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Facing the future: opportunities and challenges for 21st-century public health in implementing the Sustainable Development Goals and the Health 2020 policy framework

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1. Executive summary

The Shanghai Declaration[1] emphasized that health and well-being are essential for sustainable development. National health policies, strategies and plans informed by the SDGs and Health 2020 are vital to achieving health improvement. Every country needs to plan health development within its overall SDG-informed development goals, and to identify investment priorities that will have the greatest potential impact on health and well-being

This paper is about public health, and its contribution to these processes. Whilst often invisible to the general public, public health delivers essential and primary public goods, protects community health, addresses risk factors which are often difficult for the public to visualize, and sets the parameters for continuous health system reform and adaptation. It also drives essential research in specific areas, translating research outcomes into benefits for health.

Public health however remains an elusive concept, despite its considerable historical achievements. There is a need for a more comprehensive vision for public health in the 21st century, and the strengthening of public health to face the challenges of the SDGs and Health 2020 and the health and well-being challenges of the 21st century.

This paper reflects on 21st-century health policy development and public health practice, as a basis for guidance and support to Member States. Public health is a societal function, facing complex political, social, economic and environmental challenges, to which multisectoral responses are required, involving both vertical and horizontal integration. It needs an institutional base or bases, and the services and capacities described in the EAP-PHS and the EPHOs.

There is growing evidence of the cost-effectiveness of public health interventions. Complex systems approaches are required for implementation, with real-time evaluation and feedback. Public health evidence needs to be made more relevant and instrumental in health development through advocacy and by interfacing effectively with other sectors.

Health systems have a key role to play, and the thinking about these has moved from an exclusive focus on the coordination and integration of individual services, according to the needs of individuals and patients, to a broader concept of health systems as drivers of equitable health improvements at the population level. New organizational forms and examples are available, although these need further study and evaluation.

Public health practice requires appropriately trained and orientated professionals, who must recognize and appreciate the reality that public health policy is set in a world of complexity, ambiguity and politics, in which evidence is important, but insufficient. Today's public health leaders and practitioners must be able to work and be comfortable and effective in this environment. They must deal with all the determinants of health, interface effectively with other sectors and learn to work within their agendas. Throughout there are profound and urgent training and development needs.

[1] The Shanghai Declaration on promoting health in the 2030 Agenda for Sustainable Development World Health Organization Geneva 2016
http://www.who.int/healthpromotion/conferences/9gchp/shanghai-declaration.pdf?ua=1

2. Current challenges and priorities in national health policy development

Health is both a driver of development as well as, given good policies, its outcome. Yet the development agenda has changed. There has been a shift in political perceptions and assumptions following the global financial collapse in the period 2008-10, with deep divisions posing threats to political and social cohesion and changing attitudes to health rights and opportunities. However health can be a source of societal cohesion and inclusion,

Today's health challenges are formidable, including ageing; unhealthy lifestyles; the burden of behavioural determinants leading to increased mortality and morbidity from noncommunicable diseases; the rapid transfer of infectious pathogens and the potential for global pandemics; national disasters, conflicts and mass population movements: antimicrobial resistance; injuries; and the health impacts of climate change and environmental pollution.

Faced with these challenges governance structures appear outdated, using inadequate development criteria reflecting countries' historical economic and productivity systems. A different developmental paradigm is needed which privileges the equitable enhancement of health and wellbeing.

Both the SDGs and Health 2020 make it clear that health and well-being should be addressed in the overall development programmes across all sectors of Member States governance and policies. In practice, the aim is government priorities, policies and budgets which are health orientated, based on health impact assessment, and focused on sustainability within the framework of the SDGs.

Governments should have a national health policy that is coherent, integrated and focused within the country's overall development priorities. Health policy development requires engagement in political and social structures. It emphasizes multisectoral whole of government, whole of society and health in all policies approaches which work with key sectors related to health (education, social sectors, agriculture, transportation, trade, among others) and with civil society and the private sector, within institutional and organizational structures designed at the country level. Establishing and sustaining such multisectoral efforts will usually require a fundamental shift in thinking and practice.

Health policy should deal with what matters for population health using a complex causal architecture approach[2]. It should use economic arguments more visibly and effectively, to demonstrate cost-effective investments which improve health and to show where investment might be withdrawn if interventions are known to be ineffective. It should also grapple with people's diverse and ever-changing lifestyles and behaviours, and the political, social and commercial influences which are operating to affect these.

