-solving based field work, leadership development and exposure to other disciplines such as engineering, business, law and public policy. While many schools of public health have provided such training for years (Fried et al., 2010), there is no doubt that more could be done. The challenges of global health concerns could provide an opportunity for closer relationships between schools of public health and schools of medicine in addition to the other health science professional schools.

As noted already, public health is interdisciplinary, drawing on many fields, including biology, mathematics and statistics, law, business, economics and numerous other social science disciplines. However, there is only limited interprofessional education in public health. Despite recent renewed interest

in interprofessional training – in the fields of medicine, dentistry, pharmacy and public health – relatively little is occurring (Frenk et al., 2010). Among the reasons are: protection of professional turf; the lack of top academic leadership and resources; lack of time and alignment of academic calendars; lack of faculty training and incentives; and lack of recognition by accrediting bodies that interprofessional competences are important (Interprofessional Education Collaborative Expert Panel, 2011). However, the most limiting factor in the current conception of interprofessional training is the relative exclusion of the major focus of public health; namely, the health of populations and communities. When most people refer to interprofessional education, they are primarily talking about creating effective *patient care-centred* teams. For example, a recent influential report defines interprofessionality as involving "...continuous interaction and knowledge sharing between professionals, organized to solve or explore a variety of education and care issues, all seeking to obtain the patient's participation" (D'Amour & Oandasan, 2005, p.9). Thus, to the extent that interprofessional education gains traction, one of the challenges for schools of public health is to define its role within this area.

Three possible approaches to interprofessional education include concurrent degrees, joint degrees and "embedded" degrees that could be given by schools of public health and other health science professional schools, such as medicine, nursing, dentistry and pharmacy. A concurrent degree involves the admission of students to two schools (e.g. medicine and public health) from the start of the programme with a defined sequencing and pathway of interrelated courses. Upon successful completion of requirements, students are simultaneously awarded both degrees. For example, at the University of California at Berkeley such programmes exist between public health and business, public policy, social welfare, city and regional planning, and journalism. However, this is not yet offered with the health science professional schools perhaps because they are not located on the Berkeley campus.

A joint degree, on the other hand, consists of students receiving two degrees, but typically not at the same time and with relatively little overlapping course work. Usually the medical or nursing degree is completed first and then students enrol for their MPH degree. In most cases, the MPH degree is considered "secondary" to the students' primary clinical degree. Many schools of public health in the United States offer such joint degrees.

Finally, a new and different approach exists which is called an embedded degree. This is offered as an arrangement between The University of California at Berkeley School of Public Health and Stanford University's School of Medicine. In this arrangement, up to five Stanford medical students interrupt their medical school education during the second year to participate in an intensive one-year 42-credit hour set of courses at Berkeley's School of Public

Health. The Stanford students then complete their medical training. Upon completion of a jointly overseen Berkeley–Stanford thesis project, students are awarded both their MD and MPH degrees.

Another example, again at Berkeley, involves placement of a medical degree programme *inside* a School of Public Health while still in collaboration with a medical school. In this combined “joint medical programme” students spend their first three years on the Berkeley campus. Instruction focuses on case-based individual and team-based problem-solving, assessing patients and their illness within the larger context of the community and the social environment in which patients live (Shortell & Swartzberg, 2008). Upon completion of the three years, students complete their medical training and board exams at the UC San Francisco Medical School campus. The embedded approach is perhaps the most innovative of the three. The extent to which these, and possibly other examples of interprofessional training, might be relevant to Europe and other parts of the world is a topic worthy of further discussion.

4.2. Lifelong learning and the importance of employability

We live in the era of learning, witnessing new educational policy discourse with neo-liberal tenets (Brine, 2006). Policies of the EU support this “learning drive”. It can be stated that we are observing a shift from competitiveness, growth and employment to employability – the ability to become employed. Currently, 21st century competences are on the front page of educational reforms in Europe and worldwide. A Green Paper from the EU Commission calls for greater investment in workforce planning, while the EU Council has asked for greater priority to be given to lifelong learning as “a basic component of the European social model” (European Council, 2001). In line with the establishment of the Lifelong Learning Programme (LLP) (Decision No 1720/2006/EC amended by 1357/2008 Decision), and the “New Skills for New Jobs” communication, the need to anticipate and match future skills has been developed.

