

Health Employment and Economic Growth

An Evidence Base

Edited by

James Buchan

Ibadat S. Dhillon

James Campbell



**World Health
Organization**

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Health Employment and Economic Growth: An Evidence Base
ISBN 978-92-4-151240-4

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Suggested citation. Buchan J, Dhillon IS, Campbell J, editors. Health Employment and Economic Growth: An Evidence Base. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

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Printed in USA

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Introduction to Health Employment and Economic Growth:

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A. Context, aims and summary of this book

Health and social care in every system and in every country is labour intensive, and must be oriented to people's needs if it is to be effective. It is now widely recognized that human resources for health (HRH) are a key enabler for the attainment of universal health coverage, and for the achievement of Sustainable Development Goal (SDG) 3 – Ensure healthy lives and promote well-being for all at all ages. As is stressed in the Global Strategy on Human Resources for Health: Workforce 2030,¹ there can be no viable national, or global, health system without an effective health workforce.²

The Global Strategy, adopted at the Sixty-ninth World Health Assembly in May 2016, challenges the erroneous narrative of health workers as a unit of cost in the production of health. The evidence instead presents an intersectoral agenda on the pre-condition of equitable access to health workers in the attainment of universal health coverage, along with a dynamic labour market understanding of the substantive impact on education, employment, jobs and innovation in the health and social care economy. The Global Strategy, therefore, enables governments and other relevant stakeholders to adopt a holistic, rather than fragmented, approach to ensuring that the health workforce contributes both to improved health and to broader socioeconomic development.

1 Global Strategy on Human Resources for Health: Workforce 2030 <http://who.int/hrh/resources/globstrathrh-2030/en/>.

2 Throughout the chapters of this book, the terms “health workforce” and “human resources for health” are considered largely synonymous and are used interchangeably.

At its core, the Global Strategy puts forward an integrated set of policy responses necessary to take account of and respond to the dynamic and changing nature of HRH, including the internal and international migration of health workers. The Global Strategy highlights the importance of and need for intersectoral linkages (between the education, health, labour and finance sectors), wider stakeholder engagement, and effective analytical underpinning and alignment of policies across sectors and stakeholders.

What is equally important, and is now receiving increasing recognition, is that there can be no viable national or global economy without effective investment in the health workforce. This reflects the overall paradigm shift from a model that frames health system delivery and health employment as a “cost disease” to one in which the contribution of health to economic and societal well-being is more fully recognized. In this more complete perspective, the assessment of the contribution of the health workforce broadens out to include its impact both as a leading source of employment and as a socioeconomic multiplier, with particular benefits for women and youths. In short, support for HRH is an investment in health, security and prosperity, not a cost.

The contents of this book give direction and detail to this important perspective by presenting new evidence and analysis. It summarizes and sets out, under one cover, a series of research studies and papers that were commissioned to provide evidence for the High-Level Commission on Health Employment and Economic Growth.

In total, this book presents 17 commissioned policy briefs as chapters, including contributions from over 50 authors. This editorial introduction synthesizes the key points from this new evidence base, illustrated by examples drawn from across the regions of the world, and reflecting the input of experts from a range of disciplines and backgrounds.

The chapters, which were rapidly developed to retain a contemporary currency, are evidence based and “next steps” oriented. They summarize the facts related to the specific focus of review, but then assess them with a policy analysis lens, and provide

the evidence context for the work and policy options that were recommended by the High-Level Commission's Expert Group, and captured in the Commission's report and recommendations.

The book draws on intersectoral stakeholder contributions, reflecting the widespread recognition and deepening understanding that sustaining an effective health workforce is everyone's business, and as such requires multisectoral, whole-of-government action, backed up by broader stakeholder engagement, supported by political leadership from the highest level.

Each chapter of the book provides new analysis and fresh perspectives on aspects of employment in health. The chapters stand alone and can be read in isolation, but when read in combination, the reader will benefit from additional insights. These derive from the linkages and connections between the issues covered in each chapter, which means that the findings and recommendations are supportive and mutually interdependent. A gender lens, as provided at the front of the book, in particular helps the reader better see and understand the contribution of investments in the health workforce, as well as the reforms required.

The ordering of the chapters in the book is linked to the same health labour market framework that informs the Global Strategy. The book begins with chapters that speak to overall health workforce dynamics, including existing and future estimates of the health workforce, the gendered nature of the health workforce, and patterns of international migration. Chapters identifying the socioeconomic value of and opportunities for investment follow. The next set of chapters point to the potential to transform the manner in which health workers are educated and formed. The book concludes with a set of chapters outlining options to address existing inefficiencies in the health workforce.

Each reader will develop their own conclusions about what are the main overall messages and priorities that emerge, but the section below sets out five key messages worthy of consideration.

B. What is important: five key messages

In combination, the evidence in the papers underpins five key messages that emerged both from the analysis and from the work of the High-Level Commission. Overall, it presents a strong argument in favour of investment in the health workforce (delivering benefits across the SDGs), and a strong case for reform in how we invest in the health workforce.

1. New projections on global HRH highlight a growing mismatch between supply, need and demand, but concerted action can address these staffing shortages

The analysis on HRH need and demand points to a growing staffing and skills shortage in many countries, even in some high-income countries. The shortage is both demographically driven, with population growth and ageing important factors, and linked to the ambition of service delivery in the context of the SDG era. The analysis additionally points to an escalating mismatch between supply, need (SDG-based) and demand (ability to employ), with the international migration of health workers also increasing. The analysis for the High-Level Commission further indicates that, within a future scenario where continued fiscal and economic growth is accompanied by an increase in priority to the health sector and the health workforce, there may be sufficient financing in most countries to meet the wage bill for the additional health workers required to address identified shortages. In some other, low-income, countries, sustained development assistance from philanthropic, private and public sources, investing in education, health, gender and labour, will be required to develop and support the health workforce needed to deliver on the ambition of the SDGs.

2. New analysis provides evidence of health employment's contribution to inclusive economic growth, including in relation to women's economic empowerment

The new analysis undertaken for the High-Level Commission helps broaden out the assessment of HRH to include its impact both as a leading source of current and future employment, notably for women and youths, and as a socioeconomic multiplier. The analysis speaks to the fact that while globally the costs of HRH have been well recognized,

their contribution to inclusive economic growth has been underappreciated and worse, ignored. The work presented in this book is at the forefront of new analysis, pointing to areas for further research. Taken together the case for investment in the health workforce is strong and deserves consideration as a “best buy” that can deliver concrete returns across the SDG agenda (including SDG 1 on poverty elimination, SDG 4 on quality education, SDG 5 on gender equality, SDG 8 on decent work and economic growth, and SDG 10 on reduced inequalities).

Part of this narrative is recognizing and addressing the complexity of nongovernmental and private sector roles; leveraging the input of the private sector, alongside public sector reform, will be essential in many contexts. It also requires full recognition of the actual and potential contribution of women, who comprise two thirds of the health workforce.

3. Health workforce investment will lead to inclusive economic growth, particularly for women, provided the right policies are in place, supported by effective governance

An inclusive approach to the health workforce is required to achieve efficiencies and ensure equity. There is a need to invest in human capital and stimulate job creation, both in the health workforce and more broadly in the economy, in order to achieve the SDGs. This in turn will be more achievable if investments in the health workforce and health sector are prioritized. Action is also required to transform systemic gender biases in the health sector into platforms for women’s economic empowerment.

There is tremendous scope to leverage improved employment opportunities for women, younger entrants to the labour market, and relatively disadvantaged groups (such as rural populations) through strategic and applied HRH recruitment, policies and planning.

In part, this will be achieved by ensuring decent work; fulfilling labour rights; addressing identified “market failures”, notably in current mismatches between education, employment and population needs; appropriately recognizing and rewarding women’s contribution; and establishing new “non-traditional” career entry

points and routes that will have a payback in terms of both increased participation and distributed growth. This will in turn require additional efforts to build the evidence base and effective governance.

4. Transformative education is necessary, but will have to be matched by scale-up, particularly in the technical and vocational education and training (TVET) sector

A transformation of the training and development of HRH is one key element of achieving a more responsive and effective workforce. This must be underpinned by alignment of the health (employment) and the education (training) sectors with population health needs, through targeted funding and appropriate regulation, informed by an understanding of labour market dynamics, internal and international migratory flows, and current labour market failures.

That process must also be driven by an assessment of the optimal skills mix to achieve the SDGs and a primary care-led health system, with a strong focus on expanding socially accountable TVET. Continuous development of the workforce, particularly in underserved areas, must also be a priority; evidence suggests that investment in the skills and motivations of the current workforce will be one major factor in improving HRH distribution and impact.

5. The motivation of the health workforce, two thirds of which are women, must be encouraged and directed by equitable and effective policy, planning, management and governance, and underpinned by context-specific analysis

Countries must not lose sight of the need to have the basic constructs for an effective health workforce to be in place. These include policy, planning, management and governance, supported by analysis based on accurate and complete HRH data. Health workforce information is an obvious area for improvement in most countries; without it, policy-makers and managers are “working blind”.

An effective health workforce is about more than just getting the staffing numbers right. It is about recognizing that health workforce motivation, distribution and

retention are major contributors to improved access and productivity, and can only be achieved through responsive policy, management and governance. Improved data are also required to support effective monitoring and management of migratory flows of health workers. Decent work, workforce stability and responsiveness, the transformation of unpaid care roles into decent work, data on women in the workforce, and supportive line management are key indicators of the implementation of effective HRH policy and governance.

C. Summary

The analysis and policy options set out in the chapters of this book highlight that the global health workforce challenge cannot be solved by supply-side solutions alone. The findings reported here support one of the main thrusts of the Global Strategy – namely, that the policies that must be implemented cannot be “more of the same”, but rather must emanate from a policy-led alignment of supply, demand and need. This in turn must be informed by improved evidence and consistent application of processes and tools, national policy coherence (better aligning across the education, employment, health, labour, migration, and finance sectors), and international cooperation.

The adoption of the Global Strategy and the publication of the High-Level Commission’s report mark a watershed, and provide the foundation for a new, transformative direction for health workforce policy and planning. This book gives detail to this foundation. It is now for States and all relevant stakeholders to harness the evidence and take the lead in shaping and implementing this new direction.

The focus of our efforts must now be on accountability for change, intersectoral action, and finding new ways of working together. It will not be sufficient for a handful of well-intentioned actors to attempt to “do the right thing” through uncoordinated actions; what is now required is a critical mass of reform on employment in health that is locally focused, country led, and globally connected.

PART I

Health Workforce Dynamics

Health workforce needs, demand and shortages to 2030:

An overview of forecasted trends in the global health labour market

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Abstract

This chapter is based on analyses conducted by WHO and the World Bank using the best available evidence. Variability in completeness and quality of data required the use of assumptions, imputation and modelling techniques. Modelled estimates identified that the growing demand for health workers is projected to add an estimated 40 million health sector jobs to the global economy by 2030. Most of these jobs will reside in upper middle- and high-income countries. At the same time, modelled estimates point to the need for over 18 million additional health workers by 2030 to meet the health workforce requirements of the Sustainable Development Goals and universal health coverage targets, with gaps in the supply of and demand for health workers concentrated in low- and lower middle-income countries.

In low-income and some lower middle-income countries both demand and supply will continue to fall short of population health needs. In these contexts, it is necessary that investments – from both the public and private sectors – in health worker education be accompanied by an expansion of the fiscal space to support the creation and filling of funded positions in the health sector and the health economy. Health workforce strategies should ensure that the expansion of the health resources envelope leads to cost-effective resource allocation.

Introduction

In any health system, improving health service coverage and health outcomes depends on the availability, accessibility, and capacity of health workers to deliver quality services (1). Further, building an adequate health workforce can be a highly cost-effective public health strategy. For instance, investing in midwifery education and deploying graduates for community-based service delivery could yield a 16-fold return on investment in terms of lives saved and cost of caesarean sections avoided – a “best buy” in primary health care (2). Social returns on investments in health workers can be maximized if their services are affordable and thus financially accessible for those in need. This can only be ensured if social health protection schemes and systems are in place that provide for such access.

At the same time, investing in the health workforce is increasingly recognized as an opportunity to create qualified employment opportunities, in particular for women, further spurring economic growth and productivity. Emerging economies are simultaneously undergoing an economic transition that will increase their health resources envelope and a demographic transition that will see hundreds of millions of potential new entrants into the labour force. The confluence of these factors creates an unprecedented opportunity to design and implement health workforce strategies that address the gaps in equitable and effective coverage that characterize many health systems, while also unlocking economic growth potential. Taken together, these factors are expected to contribute to a convergence in health and development outcomes within a generation (3).

Indeed, many analyses point to the health economy – and those products, services and activities related to health care and care for the dependent, disabled and elderly (4) – as a driver of economic growth (5). There is also evidence that health sector employment remains stable or even grows during economic downturns, contributing to the resilience of national economies (6). In determining the potential for the health economy to contribute to job creation and economic growth, it is, however, important to have a more precise understanding of what constitutes “the health workforce”.

The International Labour Organization (ILO) adopts a model of the health workforce (7) that (a) recognizes all workers in or contributing to the health sector based on the concept of economic activity; (b) separately identifies specialized workers in

health-specific occupations or with training in a health field; and (c) takes into account the contributions of volunteer and family carers. The ILO approach provides a basis for the development of internationally comparable statistics that can inform national and international health labour market analyses (Box 1).

The available information is most complete for salaried and trained health workers employed in the public sector; data can be more limited for health workers employed in the private, not-for-profit or defence sectors, the self-employed, and health workers with public health, health management, administrative or support roles. Despite the existence of international measurement frameworks and classification systems, the quality and quantity of information on the health workforce remains limited for many countries, and particularly for those facing the most severe health workforce challenges. In these contexts, there is a pressing need to improve statistical and administrative data capacities, and infrastructure for improved health workforce evidence.

Box 1

What is the health workforce?

The 2006 *World health report (8)* defined health workers as “all people engaged in actions whose primary intent is to enhance health.” For the purposes of health workforce planning, it is necessary to understand the types of jobs needed to provide health care, and the requisite skills and training for those jobs. This necessitates a focus on occupations that require specific skills in the provision of health care and that are in severe shortage in many countries. To understand the full impact of investment in the health sector on employment and economic growth, however, we also need to take into consideration the wider group of workers employed in the health sector and in those industries that support it, as well as those providing unpaid or informal care.

(continued on page 6)

BOX 1. (continued)**What is the health workforce?**

Existing frameworks (9) for the operational measurement of health workers employed within and outside the health sector distinguish three categories of workers relevant for health workforce analysis and planning:

- a. those with health training and working in the health industry;
- b. those with training in a non-health field (or with no formal training) and working in the health industry;
- c. those with health training who are either working in a non-health-care-related industry, or who are currently unemployed or not active in the labour market.

Categories (a) and (c) together form the trained (skilled) health workforce (active or inactive) available in a given country or region, while (a) and (b) represent the workforce employed in the health industry. The sum of the three elements – (a), (b) and (c) – provides the total potential health workforce available. A fourth category, (d), encapsulates all others, that is, those workers without training for a health occupation and not working in the health industry.

The International Standard Classification of Education (ISCED), International Standard Classification of Occupations (ISCO) (7) and International Standard Industrial Classification of All Economic Activities (ISIC) (10) guide the categorization according to, respectively, fields of education and training, the occupations, and the industries in which they work.

The current version of the International Standard Classification of Occupations (ISCO-08) provides a framework for the comparability of occupational information compiled according to the various classification systems used in different national and regional contexts. It includes both aggregate and detailed categories for specialized health occupations, including:

- “health professionals” (well trained workers in jobs that normally require a university degree for competent performance, such as doctors, nurses, midwives, dentists, pharmacists);
- “health associate professionals” (requiring skills at tertiary educational level but not equivalent to a university degree, such as associate nurses, medical and pharmaceutical technicians, traditional practitioners that do not require formal training);
- “personal care workers in health services” (which includes health care assistants and home-based personal care workers).

The strength of this framework is that it allows the compilation of internationally comparable data on people with health-specific training, workers in health occupations, and the total number of workers employed in the health industry.

A limitation, however, is that the strong focus and better data availability on trained workers in formal employment tends to overlook and underestimate the role of many of those who contribute to the health sector as informal workers, regardless of training or remuneration. In addition, it does not fully take into consideration workers in non-health sectors that contribute to the health sector, such as those involved in the pharmaceutical sector, in transportation services or in the construction of medical facilities. These groups, included under the ISCO groupings in categories other than health workers, would also need to be quantified and monitored to assess the overall employment impact of the health sector.

Most of the existing data available on the health workforce, however, are restricted to workers in paid employment and in many cases only to those formally employed in health services. Data are also more frequently complete for health professionals than for other groups.

Source: ILO.

To develop medium-term forecasts for trends in needs, supply and market-based demand for the health workforce (Box 2), and based on data availability, analyses typically focus on health workers with health training working in the health industry. The analysis presented here has also adopted this approach. Growth in the employment of trained health workers, however, will probably be accompanied by growth in the employment of other types of health workers (for example, health sector management and support workers) and of workers in other sectors linked to health (for example, pharmaceutical and medical devices industries) (11). Therefore, estimates for workers with health training represent only a subset of the total affected workforce, and are likely to substantially underestimate the economic growth and job creation potential of the health economy at large.

Box 2

Operational definitions of health workforce needs, supply and demand

Need: the number of health workers required to attain the objectives of the health system. There are various approaches to calculating this number – for example, it is sometimes estimated based on a threshold of minimum availability of health workers to address priority population health issues, or in relation to the specific service delivery profile and requirements of a health system.

Supply: the number of health workers who are available in a country. Future supply can be estimated taking into account a variety of parameters, including education capacity, attrition and retention.

Demand: the number of health workers that the health system (both public and private) can support in terms of funded positions or economic demand for services. Demand correlates with the economic capacity of a country, with higher levels of resource availability resulting in greater demand for health services and thus for health workers to provide them.

Estimates recently produced by the ILO (12) suggest that the size of the total health workforce, and of workers employed in the broader health economy, could be significantly larger than previously estimated. Estimation of the more limited health workforce who have a clinical qualification is also a challenging task, as data from various sources differ in terms of the definitions used, and the scope and completeness of the data. The ILO estimates are based on data sources that differ from those used by the World Health Organization (WHO) and are higher than the WHO estimates. Further, the ILO estimates include categories of workers that are not defined by WHO as health workers, so the results are not directly comparable. Every effort is being made to improve the quality and comparability of estimates by both organizations. The differences show the range of the size of the total health workforce depending on choices about which groups to include. They do not impact the estimation of significant needs-based shortages, presented below.

2. Methods

The methodological approach used to estimate and forecast needs-based shortages of health workers was guided by the overarching goal of addressing population health needs to make progress towards universal health coverage. Policy actions and investment decisions should focus on redressing failures in health labour markets, including easing supply constraints, to equitably meet population health care needs. To this end, three main analyses were conducted: (a) estimation of the projected supply, needs and needs-based shortages of health workers to 2030, with a special emphasis on countries falling below a minimum threshold of health worker availability; (b) projection of labour market demand for health workers to 2030, taking into account economic growth trends and other relevant parameters; and (c) simulation of trends in the supply of health workers vis-à-vis requirements in high-income countries in the Organisation for Economic Co-operation and Development (OECD). In high-income countries, the demand for health workers by far exceeds any needs-based thresholds, which may attract health workers from other countries and has important implications for global health workforce mobility patterns.