Such health policy-making and implementation are complex and often messy processes. Whilst there remains a need for clear scientific evidence and analysis, this must be set against a social and political context of growing complexity and ambiguity. Evidence

[2] Keyes K, Galea S What matters most: quantifying an epidemiology of consequence. Annals of Epidemiology 25 (2015) 305-311http://dx.doi.org/10.1016/j.annapidem.2015.01.016

needs to be effectively communicated and presented to politicians, policy-makers, professionals and the public in terms, and with examples, that they both understand and welcome.

Overall, health needs to move out of a paradigm narrowly confined to, and based on, health care, into this wider multisectoral framework which better reflects health as a public priority, deals with all determinants, focuses on health as an investment rather than a cost, and a measure of a good society.

A new focus is needed on "upstream" determinants of health supported by evidence favouring a paradigm shift from a cure-oriented model of health towards a health-promoting and preventive model[3]. Such a model would include improved health outcomes and reduced inequities in health[4], and be based on evidence generating economic value and providing for a progressive shift towards more heath focused development.

Health systems are a key component of health policy, and remain under great pressure, in terms of availability, access and delivery. These pressures include demography, the expansion of co-morbidities, diagnostic, therapeutic and pharmacological advances, rising population expectations, pressures from litigation, the ever-present pressures for quality, efficiency and cost-control, and some specific disease burdens, for example HIV/AIDs in the WHO European Region.

Conclusion: national health policies, strategies and plans informed by the SDG and Health 2020 are vital to achieve health improvement. Such policies are set in a world of complexity and ambiguity, remain fragile and are often under threat. Existing evidence is important but insufficient. It must be made more relevant and become instrumental in health development and the development of national health policies,

3. The nature of today's public health challenges

Modern public health activities must be effective in a world of considerable unpredictability, complexity, ambiguity and uncertainty. Some actions will remain more aspirational, particularly if these require fundamental political and social reorientation; other actions are more tactical and the challenge is implementation.

The breadth of potential public health aspiration and engagement requires prioritization, and a focus on "what matters most" to the health of populations[5]. This acknowledges that single causal risk factors do not act in isolation, and that understanding the nature of diseases requires understanding the nature of causal structures[6]. The political challenge

[3] Health at a Glance. Europe 2016. State of Health in the EU cycle. OECD 23 November 2016. http://www.oecd.org/health/health-at-a-glance-europe-23056088.htm

[4] Marmot M, The Health Gap: The Challenge of an Unequal World. Bloomsbury. London 20016

[5] Galea S, Annas G, Aspirations and Strategies for Public Health. Journal of the American Medical Association Published Online 28 January 2016 http://jama.jamanetwork.com

[6] Marshall BD, Galea S. Formalizing the role of agent-based modelling in causal inference and epidemiology. Am J Epidemiology 2015; 181 (2): 92-9

here is to accept responsibility and respond positively to the social and economic dimensions of health experience.

While traditional rational, linear approaches to evidence in support of programme development and implementation have often prevailed to date, a "complex adaptive systems" perspective[7] suggests that these are invariably found wanting. Whilst evidence is important, it is inevitably imperfect and incomplete, and action is also needed. Context and relationships also matter; and we learn by doing and through real-time evaluation.

As an example, this complexity is manifest in "wicked" issues, such as obesity. Recent studies on obesity suggested that, based on existing evidence, any single intervention is likely to have only a small overall impact on its own.[8] A systemic, sustained portfolio of initiatives, delivered at scale, is needed to address this condition and its associated health burden.

Importantly such initiatives were considered cost-effective for society: savings on health-care costs and higher productivity outweighed the direct investment required to deliver the intervention, when assessed over the full lifetime of the target population[9].

Whilst education and personal responsibility are critical elements of any programme to reduce obesity, these are not sufficient on their own. Additional interventions are needed that rely less on conscious choices by individuals and more on changes to the environment and societal norms.

Such changes require engagement from as many sectors as possible, including the private sector at all points along the food chain. Nevertheless, implementing an obesity abatement programme at the required scale will not be easy.

In addition to such analyses, the pervasive phenomenon known as "lifestyle drift" [10] suggests a need to move beyond a single-minded approach to modifiable individual behavioural determinants, affecting specific public health topics such as smoking cessation, obesity and alcohol misuse, towards a more balanced, comprehensive, multi-determinant, systems-based approach which takes a life-course perspective and acknowledges the co-clustering of behaviours in particular groups and communities, which have complex political, economic, social and environmental causes, as well as complex consequences.

In response to such challenges success Success requires programmes which are systematic and scaled-up, driven by public health intelligence and informed by evidence, with sound infrastructure, business plans and programme management.