With regards to knowledge and skills, there are several systems and frameworks set up on the EU level, especially the “European Reference Framework” that defines the eight main competences needed for any person to be able to function successfully in their job and in society. The advantage of using this reference tool is that it actually reflects on the learning outcome of a person instead of using only length of time in the educational system. A classification structure called “European Skills, Competences and Occupations” (ESCO) is another example of ongoing work from the EU. This system is planning to bring together the most relevant skills and qualifications for numerous jobs into one network.

The European Commission supports the development of lifelong skills and competences, both formally and informally, and in aiming to promote the development of European educational know-how, including the use of modern technology to support learning.

It is to be noted that effective use of the European Commission financial instruments contributes to the development of collaborative learning, exchange of good practices and rise of new forms of teaching and learning, ranging from problem-based, active, self-directed, student-centred approaches to blended or hybrid learning, which is a combination of face-to-face and online learning. A broad range of options exists, from the principle of mutual recognition of programmes and diplomas through the Erasmus Mundus grant to individual mobility throughout Europe. These programmes are not only restricted to European countries, but allow for wider global participation, an important factor to be considered by public health educators. Moreover, programmes offered by the European Commission support the learning of foreign languages, increasing intercultural understanding, raising awareness of the potential of languages and calling on decision-makers to ensure efficient language education.

It should be recognized that, unlike other health professions, public health does not have a specific continuing professional development (CPD) programme and uses courses from other health care fields. However, as has been illustrated, many possibilities exist that can support the development of continuing education in public health and can help give rise to the still underdeveloped area of LLL in the field.

4.3 Accreditation

Accreditation is an important step towards ensuring or enhancing the level and quality of public health curricula and improving the standardization of a core curriculum in public health education. Recently, along with developing lists of competences for public health professionals and for MPH education, ASPHER has taken the initiative, together with its partners (the European Public Health Association (EUPHA), European Public Health Alliance (EPHA), European Health Management Association (EHMA) and EuroHealthNet), and in consultation with WHO Europe and the European Commission, of establishing a European agency for the accreditation of public health educational programmes and schools of public health (Otok et al., 2011). This agency has become an independent body, the Agency for Public Health Education Accreditation (APHEA), assuring its credibility and gaining approval from international agencies in charge of accrediting bodies and entry into international quality assurance registers.

The APHEA Board of Directors includes representatives from all five partner organizations (ASPHER, EUPHA, EPHA, EHMA and EuroHealthNet) but

guidelines require that the Chair of the Board of Accreditation is an individual highly distinguished in the field but not directly associated with any of the organizations in the consortium.

The European accreditation process for MPH programmes is now underway. All participant organizations and individuals who have contributed to this process are confident that it will set new and improved standards for MPH training in Europe. This will ultimately help to improve the competences and employability of those graduating from public health programmes and entering the workforce, thereby contributing to the advancement of the field of public health across the vast European region.

The curriculum required by APHEA is based on the core subject domains from the list developed in the European Public Health Core Competences Programme, although slightly regrouped (Table 4). The agency adopted a “fitness for purpose” approach to assessing academic institutions, based on the premise that an academic institution will set its mission for education and research within the context of a specific regional or national environment. This approach requires institutions to be orderly in developing programme aims, in carrying out ongoing assessments, and in using this information to direct and revise final qualifications, curriculum modules, strategies and operations. Ongoing assessment is intended to lead to programme improvement as part of this approach. For the purposes of determining conformity with APHEA accreditation criteria, the Board of Accreditation will consider current developments and planned changes as they relate to the “fitness for purpose” process. This approach takes into account the diversity of the European SPH, but simultaneously sets certain curriculum standards for high-quality education and training in public health in Europe.

The “Call for Commitment” circulated to ASPHER members in October 2010 indicates that there is great interest among ASPHER member institutions for undergoing accreditation of their public health or equivalent programmes at the European level. The agency started with three accreditations in 2011 and hoped to reach a capacity of 10 per year by 2013.