2.1 Identifying needs-based shortages of health workers

Twelve key population health indicators were selected to measure the projected health needs of populations based upon the health targets in the Sustainable Development Goals (SDGs): family planning, antenatal care coverage, skilled birth attendance, DTP3 (diphtheria–tetanus–pertussis) immunization, tobacco smoking, potable water, sanitation, antiretroviral therapy, tuberculosis treatment, cataract surgery, diabetes, and hypertension treatment. These indicators had been previously identified as tracers for universal health coverage in joint WHO–World Bank research (13), and their relative importance to the composite index of human resources for health (HRH) availability was calculated on the basis of the proportional contribution to the global burden of disease that each service is targeted towards. A minimum threshold of health workers required to achieve health targets in the SDGs was then calculated. Building on previous approaches for estimating minimum thresholds of health worker availability (Box 3), a density threshold of health workers estimated to be needed to achieve the median level of attainment (25%) for a composite index comprising the 12 selected indicators above, weighted according to the global burden of disease, was derived through regression analysis. The resulting “SDG index threshold” of 4.45 doctors, nurses and midwives per 1000 population (Figure 1) was identified as the minimum density representing the need for health workers. It should be noted that if a different level in the attainment score of the 12 indicators mentioned above were chosen (that is, the 25th and 75th percentile instead of the median value), the threshold would vary widely, from 0.31 to 35.1 doctors, nurses and midwives per 1000 population. This broad range illustrates the sensitivity of the SDG index to different thresholds of attainment.

This SDG index threshold advances previous methods by empirically linking health worker density to coverage of a broader range of health services based on universal health coverage and SDGs. However, similarly to its predecessors, it should not be used as a benchmark for planning at national levels as it does not account for the high degree of heterogeneity across countries (with regard to baseline conditions, epidemiology, demography, finances, health system needs, optimal workforce composition and skills mix), which should be examined on an individual basis when planning the workforce needed to meet the SDGs by 2030. Further, it is also important that the use of the SDG index threshold does not result in an exclusive

Box 3

Prior thresholds for health worker needs

The 2006 *World health report* (8) identified a minimum health worker density of 2.3 skilled health workers (physicians and nurses/midwives) per 1000 population, which was considered generally necessary to attain high coverage (80%) of skilled birth attendance. For nearly 10 years, the 2.3 workers per 1000 threshold has galvanized support and enabled policy-makers and advocates to push for goals and countries to measure their progress. However, this threshold has its limitations in the SDG era: it is based on a single health service (assisted deliveries) that is provided episodically, and its focus is on maternal and newborn health, whereas the SDG agenda refers to a broader range of services, including noncommunicable diseases.

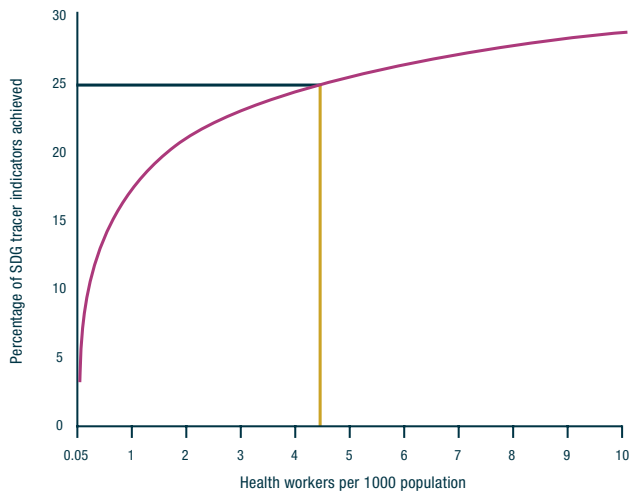
To reflect the broader nature of universal health coverage, the ILO has developed an alternative method to identify a minimum threshold of health worker availability, rooted in an approach that identifies vulnerable countries in terms of their social protection systems and outcomes. Based on this approach, reflected in the 2010/2011 *World social security report* (14), the threshold, termed as a “staff access deficit indicator”, identified a minimum workforce availability of 3.4 skilled health workers per 1000 population. This value has subsequently been updated to 4.1 per 1000 (15). The ILO approach, while linked more explicitly to the policy ambition of universal health coverage in the context of broader social protection, does not have a direct empirical link with health service coverage.

Other similar thresholds exist. For instance, a value of 5.9 skilled health professionals (midwives, nurses and physicians) per 1000 population was identified as the workforce requirements for the Ending Preventable Maternal Deaths initiative, which entails reducing global maternal deaths to 50 per 100 000 live births by 2035 (16).

focus on physicians and nurses/midwives, thereby underinvesting in other cadres. Current and future needs-based shortages in countries falling below this threshold were estimated after taking projected trends in the supply of health workers into account.

Figure 1

SDG composite index: percentage of 12 SDG tracer indicators achieved as a function of aggregate density of doctors, nurses and midwives per 1000 population



2.2 Projecting global demand for health workers

The demand for health workers (physicians, nurses/midwives, and other health workers) was estimated based on a model using per capita gross domestic product (GDP), per capita out-of-pocket health expenditures, and population aged 65 years and older. In this approach, demand is therefore more a function of economic capacity than population needs. Demand for nurses/midwives was calculated assuming a ratio of 2.5 to one physician (the average value in OECD countries). Estimates could only be developed for 165 countries and territories with sufficient data on the economic variables required to model demand.

2.3 Health worker employment in high-income OECD countries

The supply of and demand for health workers in high-income OECD countries vastly exceeds – now and in the future – the needs-based thresholds described earlier. Considering the potential impact on the global health labour market of demand-based shortages in high-income countries, we developed a model to produce estimates of possible scenarios of health labour market trends in these contexts. The model is based on a population needs-based approach that determines HRH requirements in relation to health system objectives and health services requirements (17). A stock-and-flow approach was used to simulate future HRH supply in terms of headcounts, adjusting current HRH stocks according to expected flows in (for example, new graduates) and out (for example, due to retirement) of each country's stock. These were then adjusted according to levels of participation (providing direct patient care) and activity (proportion of full-time hours spent providing direct patient care) for different types of HRH cadres.

3. Findings

Table 1 displays the forecasted numbers and percentage growth of health workers by income group and WHO region in 2013 and 2030, assuming that recent trends in training and employing health workers will stay the same. According to the latest available data in 2013, the global health workforce was over 43 million, including 9.8 million physicians, 20.7 million nurses/midwives, and approximately 13 million other health workers. The global nurse/midwife to physician ratio was 2.1 : 1. Based on current trends and under the assumptions made in the model, the supply of health workers is estimated to grow substantially (55%), leading to an aggregate of 67.3 million health workers by 2030, comprising approximately 13.8 million physicians, 32.3 million nurses/midwives and 21.2 million other health workers (18).

Table 2 shows the needs-based shortages of health workers in 2013 and 2030 in countries below the SDG index threshold. Globally, there are more than enough health workers to meet the SDG index threshold, but due to the uneven distribution of health workers, there are countries in all income groups with needs-based shortages, including the majority of low- and lower middle-income countries. “Surpluses” in countries above the threshold were not computed towards the

Table 1

Supply of health workers (millions), 2013 (WHO Global Health Observatory) and 2030 (forecast)

INCOME GROUP	2013				2030				Total worker % change
	Physicians	Nurses/ midwives	Other cadres ^a	Total	Physicians	Nurses/ midwives	Other cadres	Total	
Income High	3.7	9.1	4.8	17.6	4.4	14.1	5.8	24.3	38%
Upper middle	3.9	6.6	4.3	14.7	5.4	9.5	7.8	22.6	54%
Lower middle	2.0	4.5	3.6	10.0	3.5	8.1	6.7	18.3	82%
Low	0.2	0.5	0.4	1.1	0.5	0.6	1.0	2.1	86%
WHO REGION									
Africa	0.2	1.0	0.6	1.9	0.5	1.5	1.0	3.1	63%
Americas	2.0	4.7	2.6	9.4	2.4	8.2	3.4	14.0	50%
Eastern Mediterranean	0.8	1.3	1.0	3.1	1.3	1.8	2.2	5.3	72%
Europe	2.9	6.2	3.6	12.7	3.5	8.5	4.8	16.8	32%
South-East Asia	1.1	2.9	2.2	6.2	1.9	5.2	3.7	10.9	75%
Western Pacific	2.7	4.6	3.0	10.3	4.2	7.0	6.1	17.3	68%
World	9.8	20.7	13.0	43.5	13.8	32.3	21.2	67.3	55%

Note: Absolute values are expressed in millions, rounded to the nearest 100 000. Totals may not precisely add up due to rounding.

a. Refers to the seven other broad categories of the health workforce as defined by the WHO Global Health Workforce Statistics database, that is, dentistry personnel, pharmaceutical personnel, laboratory health workers, environment and public health workers, community and traditional health workers, health management and support workers, and other health workers. A multiplier for “all other cadres” was developed based on the values of countries with available data.

accumulation of totals. Globally, the needs-based shortage of health workers in 2013 was estimated to be about 17.4 million, of which almost 2.6 million were doctors, over 9 million were nurses and midwives, and the remainder other health worker cadres. While the largest absolute shortage is in South-East Asia (6.9 million) due to the large populations of countries in this region, the largest relative shortage (after taking into account population size) occurs in the African Region (4.2 million). The global needs-based shortage of health care workers is projected to still exceed 14 million in 2030 (a decline of only 17%). Hence, current trends of health worker

Table 2

Estimates of health worker needs-based shortages (millions) in countries below the SDG index threshold by region, 2013 and 2030

INCOME GROUP	2013				2030				Total worker % change
	Physicians	Nurses/ midwives	Other cadres	Total	Physicians	Nurses/ midwives	Other cadres	Total	
High	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	-7%
Upper middle	0.1	2.6	0.9	3.7	0.2	1.4	0.2	1.8	-50%
Lower middle	1.6	4.3	3.2	9.1	1.2	3.2	2.2	6.6	-28%
Low	0.8	2.0	1.7	4.6	1.0	2.9	2.1	6.1	33%
WHO REGION									
Africa	0.9	1.8	1.5	4.2	1.1	2.8	2.2	6.1	45%
Americas	0.0	0.5	0.2	0.8	0.1	0.5	0.1	0.6	-17%
Eastern Mediterranean	0.2	0.9	0.6	1.7	0.2	1.2	0.3	1.7	-1%
Europe	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	-33%
South-East Asia	1.3	3.2	2.5	6.9	1.0	1.9	1.9	4.7	-32%
Western Pacific	0.1	2.6	1.1	3.7	0.0	1.2	0.1	1.4	-64%
World	2.6	9.0	5.9	17.4	2.3	7.6	4.6	14.5	-17%

Note: All values are expressed in millions, rounded to the nearest 100 000. Totals may not precisely add up due to rounding.

production and employment will not have sufficient impact on reducing the needs-based shortage of health care workers by 2030, particularly in the African Region, where the needs-based shortage is actually forecasted to worsen, while it will remain broadly stable in the Eastern Mediterranean Region (18).

Table 3 shows that, by 2030, there will be a global aggregate demand for some 80 million health workers (in the 165 countries and territories with sufficient data to produce demand estimates), with the potential for the creation of approximately 40

million additional jobs (above the current estimated stock of 43.5 million in 210 WHO Member States and territories – see Table 1). The additional jobs, however, will not necessarily be created in the regions and income groups where they are most needed to address SDG population targets. In the African Region and in low-income countries, a modest growth in the capacity to employ workers will lead to a shortage in the labour market based on economic demand, but both demand and supply will fall short of population needs. The figures in Table 3 are not directly comparable to those of the preceding Tables 1 and 2, as they refer to a different number of countries and territories (165 instead of 210) (19).

With regard to high-income OECD countries, our simulations indicate that, on current trends, most countries, while having a higher availability of health workers than the SDG index threshold, could face shortfalls of one or more types of HRH by 2030 in relation to their specific health service delivery profiles. In contrast, some high-income OECD countries may experience surpluses. Simulations give aggregate shortfalls against service requirements of about 750 000 physicians, 1.1 million nurses and 50 000 midwives across the 31 included countries for 2030. These estimates are however highly sensitive to even modest changes in the assumed future values of different planning parameters, including population growth, population health status, average levels of service provision, HRH productivity, and the training, participation, retention and activity of HRH: scenario sensitivity analysis shows that by 2030 the shortfall compared to service requirements could be in excess of 4 million health workers (1.2 million physicians, 3.2 million nurses and over 70 000 midwives) (17).

Table 3

Estimates of labour market demand (millions) for health workers in 2013 and 2030 (165 countries)

	2013 (165 countries)	2030 (165 countries)
WORLD BANK INCOME GROUP	Demand	Demand
Low	0.6	1.4
Lower middle	10.9	21.7
Upper middle	19.0	33.3
High	17.7	23.8
WHO REGION		
Africa	1.1	2.4
Americas	8.8	15.3
Eastern Mediterranean	3.1	6.2
Europe	14.2	18.2
South-East Asia	6.0	12.2
Western Pacific	15.1	25.9
World	48.3	80.2

Source: Liu et al. (19).

4. Discussion

The estimates described in the preceding sections were developed on the basis of the best evidence and data available to WHO, which was nevertheless characterized by variability in both completeness and quality. Assumptions had to be made to overcome challenges relating to missing data; extensive use was made of modelling and imputation techniques, which are described in greater detail in the full analyses. Caution is therefore warranted in interpreting the findings: the results of these simulations should not be interpreted as predictions of what will happen; instead they are meant to show the directions in which the HRH situation is projected to be heading if current trends continue, and to identify the policy levers to influence these trends.

4.1 Challenges

Investment in the health workforce is lower than is often assumed (on average 33.6% of total government expenditure on health in countries with available data) (20), hindering the sustainability of health systems. The chronic underinvestment in education and training of health workers in some countries and the mismatch between education strategies and health systems and population needs result in needs-based shortages. Considering jointly the needs-based shortages of over 14 million health workers in countries currently below the threshold of 4.45 physicians, nurses and midwives per 1000 population, and the shortfall against service requirements in high-income OECD countries (possibly in excess of 4 million), the aggregate projected global deficit of health workers against needs (defined differently in different contexts) could exceed 18 million (range: 16–19 million) by 2030. These challenges are compounded by difficulties in deploying health workers to rural, remote and underserved areas.

Globally, 20–40% of all health spending is wasted (21), with health workforce inefficiencies responsible for a substantial proportion. For example, service organization models that place excessive reliance on specialists delivering curative care in tertiary settings are neither cost-effective nor responsive to population needs. In addition, weaknesses in transparency and accountability can lead to inappropriate use of resources, such as ghost workers artificially inflating health sector wage bills (22).

Policy reforms towards a more efficient and equitable allocation of resources are often challenged by special interests, such as protecting overrestrictive access to health professional education, or by well intentioned but misguided macroeconomic policies that, while aiming at promoting economic stability, can result in underinvestment in health systems (23) and in lost opportunities for job creation, economic growth and improved health outcomes.

4.2 Lessons learned

Past efforts in health workforce development have yielded significant results; examples abound of countries that, by addressing their health workforce challenges, have improved health outcomes (24, 25). In reviewing past efforts in implementing

national, regional and global strategies and frameworks, the key challenge is to mobilize political will and financial resources for the health system and its critical HRH component in the longer term (26, 27).

Market forces in the health sector do not necessarily and automatically lead towards desirable health outcomes; health labour markets are an example of the potential for market failure in the pursuit of social goals. Based on current trends, by 2030 the world would face a substantial and widening mismatch between the need for, supply of and demand for health workers (see Tables 1 to 3). Evidence also indicates that private sector investment in health worker education and employment tends to cluster around the most remunerative professions and those marketable at the global level, rather than the primary health care workforce, which is most needed and effective in improving equity in access to essential health care services (28). It is therefore critical that public sector policies and investments directly address health labour market failures, better aligning supply of and demand for health workers to population health needs, and prioritize investment in the cadres that have the skills and competencies to meet the identified needs.

Past efforts for increasing the health workforce have also revealed the limitations of approaches simplistically focused on scaling up the supply of health workers without taking into account health labour market realities. For instance, several low-income countries experience underemployment of doctors and nurses, yet they simultaneously invest substantial public funds in producing more, worsening underemployment and reducing the efficiency of government expenditures (29). Conversely, effective strategies need to be targeted to the specific realities and conditions of the health labour market and to improving the productivity of the existing health workforce. These strategies should be accompanied by the establishment of social protection schemes to make health care affordable to the population, which can boost health system demand for health workers.

5. Policy options

In many high-income and upper middle-income countries, economic growth and demographic trends will drive demand for health care for ageing populations and additional services. In many of these contexts, however, the supply of health workers will remain constrained – a mismatch that could raise the cost of health workers, fuel broader cost escalation in the health sector, and stimulate health worker mobility across borders. In these settings, relaxing barriers to entry into health training and health professions may be required, together with increasing both public sector and private sector investment in health education geared to a more efficient and responsive skills mix. Quality standards should be maintained and harmonized across public and private health education institutions and reinforced with effective regulatory mechanisms to protect the public from harm.

In low-income and some lower middle-income countries, on the other hand, both demand and supply will continue to fall short of population needs. In these contexts much-needed investments – from both the public and private sectors – in health worker education should be accompanied by an expansion of the fiscal space to create and fill funded positions in the health sector. Most funding should come from domestic resources. However, several low-income countries and other settings affected by complex humanitarian emergencies will still require international development assistance for a few more decades.

Health workforce strategies should ensure that the expanded health resources envelope leads to cost-effective resource allocation. An important strategy to inform resource allocation will be to fully understand the health needs of populations in order to design care delivery models that are both effective and efficient. Specifically, deploying interprofessional primary care teams of health workers with broad-based skills should be prioritized to avoid the pitfalls and cost escalation of overreliance on specialist and tertiary care. This requires adopting a diverse and sustainable skills mix, and harnessing the potential of community-based and mid-level health workers to extend service provision to poor and marginalized populations (30, 31). In many settings, developing a national policy to integrate community-based health workers in the health system can enable these cadres to benefit from adequate system support and to operate more effectively within integrated primary care teams (32, 33).

6. Implementation considerations

Technical and management capacities are needed to translate political will and decisions into effective implementation; just as capable clinicians and health professionals are needed, so are capable professional health managers, planners and policy-makers. All countries should have an HRH unit or department, reporting to a senior level within the ministry of health, with the capacity, responsibility and accountability for a standard set of core functions of HRH policy, advocacy, analysis, planning, governance, data management and reporting (34). Crucially, this capacity needs to be available at the appropriate administrative level: in federal countries, or those with a decentralized health workforce administration, competency, human capital and institutional mechanisms for the core functions described above should be built at the subnational and local levels.

Better HRH data and evidence are required as a critical enabler to enhance advocacy, planning, policy-making, governance and accountability at subnational, national and global levels. All countries should invest in analytical capacity for HRH and health system data. This should be based on policies and guidelines for standardization and interoperability of available and appropriate HRH data, such as those given in the WHO minimum data set for health workforce registry (35), to establish and implement national health workforce accounts.