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[7] Stirling, Diana. "Learning and Complex Adaptive Systems." Learning Development Institute. 31 May 2014. Web.

[8] Overcoming obesity: an initial economic analysis. McKinsey Global Institute; 2014.

[9] Sassi F. Obesity and the Economics of Prevention. OECD Paris 2010 https://books.google.co.uk/books/about/Obesity_and_the_Economics_of_Prevention.html?id=C2ToibnnYakC&printsec=frontcover&source=kp_read_button&redir_esc=y&hl=en#v=onepage&q&f=false

[10] Popay, J., Whitehead, M. and Hunter, D.J. (2010) Injustice is killing people on a large scale – but what is to be done about it? *Journal of Public Health* 32(2): 150-6.

Such complex programmes for population-level change will not all be delivered through conventional services, and may well involve three points of intervention:

- population level (healthy public policy, legislation, regulation, licensing);
- systematic and scaled intervention through services (health, social and third-sector); and
- systematic community engagement, including the private productive sector (about which attitudes often currently differ. It may be thought of variously both as a partner or as an antagonistic element).

Real-time evaluation allows interventions to be tracked and adjusted continuously as required, based on the results of monitoring along clear and measurable process and outcome indicators. To date, evaluative research has often not provided sufficiently rapid feedback to be useful for policy analysis and change.

It is however, an issue of which academics are increasingly aware and which they are actively seeking to address by clarifying, and giving greater attention to, pathways for the co-production and co-design of research in tandem with those to whom it is targeted.

Conclusion: the complex, political, social, economic and environmental challenges of the 21st century require multifaceted, multilevel policy interventions, involving both vertical and horizontal integration. In the health field, there is growing evidence of the cost–effectiveness of such interventions. Complex systems approaches are required, with real-time evaluation and feedback.

4. New scientific and policy thinking

New thinking shapes todays' health policy making. An example is the current focus on the impact of health determinants and experiences. It is increasingly clear that human beings throughout the life-course are affected by genetic, epigenetic and intrauterine legacies, by environmental exposures, by nurturing family and social relationships, by behavioural choices, by social norms and opportunities which are carried into future generations, and by historical and structural contexts. These diverse and inequitable trajectories are strongly influenced by policies, environments, opportunities and norms created by society.

These findings make the case for coherent policies that proactively address the totality of human life across ages and generations. Action must focus on preconception, pregnancy, foetal development and the most vulnerable life stages, focusing particularly on early life prevalent causes such as material deprivation, early childhood education and child adversity[11]. There is an increasing consensus that it is these early life, upstream and macro-policy related factors that are the critical drivers of many adult outcomes.

[11] Ludwig J, Phillips DA, Long term effects of head start on low-income children. Ann N Y Acad, Sci 2008; 1136:257-68

A second example is ecological public health[12], now developed further as the concept of planetary health, focusing on the requisites for planetary sustainability[13]needed to deal with some of today's big public health issues, such as climate change, air pollution and the social and economic impacts of trade policies and agreements.

A third example is the science of epigenetics. The expectation has been that the knowledge generated from systems biology, epigenomics and genome-environmental interactions may be used to advance understanding of biology and the pathophysiology of common diseases, and advance population health.

There has been much enthusiasm about the potential for so-called "personalized medicine" or "precision medicine", treating each person as an individual and not part of a group with whom they share common health-related characteristics[14]. Whilst at population level potential benefit lies with genetic profiling improving common disease prevention, currently prospects are limited[15], prospects for concrete applications remain in the future[16]. However, the potential for public health genomics remains, with the development of technologies identifying individuals who would benefit from specific interventions based on risk[17].

Here there are significant public health workforce implications in terms of knowledge and understanding of genomic science and its application.

Conclusion: new approaches include those from the present focus on the interactions between the individual and the environment across the life-course, ecological public health and epigenetics. There are substantial public health workforce implications in terms of knowledge and understanding.

5. How can health systems policy respond?

How should health systems policy respond to these public health and health policy challenges and priorities? An illustration of leading-edge thinking is found in an article published in *Health Affairs* on "Applying a 3.0 transformation framework to guide large-scale health system reform"[18]. This summarizes new approaches to public health implementation, describing three stages of thinking.

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[12] Ecological public health: the 21st century big idea? An essay by Tim Lang and Geof Rayner. BMJ 2012; 345: e5466

[13] www.thelancet.com/planetary-health. Vol 1 April 2017 http://www.thelancet.com/journals/lanplh/issue/current

[14] It should be noted that the term "personalized medicine" can also refer to an approach to health that takes account of personal values and preferences, and places the person at the center of their own care.