Table 4: APHEA core subject domains for MPH curricula

Core subject areas	Curriculum content	ECTS*
Credit ranges**		
Introduction	Introduction to public health	2
Methods in public health	Epidemiological methods, biostatistical methods, qualitative research methods, survey methods	18–20
Population health and its determinants	Environmental sciences (including physical, chemical and biological factors), communicable and noncommunicable disease, occupational health, social and behavioural sciences, health risk assessment, health inequalities along social gradient	18–20
Health policy, economics and management	Economics, health care systems planning, organization and management, health policy, financing health services, health programme evaluation, health targets	16–18
Health education and promotion	Health promotion, health education, health protection and regulation, disease prevention	16–18
Cross-disciplinary themes (mandatory and/or elective courses)	Biology for public health, law, ethics, ageing, nutrition, maternal and child health, mental health, demography, IT use, health informatics, leadership and decision-making, social psychology, global public health, marketing, communication and advocacy, health anthropology, human rights, programme planning and development, public health genomics, technology assessment	21–23
Internship/final project resulting in thesis/dissertation/memoire	Supervised by faculty (full time and/or adjunct)	24–26
<p>* European Credit Transfer and Accumulation System (or equivalent). ** The subject areas and credit ranges above are recommended; the accreditation process will assess the credit division among subject areas for a given programme. APHEA – http://www.aphea.net CEPH – http://ceph.org/pg_about.htm</p>		

5 Conclusions

Public health is rapidly gaining prominence in the various public policy domains in Europe. The increasing importance of preparedness for major health threats; growing recognition of the fact that health is an important resource for economic growth and sustainability; and heightened awareness of important health inequalities in Europe are powerful driving forces in this regard. However, many EU Member States and Candidate Countries have insufficient institutional and professional capacity for public health and the process of reforming the relevant services is slow. Compared to the United States and other industrialized countries, as well as some emerging economies (e.g. Brazil),

the relative lack of public health capacity in the EU is striking. In addition, the situation within countries differs a great deal.

As stated in the European Action Plan:

Current public health capacities and arrangements of public health services vary considerably across the WHO European Region. These differences reflect variations in political prioritization and organizational models of public health services, as well as the distribution of functions and responsibilities across different administrative levels. However, there are many similarities across the European Region, mainly in basic needs for public health information, knowledge and competences. There are often continuing problems of under-resourcing, skill shortages, insufficient capacity, poor morale and low pay. Competency frameworks for a public health workforce, as well as career pathways, remain under-developed. Public health functions are fragmented and sections of the workforce may work in an isolated way. While research capacity is well established in some countries, effective facilitation of research capacities to support policy development and programmes still lags behind. (WHO, 2012)

As an essential element of good governance, the European Ministers of Health in the Council of Europe request that a competent postgraduate training institution is available at national level, as well as in large regions, with links to both academic and health administrations (Council of Europe, 2010).

The Schools and Departments of Public Health provide the main structures for the education and training of public health professionals, as well as for consultation and applied research for health administrations. The public health services, comprising qualified and certified public health professionals, have to address the four main deficits of: information, prevention, social equity and a weak regulatory framework. It is estimated that an additional 22,000 public health professionals are required per year for the EU alone to maintain an appropriate level of services. Almost three times the present educational capacity is needed to provide these numbers.

However, in order to meet population health needs, significant efforts are required not only to increase the number of public health professionals, but also their quality and relevance to public health (WHO, 2012). Traditional disciplinary, sectoral approaches are no longer sufficient to resolve complex health problems and provide different perspectives (Choi & Pak, 2006). Investing in a multidisciplinary public health workforce is a prerequisite for the current challenges. In fact, as stated in the European Action Plan for Strengthening Public Health Capacities and Services “a sufficient and competent public health workforce constitutes the most important resource in delivering public health services.” (WHO, 2012)

The European Schools and Departments of Public Health have widely adopted the Bologna format of teaching, as 47 countries are committed to joint action for strengthening a European Higher Education Area. In spite of this, inequalities and the need for harmonization still exist. Agreement is therefore sought, especially on standardized lists of competences required in order to perform specified service functions. The education and training of public health professionals in Europe has to be interdisciplinary and multiprofessional, comprising the medical as well as social sciences. In addition to core competences, cross-cutting competences are important to consider, including broader, multidimensional areas such as leadership, diversity and culture. These competences should inform and shape public health education and training programmes, leading to competence-based education. This approach will close the gap between traditional teaching methods and the competences actually required in practice. Moreover, it is recognized that education and training for public health should be continually evaluated and updated through the use of performance measurement in everyday public health practice.

As employability is one of the key criteria for successful training of public health professionals, two key questions have to be answered: 1) Who employs the public health professionals and what are their agendas? 2) What is the performance of public health professionals? It is of utmost importance to measure preferences of public health employers with respect to the competences required of graduates of public health studies at Bachelor and Master degree levels. Specifying competences required by the public health labour market can result in a benchmark approach to competence-based education; the selected competences serving as benchmarks would standardize the criteria for change in the education of public health professionals.

