

COMMENTARY

Open Access



A call for action to establish a research agenda for building a future health workforce in Europe

Ellen Kuhlmann^{1,2*} , Ronald Batenburg³, Matthias Wismar⁴, Gilles Dussault⁵, Claudia B. Maier⁶, Irene A. Glinos⁴, Natasha Azzopardi-Muscat^{7,8}, Christine Bond⁹, Viola Burau¹⁰, Tiago Correia¹¹, Peter P. Groenewegen^{3,12,13}, Johan Hansen³, David J. Hunter¹⁴, Usman Khan¹⁵, Hans H. Kluge¹⁶, Marieke Kroezen¹⁷, Claudia Leone¹⁸, Milena Santric-Milicevic¹⁹, Walter Sermeus²⁰ and Marius Ungureanu²¹

Abstract

The importance of a sustainable health workforce is increasingly recognised. However, the building of a future health workforce that is responsive to diverse population needs and demographic and economic change remains insufficiently understood. There is a compelling argument to be made for a comprehensive research agenda to address the questions. With a focus on Europe and taking a health systems approach, we introduce an agenda linked to the 'Health Workforce Research' section of the European Public Health Association. Six major objectives for health workforce policy were identified: (1) to develop frameworks that align health systems/governance and health workforce policy/planning, (2) to explore the effects of changing skill mixes and competencies across sectors and occupational groups, (3) to map how education and health workforce governance can be better integrated, (4) to analyse the impact of health workforce mobility on health systems, (5) to optimise the use of international/EU, national and regional health workforce data and monitoring and (6) to build capacity for policy implementation. This article highlights critical knowledge gaps that currently hamper the opportunities of effectively responding to these challenges and advising policy-makers in different health systems. Closing these knowledge gaps is therefore an important step towards future health workforce governance and policy implementation. There is an urgent need for building health workforce research as an independent, interdisciplinary and multi-professional field. This requires dedicated research funding, new academic education programmes, comparative methodology and knowledge transfer and leadership that can help countries to build a people-centred health workforce.

Keywords: Health workforce research, Health workforce policy, Health workforce governance, Human resources for health, Health professions, Skill mixes, Integrated care, Health workforce mobility, Europe

Background

The health workforce is central to health system performance and to population health, and is critical to quality of care and patient safety. Additionally, it has an enormous economic significance and directly impacts on economic growth [1], accounting for more than 10% of

total employment in several Organisation of Economic Co-operation and Development (OECD) countries [2]. Better healthcare increases the potential productive life years, reduces unemployment and productivity loss due to chronic illness, and avoids premature labour market exit, hence decreasing social benefit expenditures [2]. The importance of better healthcare policy and governance to achieve a competent and sustainable health workforce is increasingly recognised in Europe [3–10]. This is now also supported by improved data sources as well as by international recommendations and frameworks for action [1, 2, 11–16]. However, many challenges remain.

* Correspondence: kuhlmann.ellen@mh-hannover.de; ellen.kuhlmann@ki.se

¹Institut für Epidemiologie, Sozialmedizin und Gesundheitssystemforschung, Medizinische Hochschule Hannover, OE 5410, Carl-Neuberg-Str. 1, 30625 Hannover, Germany

²Karolinska Institutet, Medical Management Centre, LIME, Tomtebodavägen 18a, 171 77 Stockholm, Sweden

Full list of author information is available at the end of the article



Stronger evidence-informed policies are needed as all European countries struggle to sufficiently prepare their workforce to effectively respond to socio-demographic changes and an increase in chronic non-communicable diseases (NCDs) and multi-morbidity. In many countries, the health workforce is also threatened by shortages [15, 17], and some countries have been affected by austerity politics which reduced the number of health workers employed, deteriorated working conditions, and in some cases led to emigration [18, 19]. These conditions call for population and system-specific approaches and greater attention to diversity and contexts. There are also sector-specific workforce needs to respond to the reconfiguration of hospitals, the strengthening of primary healthcare, and an increasing focus on mental health, social, long-term, and end of life care. At the same time, the inter-dependence of health systems with regards to health workforce planning calls for improved coordination and integration between countries and between national healthcare systems, sectors, providers and professional groups [20–22].

We, a group of health workforce researchers from different institutions and European countries and with different professional backgrounds, argue that there is a need for action to step-up efforts to improve health workforce governance and leadership and address knowledge gaps through research. Closing these knowledge gaps is an important step towards more effective health workforce governance and policy implementation. We introduce a complex research agenda that is closely linked to a new ‘Health Workforce Research’ section of the European Public Health Association. With a focus on Europe and taking a health system and governance approach, six major objectives have been identified as follows: (1) to develop frameworks that align health systems/governance and health workforce policy/planning, (2) to explore the effects of changing skill mixes and competencies across sectors and occupational groups, (3) to map how education and health workforce governance can be better integrated, (4) to analyse the impact of health workforce mobility on health systems, (5) to optimise the use of international/European Union (EU), national and regional health workforce data and monitoring, and (6) to build capacity for policy implementation.

In our overview below, we highlight critical knowledge gaps at different levels of health workforce governance and in different policy areas and professional groups. These persisting gaps seriously hamper the efforts of policy-makers seeking evidence-informed responses to implement health workforce governance and policy reforms more successfully. We therefore believe it is time to define health workforce research in Europe as a priority academic field within the wider health systems research agenda, bringing together knowledge and research in a

systematic and comprehensive way, and developing effective problem-oriented knowledge transfer and leadership. This can ensure that policy-makers have access to the best evidence available on what the challenges are, which policy options can be envisaged, and how to increase the probability of successful implementation.