[15] Smith GD, Ebrahim S, Lewis S, Hansell AL, Palmer LJ, Burton PR. Genetic epidemiology and public health: hope, hype, and future prospects. Lancet 2005, 366 (11): 1484-1498

[16] Cleeren E, Van de Heyden J, Brand A, Van Oyen H. Public health in the genomic era: will Public Health Genomics contribute to major changes in the prevention of common diseases? Archives of Public Health 2011, 69:8 http://archpublichealth.com/content/69/1/8

[17] Zimmern R, Stewart A: Public health genomics: origins and basic concepts. UPH 2006, 3 (3-4): 9-15

[18] Halfon N, Long P, Chang DI, Hester J, Inkelas M, Rodgers A. Applying a 3.0 transformation framework to guide large-scale health system reform. Health Affairs. 2014; 33(11):2003–11.

- The first era, from the 1850s to the 1960s, had a biological focus, emphasizing the diagnosis and management of acute diseases.[19] The aim was to improve life expectancy. Patients were passive inexperienced, and deferential.
- The second era, from the 1950s to the present day, focused more on the reduction of chronic disease, modifiable behavioural determinants and the integration and coordination of care at the level of the individual. Here the patient becomes an active partner in care.
- The third era, from 2000 forward, focuses on creating capacities to achieve goals for equitable health improvement, health over the life-course and the development of community-accountable health development systems at the population level, which are responsible both for service delivery for individuals and for equitable health improvement of the population as a whole. Here, individuals and communities are co-designers of health, using the concepts of health literacy and empowerment to become involved on their own behalf in health policy and service development, and aligning different interests and capacities to develop new paradigms and shared policy commitment. The consistency and alignment between this approach and Health 2020 approaches is striking.

Some new models are emerging[20],[21],[22],[23],[24],[25], although these are at an early stage of development and evaluation. Of crucial significance, these models focus on improving health outcomes for geographically defined populations, including dealing with upstream socioeconomic, environmental, behavioural and developmental determinants of health. Within these models multiple health and human service sectors share leadership, create a common purpose, and align and distribute accountability for addressing social and developmental conditions.

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[19] Earlier achievements in sanitary engineering systems, such as water, sanitation and housing, had a significant impact on mortality, including child mortality, yet public health had limited visibility and was not a key determinant of the way such systems changed over time.

[20] Schulte T, Pimperl A, Hildebrandt H. Comparing Accountable Care Organizations in the Public Sector of the US Healthcare System to the Integrated Care System Gesundes Kinzigtal in Germany and Potential Lessons Learned. International Journal of Integrated Care. 2015;15(5). DOI: http://doi.org/10.5334/ijic.2157

[21] Ádány R, Kósa K, Sándor J, et al: General practitioners' cluster: a model to reorient primary health care to public health services. Eur J Public Health, 23:529-530, 2013

[22] https://www.ars.toscana.it/it/aree-dintervento/problemi-di-salute/malattie-croniche/news/2139-la-sanita-d-iniziativa-in-toscana-un-primo-bilancio-a-tre-anni-dall-adozione.html

[23] Nalin M, Baroni I,Romano M, Levato G. Chronic related groups (CreG) in Lombardy. European Geriatric Medicine July 2015 Volume 6, Issue 4, pp325-330 http://www.europeangeriaticmedicine.com/article/S1878-7649(15)00070-4/pdf

[24] http://www.kingsfund.org.uk/topics/integrated-care/accountable-care-organisations-explained?gclid=CPyo9I-FoswCFZadGwod0OAPAA

[25]https://www.england.nhs.uk/ourwork/futurenhs/deliver-forward-view/stp/

These new approaches hold promise, but further evaluation is required before their application is extended. Each is context specific and replicability may be limited, pointing to the need for local interpretation and the use of local capacities and assets.

All these new approaches have the following requirements in common:

- Political and governmental commitment as a driving force that stimulates the implementation process;
- a local infrastructure;
- a physical or virtual organization which supports horizontal alignment and integration of medical, public health and population health services and support;
- financing arrangements which expand the concept of value to include the creation of health and well-being as a social investment; and
- the development of new forms of health-related information and information management, which measure population health trajectories and demonstrate return on health investments by linking investments to health, community and economic outcomes.