The European Union has recognized the importance of developing the field of public health in its *ET 2020* strategy, and both the EU and WHO (*Health 2020*) are cooperating. However, each country should develop a strategic plan for capacity building in public health education and training, starting with a SWOT analysis and defining specific capacity building objectives and targets with a minimum set of indicators for monitoring and evaluation.

New developments are heading in the direction of broader approaches to training, employability and better performance of public health professionals. The focus is on defining the underlying competences needed for students to become effective global health professionals and leaders. In the age of innovation, the most valuable knowledge will be tacit, and universities and businesses must create environments that promote imagination, inspiration, intuition, ingenuity, initiative, a sense of self, self-assurance, self-confidence and self-knowledge. In the future, the public health professional will

increasingly require skills such as interdisciplinary and interagency team working and communication skills.

To the extent that interprofessional education gains traction, one of the challenges for schools of public health is to define its role. Three possible approaches include the development of: concurrent degrees, joint degrees and “embedded” degrees, which could be implemented between schools of public health and other health science professional schools, such as medicine, nursing, dentistry and pharmacy.

In recent years, the relevance of a concept of lifelong learning has been recognized by all actors, particularly the EU. Supported by blended or hybrid learning, and employing online technology, these developments will change the educational landscape for all professionals and help to make professionals more employable. In addition, accreditation agencies can help raise the quality and standardization of a core curriculum in public health education. The recent development of the Agency for Public Health Education Accreditation in Europe will support and promote improvements in training.

Finally, it should be recognized that for the public health workforce truly to be equipped to tackle current public health challenges, genuine leadership should exist at all levels, and strengthening leadership capacity can have a positive effect on public health programmes (Czabanowska et al., 2013). Leadership that is transformational and collaborative rather than top-down, needs to be in place at the policy level to bring about educational reform; at the teaching level to implement change; and at the level of public health professionals to put into practice the new skills.

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ANNEX

Case study 1

Regional cooperation: the development of a regional public health strategy in South Eastern Europe (Vesna Bjegovic-Mikanovic)

A regional public health strategy for South Eastern Europe was developed during a public health expert seminar in August 2004 in Belgrade, organized into the framework of the Forum for Public Health in South Eastern Europe (FPH-SEE). Strengths, weaknesses, opportunities, threats and their interactions were defined based on a SWOT analysis. Within this, a framework for a regional public health strategy, including strategic goals and objectives, was determined based on priorities identified by nominal group techniques.

One of the identified goals was “Strengthening human resources in public health” and, within this, was the objective of “Ensuring sustainable development of human resources”.

Activities included:

- Developing common curricula for public health at different academic levels.
- Providing a common glossary and terminology for public health.
- Based on this, the following exercises are proposed:

Task 1:

Students split up into groups to discuss the draft strategic framework. They analyse strengths and weaknesses, considering: a) the development process; b) the draft framework with its goals and objectives; and c) recommendations for improvement. Each group prepares a summary report on strengths, weaknesses and their recommendations, and presents them in plenary.

Task 2:

Students compare the national public health strategy of their own country (or health policy if no specific public health strategy exists) with the draft framework for a regional strategy, highlighting the similarities and differences between them.

Task 3:

Students experience participatory and consensus building methods: a SWOT analysis on the public health situation in their country (or province, district, community or city) is conducted and, subsequently, a priority-setting method is applied so that a list of public health priorities can be identified in the selected setting.

Source: Scintee SG, Galan A, eds (2005). Public Health Strategies: a tool for regional development. A handbook for teachers, researchers and health professionals. Lage, Hans Jacobs: 583–647; ISBN 3-89918-145-X.

Case Study 2

Master's degree programmes in public health: the case of Serbia (Vesna Bjegovic-Mikanovic)

To face the challenges of the 21st century, Serbia has had to reorient its public health education. Thus, the Centre School of Public Health (CSPH) in the Medical Faculty of the University of Belgrade was established in 2004 (Bjegovic et al., 2007). Founded at the request of the country's Ministry of Health under the framework of the "Support to the Development of Public Health in Serbia" project, managed by the European Agency for Reconstruction, and funded by the European Union, it received a Tempus grant in 2005 in order to offer a Master of Health Policy and Management degree (MHPM) in addition to the Master of Public Health degree. Both programmes are based on modular principles and the ECTS approach (60 ECTS). The main aim of the MHPM programme is to provide up-to-date knowledge for public health professionals, clinicians and health administrative staff who will play a key role in the transition and health system reforms in Serbia. Beginning in 2010, the CSPH began offering a third Master's degree programme in Health Services Management, developed as a joint project of the EU with the Ministry of Health, in accordance with internationally recognized standards.