In parallel with country actions, there are also opportunities to strengthen and streamline global HRH governance. For example, global health initiatives should establish mechanisms to ensure that all grants and loans include an assessment of health workforce implications. Their programmes should contribute to HRH capacity-building efforts at institutional, organizational and individual levels. The recruitment of general service staff by disease-specific programmes weakens health systems, and should be avoided through integration of disease-specific programmes into primary health care strategies and pre-service education. Emphasis should be given to increasing sustainable investment and support for HRH, including both capital and recurrent costs. The implementation of global normative and policy instruments, such as the WHO Global Code of Practice on the International Recruitment of Health Personnel (36), and of the WHO Global Strategy on Human Resources for Health: Workforce 2030, should be reinforced and accelerated.

Acknowledgements

The chapter incorporates four components that have been developed separately in collaboration with other partners and institutions.

1. Health workforce requirements for universal health coverage and the Sustainable Development Goals: background paper no. 1 to the Global Strategy on Human Resources for Health:

Workforce 2030 (commissioned and coordinated by WHO):

Authors: Richard Scheffler (University of California, USA), Giorgio Cometto (WHO) (co-first authors), Kate Tulenko (IntraHealth International, USA), Tim Bruckner (University of California, USA), Jenny Liu (University of California, USA), Julia Brasileiro (IntraHealth International, USA), James Campbell (WHO).

Acknowledgements: Eric Keuffel (Temple University, USA), Alexander Preker (Health Investment and Financing Corporation, USA), Barbara Stilwell (IntraHealth International, USA) and Rebecca Bailey (IntraHealth International, USA) contributed to some components of the analysis of needs-based shortages.

David Evans (University of Basel, Switzerland), Akiko Maeda (World Bank), Tomoko Ono (JICA), Octavian Bivol (UNICEF), Gabriele Fontana (UNICEF), Gilles Dussault (IHMT, Portugal), Remco Van de Pas (ITM, Belgium), Angelica Sousa (WHO), Amani Siyam (WHO), Karin Stenberg (WHO), Tessa Edejer (WHO) and Xenia Scheil-Adlung (ILO) were part of the advisory group that provided strategic direction and peer review to the analysis of needs-based shortages.

Melanie Cowan (WHO), Leanne Riley (WHO), Gretchen Stevens (WHO) and Daniel Hogan (WHO) availed health service coverage used in the analysis.

2. Global health workforce labour market projections for 2030 (commissioned and coordinated by the World Bank):

Authors: Jenny Liu (University of California, USA), Yevgeniy Goryakin (University of East Anglia, United Kingdom), Akiko Maeda (World Bank), Tim Bruckner (University of California, USA), and Richard Scheffler (University of California, USA).

3. Future human resources for health supply and requirements in high-income OECD countries (commissioned and coordinated by WHO):

Authors: Gail Tomblin Murphy (Dalhousie University, Canada), Stephen Birch (University of Manchester, United Kingdom), Adrian MacKenzie (Dalhousie University, Canada).

Acknowledgements: Janet Rigby (Dalhousie University, Canada) and Annette Elliott Rose (Dalhousie University, Canada) helped obtain necessary data for analyses in high-income countries.

4. Definition and measurement of the health workforce (contributed by ILO):

David Hunter (ILO) contributed the relevant section (box 1) of this policy chapter.

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General acknowledgement

James Buchan provided valuable feedback on an earlier draft of this policy chapter.

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ANNEX 1: Overview of methodology to identify needs-based shortages of health workers

The full methods and results of this analysis were published in a background paper to the Global Strategy on Human Resources for Health: Workforce 2030. The following is a chapter overview of the methods adopted.

To estimate each country's current stock of health workers, we retrieved health workforce figures from the WHO Global Health Observatory, which was updated in 2014 and therefore reflects to a large extent data referring to 2013. Yearly workforce density (that is, per 1000 population) data were obtained for 210 countries and territories. For each country, we calculated the population density of physicians and nurses/midwives for the most recent year (since 2008) for which there were data and adjusted the number to the 2013 populations of these countries. For countries with missing data on health workers (that is, no values since 2008), we imputed numbers of physicians and nurses/midwives based on the median density of physicians and nurses/midwives for each of the four World Bank-designated income groups.

The supply of physicians and nurses/midwives was projected to 2030 based on historical data on the increase in densities of physicians and nurses/midwives in each country. To forecast supply, a linear growth rate model was adopted, which assumes that the historical growth rate of physicians and nurses/midwives per capita for each country will continue into the future at the same rate each year.

Data points that represented obvious outliers due to misreporting were removed and replaced with missing data. Missing data points for physicians and nurses/midwives per 1000 population between any two real data points were linearly interpolated. The following equations were then estimated for each country from time $t = \{1990, \dots, 2013\}$:

$$\text{(Equation 1) Physicians per 1000 population}_t = \alpha_0 + \alpha_1 \cdot \text{year}_t + \varepsilon_t$$

$$\text{(Equation 2) Nurses/midwives per 1000 population}_t = \beta_0 + \beta_1 \cdot \text{year}_t + \varepsilon_t$$

where ε_t is the random disturbance term and α_0 , β_0 , α_1 and β_1 are unknown parameters, with the last two parameters representing the linear growth rates to be estimated from the model.

The following rules were applied to predict future (2014–2030) values of worker densities:

- Where at least two data points were available, the estimated linear trend was extended into the future until 2030 using the estimated coefficients for α and β .
- If the estimated linear growth was found to be too large or too small, the country's growth rate was replaced with aggregate medians, and then the median growth rate was applied to the last available observation for that country (that is, most recent year).
- For physicians: If a given country's linear growth rate was larger or smaller than 1 standard deviation from the mean growth rate for all countries, the median growth rate of a comparable group of countries was substituted.
- For nurses/midwives: For nurses, there was large overdispersion of the linear growth rate distribution. Consequently, if a country's linear growth rate was larger than 80% or smaller than 20% of the growth rate distribution, then the median growth rate of a comparable group of countries was substituted.
- For both physicians and nurse/midwives: If the predicted density in 2030 resulted in a negative number, that country's growth rate was also replaced with the corresponding median aggregate value in a comparable group of countries.
- If there was just one point for a country (and thus linear growth rate could not be estimated), the same median substitution for the growth rate as described above was applied.
- When no observations were available before 2013 (that is, no empirical data at all for both physicians and nurses/midwives), neither the supply of physicians nor the supply of nurse/midwives was projected. Instead, the mean 2030 predicted supply density across a comparable group of countries was substituted.

Women's contributions to sustainable development through work in health:

Using a gender lens to advance a transformative 2030 agenda

Veronica Magar, Megan Gerecke, Ibadat S. Dhillon, James Campbell

Abstract

This chapter explores trends in women's work in health as related to the achievement of the Sustainable Development Goals (SDGs), focusing on SDG 3, SDG 5 and SDG 8.¹ It outlines challenges arising from gaps in the knowledge base, gender biases in health systems, and gender biases in the institutions that surround health systems. A qualitative literature review was supplemented with sex-disaggregated data from several international organizations.

The health and social sector is a leading employer of women. However, significant occupational segregation occurs by sex and institutionalized hierarchies are prevalent within and across occupations, particularly in terms of pay rates, career pathways and decision-making power. Gender biases create systemic inefficiencies in health systems by limiting the productivity, distribution, motivation and retention of female health workers.

While the health sector plays a positive role in drawing women into employment, it could make a larger contribution to sustainable development by addressing persistent gender biases and recognizing and valuing women's unpaid and informal work. The chapter calls on policy-makers to build the evidence base on women in the health workforce; to work across sectors to recognize and reform unequal gender laws and institutions; and to address gender biases in health systems.

1. On good health and well-being, gender equality, and decent work and economic growth, respectively.

1. Introduction and outline of methods

The health workforce, as the backbone of health systems and a key employment sector (1), is essential to sustainable development. However, it is not a gender-neutral terrain. Significant occupational segregation occurs by sex and institutionalized hierarchies are prevalent within and across occupations, particularly in terms of pay rates, career pathways and decision-making power. Many of these inequalities stem from gender biases in health systems and in the societies and institutions that support and surround them.

In and of themselves, gender biases undermine the achievement of many of the Sustainable Development Goals (SDGs), including gender equality (SDG 5) and inclusive growth, full employment and decent work (SDG 8). They also create systemic inefficiencies in health systems by limiting the productivity, distribution, motivation and retention of female workers, who constitute a large share of the health workforce (2, 3). A focus on gender equality in the health sector can help countries effectively remedy these problems and act on the mandate to increase health financing and the recruitment, development, training and retention of the health workforce (SDG 3.c).

Despite the importance of gender dynamics in the health workforce, gender issues are rarely given heed in health systems design (4). This chapter draws on relational and structural theories of gender to cast light on unaddressed issues within health systems and the institutions that support them. While recognizing that gender is a social process affecting both men and women, the chapter focuses primarily on female health workers.

Gender inequalities in the health workforce are neither static nor universal (3). They are embedded in particular contexts and shaped by health system design, the national political economy and culture. Relational theories of gender recognize that gender is a social process that is inextricable from “economic relations, power relations, affective relations and symbolic relations; and [that it operates] simultaneously at intrapersonal, interpersonal, institutional and society-wide levels”

(5). Health systems, and women's individual experiences within them, shape and are shaped by processes operating on multiple levels. Women's position along other axes of inequality – such as race, ethnicity and socioeconomic class – intersect with gender to create new hybrid identities and structures that inform their individual (intersectional) experiences (6).

In this chapter, for a gender and human rights framing we look to the 2030 Agenda for Sustainable Development, as adopted by 193 countries at the United Nations General Assembly in September 2015 (7). As such, the chapter explores trends in women's work in health as they relate to the achievement of the SDGs, focusing on SDG 3 (good health and well-being), SDG 5 (gender equality), and SDG 8 (decent work and economic growth) in particular. Ending discrimination (SDG 5.1) is a major cross-cutting theme of the chapter.

The chapter outlines challenges that arise from gaps in the knowledge base on gender, gender biases in workforce policies and practices in health systems, and gender biases in the institutions that support and surround health systems. After summarizing current and previous efforts, it presents policy options for progress in these three areas and explores challenges related to their implementation.

A desk review of literature on women's work in health, covering more than 100 articles, chapters, books and reports, supports this analysis, which is based on an earlier review of 175 sources (8). This qualitative literature review was complemented by sex-disaggregated data on women in the health workforce, gathered from several international organizations, including the World Health Organization (WHO), International Labour Organization (ILO), Organisation for Economic Cooperation and Development (OECD) and European Commission. Current trends and issues were mapped onto the SDGs through a careful review of the goals, targets and indicators. Finally, the literature was surveyed for possible gender-transformative solutions that are in line with the SDGs.

2. Findings

Significant gaps exist in the evidence base. Gender dynamics in the health workforce are underexplored (4). Much of women's work in health is unpaid or in the informal sector and, as such, is poorly covered by official statistics. However, a review of the existing evidence does reveal important findings, as summarized in the following subsections.

2.1 Recognizing and valuing the contribution of unpaid and informal female health workers

SDG target 5.4 calls on countries to value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family.

Health systems rely heavily on unpaid or informal work but fail to recognize or value it. For example, in Spain, 88% of all health work is unpaid (9). A study of volunteer caregivers in six African countries found that women made up the majority of such workers (81%) and that only 7% of volunteers received a stipend (10).

Shortfalls to an available, accessible, acceptable and quality health workforce create demands for unpaid or informal health care work that disproportionately falls on women and girls, due to the unequal division of care responsibilities at the household and community levels. Such informal care work is typically poorly regulated and poorly paid (or not paid at all). For example, domestic, informal and home health workers are often excluded from protective labour regulations (2), reducing progress on SDG 8.

Informal and unpaid care work reproduces hierarchies not only across gender but also across class and race, with low-income, minority and immigrant women doing the bulk of unpaid and informal care work (11). Women's informal care work buffers weaknesses in the health care system and may hide the extent to which these systems are inefficient and are creating medical poverty traps (3).

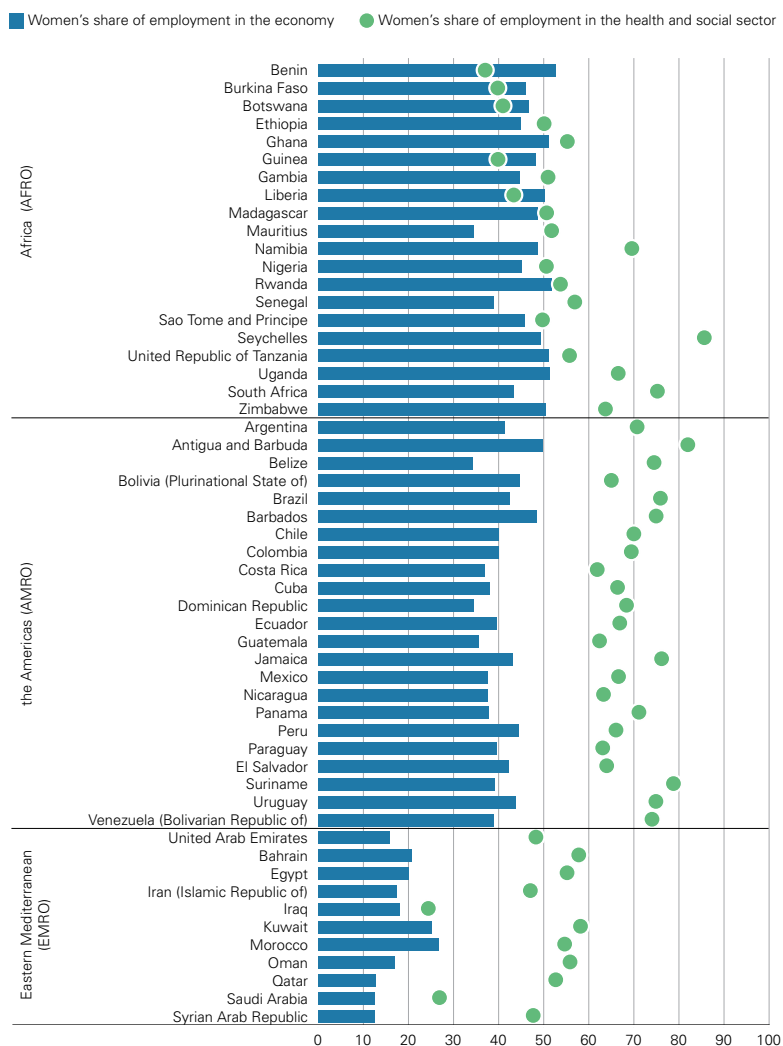
2.2 The health sector as a major employer of women: supporting the goal of full, inclusive employment

SDG 8 calls for sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Looking at women in the health workforce, SDG 8 overlaps with SDG 3.c, which calls for an increase in health financing and the recruitment, development, training and retention of the health workforce. SDG 8 also overlaps with SDG 5.1, which provides a mandate to end all forms of discrimination against all women – in this case, discrimination against women in the health workforce.

In terms of the quantity of employment, the health sector, as a major employer of women, contributes to the goal of full employment and decent work for all (SDG target 8.5). In most countries, women's share of employment in the health and social sector is much higher than their share of employment in the economy as a whole (Figure 1). Across the countries shown in Figure 1, women make up an (unweighted) average of 67% of health and social sector employment, compared with 41% of total employment. This is true in countries and regions with both high and low overall rates of female employment. While certain exceptions exist, for the most part, the health sector has a disproportionate impact on increasing women's representation in the workforce. This in turn helps to ensure women's full and effective participation in political, economic and public life (SDG target 5.5); to reduce poverty and hunger by allowing women to gain livelihoods (SDGs 1 and 2); and to reduce inequalities by sex and improve equal opportunities (SDG 10).

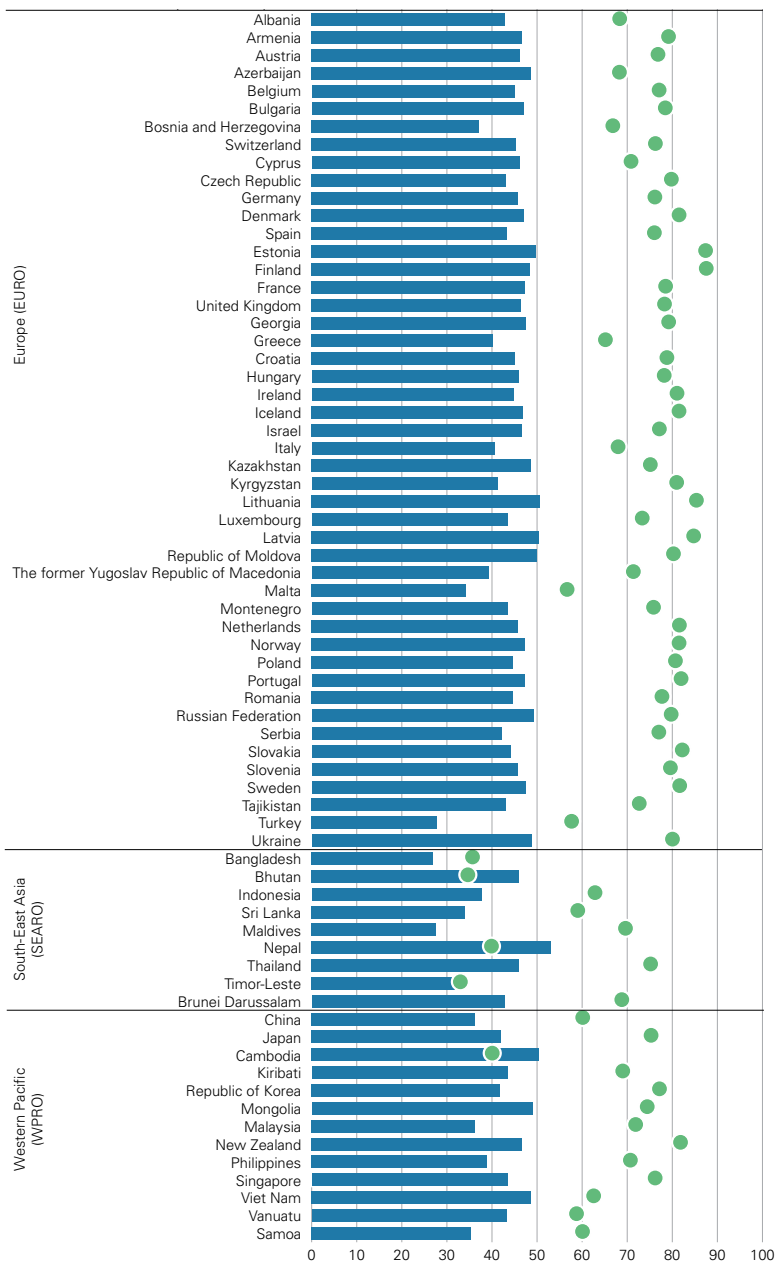
Figure 1

Women's share of employment in the health and social sector versus total employment (%), by WHO region, average values for the period 2005–2014



Source: ILOStat series: Female share of employment by economic activity (EMP_XFEM_ECO_RT)

■ Women's share of employment in the economy ● Women's share of employment in the health and social sector



Over time, women's representation in the health sector has increased. In many countries, nursing and midwifery have long been female-dominated occupations (3). However, over the past few decades, women have been entering medical school in growing numbers and are making up a growing share of physicians; for example, across OECD countries, the female share of physicians has grown from an average of 29% in 1990 to 45% in 2013 (12).