Notably, these new models generally rely less on structures and organizational arrangements and more on relationships and functions. While governance is clearly important, systems leadership requires greater attention to soft skills, such as relationship-building, negotiation, conflict resolution and political astuteness, and less attention to organizational structures and overly formal governance arrangements which, only too often, absorb and divert attention and energy that should be devoted to making the arrangements work better[26].

Conclusion: consider new health systems concepts incorporating these into Member States' policy thinking and implementation. In addition to focusing on the coordination and integration of individual services around the needs of individuals and patients, thinking about health systems needs to consider the role of health systems as drivers of equitable health improvement at the population level. Careful reflection, planning and resourcing will be required to incorporate these concepts.

6. Implementation to date of relevant policy instruments

Health 2020

The SDGs, Health 2020 and EAP-PHS, considered together within an aspirational human rights framework, offer a real strategic opportunity to move thinking about health and development to a new phase.

The monitoring of the Health 2020 targets and indicators shows that Member States have made good progress since 2012 and that the European Region is on track to reach the Health 2020 targets. Some examples: life expectancy has now reached 78 years (74 years for men and 81 years for women); healthy years at birth across the Region have now reached 68 years; the mortality trend from major noncommunicable diseases for

[26] Hannaway C. Plsek P, and Hunter D, J, Developing leadership and management for health. In Managing for Health Chapter 2, pages 161-4 Routledge Abingdon 2007

those aged 30-69 is declining for both sexes; infant mortality is 6.7 per thousand children born alive. The proportion of infants vaccinated against rubella has reached 94%.; and the proportion of the Region's population with improved sanitation facilities has reached 93%.

Whilst this progress is welcome, it is uneven and substantial inequalities remain within and across countries. Further progress will depend on careful health policy development and improving governance and leadership, based on the human right to health, and the values of equity and gender equality. Needed are necessary legislation and institutional capacity to replace compartmentalized, bureaucratic divisions with new horizontal and place-based approaches to tackling all of today's health determinants (political, economic, social, environmental, cultural, and commercial).

Particularly important will be collaboration and coordination within the United Nations system, the European Union and its institutions, the Organisation for Economic Co-operation and Development, the Global Fund to Fight AIDS, Tuberculosis and Malaria and the GAVI Alliance, supported by the new WHO Framework of Engagement with Non-State Actors. Also important are relationships with the private productive sector, mediated for example by the World Bank and regional development banks.

The European Action Plan for Strengthening Public Health Capacities and Services

The WHO European Regional Committee adopted the European Action Plan for Strengthening Essential Public Health Operations and Services (the EAP-PHS) in September 2012. The EAP-PHS was supported by ten Essential Public Health Operations (EPHOs) and a self-assessment tool to assist Member States in assessing their current state of their practice against the EPHOs, as well as charting improvements.

A review was carried out in 2016[27]. In summary, many Member States had carried out a self-assessment using the self-assessment tool. For many the resulting reports provide the only comprehensive documentation detailing the strengths and weaknesses of public health capacities and services. Whilst there had been good progress in strengthening public health capacities, more needed to be done, including the development of common understanding, visibility and marketing, creating societal support and consensus, communication, the training of the essential workforce, and the development of health literacy in the wider society,

It was clear that political will for change is more important than the availability of a useable tool to effect that change. Positively in some countries the self-assessment results were well integrated into the policy cycle, with the development of comprehensive strategies to revitalize public health services. However in other countries the assessment was less centrally (or only marginally) important; however these countries also succeeded in passing meaningful reform and public health legislation.

[27] EUR/RC66/Inf.Doc./4 Lessons learned from Member States assessments of Essential Public Health Operations
http://www.euro.who.int/__data/assets/pdf_file/0006/317994/66id04e_EPHOAssessments_160576.pdf?ua=1

Overall countries demonstrated a broad growing recognition of the importance of public health, with strong institutions and professionals advocating for programmes and policies that promote and protect population health and prevent disease. These professionals will build the foundation for leadership and momentum for change in the future.

7. A new vision for public health in the 21st century

Given the new thinking about health and health systems, where does public health fit in[28]? What is its role and contribution to health systems transformation?

Today public health remains an elusive and often contested concept. The term "population health" may be preferred by some, aiming to maximize value and equity for populations and individuals within them, and focusing on populations defined by common needs rather than on institutions, specialties and institutions[29]. This wish to take a perspective much broader than health care and medicine leads others to prefer terms such as "health improvement" and "health and well-being", which are nonexclusive and emphasize a broader approach than is sometimes perceived by the use of the term public health[30].