Challenges to health workforce policy and relevant research gaps

Knowledge about concepts and tools for health workforce policy have significantly improved [6–8, 15, 23]. We also know what is driving change in the supply, need and demand for health workers, and what strategies could improve people-centred health workforce planning and governance [1, 2, 16, 24–26]. It is also increasingly recognised that workforce change goes far beyond mere numbers and shortages. The drivers are highly complex and include, among others, stronger primary care and integrated care policies which may lead to new connections between health and social care and involvement of informal carers, new technologies (eHealth, robots, etc.) and improved health literacy to respond to changing expectations of the public and strengthen user participation [11, 26].

However, understanding how to meet the new demands and needs for integration and participation in healthcare systems that are fundamentally built on ‘silo approaches’ and a hierarchical structure remains a challenge. These approaches are relevant on all levels of healthcare governance and shape the content of policy reforms, service organisation and professional practice; they are strongly embedded in the education and organisation of the health workforce. Moreover, occupational categories based on silos inform health workforce governance and planning as well as research, despite some novel approaches and European comparative research, such as the recent OECD feasibility study on skills assessment, which seeks to focus on tasks and functions rather than occupational categories [11]. Knowledge is poorly developed with regards to the policy levers for successfully implementing innovative and transformative actions and interventions, as well as the tools and channels through which to foster dissemination of this knowledge and provide advice for policy-makers. More specifically, the six major objectives previously mentioned and the critical knowledge gaps will be discussed in greater detail below.

Develop frameworks that align health systems/governance and health workforce policy/planning

Bringing a health systems and governance approach to health workforce research is a priority goal to better understand the multi-level, multi-professional and multi-sectoral conditions of successful policy development and implementation. The recent high-level regional meeting on NCDs, led by the WHO Regional Office for

Europe, has highlighted the relevance of a health systems approach: “*Workforce policy and planning, regulation and management are aligned with service planning and delivery, and support integrated teams rather than isolated individual health professionals, effectively addressing NCDs at all levels of service*” ([9], p. 6). A skills assessment by OECD has added further evidence “*for a systems-relevant approach*”, because “*the existing skills assessment instruments do not readily enable differentiation between the skills mismatch caused, on the one hand, by the inadequacies of the education and training system or, on the other hand, by the inadequacies of competing pressures in the health system*” ([11], p. 69). A recent statement for the consultation of the next EU Research and Innovation Programme on behalf of the European Public Health Association section ‘Health Workforce Research’ has additionally addressed the need for differentiation between the levels of systems, sectors, professions and individuals, and introduced suggestions for research [27].

While knowledge and tools have been improved significantly, still little is known on how to implement these tools in a variety of healthcare systems. What works, in which settings, why and how is not always well understood. Moreover, even if we know what could be done to create a more sustainable and people-centred health workforce [1, 15, 16, 24], we often do not know how to make it happen. Strategic leadership, change management, and effective knowledge transfer and brokering remain major challenges that often block successful implementation of policy reforms [28–32]. This is especially true for multi-professional environments and trans-sectoral care delivery. Currently dominant health workforce planning and governance models are still shaped by a uni-professional ‘silo’ approach, which does not take into account the evolving roles of the different professions and does not respond to changing population needs.

Another problem is that little comparative health workforce research is available that takes a broader perspective [33]. Health system research and comparative health policy is primarily built on economic indicators, especially financial expenditures [34–36], while human resources are usually either ignored or reduced to the numbers of doctors (and sometimes also nurses). Accordingly, we do not know how a successful integrated, people-centred health workforce planning model or an effective governance tool in one healthcare system plays out in another.

This brings the importance of a whole health systems approach into play, which enables the formulation of an overarching strategy to ensure higher effectiveness in health workforce policy and governance. It offers a practical way to strengthen health systems through a ‘systems thinking’ lens by making complex issues better understood. This helps to explain not only what works (or does not work), but for whom and under what circumstances

[37, 38]. Further benefits of systems thinking include the capacity to promote dynamic networks of diverse stakeholders, to inspire continued learning, and to foster more system-wide planning, evaluation and research [38]. Therefore, research on the connections between health systems and governance models and the health workforce is an overarching priority issue and an important factor to enhance policy learning and translation between countries.

Explore the effects of changing skill mixes and competencies across sectors and occupational groups

There is increasing evidence of the benefits of the professional development of nurses in new roles [39–47]. The benefits of stronger primary healthcare systems through the scaling-up of the role of general medical doctors in relation to specialists and of the delegation of tasks from doctors to nurses and other healthcare professionals, as well as better workforce planning are now also documented [9, 23, 26, 48–50]. Nevertheless, Maeda and Sotcha-Dietrich, in their recent skills assessment [11], highlighted the need for assessing tasks and functions rather than specific professional categories.

Furthermore, not enough attention has been given thus far to the composition of the health workforce, and the capacity and competencies of middle- to lower-qualified professional groups to innovate in service provision nor of the barriers that prevent them from doing so. It is also important to understand that health workforce needs may be different in hospital care, primary care, community or long-term care and in specific areas like rehabilitation [51] or public health [52]. Furthermore, there are significant differences and high variation in the composition of health workforces in Europe [33, 49, 53–56]. Whilst some of these particularities can be traced back to historical development, the underlying reasons and driving forces that create and perpetuate these differences remain largely unknown. We therefore do not know how to effectively utilise skill mixes in different healthcare systems and how to establish an approach which moves beyond the professional silos [11], underlining the need for a health systems approach [21, 27].

Furthermore, an increase in NCDs resulting in chronic conditions and in multi-morbidity [9, 10] has strengthened the demand for primary care and elder/long-term care services. A more integrated approach between health and social care is therefore a priority goal to serve the multifactorial needs of this population. However, this is one of the most under-researched areas. Research is also needed to overcome professional boundaries, to coordinate provider organisations and financing systems across sectors, and to promote the development of new skills and competencies of health professionals to effectively respond to patient needs [16, 23, 57, 58].