These programmes focus on health policy, management and economics, but also on bottom-up health promotion and health development in an open civil society, two areas with special relevance for South Eastern Europe and Serbia. A wide array of documents and websites has been analysed in order to identify the requirements of public health education in Serbia and to meet the demands of public health professionals. The starting point was research on the public health service in Serbia in the years 2002 (Aarva et al., 2002) and 2007 (Bjegovic-Mikanovic et al., 2009). It became apparent that the interdisciplinary approach adopted for the curriculum development was mandatory, as was multiprofessionalism in modern public health.

The School has a strategic plan, which identifies its main roles, working principles and mission; elaborates strategic objectives; and defines timelines for the implementation of the key midterm programme activities. It is also the main tool for defining the School's future direction and a framework for meeting existing and future challenges. Part of the School's strategic plan is to increase partnerships for addressing public health problems. Along with cooperation throughout Serbia, the School collaborates with a regional network of public health schools for education and research in the field of public health across South Eastern European countries, ASPHER, and also schools of public health in Germany, Croatia, Italy and France, plus other institutions and individuals.

The most important public health role in Serbia belongs to the Institutes of Public Health (IPH), organized at the republic, regional and Belgrade city levels. The IPH is in the midst of a far-reaching transition process, which has been considerably delayed by a lack of financial resources. Lack of funds, inappropriate legislation and insufficiently trained staff are the biggest current constraints on the country's public health efforts.

To help promote a better-trained workforce, three areas have been identified for CSPH:

- 1) doctoral programmes in public health, and in health policy and management;
- 2) continuing and lifelong learning in good governance and public health management; and
- 3) research around public health and management.

Case Study 3

Public health leadership in Europe (Katarzyna Czabanowska)

In October 2010, "Leaders for European Public Health" (LEPHIE) was developed, a European Erasmus multilateral curriculum development project in the lifelong learning (LLL) format. This is a collaborative effort between Maastricht University (NL), Sheffield Hallam University (UK), Lithuanian University of Health Sciences (LT), Medical University of Graz (AT) and ASPHER, and it resulted from an ASPHER and EUPHA online survey that had highlighted the need for online, problem-based leadership courses.

This module aims to develop leadership competences through the following:

- Examining the key debates around leadership in public health.
- Introducing key theoretical frameworks that underpin leadership learning, and applying theory to actual practice.
- Developing the ability to analyse the public health leadership role and development needs of individuals.
- Stimulating self-assessment of leadership competences to identify knowledge gaps and further training needs.

The competence-based programme focuses on a variety of situations related to public health risks, with special attention paid to ageing and chronic diseases, as reflected by identified priorities. The public health leadership content is designed to be applicable to performance in diverse European public health practices and contexts, and reflects the priorities and objectives of the European

Health Programme.¹ Based on an extensive literature review and expert review panels, a framework was developed to support the curriculum and facilitate self-assessment.

The module uses innovative training methods, such as problem-based and blended learning formats (a combination of face-to-face and online learning), and students are active participants in the process. Thus, students have a common goal, share responsibilities, are mutually dependent on each other for their learning needs, and are able to reach agreement through open interaction (Suzuki et al., 2007). Such an educational approach proves to be successful in the LLL context. The participants are offered interactive lectures, tutorial group meetings and other collaborative sessions at a distance. The course is delivered via an intranet, such as Blackboard or Moodle, and course material can be downloaded directly.

After being successfully piloted in the UK, a mutually recognized international blended learning leadership course worth 7 ECTS will be delivered by the international consortium. It is believed that the integration of modern learning technology with collaborative learning techniques, supported by interdisciplinary competence-based education transcending institutional boundaries, will result in transformative learning, which is about developing leadership attributes (Frenk et al., 2010). This constitutes a small step towards interprofessional and transprofessional education in the area of public health leadership, which is still not common in public health training programmes around the world (Czabanowska et al., 2013).