Structural and relational factors shape women's engagement in the labour market in general and in the health sector in particular. A variety of factors operate at multiple levels:

- **Women's employment in general** is restricted by a number of factors, including the uneven division of care and domestic work within the household; restrictive norms about women's role in public life; mobility restrictions based on safety or lack of transportation; unequal legal rights; and unequal opportunities for education. Equitable progress in these domains can encourage greater labour force participation. That said, high rates of female labour force participation cannot be blindly accepted as normatively good; female labour force participation may reflect an involuntarily decision taken in order to survive extreme poverty (13).
- **Women's employment in the health sector** is restricted by the factors listed above and factors within health systems. Biases within human resource policies (for example, lack of appropriate work–life balance policies) limit the retention of female workers, particularly given the psychosocial demands specific to health care providers. The reliance of health systems on unpaid or informal work also limits opportunities for employment.

The degree to which these factors affect individual women will depend on their resources and capacities. The distribution of resources and capacities are in turn shaped by where women fall on a variety of axes of inequality, such as race, ethnicity, caste, socioeconomic status and geographical location. For example, much of unpaid home care is concentrated among low-income women, who have fewer resources to purchase paid care.

2.3 Better-quality employment for women in the health sector

This section looks particularly at equal pay for work of equal value (SDG target 8.5); equal opportunities for leadership at all levels of decision-making (SDG target 5.5); safe and secure working environments (SDG target 8.8); and the protection of labour rights (SDG target 8.8). In all these areas, the health sector could improve the quality of employment it offers women.

2.3.1 Closing gaps in pay across sectors and by sex

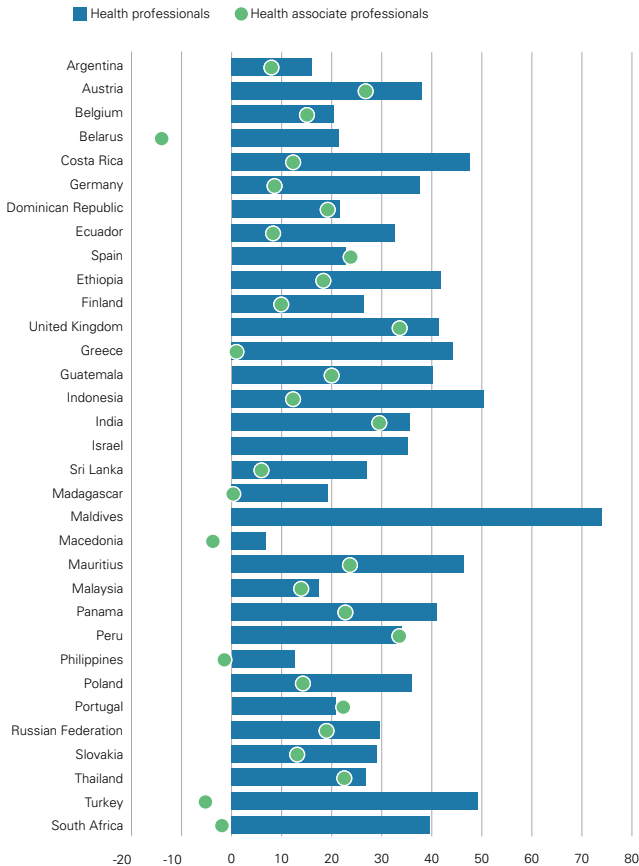
Equal pay for work of equal value means eliminating pay gaps between individuals holding jobs that are the same or of comparable worth in terms of qualifications, effort, responsibility and working conditions (14).

In most countries, pay for jobs in health care is lower than pay for jobs with similar qualifications in other sectors. In fact, a pay penalty exists in general for care-related work (including, for example, health care and child care), which remains even after controlling for the sex composition of the workforce (15, 16). As women are overrepresented in caring professions such as health care, they are disproportionately affected by this pay penalty.

Looking within the health sector, gender wage gaps are common. ILO data on 33 WHO Member States show that female health professionals tend to earn less than their male counterparts (Figure 2). Gaps among associate professionals also exist in most cases. However, as shown in Figure 2, women earn the same or more in seven of 33 Member States for which data exist. The data do not adjust for individual and contextual factors that affect wages, such as seniority, education, working hours, contract type, establishment type and size, region, and unionization.

Figure 2

Unadjusted gender wage gaps in mean monthly earnings among health professionals and health associate professionals, 2005–2014 (latest year for which data are available)



Notes: The gender wage gap is calculated as the difference between average earnings of men and average earnings of women expressed as a percentage of average earnings of men (using nominal monthly earnings).

Due to concerns about the quality of data, the 2012 instead of the 2013 observation has been used for Guatemala.

Source: Authors' calculations based on ILOSTAT: Mean nominal monthly earnings of employees by sex and occupation – selected International Standard Classification of Occupation (ISCO) level 2.

Studies that adjust for individual and contextual factors affecting wages confirm gender-related gaps in pay. While there are a few studies that find little or no evidence of discrimination (17, 18), most find significant gender gaps in pay even after adjusting for individual and contextual factors (19–24). As shown in Figure 2, gaps tend to be larger in higher-income occupational categories (19, 21). Worryingly, gaps may be widening over time (23). A recent study of gender pay gaps in the United States of America found that gaps among health workers were among the highest across different sectors and occupations (25).

Unequal division of care and domestic work within the household may lead women to reduce their paid working hours and take career breaks. Biases in human resourcing policies mean these choices are unfairly penalized with, for example, unequal pay for part-time work or reduced eligibility and access to pensions and other social benefits. Time taken off work for child care and other responsibilities may also derail career paths, particularly if women returning to the labour market lack opportunities to upgrade skills and access positions of power. Women from minority and vulnerable groups may face structural obstacles on multiple levels, exacerbating disadvantages. For example, migrants with foreign credentials have been shown to suffer pay penalties (26).

2.3.2 Increasing women's representation in positions of leadership and decision-making in the health sector

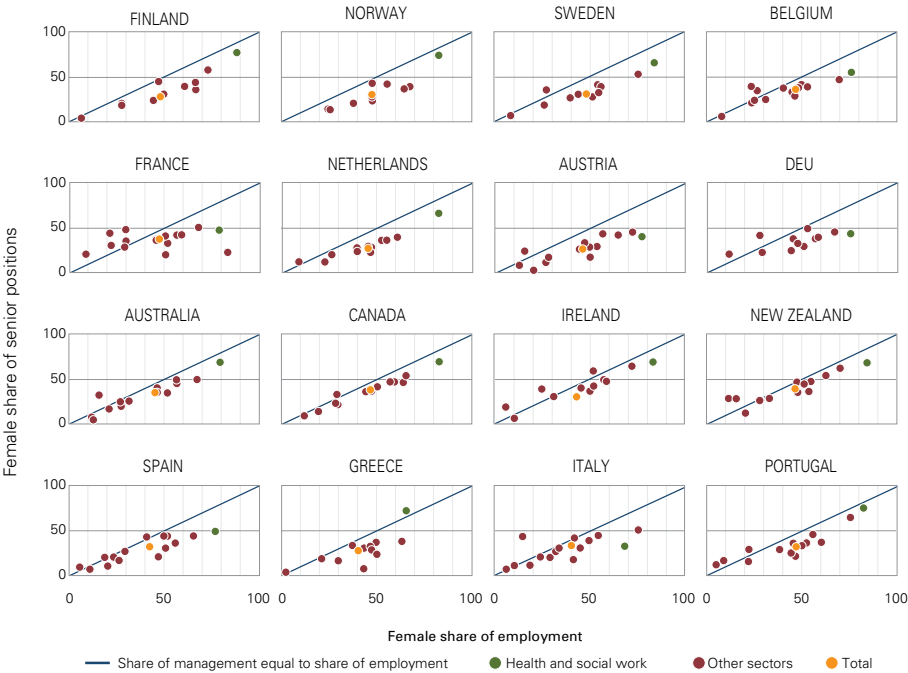
A large share of the wage gaps described above reflects women's underrepresentation in positions of power in the health sector. In terms of political representation across 191 countries, only 51 countries had a female minister of health (27).

Data on a selection of high-income countries for 2007 show that in many countries, women make up the majority of managers in the health and social sector but are almost always underrepresented if one takes into account their share of total employment in the sector (Figure 3). Underrepresentation seems to be more prominent in countries with welfare regimes that attach social benefits to earnings

and occupation, arguably replicating market-generated inequalities (28)² (that is, Austria, Belgium, France, Germany and Italy; the Netherlands stands as an exception). This may suggest that countrywide social policies are a significant factor in determining women's opportunities for advancement within the field of health.³

Figure 3

Women's share of senior positions over their share of employment, by sector and by country, 2007



Source: Authors’ calculations based on ILO’s Labour Statistics database (LABORSTAT): Economically active population, by industry and by occupation (thousands).

2 Examining the institutional logic of welfare states (that is, how the responsibility for welfare is divided between the state, the market and the family), Esping-Andersen categorized countries as “social democratic” (largely Nordic), “liberal” (largely Anglo-Saxon) and “conservative” (continental European) (28). This categorization has been critiqued and expanded upon by several authors, but in general, revisions have produced similar country groupings.

3 That said, countries’ choice of social policies is embedded in their particular sociocultural context and political economy.

2.3.3 Violence, harassment and work-related stress as risks for all health workers, especially women

In terms of offering safe and secure working environments, women's work in the health sector falls short of the objectives under SDG targets 8.8 (protect labour rights and promote safe and secure working environments for all workers) and 5.2 (eliminate all forms of violence against all women and girls in the public and private spheres).

Health workers, particularly nurses and community health workers, are often at risk of violence and harassment, as understood in SDG target 5.2 (29, 30). In addition to being problems in their own right, violence and harassment increase absenteeism and reduce workforce retention, motivation and the quality of services provided (29). In some countries, problems of violence and harassment are particularly rampant in rural and remote areas, which may exacerbate uneven distribution of health workers. Disturbingly, targeted attacks against health workers have also increased in recent years, leading to the adoption of a United Nations Security Council resolution strongly condemning attacks against medical personnel (31).

In addition, stress, fatigue and a high workload are common complaints in the sector (32). Unequal division of care work within the household can exacerbate these problems, with female health workers having the double duty of caring for patients at work and family members at home. This contributes to the health care worker's poor mental and physical health. Lack of appropriate work–life balance policies and conflicts between work and family demands have been shown to increase workers' stress levels (33).

2.3.4 Promoting greater gender equality through strong labour rights

Freedom of association and the effective recognition of the right to collective bargaining are internationally recognized as fundamental labour rights.⁴ Collective bargaining coverage is associated with higher wages, less wage inequality, shorter working hours and, in some cases, increased provision of training (34–37). As such, collective bargaining has the possibility of addressing many issues that affect female

⁴ The ILO Declaration on Fundamental Principles and Rights at Work recognizes three other fundamental principles and rights at work: the elimination of (a) discrimination, (b) forced or compulsory labour and (c) child labour.

health workers. In addition, agreements may explicitly target gender issues – for example, a recent review of industrial relations in Europe found that trade unions in several countries had successfully campaigned for policies on greater work–life balance and reduced gender pay gaps in the health sector (32).

However, structural disadvantages may mean that vulnerable workers, such as migrants and women, are less willing or able to exercise their voice (38). Unions and professional associations should actively recruit women and cover a wide enough range of interests that they are able to promote the welfare of all health workers and their patients.

3. Discussion

3.1 Challenges

While the health sector plays a positive role in drawing women into employment, it could make a larger contribution to sustainable development by addressing persistent gender biases and recognizing and valuing women's unpaid and informal work. To achieve the targets under SDG 3, SDG 5 and SDG 8, a robust gender (and equity) analysis and compelling response is called for. Obtaining data and conducting analyses in underexplored areas is challenging – especially given the likely implications for overarching policies on accountability, non-discrimination and equality – but a gender-responsive and equity-enhancing approach is indispensable.

3.2 Action under way and previous efforts

The challenges outlined in this chapter are not new – they are recognized by the 193 countries that endorsed and adopted the SDGs. For instance, SDG target 17.18 calls on countries to build the evidence base on inequalities with disaggregated data, and SDG targets 5.c, 10.3 and 16.b call on countries to address gender bias and other forms of discrimination at large through laws and policies that are non-discriminatory and gender equal. Finally, SDG targets 3.c and 5.4 recognize deficiencies in health care and the care economy, calling for increased financing of health systems, valuation of unpaid care work, and better recruitment, development, training and retention of the health workforce in developing countries.

3.2.1 Building the evidence base on women in the health workforce

More and more countries are collecting disaggregated data in order to monitor health inequalities. Significant gaps, particularly in country capacity, remain in collecting, analysing, interpreting, reporting and using data. Within the health sector, there have been commendable efforts to explore health inequities and the social determinants of health. Some countries (for example Mexico) have begun monitoring and evaluating policy solutions in these areas (39). Less explored are the gender dynamics and gender-disaggregated data across occupations, within both the formal and informal health workforce and the broader health economy. This requires a health labour market perspective, contextual analysis and the use of mixed methods, with a focus on intersecting inequalities. Nonetheless, the issue is gaining attention, with recent adoption of WHO national health workforce accounts as a concrete step forward (2, 40, 41).

3.2.2 Working across sectors to recognize and reform unequal and discriminatory laws and institutions

What are sometimes seen as individual choices in how men and women engage in health work (for example, the decision of women to work fewer hours, and different rates of volunteer work) are structured by larger social processes and biases in institutions and laws. A 2016 survey of laws in 173 countries found that while support for equality is written into the constitutions of most countries (91%), less than half of the countries explicitly mandate equal pay for work of equal value (41%) or non-discriminatory hiring based on gender (40%) (42). Progress in these areas will assist greatly in improving equity in the health workforce.

Labour, wage and social protection policies can help narrow inequalities by gender. For example, policies and legislation on “equal pay for work of equal value” can address wage gaps across sectors, by sex and along other axes of inequality, such as migrant status. They can also address less favourable treatment of part-time workers in terms of (pro rata) pay and benefits. Such policies usually examine gaps employer by employer. This makes them powerful tools when the health workforce is concentrated under one large employer (for example, when health services are publicly provided), but less effective when it is scattered across many private employers. Other wage policies, such as minimum wages, can also help reduce

inequalities in pay. In compressing the wage structure, these policies reduce the magnitude of pay gaps, and, as women and other vulnerable workers tend to be overrepresented at the bottom of the wage distribution, they increase the wages of women (43).

Social protection policies such as cash transfers can help channel resources to women in unpaid care work. Many countries compensate time dedicated to child care in their social security systems, for example by increasing caregivers' eligibility for and entitlement to pensions (44). In addition, labour laws that challenge the gendered division of care work within the household could foster women's integration in and return to the labour market; for example, non-transferable parental leave for fathers challenges the idea that women are the natural caregivers of children.

Policies that improve basic infrastructure and services can also narrow gender inequalities. Those that improve mobility (for example, transportation services and roads) can reduce the risks and costs associated with travel, thus increasing female employment and educational attendance (45). Investments in housing and public safety could also improve the retention and distribution of female health workers; for example, one study highlights that women's reluctance to work in rural areas has more to do with concerns about security and inadequate housing than pay (46).

Improving women's outcomes in the health workforce can also be supported through designing inclusive education systems that provide, recognize, subsidize and reward investments in vocational training and in-work training.

3.2.3 Addressing gender and diversity biases in health systems

Countries have attempted to address gender biases within their health systems. For example, Costa Rica, Turkey and the United Kingdom of Great Britain and Northern Ireland, among others, have recognized the valuable contribution of unpaid caregivers to health systems by introducing laws and regulations that remunerate care work and provide job protection during leave for care (4). Norway, in particular, has been successful in formalizing previously informal work in health services and care for children and older people, leading to an eightfold increase in formal employment in “care” sectors between 1970 and 2014 (47). Other countries have introduced better work–life balance policies for female health workers; for example, a nurses’ union in Finland increased workforce retention and improved quality of services through better working time policies (including predictable hours, guaranteed time off between shifts and consecutive days off) (4). Other countries have attempted to make job evaluations gender neutral; for example, the United Kingdom’s Agenda for Change covers 1 million workers in the national health system (48). Gender-neutral job evaluations and more transparency in pay structures can build towards pay equity (14).

Efforts have also been made to address problems of retention and recognition through inclusive high-quality education and lifelong learning (SDG 4). For example, a four-month chronic care expert training programme was established for nurses in Thailand. This helped nurses upgrade their skills and gain recognition; after the programme, “patients [grew] to view their nurses as their primary health-care providers rather than doctors” (4).

The international migration of health workers is increasing rapidly. The number of migrant doctors and nurses working in OECD countries has increased by 60% over the last decade (49). Many are women. The WHO Global Code of Practice on the International Recruitment of Health Personnel provides normative guidance in this area, particularly in relation to protecting the rights of migrating health personnel.

Similarly, the Framework Guidelines for Addressing Workplace Violence in the Health Sector, developed by WHO, ILO and two international trade union federations, provides norms and standards for reducing and preventing violence and harassment (50).

It should be noted that much more could be done to address gender biases in the health system. For example, work–life balance measures remain rare, even among developed countries (32), and policies to remunerate unpaid health care work are few and far between.

3.3 Policy options

3.3.1 Build the evidence base on women in the health workforce

Before appropriate gender-responsive policies can be identified and adopted, the current situation in the health workforce must be understood. To monitor progress, it will be useful to collect, publish and analyse disaggregated data on human resources for health (as outlined under SDG target 17.18). These data should be disaggregated not only by sex, but also by ethnicity, age, class, migrant status and sexuality, wherever possible, to allow for greater understanding of the intersecting effects of social inequalities.

Simply publishing statistics is not enough. They need to be analysed, reported and used to set the research agenda for human resources for health. Efforts should be made to strengthen the collection and use of routine data at country and local levels, also drawing on evidence established in qualitative studies. Thinking about problems and constraints from a gender lens may prove to be a cost-effective exercise for health systems; for instance, work–life balance policies could improve retention at a relatively low cost to health systems.

3.3.2 Work across sectors to recognize and reform unequal gender laws and institutions

Health care is situated in a larger institutional framework. To address gender bias in the health care workforce, countries need to recognize and reform unequal gender laws and institutions. Accountable, non-discriminatory institutions, laws and policies are important in their own right (SDG 16) and will also help achieve SDG 3, SDG 5, SDG 8 and SDG 10.

To build supportive institutional frameworks, countries need to work across sectors to address intersecting axes of inequality that stop health workers from reaching their full potential. Labour market and social policies can help to reduce inequalities and address the gendered division of care. Social protection and wage policy can help reduce inequities in income among both paid and unpaid workers. Basic infrastructure and services can help women access labour market opportunities, and inclusive systems of education and lifelong learning can improve women's career pathways and the quality of services.

3.3.3 Address gender biases in health systems

Better policies on work–life balance (such as flexible work, regular hours and provision for child care), remuneration and international migration can help narrow inequalities and promote decent work (SDG 8 and SDG 10). In particular, health systems must stop taking the male work model as the standard work model; policies that unfairly penalize career breaks and shorter working hours constrain the productivity, distribution and retention of female workers. Inclusive high-quality education and lifelong learning (SDG 4) can help address problems of retention and recognition. Violence and harassment are important issues for all health workers, especially women.

All health care, including unpaid health care, should be formalized in the health workforce. Outside the paid labour force, countries should take steps to recognize and compensate women for unpaid or informal health care work. This could involve moving women into formal work and ensuring that career pathways exist.