Map how education and health workforce governance can be better integrated

The strengthening of education and training programmes is the foundation of future health workforce governance and a key to better prepare health professionals for people-centred and integrated, team-based care provision. Whilst many now pay lip service to this, interprofessional education is still not fully and meaningfully integrated into current educational and continuous professional development/learning programmes; instead, uni-professional competency frameworks often remain influential (e.g. [59]). Research has revealed a need for a health systems approach to transform the educational systems [60, 61]. A health systems approach directs our attention to cross-sectoral governance of health and education systems and calls for integration and coordination to overcome the ‘professional silos’ in healthcare [7, 11, 62].

Better integration is also needed in relation to the entire range of available health human resources. Efforts must be strengthened to improve the inclusion of new labour market groups, such as older health professionals, migrants and men in caring professions, and to increase the participation of women in leadership positions. For instance, Europe’s gender mainstreaming policy [63] is still poorly connected to health workforce education and research [64]. Notably, academic health centres in different EU countries show a persisting gender gap in leadership and management positions, which is bigger in academia than in hospitals [65]. Improved standardisation of health professional education across European countries [66] and an expansion of the recognition of qualifications of provider groups such as, for instance, physiotherapists, social workers and public health professionals, and non-academically qualified groups (e.g. physician/medical assistants, nursing assistants), is also important.

Analyse the impact of health workforce mobility on health systems

Migration and mobility of health professionals have significantly increased over recent years and have rendered health systems performance subject to inter-dependencies beyond national borders. Given that mobility of persons is a founding principle of the EU, there is a special responsibility in taking the leadership in developing mechanisms to monitor the mobility of health professionals and its effects. A major challenge is to reduce inequality between EU Member States and counterbalance the risks of push-pull factors that benefit the resource-rich countries and threaten the healthcare systems in some Eastern and Southern European countries [18, 19, 67–74]. These factors are also relevant within countries and may create health workforce shortages in rural and remote areas [75].

While many recruitment and retention interventions have been developed to improve the geographical maldistribution of health professionals [17, 71], very little is known about their effectiveness. This is true for the micro-level, the experiences and deployment of health-care workers in the destination countries [69, 76], and for macro-level policy interventions. Notably, the effects of structured mobility programmes in addressing health workforce retention and providing improved access to specialised health services across Europe remain largely unexplored [77]. The high context-dependency of recruitment and retention needs and interventions [17, 25, 75], again emphasises the need for a health systems and multi-level governance approach, that can identify facilitators and barriers in different areas.

Existing maldistribution and growing inequity concerns in the EU call for new strategies to govern mobile health workers more effectively across countries, while at the same time respecting free mobility [19]. It is also important that Europe shares a global responsibility and improves the monitoring of the international workforce flows especially from resource-poor countries. This also includes better knowledge of the recruitment strategies in resource-rich countries, the individual motivation of health workers, and the opportunities for improving equity and solidarity [19]. The Global Code of Practice on International Recruitment of Health Personnel [78] and the introduction of ‘circular migration’ in health workforce policies [8] may be useful tools to mitigate negative effects. Yet more has to be done at the EU level, for instance, greater attention to the health workforce in the European Semester [79] and other economic steering tools and structural funds; there is also a need for greater responsibility to prevent ‘brain drain’ of health workers in resource-poor countries in the global South and small islands developing states, which are particularly vulnerable to health workforce ‘brain drain’ and ‘care drain’.

Optimise the use of international/EU, national and regional health workforce data and monitoring

Data sources are the basis of health workforce planning. Analyses have been significantly improved over recent years [12, 15], yet major problems remain. International, national and regional data sources are still poorly integrated, and the opportunities of more detailed regional data sources are not used effectively. On top of this, there remains a wide variation in indicator definitions, registration methodologies and data availability. The situation is worst when it comes to nurses, therapists and public health professionals as well as lower-level qualified occupations (e.g. nursing assistants, medical assistants), yet these are precisely the groups with high capacity for transforming service delivery. Even new titles of higher-qualified nurses may mean different things

in different countries, as for instance ‘nurse practitioner’ or ‘advanced practice nurse’. Qualitative health workforce indicators are overall in a developmental stage and usually not measured, as for instance, competencies and team-based skills [20]. These conditions hamper the use of data in workforce planning and to inform policy-makers and create major problems for international comparative research [2, 15, 34].

Furthermore, planning and monitoring are primarily concerned with highly qualified, academically trained health professionals, especially doctors, and more recently also nurses, while comprehensive data on other occupational groups are often lacking [80]. Professional ‘silo’ approaches are still dominant, while little attention is paid to standardised measurements of teams and the occupational composition of the health workforce [11, 55]. This has been addressed to some degree by the most recent Joint Questionnaire and Health Workforce Account programmes of the OECD/EUROSTAT/WHO [81, 82]. Hence, the current need remains to obtain reliable data to inform integrated health workforce planning, to improve cross-country comparative approaches and to set up more comprehensive monitoring systems that are responsive to changing health workforce needs as well as to the needs of different countries. The challenge is to fully include the large and small, centralised and decentralised/federalist/community-based, and resource-rich and resource-poor countries, as well as their urban and remote/rural regions.