Case Study 4

Strengths of networking and collaboration: public health education and training in South Eastern Europe (SEE) (Ulrich Laaser)

Countries of South Eastern Europe (SEE) continue to struggle with a difficult heritage of inappropriate vertical management structures, overstaffing and migration of the well-educated youth. A new public health training approach is emerging in these countries due to the fact that health is recognized as being an important determinant of social cohesion and a major factor in peace-building, investment and development in the region. Since 2000, a collaborative network (the Forum for Public Health in South Eastern Europe), a project of the European Stability Pact and German Academic Exchange Service (DAAD) has been working on a common set of modular teaching materials, which comprise six thematic volumes with nearly 250 modules

¹ http://ec.europa.eu/health/programme/policy/2008-2013/index_en.htm (accessed 23.02.2014).

on some 4000 pages. This constitutes not just a valuable and much needed aid for students and teaching staff, but has also promoted close links across borders and amongst people who were at war during the 1990s. For example, in the 2008 volume on Management in Health Care Practice, 49 authors from 10 countries are listed. During a decade of cooperation, there have been many opportunities to test the teaching modules, at conferences and meetings (coordination and editorial); at summer and winter schools; and at student conferences. Between 2000–2005, more than 1800 teachers and students have taken advantage of professional mobility.

Furthermore, countries have identified minimum indicators necessary for regional health monitoring. In addition, a joint project of the Open Society Institute (OSI) and ASPHER, together with the EU Stability Pact, facilitated the establishment of schools of public health in selected countries of Eastern Europe, with a main focus on developing teaching curricula at the Master's degree level. Thus, an ongoing, long-term collaboration has been established among the public health institutions in the region, including the SPH, the national public health associations (PHA) and some national Institutes of Public Health. Although IPHs were pre-existing in all countries, including the successor states of the former Yugoslavia, SPHs and PHAs had to be newly formed, with the exception of the Andrija Stampar School of Public Health in Zagreb. MPH programmes have been established in Albania (Tirana), Bulgaria (Sofia, Pleven, Varna), Macedonia (Skopje), Moldova (Chisinau), Romania (Bucharest) and Serbia (Belgrade); close ties exist with professional groups in Bosnia and Herzegovina, Montenegro and Slovenia. A similar development has taken place with regard to the organization of professionals in national PHAs (sometimes under a different name), supported by CPHA (the Canadian Public Health Association), EUPHA (the European Public Health Association) and OSI. Today, the mission of the Forum for Public Health Education in SEE is defined as an open arena, set to enhance the quality of education, training and research for better performance of public health in South Eastern Europe.

Case Study 5

Searching for sustainable development by linking a school of public health to other professional schools: the case of Serbia (Vesna Bjegovic-Mikanovic)

Serbia is a latecomer in the Bologna Process (started in 2003) but, soon after it joined, Serbia endorsed a new Law on Higher Education (in 2005) to implement it. The first nationally accredited academic programme (launched in 2010), based on the accumulation of ECTS points, is delivered by two faculties in Serbia at the Belgrade School of Public Health and Management (Faculty

of Medicine, University of Belgrade). It combines different disciplines and is supported by a European Union grant.

The Master's in Health Management (MHM) is a flagship programme that has a number of unique features. It was developed as part of a three-year EU-funded project that engaged over 20 international experts working with local academics to develop training material and course content, applying practical, modern, management theory to the health care industry in Serbia. It was the first programme to be accredited by the University of Belgrade as a collaborative arrangement between two faculties: the Faculty of Medicine with its Centre School of Public Health and Management (FOM-CSPH) and the Faculty of Organisational Science (FON). The programme consists of a series of core and option modules, delivered in intensive, interactive group-teaching sessions. The first two generations of students were funded as part of the EU project, with teaching by both international experts and local faculty members. The current fourth generation of students includes self-financing students and is being delivered by local professors with only the occasional use of international guest lecturers.

A SWOT analysis, identifying strengths and weaknesses, was carried out to assess the programme's marketing and long-term sustainability (Marriot, 2011). The main strength of the programme was determined to be the accreditation of the first genuinely collaborative Master's degree programme developed with the support of so many EU experts. On the flip side, the programme's main threat is competition. Other countries and regions may seek similar EU support for their own competing projects, citing the MHM as proof of success. In addition, it was identified that senior health executives could either be the programme's strongest advocates or its biggest downfall. Thus, to respond to this important threat, it was determined that accreditation of prior learning is fundamental.

The Strategic Plan 2011–2015 of the Belgrade Centre School of Public Health and Health Management provides guidelines and defines the direction, framework and content of the School's activities in the forthcoming years, including collaboration with other faculties.