That said public health is a term that has long and wide usage, and will continue to be used in this paper. In simple terms it means just what the words say, namely the health of the public. It may be referred to as:

- an outcome of equitable improvements of health and well-being;
- a function embracing all of government and society to pursue this aim; and
- a set of specialist functions.

An outcome of equitable improvements of health and well-being

At the core of the concept of public health is the human right to health, which governments hold a duty and responsibility to pursue under international law. Governments are required to establish the equitable promotion of health and well-being as a function of governance for health, and to do this they need to provide functioning public health capacities and services and a functioning health system.

In this context how is public health and its contribution to the equitable improvement of health and well-being to be defined precisely? This paper uses the definition of public health first put forward by Winslow in 1920, adapted by Acheson in 1988, and used in both Health 2020 and EAP-PHS, namely "the science and art of preventing disease, prolonging life, and promoting health through the organized efforts of society".

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[28] Marks L, Hunter D J, Alderslade R. Strengthening Public Health Capacity and Services in Europe. World Health Organization. Copenhagen, 2011 http://www.euro.who.int/__data/assets/pdf_file/0007/152683/e95877.pdf

[29] How to Practice Population Medicine. Muir Gray JA. Offox Press 2016 http://www.offoxpress.com/how-to-practise-population-medicine.html

[30] See Chapter 2 Hunter DJ, Marks L, Smith KE (2010) *The Public Health System in England*, Bristol: The Policy Press.

This definition is widely although not universally accepted internationally and has important characteristics. It is generic and does not require any form of institutional mechanism; it refers to both science and art, describing public health as a combination of knowledge (always imperfect) and action; it reflects the core purposes of preventing disease, prolonging life and promoting health; and it emphasizes that public health is an organized, whole-of-society function. The definition roots public health as a function within the fabric of society and points to an inclusive approach to equitable health improvement pervading society, government and institutions in a way that we now know to be a strong contributing factor for human and societal growth and development.

A function of government and society

The public health function is then an organized, multisectoral, societal function, involving government as well as other dimensions of society (civil society, the media, and so on). Ultimately, because of the government's responsibility for the human right to health, the function rests with government. In practice leadership may be delegated to the ministry of health or another responsible organization or organizations.

It is far more than simply an expert, professional or service function. It must avoid being, or becoming, overly narrow and, while scientifically sound, it should avoid spurious scientism. The public health function should be an advocate for the paradigm shift towards a focus on health, well-being, health promotion and disease prevention, provide a strong and consistent voice on behalf of vulnerable populations and address health inequities.

The public health function needs a locus. It will be for Member States to decide where the leadership should lie, and at what level. Public health will be needed centrally, regionally and locally. The identity of the locus and the organization(s) will differ from country to country, depending on the context and other prevailing circumstances. National institutes of public health may play a major role, as centres of knowledge, expertise, research, post-graduate and continuing education, and capacity-building. Universities, schools of public health, medical schools and wider academia have similarly important roles to play, as do collaborative professional organizations working internationally. It is worth mentioning that some of these are already WHO collaborating centres.

However, for consistency with the horizontal, networked view of governance for health found in Health 2020, the responsible organization should be close to the decision-making levels of government of the country, working with different sectors and communities and with all determinants of health, and not merely close to the health system itself. Here the role of health ministers is crucial, with support from heads of state, presidents and prime ministers. Supportive civil service, public health functions, and capable intersectoral and interagency institutions and processes are also required.

A set of specialist functions within the health system

This broad public health function includes specialist capacity providing many technical public health services. These services provide a range of public, specific, organizational forms for delivering the 10 EPHOs in a given Member State.

The 10 EPHOs are shown in the Table below. They deal with the full range of determinants of health: genetic, political, social and economic, environmental, commercial, cultural and health system. This requires interconnected, horizontal and networked governance for health – open, collaborative and consensual.

There are overlaps with the wider public health function at the societal level (for example, health promotion tackling the social determinants of health) and with individual-level health and social services which have clear population as well as individual benefits (for example, immunization and screening services, health protection and the response to health hazards and emergencies, elements of the workforce serving both population and individual health objectives, and research).

The aim is the successful and equitable promotion of health and well-being as a matter of public policy. This requires stronger leadership and governance for health from the Ministry of Health and the health sector, whole of government, whole of society, and health in all policies approaches, and the genuine involvement of the productive sector. Also needed is alternative thinking on ways to define and pursue developmental objectives.