Countries should work to understand and meet the health and social needs of migrant health workers working in new and potentially discriminatory or isolating contexts.

In designing and adopting new policies, it will be important to adopt participatory processes and good governance practices that involve and empower women in decision-making. Women are underrepresented in positions of power and decision-making, from the micro to macro level (that is, in households, health care settings and higher-level policy debates). Ensuring that women's voices are heard and that women from diverse social and geographical contexts are involved in decision-making is essential to remedying current problems that plague the health care workforce. Participatory designs will help ensure that more resources are dedicated to upgrading the health workforce and implementing gender-sensitive policies.

3.4 Implementation considerations

In addressing gender issues in the health workforce, policy-makers will face a broad range of implementation challenges. This chapter focuses particularly on difficulties in ensuring that enacted law is reflected in practice. As is well documented in the growing field of *leximetrics*,⁵ this is not always the case; there are often significant differences between *de jure* and *de facto* practice.

To ensure that laws and policies are put into practice, particular attention should be given to process and participation, including with regard to the private sector. Clear enforcement provisions, backed by appropriately resourced and well governed agencies (for example, labour inspectorates, human rights commissions and anticorruption commissions), can make a forceful contribution to ensuring implementation.

In addition, health workers and women in particular must be empowered to defend their rights. This requires increasing awareness of labour rights and existing gender biases, and facilitating collective action to defend these rights.

⁵ A field that produces quantitative measurements of laws and subsequently analyses them against objective outcomes.

In health establishments, training on equity could bring attention to biased human resourcing practices (though it should be noted that there are few evaluations of the effectiveness of such awareness-building exercises). Working within social movements and with women's collectives can also empower women and workers to defend their rights.

Finally, the bargaining power of women and workers can be reinforced by efforts to guarantee substantive freedom of choice. Female health workers accept unfair working conditions because their choice of alternatives is constrained. Thus it is important to evaluate the range of alternatives and resources available to individuals in order to enable them to widen their range of choices (51). Upgrading women's labour market opportunities and their access to resources will improve their situation in the health sector and serve as an engine for economic growth.

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Achieving sustainable and appropriately trained health and social care workers for ageing populations

Edward Salsberg and Leo Quigley

Abstract

Chronic illnesses increase with age, while intrinsic capability decreases. Globally, the population aged 60 years and over is projected to grow from 901 million, 11% of the world's population, in 2015, to 2.1 billion, 22% of the world's population, by 2050. Such rapid growth of this high-need population will drive an increased need for more and more complex services.

Following a review of 127 articles, this chapter recommends a three-pronged strategy to ensure an adequate supply and distribution of health and social care workers to maximize the quality of life as people live longer. The strategy includes the following: support to countries to assess the quantitative and qualitative gaps between services currently available and those needed over the next 15 years, and the design of appropriate workforce strategies; ensuring that health and social care workers have skills and competencies to provide quality effective care to older people, including support to a cadre of health workers with expertise in geriatrics; and organization and deployment of the workforce to make effective and efficient use of health and social care workers (for example, expanding scopes of practice; deploying more workers with specific roles, such as care coordinators, to engage with needed health and social support services; and expanded use of care teams).

1. Introduction and methods

As the World Health Organization (WHO) noted in its 2015 report on ageing and health (1), both the proportion and absolute number of older people around the world are increasing dramatically and will continue to do so for many years to come, leading to the increased need for health services adapted to the needs of older people. There is a strong rationale for believing that responding to this increased need requires more than simply increasing the capacity of the existing health systems. Health systems around the world are largely designed around disease-driven episodic care using a biomedical approach that emphasizes finding a medical problem and fixing it (1). However, the health needs of ageing populations are interlinked with their social needs. Furthermore, these needs are typically complex and long term, span a range of areas of functioning, wax and wane over time, and require a goal of maintaining functional ability rather than curing disease. In addition, older people face many barriers that limit their access to health services, particularly in low- and middle-income countries and among disadvantaged people in higher-income countries (1). The complex organizational and professional structures and skills required to address these concerns suggests the need to rethink health system design.

A key component in system redesign is the workforce. The health workforce is typically trained to identify and treat symptoms and conditions using an episodic approach to care, deployed in a compartmentalized fashion according to clinical role or disease specialty (1), and tied to clinical settings in ways that limit their ability to address important social determinants of health. In part as a consequence of the limits of current curricula, many members of the health workforce have not achieved competency in geriatric health care or in critical non-clinical processes such as shared decision-making, team-based care, information technology and quality improvement (1).

Achieving our workforce goals for ageing and health requires a strategy that includes five interconnected steps: assessment of existing workforce needs and gaps; developing the right numbers of workers; giving them the right knowledge and skills; deploying them in the right organizations and geographical locations; and using them in the right roles to deliver care in a cost-effective manner that meets the needs of a growing older population. There is not a single blueprint: how these strategies

are implemented will vary from country to country depending on factors such as national wealth, the structure and financing of health systems, geography, cultural specificities and social structures.

This chapter on workforce strategies for ageing and health synthesizes material from peer-reviewed research and WHO reports in three areas: demand and need projections; workforce issues relating to supply, utilization and organization; and tested or proposed policy solutions. The chapter draws on prior work of WHO, including:

- *World report on ageing and health* (1)
- *Global Strategy on Human Resources for Health: Workforce 2030* (2)
- *WHO Global Strategy on People-Centred and Integrated Health Services* (3)
- *Multisectoral action for a life course approach to healthy ageing: draft global strategy and plan of action on ageing and health* (4)
- *Health workforce: update* (Progress report on implementation of three World Health Assembly resolutions on health workforce development) (5)
- *Scaling up, saving lives* (Task Force for Scaling Up Education and Training for Health Workers) (6)
- *The world health report 2008 – primary health care: now more than ever* (7)
- *The world health report 2010 – health systems financing: the path to universal coverage* (8)

In addition, the following reports were also important sources of data:

- *Reshaping the workforce to deliver the care patients need* (the Nuffield Trust) (9)
- *Universal health coverage* (World Bank information source) (10)
- *An aging world: 2015* (United States Census Bureau) (11)

2. Findings

2.1 Implications of the demographic transition for health workforce requirements

2.1.1 The demographic transition

In its report, *An aging world: 2015*, the United States Census Bureau notes:

The demographic transition is shifting population epidemiology from primarily acute infectious disease to primarily chronic infectious and non-infectious disease. This alone would suggest a need to reorient health systems to ensure services meet population needs, where health and social services are integrated, with continuity of care across different services. Ageing populations will have different health care needs, with more people affected by dementia, stroke, cancer, fractured hips, osteoporosis, Parkinson's disease, lower back pain, sleep problems, and urinary incontinence, for example. (11)

Two trends are driving the “demographic transition”: longer lifespans, and falling fertility rates. First, the population aged over 60 years is growing rapidly across the globe. As of 2015, life expectancy exceeded 80 years in 24 countries (11).

In 2015, there were 106 countries where less than 10% of the population was aged 60 years and over, mostly in Africa and parts of Asia, Latin America and the Caribbean; by 2050 only 41 countries will have less than 10% of their population aged 60 years and over. Further, while only one country had more than 30% of its population aged over 60 years in 2015, this will grow to 57 countries in 2050 (Figure 1).

Figure 1

Percentage of population aged 60 years and over: 2015 and 2050

2015



2050

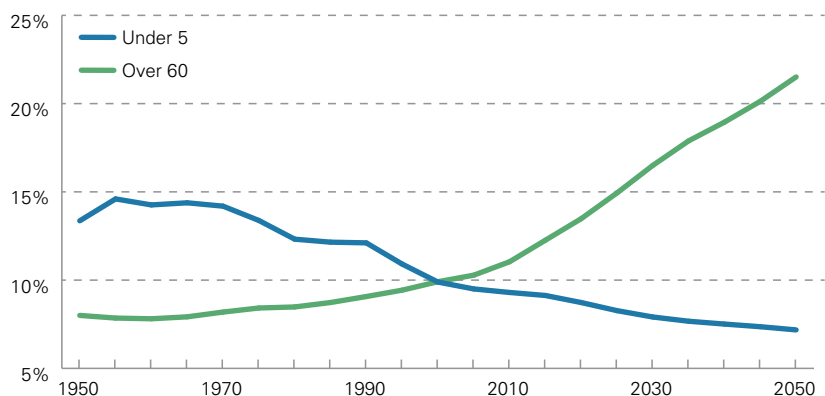


Source: World Health Organization.

The second trend is a decrease in overall fertility rates, with the result that the percentage of the population aged under 5 years has been steadily decreasing, while the percentage that is 60 and over has been increasing. A net result of the two trends is that the representation of children aged under 5 years and the population aged over 60 years as a percentage of the world's population will nearly reverse between 1950 and 2050, as indicated in Figure 2. This means that while the need for care of an ageing population is increasing, the younger population entering the future workforce to supply this care is diminishing.

Figure 2

Young children and older people as a percentage of global population, 1950 to 2050



Source: United Nations, Department of Economic and Social Affairs, Population Division (12).

2.1.2 Health needs of an ageing population

Older people not only have higher medical care needs than younger populations, they also experience decreasing intrinsic capacity and decreasing functional ability, increasing the need for the support and social services that enable people to live meaningful lives and have a good quality of life. All countries face a substantial challenge in reorienting their health care services from pervasive yet relatively inexpensive treatment for short-term conditions to the far more costly treatment of chronic conditions such as cardiovascular disease and diabetes (13).

Both the clinical and social support needs of older people are driven by the increasing prevalence of disease as well as by chronic conditions that can include hypertension, dementia, disabilities, frailty and loss of sensory capability, often in combination. This creates complex health needs. Not surprisingly, loss of functional ability and independence in older people impacts both their physical and mental health such that, as they age, older people need help with the activities of daily living.

Many of the chronic conditions of old age can be prevented or delayed by healthy behaviours. Indeed, even in very advanced years, physical activity and good nutrition can have powerful benefits for health and well-being. Other health problems and declines in capacity can be effectively managed, particularly if detected early enough. And even for people with declines in capacity, supportive environments can allow them to live lives of dignity and continued personal growth. Yet the world is very far from this ideal, particularly for older people who are poor and those from disadvantaged social groups. Comprehensive public health action is urgently needed (4).

But even as countries are successful in improving care and the quality of life of older people, the fact that there will be an increasing number of older people also means that planning for and delivering end-of-life care will be needed.

2.1.3 Workforce implications

The implications for the workforce are enormous, especially if the goal is healthy ageing with empowered and engaged seniors. Specifically, there is a need for:

- More clinical providers with relevant skills and qualifications and in the right locations providing the needed range of services: promotion, prevention, diagnosis, treatment, disease management, rehabilitation and palliative care. A precondition in low-income and middle-income countries will be to increase the general supply of health providers.
- More social service providers, assistants and other individuals to provide support services, such as assistance with the activities of daily living and transportation.

- Greater coordination to support patient-focused care and people-centred, integrated health services. This includes health workers functioning as care coordinators and case managers in chronic disease management and in primary care to fill the gaps and attend to non-clinical needs.
- Increased supply of health and social service practitioners knowledgeable and skilled in care for individuals with terminal illness and those nearing death.

High-income countries may differ from low- and middle-income countries in readiness or availability of resources to provide health care for an ageing population (11). In several European countries where geriatrics is not recognized as a medical or nursing specialty, other professionals such as dentists, pharmacists or nutritionists will need to develop competencies responsive to older people's needs.

In general, all countries would benefit from:

- an increased supply of non-physician clinicians such as advanced practice nurses and physician assistants, particularly in ambulatory settings;
- greater coordination among health workers and between health and social service sectors;
- implementation of multidisciplinary care teams with appropriate skills mix;
- increased attention to workforce maldistribution;
- attention to health and social financing streams.

Lower- and middle-income countries in particular need to focus on occupations with education pathways of up to three years and on scaling up technical and vocational training, while taking into consideration training in rural areas to reach the underserved. Such occupations include physician assistants, registered nurses and community health workers.

2.2 Evidence of health systems and health workforce reforms responding to the needs of an ageing population

While much needs to be done to reform health systems and the health workforce to meet the needs of the world's growing ageing population, there are some examples to help inform planning and policies. These examples cover funding reforms, community-level reforms, service integration reforms and wider workforce reforms, and include both progress and lessons learned. There are also examples of good practice from sources including experienced service provider leadership.¹

A review of the reforms reveals several common features, including:

- integration or extensive coordination of services;
- use of multidisciplinary teams;
- implementation at the local, community level, sometimes with central or regional support or guidance;
- encouragement of care in the home and community-based services, over care in hospitals and long-term care facilities,
- support for individual involvement and empowerment in regard to their care and lives.

The reforms also reveal the benefits of having a steady source of funds to support services to older people (Box 1).

1 See Annex 1 for a description of the literature search process used in locating these examples.

Examples of health system and health workforce reforms

Asia. Associations of older people represent an innovative approach to taking community-based action, empowering people in later life by using their skills, capacities, and willingness to actively engage with and serve their communities. For example, China recently issued a policy promoting the improvement and expansion of their 490 000 associations to align them better with the country's development goals. These associations are multifunctional and conduct a wide range of activities, including improving incomes through microcredit and income-generating activities; providing health care for older people, including through community care programmes aimed at care-dependent older people; providing social and cultural activities as well as disaster preparedness; and enabling social participation. Associations in Viet Nam have demonstrated financial sustainability through their capacity to fundraise (11).

Denmark. The success of Denmark's community-based experimentation with new models of home care and housing for older people, initiated in the early 1980s, resulted in a national decision to eliminate new construction of nursing homes and increase access to publicly funded home care. Lingering concern that the provision of paid assistance for older people could undermine family structure was allayed by the findings of a survey showing that three quarters of older people reported seeing their children on a weekly or more frequent basis. Findings from the Danish experience provide evidence that community-based services can aid family caregivers, enable frail persons to live in the setting of their choice, and be cost-effective from a public policy perspective (14). However, another study found that home care reforms have struggled to reconcile the conflicting principles of standardization and the individualization of care provision (15).

Hong Kong Special Administrative Region. Since 2008, the Hong Kong Special Administrative Region Government has taken forward various payment initiatives to promote primary care and encourage more use of private service. Nevertheless, a study found that the willingness of older people in the Hong Kong Special Administrative Region to pay for specific primary care and preventive services in the

private sector fell below the current market prices, and was associated with concerns over affordability and uncertainty (of price and quality) in the private sector. These results suggest that most older people, who are heavy users of public health services but with limited income, may not use more private services without seeing significant reduction in price (16). A separate study of the introduction of vouchers in the Region to encourage older patients to use primary health care services in the private sector found that the voucher alone was not enough to realize the government's policy of greater use of private primary care services (17).

Japan. In 2000, in response to escalating demand, Japan introduced an insurance system for long-term care to reduce the burden on family caregivers and integrate health care and welfare services into a comprehensive plan. The system provides community-based and residential care services as well as a choice of services and providers. While the number of community support centres rose to 3976 in 2011, reforms were instituted in 2012 to improve coordination of services between the health and social services and to increase oversight of for-profit providers (18).

Netherlands. Long-term care reforms give local authorities a predominant role in providing community-based long-term care. Outpatient personal care and nursing care have been transferred to the health insurance system, where only the most intensive forms of residential long-term care are covered. Meanwhile, social support, including certain home care services and respite care, has been devolved to municipalities, which must ensure that people can live in their own homes for as long as possible and receive the assistance that they need to do so (1, 19).

Pakistan. Pakistan established its first day centre for people at all stages of dementia with technical collaboration from Alzheimer's Australia in Western Australia. Care workers provide education, support groups and counselling for families as well as a broad package of services, including door-to-door transportation to and from the centre, activities such as painting, cooking, gardening, reading the newspaper and daily exercise, and help with personal care (1).

Sweden. The Swedish Government implemented the Adel reform in the care of older citizens in 1992, by which the communities where older people live became

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BOX 1. Examples of health system and health workforce reforms *(continued)*

responsible for their care and housing. An important component in the reform was an expanded need for community nurses to refer patients for emergency treatment. Nurses were appointed to make sure that older people were given appropriate care and to act as supervisors for nurses' aides (20).

United States. The Program of All-Inclusive Care for the Elderly (PACE) serves individuals who are aged 55 years or older, certified by their state as needing nursing home care, and able to live safely in the community at the time of enrolment and to live in a PACE service area. Programmes under PACE deliver all needed medical and supportive services, providing the entire continuum of care and services to seniors with chronic care needs while maintaining their independence at home for as long as possible. The programmes provide care and services in the home, in the community and at PACE centres. There are now 116 programmes in the United States serving several thousand enrollees. Comprehensiveness and coordination are key aspects of the programme. Costs of care are covered by Medicare and Medicaid. There is some evidence that the model reduces hospital use and reduces mortality, though it is still unclear whether it reduces overall expenses (21–23).

United States. Although the acute hospital is the standard venue for treating acute serious illness, it is often a difficult environment for older adults, who are highly susceptible to functional decline and other iatrogenic consequences of hospital care. Hospital care is also expensive. Providing acute hospital-level care at home, in lieu of usual institutional care, is viable. As an emerging service model, the definition of hospital at home (HaH) remains unsettled. Data favour HaH models that provide substantial physician inputs and are geared towards substituting for hospital care, provide services that are highly satisfying to patients and their caregivers, are associated with less iatrogenic complications, and are less expensive. Dissemination of HaH in integrated delivery systems is feasible. Widespread dissemination of HaH in the United States will require payment reform that acknowledges the role of HaH in the health care system (24).

United States. The United States and other countries with poorly developed primary care systems have promoted the “medical home” as a core method for improving the delivery of care. Patient care in the medical home model is coordinated by a primary care team through personalized care plans and medication reviews supported by coaching, advice and encouragement (25). This model is particularly pertinent to the chronic but preventable conditions that disproportionately affect older people. Nevertheless, a review of medical home implementation for older adult patients in primary care found that external stakeholders are less apt to recognize, encourage or incentivize elements of medical home transformation that derive from the existing practice social structure and everyday interactions between staff and patients. These results suggest that there may be no standardized, one-size-fits-all approach to making medical home implementation work, particularly for special patient populations such as older people (26).

United States. A significant rebalancing of the long-term care system away from nursing homes towards home- and community-based services (HCBS) has occurred over the past two decades. In the Commonwealth Fund Long-Term Care Opinion Leader Survey on issues related to supporting HCBS, respondents expressed strong enthusiasm for rebalancing the long-term care system towards HCBS. In particular, respondents supported system-based approaches for this expansion, with the majority indicating that greater care coordination was the single most preferred approach for rebalancing the system, helping consumers make informed long-term care choices and supporting caregivers (27).

Zambia. In 2010, the Ministry of Health in Zambia developed the National Community Health Assistant Strategy, aiming to integrate community health workers into national health plans to address the human resources for health shortage and the challenges facing the community-based health workforce in Zambia (28).

2.3 Evidence of health workforce education and training reforms responding to the need for people-centred services for ageing populations

While some progress has been made over the past several decades to develop curriculum appropriate to assure that future health workers have the competencies and skills needed to provide people-centred care to older people, far more needs to be done. Major challenges include the large number of occupations involved in providing services to older people, the very limited cooperation across occupations regarding curriculum, and the large number of existing workers who do not have the necessary competencies and skills. In addition to the consequent need to modify existing curriculum to have greater content related to the needs of older people that all countries face, many low- and middle-income countries also face the urgent need to significantly increase the number of health workers being educated and trained.