Build capacity for policy implementation

The implementation of new health policies and planning models is the yardstick of capacity-building for a future health workforce, yet knowledge is particularly lacking in this area. Greater attention to the ways in which the health workforce is governed and new health policies and reform models are implemented, monitored and evaluated are therefore among the most urgent issues [20, 21, 83, 84]. This leads us back to the need for bringing a health systems and governance approach to the health workforce [9, 11, 21, 27]. One particularly important strategy is the strengthening of stakeholder involvement. A recent study of the European Observatory on Health Systems and Policy has introduced a systematic framework for assessing the outcomes of healthcare governance, which also improves the opportunities for cross-country comparison of health workforce governance. This assessment tool comprises five major dimensions, namely transparency, accountability, participation/stakeholder involvement, integrity and capacity of governance approaches – the ‘TAPIC’ framework [84].

When applied to the health workforce, strengthening participatory approaches and stakeholder involvement may help to connect bottom-up and top-down developed policy solutions, to facilitate capacity-building for

integrated and sustainable health workforce planning, and to develop cost-effective monitoring systems. Stakeholder involvement may reduce sectoral fragmentation and other governance gaps at the macro-level; useful practical tools are, for instance, multisectoral planning groups, shared budgets, interprofessional learning and multi-professional networks [22, 49, 85]. However, the transformative capacity of stakeholder involvement does not come without conditions. It is strongly shaped by health system characteristics; for instance, conservative corporatist arrangements may promote the medical profession more than other health professions, and new public management may prioritise organisational interests over people-centred care [86].

Furthermore, professional groups have primarily been researched as ‘tribes’ that narrowly defend their professional boundaries and interests, and therefore counteract integrated service provision and people-centred care. Yet, the health professions are also serving patients and the public. Little attention has been paid so far to their capacity to develop new competencies and innovate service provision according to patient needs and to their role as policy experts [87]. To foster innovation in health workforce governance more systematically, a better understanding of professional stakeholder involvement – and more generally of effective governance [84, 85] – is needed.

Conclusions

This brief overview has highlighted important knowledge gaps and introduced major objectives for health workforce policy in Europe. The knowledge gaps cannot be solved effectively by simply collecting ‘more of the same’ data. There is a need for establishing a comprehensive research agenda, which includes new comparative methodological and theoretical approaches [27], and a better understanding of leadership, implementation processes and policy levers for creating an integrated people-centred health workforce in diverse healthcare systems and sectors [1, 16]. This also highlights the importance of different institutional and political contexts, and the lack of knowledge on what works well in which context. One important step forward can be to bring a health systems approach to the health workforce, which pays greater attention to convergence and divergence of health workforce needs and explores opportunities for governance innovation and stakeholder involvement in context, and for new assessment approaches [11, 26, 84, 85].

We have also shown that critical knowledge gaps exist at different levels of health workforce governance and in different policy areas, sectors and professional groups. These gaps hamper the opportunities of advising policy-makers on how to develop and govern a health workforce that is both quantitatively and qualitatively able to support the needs and demands being made on health systems as well

as to implement policy reforms that allow health system performance and sustainability to improve. If we agree that there is ‘no health without a workforce’ [13], then the next step must be to close these knowledge gaps and advance problem-oriented research [21, 88]. The occupational structure of healthcare is inherently conservative, but various opportunities for change are currently emerging, among others, in the education systems, more integrated service and people-centred (persons, patients, users, populations) delivery models, new technologies, and new emergent roles of professional groups [9–11, 26, 44, 83, 89, 90]. These opportunities must be explored and aligned more systematically to enhance transformative powers.

Ultimately, producing knowledge is an important step, but on its own it is not enough. In order to build an integrated future health workforce, knowledge transfer, knowledge brokering and leadership must be developed in such a way that they solve problems and serve the needs of diverse health systems and populations. These complex demands cannot be addressed only within the current landscape of pilot studies and opportunity-driven ad-hoc responses to research calls. What is needed is a comprehensive research programme that connects the different disciplines and theoretical and methodological approaches involved in health workforce research. There is therefore an urgent need for building a health workforce as an independent, interdisciplinary and multi-professional field with better funding resources, new academic education programmes, comparative methodology, and knowledge transfer and leadership. This will help countries to build a people-centred health workforce.

Abbreviations

EU: European Union; NCDs: Non-communicable Diseases; OECD: Organisation of Economic Co-operation and Development

Acknowledgements

This Call for Action is closely linked to the European Public Health Association (EUPHA) and its new section ‘Health Workforce Research’. The idea was first developed during a pre-conference and two workshops at the EUPHA Conference in November 2016 in Vienna and further investigated at the EUPHA Conference in November 2017. We wish to thank all participants for inspiring discussions and for sharing ideas and knowledge.

Disclaimer

The views expressed are those of the authors and not necessarily of the authors’ organisations and funders.

Authors’ contributions

EK had the idea and drafted the manuscript with major contributions from RB, MW, GD, CBM, and IAG; all other authors have commented on the draft; EK revised the manuscript following a consultation with co-authors and major support from NAM, RB and CB. All authors have read and approved the final version.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

All authors declare that they have no competing interests. NAM is President of EUPHA, MW is a senior policy analyst and IAG is a researcher at the European Observatory on Health Systems and Policies. UK is Director of the European Health Management Association and HHK is Director of the Division of Health Systems and Public Health, WHO Regional Office for Europe.