The first principle on which the plan is based is an interdisciplinary approach that specifically takes into account not only medical doctrines, but also social, behavioural, political, economic, organizational, legal and other sciences relevant for a "new public health". The Belgrade School strengthens professional training in the field of public health and provides a wide range of skills and high level of knowledge to experts in the field, with the aim of tackling public health challenges quickly and successfully.

Case Study 6

Lifelong learning in public health – an important but unmet need (Katarzyna Czabanowska)

It is generally accepted that lifelong learning is an imperative for individuals in a knowledge-intensive society and that it has far-reaching positive effects that go beyond simple economic issues (Groot & Maassen van de Brink, 2007). In fact, the European Council and European Commission recognize the importance of LLL and give “higher priority to lifelong learning as a basic component of the European social model and propose long-term strategies to improve LLL in Europe” (European Council, 2001). Such fields as medicine or management have shown that multidisciplinary, holistic approaches to LLL are often necessary to develop interventions that make a difference (van Merriënboer et al., 2009). Nevertheless, although LLL plays a vital role in the economic and social strategy of Europe, only 10% of the adult population in the European Union 27 (EU27) participate in LLL.

In public health, LLL programmes are limited. There is no systematic evidence in the European region on LLL public health courses delivered by SPH or other teaching institutions (Czabanowska, Mikeska & Brand, 2010). Often, Master’s and Bachelor’s degrees, or other full-time programmes, are listed as LLL programmes, as revealed in an ASPHER online survey. It is believed that LLL programme needs are unfulfilled in public health for two reasons.

First, even though the concept of LLL is widely used, its meaning is often unclear (Böcher, Gagnat & Delacrétaz, 2006; Aspin & Chapman, 2007). There is no consent in academic literature about the use of synonyms of LLL. As a result, terms such as “education of adults”, “continuing education”, “recurrent education”, “lifelong education”, “second chance”, “retraining”, “andragogy” and “education permanente” are used interchangeably, thus causing confusion when trying to grasp the idea of the concept (Courtney, 1989; Jarvis, 2002; Aspin & Chapman, 2007). For some, LLL can be organized education throughout one’s life span, while for others it may only relate to specially tailored courses intended to bridge gaps in knowledge. Such a misunderstanding is reflected in the nomenclature and the kind of courses provided by institutions. Moreover, each country interprets public health, its professions and also the concept of LLL differently, depending on historical, cultural and political influences (Biesma et al., 2008).

Second, it might be believed that LLL public health training exists when in fact it does not. This is because CPD or LLL is well developed in the area of medicine and nursing, and since public health medicine is a medical specialty in most European countries, LLL activities are organized by the medical professional bodies in charge. However, these programmes cover only a small part of the

public health workforce. Therefore, it might be “taken for granted” by both course planners and professionals that there are possibilities of professional development for public health specialists in other disciplines, when actually they do not exist. For these two reasons, there is a considerable lack of interdisciplinary public health LLL training and needs are unmet. This important area deserves further attention and focus.

Case study 7

System of shaping the professional public health workforce in Europe – shapePH initiative (Katarzyna Czabanowska, Robert Otok, Anders Foldspang)

Public health is a discipline that, unlike medicine or nursing, still struggles to achieve European recognition of professional qualifications. There is a lack of linking public health challenges with public health practice in population health and health systems, Essential Public Health Operations (EPHO) with well-defined system activities, and the competences profiles necessary to perform the EPHO with uniform certification procedures. There is therefore a profound need to develop European principles, methods, and dynamic and effective tools to assess the present public health human capacity needs and to foresee the future needs in terms of competences.

There is no standard European model allowing for testing individual competence profiles in public health CPD, shaping the profession or forming the basis for certification and licensing. Being very multidisciplinary and system-dependent though, the public health profession is still not clearly defined in European states, which hinders professional mobility and integration of public health professionals in the single market (European Commission 2011a,b).

Based on the Council of Europe recommendations (Council of Europe, 2012) and emphasis on the importance of education and training of health professionals, plus human capacity needs documented in a recent ASPHER survey (Bjegovic-Mikanovic V et al., 2012), the goal of the shapePH initiative is to develop an innovative web-based ICT-supported system of shaping the professional public health workforce in Europe, allowing for the assessment of competences and EPHO; human capacity planning; the development of CPD education and training systems; and individual testing, certification and licensing.