In 2008, the American Geriatrics Society brought together 21 organizations to form the Partnership for Health in Aging with the aim of ensuring that competencies in different professional curricula are aligned. A work group from 10 disciplines developed a set of multidisciplinary competencies in the care of older adults that can be used to supplement existing professional competencies at entry level in all the disciplines (Box 2) (29).

Box 2

Multidisciplinary competencies in the care of older adults at the completion of the entry-level health professional degree

Domain #1: Health promotion and safety

1. Advocate to older adults and their caregivers interventions and behaviours that promote physical and mental health, nutrition, function, safety, social interactions, independence, and quality of life.

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2. Identify and inform older adults and their caregivers about evidence-based approaches to screening, immunizations, health promotion, and disease prevention.
3. Assess specific risks and barriers to older adult safety, including falls, elder mistreatment, and other risks in community, home, and care environments.
4. Recognize the principles and practices of safe, appropriate, and effective medication use in older adults.
5. Apply knowledge of the indications and contraindications for, risks of, and alternatives to the use of physical and pharmacological restraints with older adults.

Domain #2: Evaluation and assessment

1. Define the purpose and components of an interdisciplinary, comprehensive geriatric assessment and the roles individual disciplines play in conducting and interpreting a comprehensive geriatric assessment.
2. Apply knowledge of the biological, physical, cognitive, psychological, and social changes commonly associated with aging.
3. Choose, administer, and interpret a validated and reliable tool/instrument appropriate for use with a given older adult to assess: a) cognition, b) mood, c) physical function, d) nutrition, and e) pain.
4. Demonstrate knowledge of the signs and symptoms of delirium and whom to notify if an older adult exhibits these signs and symptoms.
5. Develop verbal and nonverbal communication strategies to overcome potential sensory, language, and cognitive limitations in older adults.

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BOX 2. (continued)

Multidisciplinary competencies in the care of older adults at the completion of the entry-level health professional degree

**Domain #3: Care planning and coordination across the care spectrum
(including end-of-life care)**

1. Develop treatment plans based on best evidence and on person-centered and -directed care goals.
2. Evaluate clinical situations where standard treatment recommendations, based on best evidence, should be modified with regard to older adults' preferences and treatment/care goals, life expectancy, co-morbid conditions, and/or functional status.
3. Develop advanced care plans based on older adults' preferences and treatment/care goals, and their physical, psychological, social, and spiritual needs.
4. Recognize the need for continuity of treatment and communication across the spectrum of services and during transitions between care settings, utilizing information technology where appropriate and available.

Domain #4: Interdisciplinary and team care

1. Distinguish among, refer to, and/or consult with any of the multiple health care professionals who work with older adults, to achieve positive outcomes.
2. Communicate and collaborate with older adults, their caregivers, healthcare professionals, and direct-care workers to incorporate discipline-specific information into overall team care planning and implementation.

Domain #5: Caregiver support

1. Assess caregiver knowledge and expectations of the impact of advanced age and disease on health needs, risks, and the unique manifestations and treatment of health conditions.

(continued on page 67)

2. Assist caregivers to identify, access, and utilize specialized products, professional services, and support groups that can assist with care-giving responsibilities and reduce caregiver burden.
3. Know how to access and explain the availability and effectiveness of resources for older adults and caregivers that help them meet personal goals, maximize function, maintain independence, and live in their preferred and/or least restrictive environment.
4. Evaluate the continued appropriateness of care plans and services based on older adults' and caregivers' changes in age, health status, and function; assist caregivers in altering plans and actions as needed.

Domain #6: Health-care systems and benefits

1. Serve as an advocate for older adults and caregivers within various health care systems and settings.
2. Know how to access, and share with older adults and their caregivers, information about the healthcare benefits of programs such as Medicare, Medicaid, Veterans' Services, Social Security, and other public programs.
3. Provide information to older adults and their caregivers about the continuum of long-term care services and supports – such as community resources, home care, assisted living facilities, hospitals, nursing facilities, sub-acute care facilities, and hospice care.

Source: Partnership for Health in Aging (29). Reproduced with permission from American Geriatrics Society; see www.americangeriatrics.org for more information.

There are also examples of educational reforms designed either to scale up provision for or to better serve high-need populations that can serve as models to better educate health workers on the needs of older people (Box 3). Education must address the needs both of specialists in care of older people and of generalists who are needed to implement service reforms – such as community-based care – that respond to the rise in the number of older people.

Box 3

Examples of educational reform

Brazil. The Pró Saúde programme provides training institutions with financial support, through a competitive bidding process, for projects aimed at reorienting the health system to meet the needs of communities. In 2007, 90 medical, nursing and dental schools received funding for curricular changes that promoted interaction between the professions, primary care and action learning. As a result of this training, the programme aims to expand to 40 000 the number of community-based family health teams providing primary care (6).

United Kingdom. General practice in the United Kingdom is experiencing difficulty with medical staff recruitment and retention. A cultural change among medical educationalists is needed to promote general practice as a career choice that is equally attractive as hospital practice. The introduction of pre-registration house officer (PRHO) placements in general practice and improved flexibility of general practitioner (GP) vocational training schemes, together with plans to improve the quality of senior house officer (SHO) training in the future, should address some concerns about poor quality GP training raised by survey

2.4 Strengthening collaboration between the health and social sector actors in service provision

Many older people, especially as their intrinsic capability declines or in the face of multiple chronic illnesses, need both clinical care and social service support if they are to be able to live meaningful and fulfilling lives. Formal integration of health and social sector services presents many challenges, given the need to replace traditional hierarchical coordination with more or less voluntary cooperation or collaboration among organizations (32), rendering this high-level approach problematic, time consuming and costly (33). Furthermore, the evidence suggests that most financial and organizational system-level reforms have had either inconclusive or negative effects (34).

respondents. The reluctance of newly qualified GPs to enter principalships, and the increasing demand from experienced GPs for less-than-full-time work, indicate a need for a greater variety of contractual arrangements to reflect doctors' desires for more flexible patterns of working in general practice (30).

United Kingdom. Recently, NHS England decided to create a new cadre of “nursing associates” to enable nurses to concentrate on more complex tasks (31). The United Kingdom is also experimenting with nurse-led practices.²

Other countries. In South Africa, Walter Sisulu University's Faculty of Health Sciences was created in 1990 with the specific goal of producing health professionals for underserved areas. The Barrio Adentro “micro-school” project in Venezuela carries out all education and training in supervised community settings, responding directly to patients' needs. The University of the Philippines collaborates extensively with government health services in decentralized clinical settings to help students better understand and improve local health systems (6).

² For example, see <http://cuckoolanesurgery.co.uk/>.

As an alternative to large-scale organizational restructuring, an emerging tactic for improving collaboration across health and social sector services is the introduction of the new workforce role of care coordinator or case manager (35). While the professional background of care coordinators can vary, the core competencies for the role typically include advocacy, teamwork, cross-setting communication, and patient education and support. At least some of the care coordination function can be carried out by entry-level workers, such as community health workers, if they operate in a supportive and systematic service delivery system (36). Care coordination programmes require careful design but they are most likely to be successful when tailored to meet the needs of particular populations, such as older people (37).

3. Discussion

3.1 Challenges

There are three major challenges to ensuring an effective workforce for achieving the healthy ageing goals of maximizing quality of life in old age and giving older people a say in how that is achieved through action to combat ageism in policy-making and service delivery.

3.1.1 Organization of work

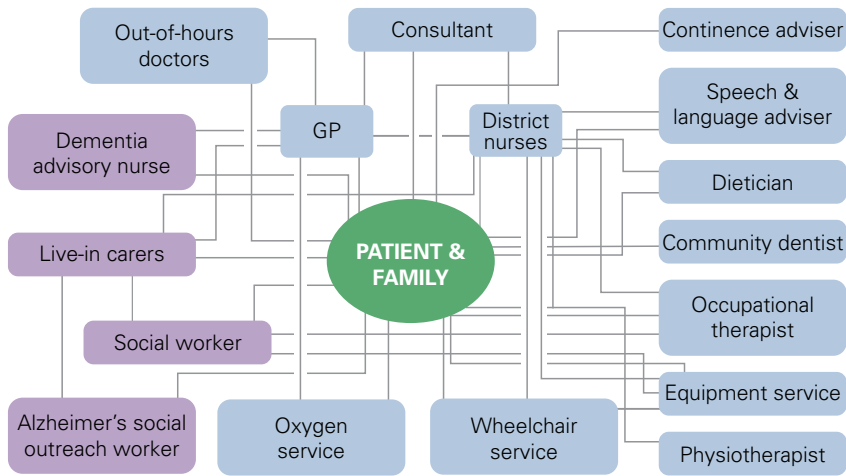
The first component is the deployment of the workforce needed to support healthy ageing. *The lack of effective links between professions and sectors* – despite the fact all may be essential for healthy ageing for many seniors – includes major gaps between health professions within the health sector and gaps between the health and social services workforce. These gaps have led to an increased need for care coordination. However, the reality is that, given the complexity of illnesses of older people and the number of clinical and non-clinical services needed, care coordination can be extremely challenging, involving use of IT, multiple referrals, self-care by the patient and a role for volunteers and relatives. Figure 3, for example, shows some of the workers typically involved in the care of an Alzheimer's patient.

Another component of the organization of work concerns *unnecessary limitations in most countries on the permissible scope of practice of many health professions*, preventing them from working to the full extent of their education, training and capacity.

Examples include allowing pharmacists to address drug interactions in polypharmacy; and allowing nurse practitioners, physician assistants, community health workers and home health aides to use their training and expertise to the full. Unnecessary scope of practice limitations not only weaken the effectiveness of the workforce, they are also costly. While there may be resistance from professional associations to expanding the scope of existing occupations and recognizing new types of workers, much may be achieved simply by maximizing the extent to which each professional operates at the top of their license to practise (38). There may also be legal and regulatory issues that need to be addressed.

Figure 3

People-centred integrated health services delivery:
the example of Alzheimer’s



Source: Adapted from WHO Global Strategy on People-Centred and Integrated Health Services (3).

Another key component to the organization of work is the *development of people-centred and integrated health services*. WHO has documented the evidence showing the benefits of this approach to care (39). It is within this framework that a wide variety of health and social service providers can be effectively employed and work to the full extent of their education and capabilities.

3.1.2 Lack of adequate preparation of health workers on the clinical
and social service needs of older people

This includes inadequate curriculum related to ageing in the training of physicians, nurses and other health workers. Most countries have few experts in geriatrics, which hinders both care and education of other health professionals.

3.1.3 A basic shortage of practitioners to care for older people

Care for older people is often regarded as a low-status, low-wage, and physically and mentally challenging occupational sector, which may contribute to shortages of carers. Home health aides in the United States, for example, earned 51% of the average wage in 2007 (40). Working hours are often long and irregular (Canadian long-term care workers, for instance, are sometimes required to be on site for 12 to 14 hours to accumulate 6 to 8 hours of paid work), and career progression is largely absent in most countries (40).

There is great variation in the reported number of long-term care workers per 1000 population aged over 65 years, ranging from 16 in France to 213 in the Netherlands (40). While some of this variation may reflect differences in job categorization and in the prevalence of part-time arrangements – which can have an impact on the difference between numbers of long-term care workers (measured as headcounts) and full-time equivalent workers – the variation is still significant.

Even in higher-income countries that have an adequate total supply, practitioner distribution is often not well aligned with high-need populations, including older people. Geriatric care management programmes aiming at improving the skills of personal care aides are found to have a strong influence on retention and job satisfaction (40).

3.2 Environmental and structural changes to support policy options

“Healthy ageing is the process of developing and maintaining the functional ability that enables well-being in older age”(1). Health and social care workers work in health systems and structures that operate within the values and beliefs of the community at large. There are four environmental and structural changes that are needed to support the policy options related to human resources for health of an ageing population. These changes will greatly magnify the impact and effectiveness of a well prepared workforce.

- **Combating ageism.** Societal attitudes – including attitudes within the health system – have to recognize the dignity of each individual regardless of age or

physical or mental capacity if the goals of empowerment and engagement of older people are to be attained.

- **Reframing sickness care to health care.** The health care system, in collaboration with the social services sector, needs to reframe its role from care of the sick to preservation of health and the quality of life.
- **Assuring a robust primary health care system.** The health care system and its workers will be more effective and productive if they can work in a health care system with a well designed system for primary health care.
- **Modifying health care financing systems.** The workforce needed for healthy and meaningful ageing extends across many services and also includes caregivers not usually considered as part of health care delivery and not provided for in health services funding. Health organizations and funders must recognize the contribution of social and community-based services, supports, and workers, such as social workers and community health workers, to the health and well-being of older people, along with the very real difficulties associated with coordinating those services in practice. Without expanded financing and reimbursement, these needed services are not likely to be covered or provided.

3.3 Workforce policy options to support healthy ageing

The following policy options are proposed to assist the health workforce in supporting healthy ageing:

A. Organize and deploy the workforce to make effective and efficient use of health and social service workers to meet the needs of older people:

- Support countries to assess the quantitative and qualitative gaps between services currently available and those needed over the next 15 years, to inform policies and programmes for older people.
- Promote the widespread adoption of teams with a wide range of skills and competencies to meet the needs of old people. The teams should include both

health and social service workers and have the capability to reach out to the community to provide more accessible health care to older people and to take advantage of community-based non-health services that may help promote independence and autonomy.

- Extend the roles of existing health workers – role enhancement – by removing unnecessary barriers to their scope of practice.
- Expand the use of technology across the continuum of care for older people and extend team membership to isolated, rural workers.
- Promote the development and expanded use of workers such as community health workers, care coordinators, case managers, registered nurses and others who can be part of teams, function as connectors between health and social services, and promote steps to improve the quality of life of older people. There are many examples of the effective use of community health workers (41).
- Promote programmes and policies that empower and assist individuals to make care decisions and to care for themselves. Also, encourage and provide support for volunteers.

B. Ensure that health and social care workers have the skills and competencies needed to provide high-quality and effective care to older people:

- Ensure competencies related to healthy ageing are included in the curriculum of all health professions students. This includes – in addition to an understanding of symptoms and care of chronic and multisystem disease – competencies around communication and empowerment, interprofessional practice, cultural competence, and knowledge of measures that can slow loss of functional capacity.
- Ensure that credentialing organizations include skills and competencies related to ageing and health of older people in certification and recertification examinations.

- Educate and train all health workers to practise collaboratively in teams of health professionals and others, and increase exposure and cross-fertilization during the educational process (both during entry into the field and in continuing professional education) of health and social service providers.
- Support the education and training of a small number of specialists in geriatrics to provide clinical, educational, and policy guidance to primary care practitioners and other health workers.
- Support the education and training of a small number of specialists in palliative care for the terminally ill and those near death.
- Ensure affordable and accessible continuing professional education in ageing and health care for existing health workers, including training in teams.

C. Ensure an adequate supply and distribution of appropriately skilled health and social care workers to meet the needs of the older population:

- Assess at the country level the supply of, demand for, need for and distribution of health and social care workers who serve older people.
- Countries should give priority to workers who can be educated and trained quickly and at a modest cost but can provide a wide range of services needed by an ageing population. This includes medical assistants, health officers, dental assistants, community health workers, nurse assistants and others. In addition, priority should also be given to non-physician clinicians and other advanced practitioners such as nurses, advanced practice registered nurses (nurse practitioners, nurse midwives and clinical nurse specialists), physician assistants, pharmacists and social workers.
- Support programmes and policies that encourage practitioners to practise in areas with shortages in their occupation. This could include scholarships or loan repayment for service, dissemination of information on areas of need, promotion of educational opportunities to those most likely to make careers in shortage areas, and reimbursement incentives for practice in underserved

areas. Priority should also be given to supporting students from underserved areas, and to education programmes in those areas, as recommended by WHO in 2010 (42).

- As noted above, there is a need to modify reimbursement and financing policies to cover both clinical and social services to older people. Clinical staff alone cannot be expected to take responsibility for reform and redesign of health systems.
- Lower-income countries in particular will need to consider how to educate and train the administrators who will share responsibility with clinicians for ensuring that health care delivery meets high-level goals such as efficiency, equity and effectiveness.

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ANNEX 1: Ovid database search process

Search terms

(‘older people’ OR ‘older adult\$’ OR ‘elderly’ OR ‘senior\$’ OR ‘later life’ OR ‘long-term care’) AND

(‘workforce’ OR ‘physician\$’ OR ‘doctor\$’ OR ‘nurs\$’ OR ‘pharmac\$’ OR ‘primary care\$’ OR ‘dentist\$’ OR ‘dental’ OR ‘care coordinat\$’ OR ‘case manag\$’ OR ‘care manag\$’ OR ‘community health worker’ OR CHW) AND

(‘federal’ OR ‘government’ OR ‘state’ OR ‘nation\$’) AND

‘reform’

Filters

English language

2006 or later

Databases searched

Ovid: Global Health and all available Medline databases

Search results

The search was run in May 2016 and yielded 184 results. Removal of duplicates, non-English language articles that had not been filtered out, and articles that were clearly not relevant left 127 articles which were reviewed and classified for subject relevance.

A full listing of the 127 articles is available on request from esalsberg@email.gwu.edu or lquigley@email.gwu.edu.

International migration of doctors and nurses to OECD countries:

Recent trends and policy implications

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Abstract

This chapter examines trends in the international migration of health workers to Organisation for Economic Co-operation and Development (OECD) countries since 2000. In total, the number of migrant doctors and nurses working in OECD countries increased by 60% between 2000 and 2010. This rate is higher for those who migrated to OECD countries from countries with severe health workforce shortages, with an 84% increase during this time period. Immigrant doctors and nurses account for growing shares of health professionals working in OECD countries. Foreign-born doctors accounted for 22% of active doctors in OECD countries in 2010/2011 (up from 20% in 2000/2001), whereas foreign-born nurses represented 14% of all nurses (up from 11% in 2000/2001).

The chapter calls for movement towards greater self-sufficiency in OECD countries through increased domestic education and training capacity, as required to respond to current and future projected demand; implementation of retention measures (for example, better working conditions and pay rates) in lower-income countries, which itself will require good governance of the health systems and may require international support as called for by the World Health Organization (WHO) Global Code of Practice on the International Recruitment of Health Personnel; and better management of health workforce migration through negotiation of mutually beneficial agreements, as well as consideration of more ambitious approaches to global governance.

1. Introduction

The international migration of doctors, nurses and other health workers is not a new phenomenon, but it has drawn a lot of attention in recent years because of concerns that it exacerbates shortages of skilled health workers in some countries, particularly in those that are already experiencing critical shortages. The WHO Global Code of Practice on the International Recruitment of Health Personnel was adopted by the World Health Assembly in 2010 to support improved management of international health personnel migration according to globally accepted ethical norms and standards. It encourages greater international cooperation and support in the area and encourages countries to achieve greater “self-sufficiency” in the training of health workers, while also recognizing the workers’ basic human right of freedom of movement (Box 1).