Publisher’s Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Author details

¹Institut für Epidemiologie, Sozialmedizin und Gesundheitssystemforschung, Medizinische Hochschule Hannover, OE 5410, Carl-Neuberg-Str. 1, 30625 Hannover, Germany. ²Karolinska Institutet, Medical Management Centre, LIME, Tomtebodavagen 18a, 171 77 Stockholm, Sweden. ³Netherlands Institute for Health Services Research, Otterstraat 118-124, 3513 Utrecht, The Netherlands. ⁴European Observatory on Health Systems and Policies, Place Victor Horta/Victor Hortaplein, 40/10, 1060 Brussels, Brussels, Belgium. ⁵Global Health and Tropical Medicine & WHO Collaborating Center on Health Workforce Policy and Planning, Institute of Hygiene and Tropical Medicine-NOVA University of Lisbon, Rua da Junqueira 100, 1349-008 Lisbon, Portugal. ⁶Department of Healthcare Management, Technische Universität Berlin, Strasse des 17. Juni 135, 10623 Berlin, Germany. ⁷Department of Health Services Management, Faculty of Health Science & WHO Collaborating Centre for Health Systems and Policy in Small States at the Islands and Small States Institute, University of Malta, Msida, MSD 2080, Malta. ⁸European Public Health Association (EUPHA), Utrecht, Netherlands. ⁹Christine Bond, Institute of Applied Health Sciences, University of Aberdeen, Foresterhill, Aberdeen AB25 ZD, United Kingdom. ¹⁰Department of Public Health, University of Aarhus, Bartholins Allé 2, 8000 Aarhus C, Denmark. ¹¹ISCTE-Instituto Universitário de Lisboa, School of Sociology and Public Policies, Avenida das Forças Armadas, 1649-026 Lisbon, Portugal. ¹²Department of Sociology, Utrecht University, Heidelberglaan 2, 3584, CS, Utrecht, The Netherlands. ¹³Department of Human Geography, Utrecht University, Heidelberglaan 2, 3584, CS, Utrecht, The Netherlands. ¹⁴Institute of Health and Society, Newcastle University, Newcastle, United Kingdom. ¹⁵European Health Management Association (EHMA), Rue Belliard 15-17, 1040 Brussels, Belgium. ¹⁶Division of Health Systems and Public Health, WHO Regional Office for Europe, Marmorvej 51, 2100 Copenhagen, Denmark. ¹⁷Department of General Practice, Erasmus University Medical Center Rotterdam, Wytemaweg 80, 3015, CN, Rotterdam, The Netherlands. ¹⁸Florence Nightingale Faculty of Nursing and Midwifery, King’s College London, 57 Waterloo Road, SE1 8WA London, United Kingdom. ¹⁹Institute of Social Medicine, Faculty of Medicine University of Belgrade, Dr Subotica, Belgrade 15 11000, Serbia. ²⁰KU Leuven Institute for Healthcare Policy, Kapucijnenvoer 35 blok d – box 7001, 3000 Leuven, Belgium. ²¹Department of Public Health, College of Political, Administrative and Communication Sciences, Babeş-Bolyai University, 7 Pandurilor Street, 400376 Cluj-Napoca, Romania.

Received: 16 August 2017 Accepted: 5 June 2018

Published online: 20 June 2018

References

1. UN High-Level Commission on Health Employment and Economic Growth. Working for Health and Growth: Investing in the Health Workforce. New York: United Nations; 2016.
2. OECD. Health at a Glance in Europe. Paris: OECD; 2016. <http://www.oecd.org/health/health-at-a-glance-europe-23056088.htm>. Accessed 3 Aug 2017
3. Azzopardi-Muscat N, Funk T, Buttigieg SC, Grech KE, Brandt H. Policy challenges and reforms in small EU Member States health systems: a narrative literature review. *Eur J Pub Health*. 2016;26(6):916–22.
4. European Commission Staff Working Document on an Action Plan for the EU Health Workforce. Strasbourg; 2012 18.4.2012. Report No.: Contract No.: SWD(2012) 93 final.
5. Hansen J, Schäfer W, Black N, Groenewegen PP. European priorities for health care organizations and service delivery. *J Health Serv Res Policy*. 2011;16(Suppl 2):16–26.