Conclusion: the public health functions to be establish ed are:

- *an organized societal commitment to the outcome of improved health and well-being at the highest level throughout society;*
- *the institutional commitment and capacity to create and sustain an organized, multisectoral, societal function, involving government as well as other dimensions of society (civil society, the media and others); and*
- *the commitment and resources to deliver a set of organized, specialized Essential Public Health Operations (EPHOs).*

Table 1. The 10 Essential Public Health Operations (EPHOS) grouped by functional category

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

Recommendation: public health should be seen as a desired societal outcome; a function of government and society informing whole-of-government, whole-of-society and health-in-all-policies approaches to equitable health improvement; and a specialist capacity providing a series of essential public health operations.

8. Implications for modern public health practice

The goals of public health practice will be the planning and organization of innovation and improvement strategies for health and well-being, as well as nurturing a learning system (a key component of systems theory) and a community of practice that can guide diverse actors, agencies and sectors towards common health-optimizing goals.

To achieve these goals modern public health must work in a horizontal and distributed way, identifying matters of public health concern and crafting the public health narrative. It must work effectively within a multisectoral framework. It must understand and work within the required components of governance, including transparency, accountability, participation, integrity and policy capacity. It must tackle health inequalities, focusing on promoting equality in health, and deal with all the determinants of health: political, commercial, social, environmental, genetic, systemic and cultural.

Much innovative practice has been developed at local and community levels, which offer opportunities for innovation in promoting upstream approaches and approaches that support a strong role for civil society. Implementation networks, such as the WHO European Healthy Cities Network, the Healthy Schools Network and the European Network for Workplace Health Promotion, create approaches to tackling the co-clustering of determinants in ways that may be more difficult to attain at the national level.

New challenges, such as the recent influx of migrants into Europe, have created agendas and opportunities for promoting public health action. Migration is one of the defining features of the 21st century, and progress can contribute to the achievement of the SDGs. Here much innovative practice has already been developed at the local level.

Conclusion: modern public health must work within a horizontal, networked environment, dealing with all the determinants of health, effectively engaging with other sectors and working within their agendas.

9. Today's public health workforce

Public health practice therefore needs a workforce with different qualifications and multidisciplinary skills. The question of who should comprise this public health workforce and how it should be best equipped and the type of leadership needed to deal with today's challenges, must be considered carefully by Member States. While, in one sense, everyone is involved, several studies[31],[32] have suggested three main groups in the multidisciplinary workforce: all those involved in the broad remit of public health practice; those with specific health-professional and clinical functions; and those institutionally trained, public health managers who can focus on the national burden of disease and provide the technical drive to deliver the EPHOs.

[31] Wider Public Health Workforce Royal Society for Public Health London 2015 http://www.rsph.org.uk/filemanager/root/site_assets/our_work/wider_public_health_workforce/rsph_widerworkforce_report_final.pdf

[32] Department of Health (2001) The report of the Chief Medical Officer's project to strengthen the public health function. London: Department of Health.

Skills will be needed in systems leadership, using influence rather than direct control, and coping with the often unforeseeable demands and pressures of complexity, ambiguity and paradox. Much of the authority of health leaders in the future will reside not only in their position in the health system, but also in their ability to convince others that health and well-being are highly relevant in all sectors. Such leadership will have the capacity to work across sectors and be adaptive. It will make use of modern public health approaches, demonstrating skills in needs assessment, impact assessment and the creation and use of information, evidence and capacities in evaluation.

As noted earlier, soft skills, such as relationship-building, influencing, negotiating and political astuteness, will be important, although they are often the hardest to acquire and deploy effectively. Leadership will be not only individual, but also institutional, collective, community-centred, place-based and collaborative within supportive national and international networks.

The acquisition of today's public health competencies has considerable implications for training and development, involving broad-based undergraduate, postgraduate and on-the-job training. Competency-based models of thinking about the capacities and training of the workforce need to be developed. Public health needs to be an attractive career option.

Schools of public health have an important role to play in familiarizing students with the vision, aims, objectives and main fields of public health action, including the UN 2030 and Health 2020 agendas, and creating a wide range of educational opportunities for the expansion of health literacy and understanding among both health professionals and the public. The suggested Framework for Action towards a Sustainable Workforce in the WHO European Region (RC67) and the Agenda for Action on the public health workforce in the WHO Regional Office are taking this work forward.

Also required are new generations of public health scientists and researchers to focus on today's public health priorities, integrating risk factor epidemiology with broader platforms of ecological and environmental assessments[33], and illuminating the mechanisms through which risk factors are operative[34].

Conclusion: today's public health workforce should be broadly based, and needs new and refashioned skills to succeed and work within the complex and multifaceted environment of the 21st century.