The 2007 Organisation for Economic Co-operation and Development (OECD) study on “Immigrant health workers in OECD countries in the broader context of highly skilled migration”, published in *International migration outlook*, presented for the first time a complete picture of the migration flows of health personnel to OECD countries by country of origin and destination (3). This work was recently updated in a chapter on “Changing patterns in international migration of doctors and nurses to OECD countries”, published in the 2015 edition of *International migration outlook* (4). This policy chapter presents some of the main results from these chapters and additional information on health workforce policies from the 2016 publication *Health workforce policies in OECD countries: right jobs, right skills, right places* (5), and the 2008 publication *The looming crisis in the health workforce: how can OECD countries respond?* (6). This chapter addresses the following questions:

- What is the scale of the international migration of doctors and nurses to OECD countries, and who heads where?
- What is the contribution of migrant health workers to their destination countries and what are the consequences for their countries of origin?
- How much do immigration and health policies affect migration growth and what is the scope of bilateral agreements and new possible global governance arrangements to better manage health workforce migration?

Box 1

Highlights from the WHO Global Code of Practice on the International Recruitment of Health Personnel

Ethical international recruitment

The Code discourages the active recruitment of health workers from developing countries with critical workforce shortages.

Equal treatment of migrant health care workers

The Code highlights the importance of equal treatment of foreign-trained health workers and their locally trained counterparts. All health care workers should have the opportunity to assess the benefits and risks associated with employment positions, and to make informed decisions about vacancies.

Health workforce development and sustainable health systems

Member States should develop strategies for workforce planning, training and retention, adapted to the specific circumstances of each country, so that there is less need to recruit migrant health workers.

International cooperation

The Code encourages collaboration between health workers' countries of origin and countries of destination, so that both benefit from the migration of health professionals.

Technical collaboration and financial support

Developed countries should provide technical and financial assistance to developing countries experiencing a shortage of health workers.

Data gathering

Member States are encouraged to strengthen or establish health personnel information systems, including information on health personnel migration, in order to collect, analyse and translate data into effective health workforce policies and plans.

Sources: WHO Global Code of Practice, and user's guide to the Code (1, 2).

2. Findings: perspective of destination countries

Immigration patterns can be measured based on nationality, place of birth or place of education/training. The first approach, based on nationality, faces several shortcomings, the main one being that foreign-born citizens disappear from the statistics when they are naturalized. The second approach, based on place of birth, is more meaningful because when the country of birth differs from the country of residence, it implies that the person did cross the border at some point in time. However, the main question that arises in evaluating the impact of highly skilled migration on origin countries is where the education took place. Some of those who were foreign born arrived at younger ages, most probably accompanying their family, while others came to the country to pursue tertiary education and stayed after completion of their study. In those circumstances, most of the cost of education will have been supported by the destination country, or by the migrants themselves, not by the country of origin. The third approach, based on the place of education/training, is probably the most relevant from a policy perspective, although it does raise several measurement issues related to the fact that medical and nursing education and training can be very long and go through different stages that may occur in both origin and destination countries (7).

This section uses two different data sets to monitor trends in the number of foreign-born doctors and nurses working in OECD countries (based mainly on population census data available in many countries at 10-year intervals) and the number of foreign-trained doctors and nurses working in OECD countries (based mainly on data from professional registries available each year). It focuses only on the migration of doctors and nurses, given the preeminent role that these have traditionally played in health service delivery in OECD countries.

2.1 Foreign-born health workers in OECD countries

Foreign-born doctors and nurses account for a significant and growing share of health professionals in OECD countries. The share of foreign-born doctors increased in most countries between 2000/2001 and 2010/2011, with the total number increasing from 19.5% to 22% across 23 OECD countries, while the share of foreign-born nurses rose from 11% to 14.5% across 22 OECD countries. In total, the number

of migrant doctors and nurses working in OECD countries increased by 60% over that decade. To a certain degree, the share of migrants among health professionals mirrors that of highly skilled immigrants in the workforce as a whole. However, the percentage of foreign-born doctors tends to be greater than the percentage of immigrants among highly educated workers, whereas the share of foreign-born nurses is similar or lower.

Although the United States of America receives the highest number of migrant doctors and nurses in absolute terms, the steepest rises in foreign-born doctors between 2000/2001 and 2010/2011 were in Germany and the United Kingdom. There were also significant increases in Australia, Ireland, New Zealand and Switzerland, while the shares continued at their relatively high levels in Canada and the United States.

There were important variations across OECD countries in the proportion of health personnel born abroad in 2010/2011. For doctors, the share ranges from less than 3% in Poland and Turkey to over 50% in Australia and New Zealand. The share of foreign-born nurses is insignificant in Poland and the Slovak Republic, but over 30% in Australia, Israel, Luxembourg, New Zealand and Switzerland. In almost all countries, with the exception of Estonia, Israel, Italy and Turkey, immigrants make up a higher proportion of doctors than of nurses. This is particularly the case in Australia, Ireland and New Zealand.

Not surprisingly, the proportions of foreign-born doctors and nurses are highest in the main settlement countries (for example, Australia, Canada, Israel and New Zealand) and European countries such as Luxembourg and Switzerland. Other countries, including Belgium and the United Kingdom, are also near the top of the list in terms of the share of foreign-born health professionals, as are some Nordic countries when it comes to doctors and Ireland in regard to both doctors and nurses (Tables 1 and 2).

Table 1

Practising doctors by place of birth in 30 OECD countries, 2000/01 and 2010/11

Country of residence	Doctors 2000/01			
	Year	Total	Foreign born	% foreign born
Australia	(2001)	48 211	20 452	42.9
Austria	(2001)	30 068	4 400	14.6
Belgium ¹	(1998-02)	39 133	4 629	11.8
Canada	(2001)	65 110	22 860	35.1
Czech Republic*	...	...	...	39 562
Denmark ²	(2002)	14 977	1 629	10.9
Estonia*	...	...	...	...
Finland	(2000)	14 560	575	4.0
France	(1999)	200 358	33 879	16.9
Germany	(1998-02)	282 124	28 494	11.1
Greece ³	(2001)	13 744	1 181	8.6
Hungary	(2001)	24 671	2 724	11.0
Ireland	(2002)	8 208	2 895	35.3
Israel*	...	...	...	...
Italy*	...	...	...	...
Luxembourg	(2001)	882 266	30.2	1 347
Mexico*	(2000)	205 571	3 005	1.5
Netherlands	(1998-02)	42 313	7 032	16.7
New-Zealand	(2001)	9 009	4 215	46.9
Norway	(1998-02)	12 761	2 117	16.6
Poland	(2002)	99 687	3 144	3.2
Portugal	(2001)	23 131	4 552	19.7
Slovak Republic*	...	...	...	21 552
Slovenia*	...	...	...	...
Spain	(2001)	126 248	9 433	7.5
Sweden ⁴	(2003)	26 983	6 148	22.9
Switzerland ⁵	(2000)	23 039	6 431	28.1
Turkey	(2000)	82 221	5 090	6.2
United Kingdom	(2001)	147 677	49 780	33.7
United States	(2000)	807 844	196 815	24.4
OECD Total (23 countries)		2 142 959	418 741	19.5

1 Other sources indicate a slightly higher increase in the number of doctors in Belgium during this period.

2 Some doctors undergoing specialty training may not be counted in 2011.

3 In 2001, doctors are only partially covered.

4 Other sources indicate a slightly lower increase in the number of doctors in Sweden during this period.

5 Some doctors undergoing specialty training may not be counted in 2000.

Sources: OECD, 2007 (3) for 2000/2001 data; database on immigrants in OECD countries¹ 2010/2011 and labour force surveys 2009–2012 for 2010/2011 data.

1 <http://www.oecd.org/els/mig/databaseonimmigrantsinoecdcountriesdioc.htm>.

Table 1 (continued)

Practising doctors by place of birth in 30 OECD countries, 2000/01 and 2010/11

Country of residence	Doctors			
	2010/11			
	Year	Total	Foreign born	% foreign born
Australia	(2011)	68 795	36 076	52.8
Austria	(2011/12)	40 559	6 844	16.9
Belgium ¹	(2011/12)	40 148	10 202	25.4
Canada	(2011)	79 585	27 780	34.9
Czech Republic*		3 468	8.8	(2011)
Denmark ²	(2011)	15 403	2 935	19.1
Estonia*	(2011)	4 145	747	18.0
Finland	(2011)	18 937	1 454	7.7
France	(2011)	224 998	43 955	19.5
Germany	(2011/12)	366 700	57 210	15.7
Greece ³	(2011/12)	49 577	3 624	7.3
Hungary	(2011)	28 522	3 790	13.3
Ireland	(2011/12)	12 832	5 973	46.6
Israel*	(2011)	23 398	11 519	49.2
Italy*	(2011/12)	234 323	11 822	5.0
Luxembourg		536	40.0	(2011)
Mexico*		...	...	...
Netherlands	(2011)	57 976	8 429	14.6
New Zealand	(2011)	12 708	6 897	54.3
Norway	(2011)	19 624	4 460	22.7
Poland	(2011)	109 652	2 935	2.7
Portugal	(2011)	36 831	6 040	16.4
Slovak Republic*		823	3.8	(2011)
Slovenia*	2011)	5 556	1 006	18.1
Spain	(2011)	210 500	21 005	10.3
Sweden ⁴	(2011/12)	47 778	14 173	29.8
Switzerland ⁵	(2011/12)	43 416	18 082	41.6
Turkey	(2011/12)	104 950	3 003	2.9
United Kingdom	(2011/12)	236 862	83 951	35.4
United States	(2007-11)	838 933	221 393	26.4
OECD Total (23 countries)		2 666	632	590 748

Notes: Countries for which data for 2000/2001 are derived from a census: Australia, Austria, Canada, Finland, France, Hungary, Ireland, Luxembourg, Mexico, New Zealand, Poland, Spain, Switzerland, Turkey, United Kingdom, United States; countries for which data for 2000/2001 are derived from labour force surveys: Belgium, Germany, Netherlands, Norway. Countries for which data for 2010/2011 are derived from a census: Australia, Canada, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Israel, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, United States; countries for which data for 2010/2011 are derived from labour force surveys: Austria, Belgium, Czech Republic, Germany, Greece, Hungary, Ireland, Italy, Sweden, Switzerland, Turkey, United Kingdom. Foreign-born doctors whose place of birth is unknown are excluded from the calculation of the percentage of foreign-born doctors. Countries marked with an asterisk (*) are not counted in the total (OECD 23) due to data gaps for at least one year.

Table 2

Practising nurses by place of birth in 30 OECD countries, 2000/01 and 2010/11

Country of residence	Nurses 2000/01			
	Year	Total	Foreign born	% foreign born
Australia	(2001)	191 105	46 750	24.8
Austria	(2001)	56 797	8 217	14.5
Belgium	(1998-02)	127 384	8 409	6.6
Canada	(2001)	284 945	48 880	17.2
Czech Republic*	...	...	...	...
Denmark ¹	(2002)	57 047	2 320	4.1
Estonia*	...	...	...	...
Finland	(2000)	56 365	470	0.8
France	(1999)	421 602	23 308	5.5
Germany	(1998-02)	781 300	74 990	10.4
Greece	(2001)	39 952	3 883	9.7
Hungary	(2001)	49 738	1 538	3.1
Ireland	(2002)	43 320	6 204	14.3
Israel*	...	...	...	...
Italy*	...	...	...	...
Luxembourg	(2001)	2 551	658	25.8
Mexico*	(2000)	267 537	550	0.2
Netherlands	(1998-02)	259 569	17 780	6.9
New Zealand	(2001)	33 261	7 698	23.2
Norway	(1998-02)	70 698	4 281	6.1
Poland	(2002)	243 225	1 074	0.4
Portugal	(2001)	36 595	5 077	13.9
Slovak Republic*	...	...	...	52 773
Slovenia*	...	...	...	17 124
Spain	(2001)	167 498	5 638	3.4
Sweden	(2003)	98 505	8 710	8.9
Switzerland ²	(2000)	62 194	17 636	28.6
Turkey*	(2000)	...	...	...
United Kingdom	(2001)	538 647	81 623	15.2
United States	(2000)	2 818 735	336 183	11.9
OECD Total (22 countries)		6 441 033	711 327	11.0

1 Other sources indicate that the number of nurses in Denmark may be about 25% higher in 2002 and in 2012. Some associate professional nurses may not be counted.

2 Other sources indicate that the number of nurses in Switzerland may be about 50% higher in 2000 and 20% higher in 2010.

Sources: OECD, 2007 (3) for 2000/2001 data; database on immigrants in OECD countries² 2010/2011 and labour force surveys 2009–2012 for 2010/2011 data.

Notes: Countries for which data for 2000/2001 are derived from a census: Australia, Austria, Canada, Finland, France, Hungary, Ireland, Luxembourg, Mexico, New Zealand, Poland, Portugal, Spain, Switzerland, Turkey,

2 <http://www.oecd.org/els/mig/databaseonimmigrantsinoecdcountriesdioc.htm>.

Table 2 (continued)

Practising nurses by place of birth in 30 OECD countries, 2000/01 and 2010/11

	Nurses 2010/11			
	Year	Total	Foreign born	% foreign born
Australia	(2011)	238 935	78 508	33.2
Austria	(2009-10)	70 147	10 265	14.6
Belgium	(2011-12)	140 054	23 575	16.8
Canada	(2011)	326 700	73 425	22.5
Czech Republic*	(2011-12)	89 301	1 462	1.6
Denmark ¹	(2011-12)	61 082	6 301	10.3
Estonia*	(2011-12)	8 302	2 162	26.0
Finland	(2011-12)	72 836	1 732	2.4
France	(2009-10)	550 163	32 345	5.9
Germany	(2009-12)	1 074 523	150 060	14.0
Greece	(2011-12)	55 364	1 919	3.5
Hungary	(2011-12)	59 300	1 218	2.1
Ireland	(2011-12)	58 092	15 606	26.9
Israel*	(2011)	31 708	16 043	50.6
Italy*	(2011-12)	399 777	39 231	9.8
Luxembourg	(2011-12)	4 372	1 347	30.8
Mexico*		...	...	...
Netherlands	(2009-10)	323 420	30 909	9.6
New Zealand	(2011)	40 002	13 884	35.0
Norway	(2009-10)	97 725	8 795	9.0
Poland	(2009-10)	245 667	595	0.2
Portugal	(2011-12)	53 491	4 643	8.7
Slovak Republic*	(2011-12)	303		0.6
Slovenia*	(2011-12)	1 483		8.7
Spain	(2011-12)	252 804	14 400	5.7
Sweden	(2011-12)	113 956	15 834	13.9
Switzerland ²	(2011-12)	110 069	36 531	33.3
Turkey*	(2009-10)	147 611	4 484	3.1
United Kingdom	(2011-12)	618 659	134 075	21.7
United States	(2007-11)	3 847 068	561 232	14.6
OECD Total (22 countries)		8 414 429	1 217 200	14.5

United Kingdom, United States; countries for which data for 2000/2001 are derived from labour force surveys: Belgium, Germany, Netherlands, Norway; country for which data for 2000/2001 are derived from a register: Denmark. Countries for which data for 2010/2011 are derived from a census: Australia, Canada, Israel, New Zealand, United States; countries for which data for 2010/2011 are derived from labour force surveys: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom. Foreign-born nurses whose place of birth is unknown are excluded from the calculation of the percentage of foreign-born nurses. Countries marked with an asterisk (*) are not counted in the total (OECD 23) due to data gaps for at least one year.

2.2 Foreign-trained health workers in OECD countries

In most OECD countries, the proportion of health workers trained abroad is lower than that of health workers born abroad, indicating that host countries provide part of migrants' education and training. In 2012–2014, foreign-trained doctors accounted for 17% of all doctors across 26 OECD countries and foreign-trained nurses for 6% of all nurses across 25 countries. While the number of foreign-trained health workers is usually lower than those that are foreign born, in some countries (for example, Israel), the share of foreign-trained health workers is higher, reflecting the fact that many people born in those countries went to study abroad before returning back to practise in their home countries.

Australia, Ireland, New Zealand and Norway have the highest share of foreign-trained doctors, with more than 30% of doctors trained abroad. Following these countries are Canada, Sweden, Switzerland, the United Kingdom and the United States, with rates between 24% and 30%. The very high proportion of foreign-trained doctors in Israel reflects not only the importance of immigration in this country, but also the fact that an increasing number of new licences are issued to people born in Israel but trained abroad (about one third in 2014). Similarly, in the case of Norway, large numbers of Norwegians study medicine abroad, with most of them returning to practise in Norway.

In absolute numbers, the United States has by far the highest number of foreign-trained health workers, with more than 200 000 doctors and almost 250 000 nurses trained abroad in 2013. Following the United States are the United Kingdom (with more than 48 000 foreign-trained doctors and 86 000 foreign-trained nurses in 2014) and Germany (with nearly 29 000 foreign-trained doctors in 2014 and 70 000 foreign-trained nurses in 2010, the latest year available).

In most OECD countries, the proportion of nurses trained abroad tends to be much lower than that of doctors. Only Australia, Israel, New Zealand and Switzerland report figures higher than 10% in 2012–2014. Recent trends in the migration of foreign-trained nurses also vary across countries. There has been a strong rise in the immigration of foreign-trained nurses in Italy, primarily driven by the arrival of nurses trained in Romania. However, in some other countries (for example, the Netherlands, Portugal and the United Kingdom), there was a reduction in the number and proportion of foreign-trained nurses between 2006 and 2012–2014.

Most OECD countries have stepped up their education and training efforts for doctors and nurses since 2000 in response to expected shortages arising from general population ageing (which is expected to increase the demand for health services) and the ageing of the medical and nursing workforce (which is expected to reduce their supply). These efforts have partly slowed down the increase in international recruitment (see section 4.1 on the impact of domestic education and training policies on international migration flows) (Tables 3 and 4).

Table 3

Foreign-trained doctors working in 26 OECD countries, 2000, 2006 and 2012–2014

Country of residence	Doctors			
	2000			
	Year	Total	Foreign-trained	% of total
Australia	2000	...	...	...
Austria	2000	25 611 ^e	461	1.8%
Belgium	2000	44 380	1 934	4.4%
Canada	2000	64 462	13 701	21.3%
Chile	2000	...	...	...
Czech Republic	2000	43 765	579	1.3%
Denmark	2000	15 551	681	4.4%
Estonia	2002	2 259	0	0.0%
Finland	2000	...	...	...
France	2000	199 445	7 795	3.9%
Germany ¹	2000	267 965	9 971	3.7%
Hungary	2000	...	...	...
Ireland	2000	12 243 ^e	1 359	11.1%
Israel	2000	21 869	14 080	64.4%
Netherlands	2001	39 772	706	1.8%
New Zealand	2000	9 890	3 756	38.0%
Norway	2000	...	...	...
Poland	2000	...	...	...
Slovak Republic	2000	18 571 ^e	130	0.7%
Slovenia	2000	...	...	...
Spain	2000	...	...	...
Sweden	2000	27 502	3 827	13.9%
Switzerland	2000	25 272 ^e	2 982	11.8%
Turkey	2000	85 242	55	0.1%
United Kingdom ²	2000	...	...	...
United States ³	2000	...	...	25.5%
OECD Total (26 countries)				

1 The data refer to foreign citizens (not necessarily foreign trained).

2 Data cover England, Wales and Scotland (but not Northern Ireland).

3 The percentage in 2000 is calculated based on all doctors registered to practise. Data for 2006 and 2013 refer to doctors who are professionally active.

e: estimation.