6. JAHWF – Joint Action on Health Workforce Planning and Forecasting. Handbook on Health Workforce Planning Across EU Countries. Brussels: European Commission; 2015.
7. JAHWF – Joint Action on Health Workforce Planning and Forecasting. Future Skills and Competencies of the Health Workforce in Europe: Horizon Scanning. WP6, Centre for Workforce Intelligence; 2016. <http://www.healthworkforce.eu>. Accessed 3 Aug 2017.
8. JAHWF – Joint Action on Health Workforce. Planning Circular Migration of the Health Workforce. WP7, Catholic University of Leuven, Belgium, and Medical University of Varna, Bulgaria; 2016.
9. World Health Organization Regional Office for Europe. High-Level Regional Meeting: Health Systems Respond to NCDs: Experience of the European Region, Sitges, Spain, 16–18 April 2018. Briefing Note for Presenters and Panellists. Copenhagen: WHO; 2018. http://www.euro.who.int/__data/assets/pdf_file/0007/366766/HSS_NCD_briefing_note_eng.pdf?ua=1. Accessed 22 May 2018
10. Euro Health. WHO Regional Office for Europe High-Level Meeting: health systems respond to NCDs. Euro Health. 2018;24(1 Special Issue):1–36.
11. Maeda A, Socha-Dietrich K. Feasibility Study on Health Workforce Skills Assessment: Supporting Health Workers Achieve Person-Centred Care. Paris: OECD; 2018. <http://www.oecd.org/els/health-systems/Feasibility-Study-On-Health-Workforce-Skills-Assessment-Feb2018.pdf>. Accessed 22 May 2018
12. Batenburg R. Comparing health workforce planning in the European Union. Health Policy. 2015;119(12):1537–44.
13. Campbell J, Dussault G, Buchan J, Pozo-Martin F, Guerra Arias M, Leone C, Siyam A, Cometto G. A Universal Truth: No Health Without a Workforce. Forum Report, Third Global Forum on Human Resources for Health, Recife, Brazil. Geneva: Global Health workforce alliance and World Health Organization; 2013. <http://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/>. Accessed 3 Aug 2017
14. Lafortune G, Schoenstein M, Moreira L. Trends in health labour markets and policy priorities to address workforce issues. In: OECD, editor. Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places, OECD Health Policy Studies. Paris: OECD; 2016. p. 37–61.
15. OECD. Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places. OECD Health Policy Studies. Paris: OECD; 2016. <https://doi.org/10.1787/9789264239517-en>. Accessed 3 Aug 2017
16. World Health Organization. WHO Global Strategy on Human Resources for Health: Workforce 2030; 2016. <http://who.int/hrh/resources/globstrathrh-2030/en/>. Accessed 3 Aug 2017.
17. Kroezen M, Dussault G, Craveiro I, Dieleman M, Jansen C, Buchan J, et al. Recruitment and retention of health professionals across Europe: a literature review and multiple case study research. Health Policy. 2015;119(2):1517–28.
18. Dussault G, Buchan J. The economic crisis in the EU: impact on health workforce mobility. In: Buchan J, Wismar M, Glinos IA, Bremner J, editors. Health Professional Mobility in a Changing Europe. Copenhagen: WHO; 2014. p. 35–64.
19. Glinos IA, Wismar M, Buchan J, Rakovak I. How Can Countries Address the Efficiency and Equity Implications of Health Professional Mobility in Europe? Adapting Policies in the Context of the WHO Code and EU Freedom of Movement. Policy Brief. Copenhagen: WHO; 2015.
20. Kuhlmann E, Batenburg R, Groenewegen PP, Larsen C. Bringing a European approach to the health human resources debate: a scoping study. Health Policy. 2013;110:6–13.
21. Kuhlmann E, Batenburg R, Dussault G. Guest Editorial. Health workforce governance in Europe: where are we going? Health Policy. 2015;119(12): 1515–6.
22. Greer SL, Wismar M, Kosinska M. Towards intersectoral governance: lessons learned from health system governance. Public Health Panorama. 2015;1(2): 111–204.
23. World Health Organization Regional Office for Europe. European Framework for Action on Integrated Health Services Delivery: An Overview; 2016. http://www.euro.who.int/__data/assets/pdf_file/0010/317377/FFA-IHS-service-delivery-overview.pdf?ua=1. Accessed 3 Aug 2017.
24. Maeda A. Health Workforce Skills Assessment Survey – Feasibility Study (2016–17). Paris: OECD. https://ec.europa.eu/health/workforce/events/20161122_de. Accessed 3 Aug 2017
25. Dussault G, Buchan J, Sermeus W, Padaiga Z. Assessing Future Health Workforce Needs. Policy Summary 2. Copenhagen: WHO, on behalf of European Observatory on Health Systems and Policies; 2010.