10. Institutional implications for Member States

Countries are already seeking to strengthen institutional mechanisms and practices for health at both national and local levels. The mid-term reviews of Health 2020 and the EAP-PHS for RC 66 provide a more detailed overview of implementation since 2012. Further efforts to encourage and strengthen implementation of both policy frameworks offer the possibility of an even more determined approach, to operational implementation, at Regional, Member State and local levels.

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[33] Krieger N, Methods for the scientific study of discrimination and health: an ecosocial approach. Am J Public Health 2012; 102 (5); 963-44

[34] Petersen ML, Sinisi SE, van de Laan MJ. Estimation of direct causal effects. Epidemiology 2006; 17 (3): 276-84

Policies and institutional mechanisms for the equitable improvement of health and well-being may be considered at two levels: i) an overall national SDG inspired developmental level – including health and well-being as a priority both in the government program as well as in the national development plan - normally chaired by the President or Prime Minister or their delegate and ii) the health level – including integrated health policy development as well as technical issues such as NCD, IHR, tobacco, AMR etc. normally chaired by the Minister of Health and supported by PM or his deputy.

In this context countries will wish to strengthen the public health function and the contribution and delivery of public health practice, in accordance with the EAP-PHS, taking account of the perspectives for public health development outlined in this paper.

Conclusion: countries will continue to develop their SDG and Health 2020 health policy context, as well as their institutional mechanisms to support whole of government, whole of society and health in all policies approaches, whilst strengthening the public health function and public health practice.

11. Institutional implications for the WHO European Region

Health 2020 has already been established as the instrument binding together the work of the Regional Office. With the degree of alignment and integration acknowledged between the SDGs, Health 2020 and the EAP-PHS the European Regional Office is now well placed to become a leading European focus of expertise and practice towards realizing modern 21st century public health.

The Regional Office has recognized that public health provides a coherent perspective linking all of its work. The Regional Office is a public health organization, and its multidisciplinary staff are in the broad sense public health practitioners. Public health may be seen as a connecting horizontal thread running through and across all of the Office, onto which individual programmes and technical areas dealing with the various determinants of health are associated.

Needed are integrated approaches to SDG, Health 2020 and EAP-PHS implementation, using UN systems and processes accordingly, to integrate health into national development thinking and planning. To achieve this goal coherence across the Office between technical areas, and approaches and mechanisms of work, is needed.

This approach should emphasize a more consistent and integrated approach to assisting Member States implement the SDGs, Health 2020 and the EAP-PHS, and helping with health policy development at both national and local levels.

In response to increasing demand from countries to facilitate multisectoral action for health in a comprehensive and coordinated way, the organizational structure in the Regional Office and WHO Country Offices has already been aligned with expertise in the social, economic and environmental determinants of health, health equity and good governance being brought together within PCR, which also hosts work on the SDGs.

In addition, an Internal Task Force has been established within the Office to align work on the SDGs, H2020 and its components, as well as the EAP –PHS together, also working closely with other divisions which house the various determinants to ensure their co-clustering.

Conclusion: 21st Century public health provides a coherent and inclusive frame of reference for the institutional development of the WHO European Regional Office as a public health organization. Much work has already been done to align to work of the Office across the determinants of health.

12. Conclusion

Health 2020 is a health policy, fully integrated and consistent with the Sustainable Development Goals. The implementation of both the SDGs and Health 2020 require focusing on all the determinants of health: political, commercial, social, environmental, genetic, systemic and cultural, in a coordinated and integrated way, and the achievement of policy coherence through whole of government, whole of society and health in all policies approaches.

National health policies, strategies and plans informed by the SDGs and Health 2020 are vital to achieving health improvement. Every country needs to plan health development within its overall SDG-informed development goals, and to identify investment priorities that will have the greatest potential impact on health and well-being.

The elusive concept of public health needs to be better understood. It faces complex political, social, economic and environmental challenges, to which multisectoral responses are required, involving both vertical and horizontal integration. The goals of public health practice will the promotion of health and well-being overall, focusing on promoting equality in health, the planning and organization of innovation and improvement strategies for health and well-being, as well as nurturing a learning system and a community of practice that can guide diverse actors, agencies and sectors towards common health-optimizing goals.

To achieve these goals modern public health must work in a horizontal and distributed way, identifying matters of public health concern and crafting the public health narrative. It must work effectively within a multisectoral framework. Public health, as a function of society, needs an institutional base or bases, and the services and capacities described in EAP-PHS and the EPHOs

Public health provides a coherent and inclusive frame of reference for the institutional development of the WHO European Regional Office as a public health organization.