Specific aims of the shapePH initiative include:

- 1) development of an overarching European Public Health Reference Framework based on evolving public health challenges, EPHO and the public health competences chain, supplied with data on career

structures, certification and licensing identified through the Public Health Qualifications and Certification Repository established by the consortium;

- 2) translation of competency profiles to public health operations, creating a basis for job descriptions, and matching competences to public health challenges in population health and health systems;
- 3) establishment of a European Council for the Public Health Reference Framework;
- 4) mapping of public health training, certification and qualification systems in Europe and development of a European model of such a system, to be fed into the ICT-based tool;
- 5) development of an innovative web-based ICT-supported system of shaping the public health workforce in Europe, allowing for competences and EPHO assessment for human capacity planning and development of CPD systems and individual testing, certification and licensing;
- 6) development of an ICT-based algorithm for systems planning and for the human capacity planning needed to meet the demands of public health CPD education and training;
- 7) testing of the system based on developed algorithms at individual and national agency levels to identify individual competence profiles and support national agencies to manage qualifications in view of the single market; and
- 8) finally, to provide feedback to training and educational systems, for adjustment of training and education programmes.

The shapePH initiative brings together various aspects of work, which had been carried out separately in the field, by developing a consortium consisting of important partners such as:

- ASPHER
- Faculty of Public Health of the Royal Colleges of Physicians of the United Kingdom
- International Health Department Maastricht University
- European Public Health Association
- European Observatory on Health Systems and Policies

The partnership is supported by the following institutions and organizations: WHO Regional Office for Europe, European Centre for Disease Prevention and Control, World Federation of Public Health Associations, International Union for Health Promotion and Education, and selected individual institutes and

schools of public health from across the European Region (Croatia, Denmark, Germany, Lithuania, Poland, Serbia, Spain, Sweden, Switzerland and the United Kingdom).

The shapePH initiative makes a vital contribution to the lifelong training of public health professionals. The web-based tool will sustain the shaping of a profession, more precise planning of public health systems and their human capacity, and will have a substantial impact on European public health CPD education and training systems, targeting the main public health stakeholders.

Joint policy summaries

1. Addressing financial sustainability in health systems
Sarah Thomson, Tom Foubister, Josep Figueras, Joseph Kutzin, Govin Permanand, Lucie Bryndová
2. Assessing future health workforce needs
Gilles Dussault, James Buchan, Walter Sermeus, Zilvinas Padaiga
3. Using audit and feedback to health professionals to improve the quality and safety of health care
Signe Agnes Flottorp, Gro Jamtvedt, Bernhard Gibis, Martin McKee
4. Health system performance comparison: an agenda for policy, information and research
Peter C. Smith, Irene Papanicolas
5. Health policy responses to the financial crisis in Europe
Philippa Mladovsky, Divya Srivastava, Jonathan Cylus, Marina Karanikolos, Tamás Evetovits, Sarah Thomson, Martin McKee
6. Promoting health, preventing disease: is there an economic case?
Sherry Merkur, Franco Sassi, David McDaid
7. Communicating clearly: enhancing information-packaging mechanisms to support knowledge brokering in European health systems
John N. Lavis, Cristina Catallo, Govin Permanand, Amy Zierler, BRIDGE Study Team
8. Learning from one another: enriching interactive knowledge-sharing mechanisms to support knowledge brokering in European health systems
John N. Lavis, Cristina Catallo, Nasreen Jessani, Govin Permanand, Amy Zierler, BRIDGE Study Team
9. Matching form to function: designing organizational models to support knowledge brokering in European health systems
John N. Lavis, Nasreen Jessani, Govin Permanand, Cristina Catallo, Amy Zierler, BRIDGE Study Team

The **European Observatory on Health Systems and Policies** is a partnership that supports and promotes evidence-based health policy-making through comprehensive and rigorous analysis of health systems in the European Region. It brings together a wide range of policy-makers, academics and practitioners to analyse trends in health reform, drawing on experience from across Europe to illuminate policy issues. The Observatory's products are available on its web site (<http://www.healthobservatory.eu>).

The **Division of Health Systems and Public Health** supports the Member States of the WHO Regional Office for Europe in revitalising their public health systems and transforming the delivery of care to better respond to the health challenges of the 21st century by: addressing human resource challenges, improving access to and quality of medicines, creating sustainable health financing arrangements and implementing effective governance tools for increased accountability.