26. Wismar M, Glinos IA, Sagan A, editors. Patients, peers, professionals: Skill-mix innovations and developments in primary and chronic care settings. Brussels: European Observatory on Health Systems and Policy; 2018.
27. Kuhlmann E, Groenewegen PP, Batenburg R, on behalf of the EUPHA HWR section. Why Europe Needs Stronger Health Workforce Research. Consultation for the Next EU Research and Innovation Programme, Statement on Behalf of the European Public Health Association (EUPHA) Section 'Health Workforce Research'. Utrecht: EUPHA; 2018. https://eupha.org/repository/advocacy/EU_Consultation_2018-HWR_statement_for_circulation.pdf. Accessed 22 May 2018
28. Holmes BJ, Best A, Davies H, Hunter D, Kelly MP, Marshall M, Rycroft-Malone J. Mobilising knowledge in complex health systems: a call to action. Evidence Policy. 2017;13(3):539–60.
29. Hunter D. Health system transformation: engaging professions to make it happen. Eur J Pub Health. 2016;26(Suppl 1):166.
30. Kluge HH. Priorities for strengthening people-centred health systems. Euro Health. 2016;22(2):4–6.
31. World Health Organization. Health System Transformation: Making it Happen. Copenhagen: World Health Organization; 2016.
32. World Health Organization. Action Plan to Strengthen the Use of Evidence, Information and Research for Policy-Making in the WHO European Region. Regional Committee for Europe 66th Session, 12–15 September. Copenhagen: World Health Organization; 2016.
33. Blank RH, Burau V, Kuhlmann E. Comparative Health Policy. 5th ed. Basingstoke: Palgrave; 2017.
34. Burau V, Blank RB, Pavolini E. Typologies of healthcare systems and policies. In: Kuhlmann E, Blank RB, Bourgeault IL, Wendt C, editors. The Palgrave International Handbook of Healthcare Policy and Governance. Basingstoke: Palgrave; 2015. p. 101–15.
35. Mossialos E, Wenzl M, Osborn R, Sarnak D. International Profiles of Health Care Systems. New York: The Commonwealth Fund; 2016.
36. Wendt C. Changing healthcare system types. Soc Policy Adm. 2014;48(7): 864–82.
37. Adams T. Editorial: advancing the application of systems thinking in health. Health Res Policy Syst. 2014;12:50.
38. De Savigny D, Adams T. Systems Thinking for Health Systems Strengthening. Geneva: Alliance for Health Policy and Systems Research & WHO; 2009. http://apps.who.int/iris/bitstream/10665/44204/1/9789241563895_eng.pdf. Accessed 3 Aug 2017
39. Aiken LH, Sloane DM, Bryneel L, van den Heede K, Sermeus W – for the RN4CAST Consortium. Nurses reports of working conditions and hospital quality of care in 12 countries in Europe. Int J Nurs Stud 2013; 50:143–153.
40. Bond C, Bruhn H, de Bont A, van Exel J, Busse R, Sutton M. Elliott R on behalf of the MUNROS team. The impact on practice, outcomes and costs of new roles for health professionals: a study protocol. BMJ Open. 2016;6:e010511.
41. Gielen SC, Dekker J, Francke AL, Mistiaen P, Kroezen M. The effects of nurse prescribing: a systematic review. Int J Nurs Stud. 2013;51(7):1048–61.
42. Kroezen M, van Dijk L, Groenewegen PP, Francke AL. Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature. BMC Health Serv Res. 2011;11:127.
43. Martínez-González NA, Tandjung R, Djalali S, Rosemann T. The impact of physician–nurse task shifting in primary care on the course of disease: a systematic review. Hum Resour Health. 2015;13:55.
44. Maier CB, Aiken L. Task-shifting from physicians to nurses in primary care in 39 countries. Eur J Pub Health. 2016;26(6):927–34.
45. Maier CB, Aiken LH, Busse R. Nurses in advanced roles in primary care: policy levers for implementation? OECD Health Working Papers No. 98. Paris: OECD; 2017. <http://dx.doi.org/10.1787/a8756593-en>
46. Sermeus W, Aiken LA, Van den Heede K, et al. Nurse forecasting in Europe (RN4CAST): rationale, design and methodology. BMC Nurs. 2011;10:6.
47. Tsiachristas A, Wallenburg I, Bond CM, Elliot RF, Busse R, van Exel J, et al. Costs and effects of new professional roles: evidence from a literature review. Health Policy. 2015;119(9):1176–87.
48. Kringos DS, Boerma GWG, Van der Zee J, Groenewegen PP. Europe's strong primary care systems are linked to better population health but also to higher health spending. Health Aff. 2013;32:686–94.
49. Kuhlmann E. Enhancing responsiveness of the primary care workforce through stakeholder involvement, Paper Presented at the WHO European Centre for Primary Health Care, First Meeting of the Primary Health Care Advisory Group, Almaty, Kazakhstan; June 2017. p. 20–12.

50. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q*. 2005;83(3):457–0.
51. Jesus TS, Landry MD, Dussault G, Fronteira I. Human resources for health (and rehabilitation): six rehab-workforce challenges for the century. *Hum Resour Health*. 2017;15:8.
52. Bjegovic-Mikanovic V, Czabanowska K, Flahault A, Otok R, Shortell S, Wisbaum W, Laaser U. Addressing needs in the public health workforce in Europe, Policy Summary 10. Copenhagen: WHO; 2014.
53. De Bont A, van Exel J, Coretti S, Güldem Ökem Z, Janssen M, Lofthus Hope K, on behalf of the MUNROS team, et al. Reconfiguring health workforce: a case-based comparative study explaining the increasingly diverse professional roles in Europe. *BMC Health Serv Res*. 2016;16:637.
54. Groenewegen PP, Heinemann S, Greß S, Schäfer W. Primary health care in 34 countries. *Health Policy*. 2015;119(12):1576–83.
55. Pavolini E, Kuhlmann E. Health workforce development in Europe: a matrix for comparing trajectories of change in the professions. *Health Policy*. 2016; 120(6):654–64.
56. Schönfelder W, Nilsen EA. An ideal-typical model for comparing interprofessional relations and skill mix in health care. *BMC Health Serv Res*. 2016;16:633.
57. Barbazza E, Langins M, Kluge H, Tello JE. Health workforce governance: processes, tools and actors towards a competent health workforce for integrated health services delivery. *Health Policy*. 2015;119(2):1645–53.
58. Nolte E, Knai C, Saltman RB. Assessing Chronic Disease Management in European Health Systems. Concepts and Approaches. World Health Organization (acting as the host organization for, and secretariat of, the European Observatory on Health Systems and Policies); 2014. http://www.euro.who.int/_data/assets/pdf_file/0009/270729/Assessing-chronic-disease-management-in-European-health-systems.pdf. Accessed 14 Jun 2018.
59. CanMEDS. Physician Competency Framework 2015; <http://canmeds.royalcollege.ca/en/framework>. Accessed 3 August 2017.
60. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376:1923–58.
61. World Health Organization. Transforming and Scaling Up Health Professionals' Education and Training: World Health Organization Guidelines; 2013. http://www.who.int/hrh/resources/transf_scaling_hpvet/en/. Accessed 3 Aug 2017.
62. Plochg T, Klazinga N, Starfield B. Transforming medical professionalism to fit changing health needs. *BMC Med*. 2009;7:64.
63. Aguirre YI. Tackling gender equity in health policy in Europe: a partnership. *Euro Health*. 2012;18(2):16–7.
64. Ovsieko PV, Greenhalgh T, Adam P, Grant J, Hinrichs-Krapels S, Graham KE, et al. A global call for action to include gender in research impact assessment. *Health Res Policy Syst*. 2016;14:50.
65. Kuhlmann E, Ovsieko P, Kurmeyer C, Gutiérrez-Lobos K, Steinböck S, von Knorring M, Buchan AM, Brommels M. Closing the gender leadership gap: a multi-centre cross-country comparison of women in management and leadership in academic health centres in the European Union. *Hum Resour Health*. 2017;15:2.
66. European Parliament. Directive 2013/55/EU of the European Parliament and of the Council of 20 November 2013 Amending Directive 2005/36/EC on the Recognition of Professional Qualifications and Regulation (EU) No 1024/2012 on Administrative Cooperation through the Internal Market Information System ('the IMI Regulation'). European Parliament; 2013. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0055&from=EN>. Accessed 3 Aug 2017.
67. Buchan J, Wismar M, Glinos IA, Bremner J, editors. Health Professional Mobility in a Changing Europe: New Dynamics, Mobile Individuals and Diverse Responses. Observatory Studies Series 32. Copenhagen: WHO; 2014.
68. Correia T, Dussault G, Pontes C. The impact of the financial crisis on human resources from health policies in three southern-European countries. *Health Policy*. 2015;119(12):1600–5.
69. Humphries N, Tyrrell E, McAleese S, Bidwell P, Thomas S, Normand C, Brugha R. A cycle of brain gain, waste and drain – a qualitative study of non-EU migrant doctors in Ireland. *Hum Resour Health*. 2013;11:63.
70. Leone C, Young R, Ognyanova D, Rafferty AM, Anderson JE, Dussault G. Nurse migration in the EU: a moving target? *Euro Health*. 2016;22(1):7–9.
71. Ono T, Schoenstein M, Buchan J. Geographic imbalances in the distribution of doctors and health care services in OECD countries. In: OECD, editor. *Health Workforce Policies in OECD Countries: Right Jobs, Right Kills, Right Places*. OECD Health Policy Studies. Paris: OECD; 2016. p. 129–61.
72. Santic-Milicevic MM, Terzic-Supic ZJ, Matejic BR, Vasic V, Ricketts TC. First- and fifth year medical students' intention for emigration and practice abroad: a case study of Serbia. *Health Policy*. 2014;118:173–83.
73. Ungureanu MI, Paina L, Olsavsky V. Health workforce management in Romania. *Lancet*. 2015;386(1009):2139–40.
74. Wismar M, Maier CB, Glinos IA, Dussault G, Figueras J, editors. *Health Professional Mobility and Health Systems: Evidence from 17 European Countries*. Observatory Studies Series 23. Copenhagen: WHO; 2011. p. 23–66.
75. Carson D, Schoo A, Berggren P. The 'rural pipeline' and retention of rural health professionals in Europe's northern peripheries. *Health Policy*. 2015; 119(12):1557–64.
76. Bruyneel L, Baoyue L, Aiken L, Lesaffre E, Van den Heede K, Sermeus W. A multi-county perspective on nurses' tasks below their skill level: reports from domestically trained and foreign-trained nurses from developing countries. In: Buchan J, Wismar M, Glinos IA, Bremner J, editors. *Health Professional Mobility in a Changing Europe*. Observatory Studies Series 32. Copenhagen: WHO; 2014.
77. Kroezen M, Buchan J, Dussault G, Glinos IA, Wismar M. How Can Structured Cooperation between Countries Address Health Workforce Challenges Related to Highly Specialized Health Care? Improving Access to Services through Voluntary Cooperation in the EU. Policy Brief 20. Copenhagen: WHO/European Observatory on Health Systems and Policies; 2017.
78. Global Code of Practice on International Recruitment of Health Personnel. http://www.who.int/hrh/migration/code/WHO_global_code_of_practice_EN.pdf. Accessed 3 Aug 2017.
79. European Semester. 2017. https://ec.europa.eu/info/strategy/european-semester_en. Accessed 3 Aug 2017.
80. Schäfer W, Kroezen M, Hansen J, Sermeus W, Aszalos Z, Batenburg R. Core Competences of Healthcare Assistants in Europe (CC4HCA). An Exploratory Study into the Desirability and Feasibility of a Common Training Framework under the Professional Qualifications Directive. Luxembourg: European Union (European Commission, Consumers, Health, Agriculture and Food Executive Agency Unit); 2016.
81. OECD/Eurostat/WHO. Joint Data Collection on Non-Monetary Health Care Statistics Joint Questionnaire 2017. <https://www.oecd.org/statistics/data-collection/Health%20Data%20-%20Guidelines%202.pdf>. Accessed 3 Aug 2017.
82. Lafortune G. Monitoring Health Workforce Migration through International Data Collection: Progress with the OECD/Eurostat/WHO-Europe Joint Questionnaire. Paper presented at The Joint Action Conference on Planning & Educating Health Workforce without Borders, Varna, Bulgaria, February 2016; 2016. http://healthworkforce.eu/wp-content/uploads/2016/02/Lafortune_Gaetan.pdf. Accessed 3 Aug 2017.
83. Dieleman M, Shaw DMP, Zwanikken P. Improving the implementation of health workforce policies through governance: A review of case studies. *Hum Resour Health*. 2011;9:10.
84. Greer SL, Wismar M, Figueras J, McKee C. Governance: a framework. In: Greer SL, Wismar M, Figueras J, editors. *Strengthening Health System Governance: Better Policies, Stronger Performance*. Maidenhead: Open University Press; 2016. p. 27–56.
85. Greer SL, Wismar M, Figueras J, Vasev N. Policy lessons for health governance. In: Greer SL, Wismar M, Figueras J, editors. *Strengthening Health System Governance: Better Policies, Stronger Performance*. Maidenhead: Open University Press; 2016. p. 105–25.
86. Kuhlmann E, Burau V. Strengthening stakeholder involvement in health workforce governance: why we need to talk about power. *J Health Serv Res Policy*. 2017;17:662.
87. Burau V, Carstensen K, Fléron SL, Kuhlmann E. Professional groups driving innovation in healthcare: interprofessional working in stroke rehabilitation in Denmark. *Eur J Pub Health*. 2016;26(Suppl 1):165.
88. Hanney SR, González-Block MA. Building health research systems: WHO is generating global perspectives, and who's celebrating national successes? *Health Res Policy Syst*. 2016;14:90.
89. SARWGG – Strategic Advisory Board Well-being, Health, Family, Vision Statement. A New Professionalism in Care and Support as a Task of the Future. Brussels: SARWGG; 2015.
90. Lindgren S. Reform of the Medical Curriculum in Sweden: Towards a More Active and Multidisciplinary Learning of People-Centred Care. Good Practice Brief. Copenhagen: WHO Regional Office for Europe; 2018. http://www.euro.who.int/_data/assets/pdf_file/0006/367278/gpb-hss-ncds-swe-eng.pdf. Accessed 15 June 2018.