Table 3 (continued)

Foreign-trained doctors working in 26 OECD countries, 2000, 2006 and 2012–2014

Doctors							
2006				2012–2014			
Year	Total	Foreign-trained	% of total	Year	Total	Foreign-trained	% of total
2005	...	...	25.0%	2013	82 498	25 153	30.5%
2006	30 236	888	2.9%	2014	35 844	1 640	4.6%
2006	49 695	2 636	5.3%	2014	59 070	6 732	11.4%
2006	70 870	15 237	21.5%	2013	90 205	21 225	23.5%
2006	...	...	...	2014	36 013	5 489	15.2%
2006	44 064	1 744	4.0%	2014	41 671	1 135	2.7%
2006	18 403	1 145	6.2%	2012	20 250	1 127	5.6%
2006	5 336	30	0.6%	2014	6 294	166	2.6%
2005	...	...	...	2012	20 866	4 154	19.9%
2006	212 711	12 261	5.8%	2013	219 833	20 275	9.2%
2006	284 427	14 703	5.2%	2013	326 945	28 901	8.8%
2006	37 908	2 917	7.7%	2013	32 668	2 470	7.6%
2006	15 512 ^a	4 663	30.1%	2014	19 066	6 877	36.1%
2006	23 890	14 746	61.7%	2014	25 570	14 839	58.0%
2006	45 051	941	2.1%	2011	51 939	1 352	2.6%
2006	11 889	4 833	40.7%	2014	14 786	6 298	42.6%
2008	18 557	5 996	32.3%	2014	22 659	8 447	37.3%
2008	119 604	2 529	2.1%	2012	125 073	2 203	1.8%
2004	17 375 ^a	139	0.8%	2011	16 899	506	3.0%
2006	...	...	...	2013	5 416	781	14.4%
2006	...	...	...	2011	207 042	19 462	9.4%
2006	32 802	6 321	19.3%	2012	38 144	9 283	24.3%
2008	29 653	6 479	21.8%	2012	31 858	8 617	27.0%
2006	104 475	240	0.2%	2013	133 775	261	0.2%
2008	146 834	43 885	29.9%	2014	172 561	48 766	28.3%
2006	664 814	166 810	25.1%	2013	859 470	214 438	25.0%
OECD Total (26 countries)					2 696 415	460 597	17.1%

Note: Doctors whose place of training is unknown have been excluded from the calculation of the percentage of foreign-trained doctors (Netherlands, Slovak Republic, Slovenia and United Kingdom).

Source: Annex 4.A1 in chapter 4 of OECD, *Health workforce policies in OECD countries: right jobs, right skills, right places* (5).

Table 4

Foreign-trained nurses working in 25 OECD countries, 2000, 2006 and 2012-14

Country of residence	Nurses			
	2000			
	Year	Total	Foreign-trained	% of total
Australia	2000	...	...	...
Belgium	2000	130 560	679	0.5%
Canada	2000	232 566	14 187	6.1 %
Chile	2000	...	...	...
Denmark ¹	2000	49 694	889	1.8%
Estonia	2000	...	...	...
Finland ²	2000	...	...	0.2%
France	2000	404 564	7 016	1.7%
Germany ³	2000	...	...	...
Hungary	2000	...	...	...
Ireland	2000	...	...	...
Israel	2000	39 064	7 277	18.6%
Italy	2000	304 159	1 825	0.6%
Netherlands	2001	169 580	1 495	0.9%
New Zealand	2002	33 027	4 860	14.7%
Norway	2000	...	...	...
Poland	2000	...	...	...
Portugal	2002	41 902	1 954	4.7%
Slovenia	2000	...	...	...
Spain	2000	...	...	...
Sweden	2000	88 302	2 358	2.7%
Switzerland	2000	...	...	...
Turkey	2000	69 550	11	0.0%
United Kingdom ⁴	2001	632 050 ⁵	50 564	8.0%
United States ⁵	2000	...	...	...
OECD Total (25 countries)				

1 The data only include professional nurses (and exclude associate professional nurses).

2 The data refer only to general nurses.

3 The data refer to citizens born abroad, not German by birth (except ethnic German repatriates), and the highest degree in nursing acquired in a foreign country.

4 Different source in 2001 (8).

5 Data refer to all nurses registered to practise.

Table 4 (continued)

Foreign-trained nurses working in 25 OECD countries, 2000, 2006 and 2012–2014

Nurses							
2006				2012–2014			
Year	Total	Foreign-trained	% of total	Year	Total	Foreign-trained	% of total
2007	263 332	38 108	14.5%	2013	296 029	47 507	16.0%
2006	150 817	1 290	0.9%	2014	186 278	5 411	2.9%
2006	326 170	21 445	6.6%	2013	375 768	28 330	7.5%
2006	...	...	...	2014	34 674	702	2.0%
2006	51 840	818	1.6%	2012	55 037	724	1.3%
2006	10 264	...	...	2014	12 519	4	0.0%
2005	...	...	0.3%	2012	72 471	1 293	1.8%
2006	493 503	11 712	2.4%	2014	622 052	17 692	2.8%
2006	...	...	...	2010	1 211 000	70 000	5.8%
2006	...	...	...	2013	53 323	650	1.2%
2004	60 819 ^e	8 758	14.4%	2013	...	...	...
2006	43 481	6 077	14.0%	2014	45 982	4 528	9.8%
2006	358 746	15 108	4.2%	2014	424 813	20 072	4.7%
2006	186 990	2 149	1.1%	2011	198 694	1 358	0.7%
2008	39 247	8 931	22.8%	2014	45 572	11 170	24.5%
2008	70 575	5 022	7.1%	2014	83 647	7 640	9.1%
2008	268 015	5	0.0%	2012	278 496	7	0.0%
2006	51 095	2 285	4.5%	2013	65 868	1 947	3.0%
2006	...	...	...	2013	4 797	20	0.4%
2006	...	...	...	2011	250 277	5 247	2.1%
2006	98 905	2 789	2.8%	2012	106 176	2 882	2.7%
2006	...	...	...	2012	61 609	11 536	18.7%
2006	82 626	79	0.1%	2013	139 544	239	0.2%
2006	659 470	88 609	13.4%	2014	683 625	86 668	12.7%
2006	...	...	...	2012	4 104 854 ^e	246 291 ^e	6.0%
					9 413 105	571 918	6.1%

e: estimation.

Note: Nurses whose place of training is unknown are excluded from the calculation of the percentage of foreign-trained nurses (for example, Switzerland).

Source: Annex 4.A1 in chapter 4 of OECD, *Health workforce policies in OECD countries: right jobs, right skills, right places* (5).

3. Findings: experiences of sending countries

3.1 Countries of origin of migrant health workers in OECD countries

The emigration of health workers from their country of origin can be reconstructed through the use of data collected in OECD destination countries.³ Figure 1 presents the distribution by region of origin of foreign-born doctors and nurses who were working in OECD countries in 2000/2001 and 2010/2011.

In 2010/2011, 26% of doctors and 29% of nurses working in OECD countries came from other OECD countries. These figures reflect both the scale of historical migration – particularly of Europeans to the main settlement countries – and the vitality of intra-European Economic Area, trans-Tasman and North American flows. Beyond movements between countries within the OECD, the region from which most doctors originated was South-East Asia, while most nurses came from the Western Pacific Region. Growth in the number of expatriate doctors between 2000/2001 and 2010/2011 was distributed fairly evenly among these different regions. For nurses, it was more uneven, depending on the region of origin.

Figure 2 shows the top 25 countries of origin of foreign-born doctors and nurses working in OECD countries in 2010/2011 and the increase since 2000/2001. In the South-East Asia Region, the increase came mainly from doctors born in India. Germany and the United Kingdom were the main countries of origin among OECD countries. In non-OECD European countries, Romania also stands out for its high volume of emigration. In the Eastern Mediterranean and Western Pacific Regions, Pakistan and China accounted for the highest shares of foreign-born doctors working in OECD countries, while the Philippines sent the largest proportion of nurses. In the African Region, immigrant doctors in OECD countries came primarily from Nigeria and South Africa, and in the Region of the Americas, from Colombia and Peru, while the Caribbean supplied the most nurses.

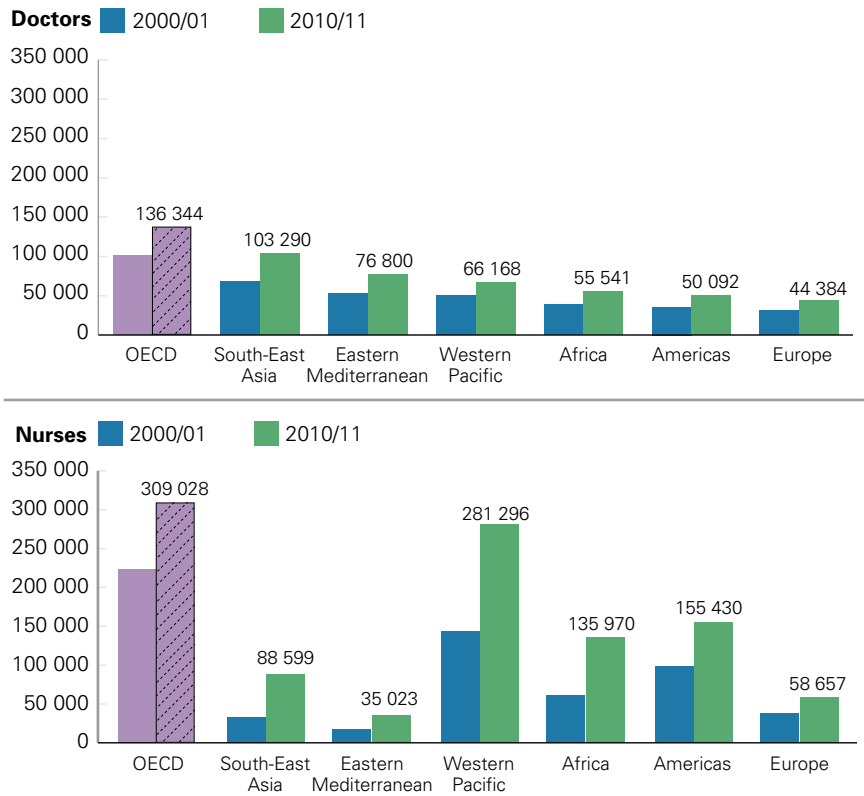
India and the Philippines account for the largest shares of migrant doctors and nurses in OECD countries. They were already the two main sending countries in

3 These data provide a lower-bound estimate, as they do not include migration to other non-OECD countries.

2000/2001, but their outflows grew further over the following decade. The first seven countries of origin accounted for nearly half of the increase in the number of foreign-born doctors. For nurses, nearly half of those emigrating came from the first four countries of origin. The tendency of some countries to train health professionals who intend to migrate is an important factor in the international mobility of health workers.

Figure 1

Number of foreign-born doctors and nurses in 30 OECD countries by main region of origin, 2000/2001 and 2010/2011

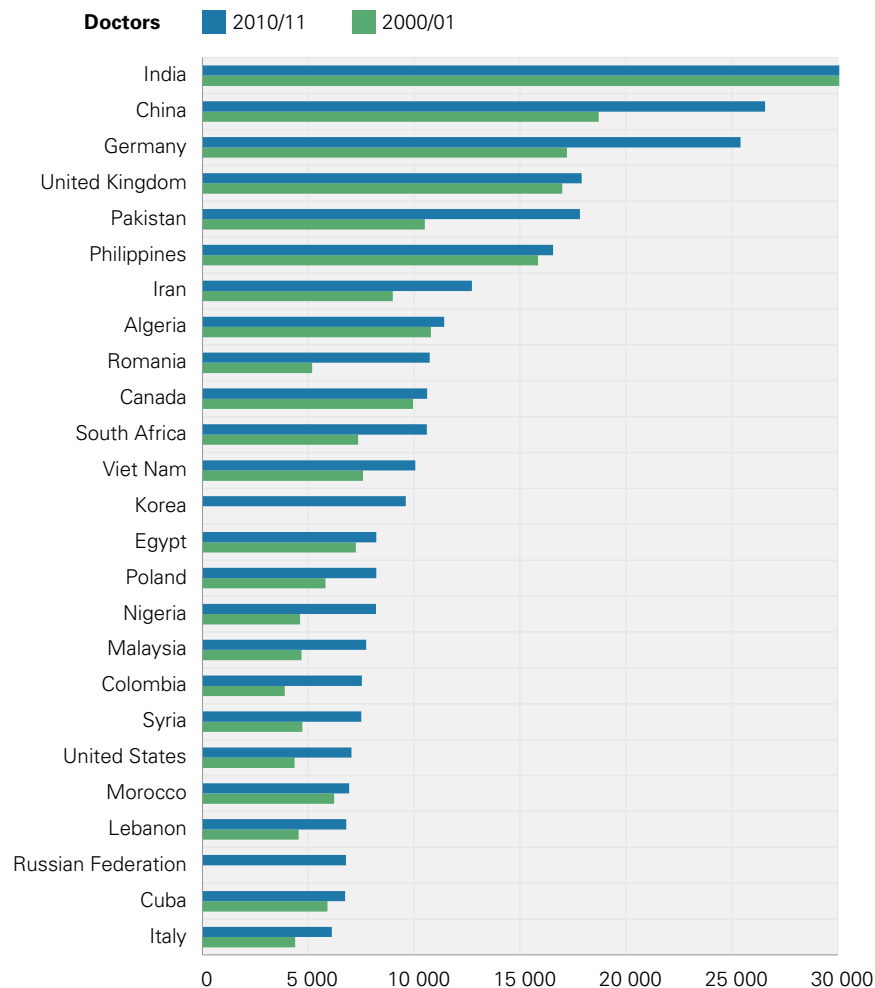


Note: The regional groupings correspond to the six WHO regions (for country details, see <http://www.who.int/about/regions>), except the OECD countries.

Source: OECD, *Changing patterns in the international migration of doctors and nurses to OECD countries*, Figure 3.15, p. 129 (4).

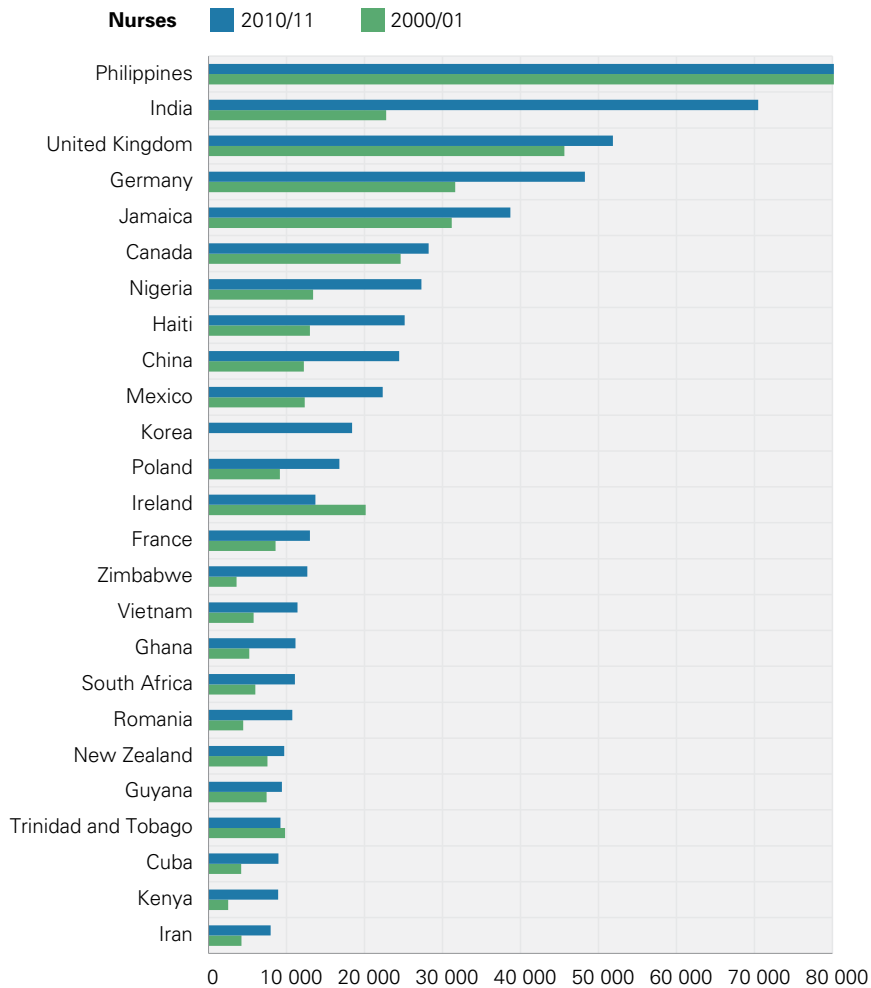
Figure 2

Number of foreign-born doctors and nurses in OECD countries by 25 main countries of origin, 2000/2001 and 2010/2011



Source: OECD, *Changing patterns in the international migration of doctors and nurses to OECD countries*, Figure 3.16, p. 129 (4).

FIGURE 2 (continued)
 Number of foreign-born doctors and nurses in OECD countries by 25 main countries of origin, 2000/2001 and 2010/2011



3.2 Expatriation rates from countries of origin

Table 5 summarizes the broad trends in expatriation rates over the past decade.⁴ Between 2000/2001 and 2010/2011, emigration rates have risen for both doctors and nurses. In 2010/2011, about 6% of doctors and nurses in the world had migrated to an OECD country.

In Africa, the expatriation rate for nurses in South Africa rose from 12.6% in 2000/2001 to 16.5% in 2010/2011, in Nigeria from 10% to 17%, and in Zimbabwe from 28% to 43%. For the two main origin countries of doctors in Africa

Table 5

Trends in the expatriation rates of doctors and nurses to OECD countries, 2000/2001 and 2010/2011

	Doctors		Nurses	
	2000/01	2010/11	2000/01	2010/11
Overall expatriation rate	5.3	5.9	4.5	5.7
Average expatriation rate	19.5	21.8	16.6	21.8
Median expatriation rate	13.0	13.6	6.4	10.4

Notes: The average expatriation rate corresponds to the unweighted average of each country's expatriation rate (and therefore does not take into account the demographic weight of each country), whereas the overall expatriation rate indicates the share of expatriates in OECD countries in the total number of doctors and nurses of the countries examined. The average expatriation rate is higher than the global rate, because countries with the lowest populations and those that are islands show the highest rates of emigration. Countries for which expatriation rates are under 10 for nurses (5 for doctors) or resident rates in the origin country are below 50 for nurses (10 for doctors) are not included in the calculations. Expatriation rates are only calculated for countries for which data back to 2005 at the latest are available. Therefore, 149 countries of origin are included for doctors and 141 for nurses. Data on the expatriation rates in 2000/2001 of nurses born in Brazil, India and South Africa have been updated on the basis of new data on the number of nurses working in these countries in 2000/2001. The revised expatriation rates in 2000/2001 are: Brazil 1.5%; India 2.9%; and South Africa 12.6%.

Sources: OECD (3); database on immigrants in OECD countries 2010/2011;⁵ labour force surveys 2009–2012; Global Health Observatory (WHO).

4 Table 3.A1.1 in the *International migration outlook 2015 (4)* presents expatriation rates by country of origin.

5 <http://www.oecd.org/els/mig/databaseonimmigrantsinoecdcountriesdioc.htm>.

who have migrated to an OECD country (Nigeria and South Africa), expatriation rates have also risen: in South Africa from 17% to 22%, and a lower rise in Nigeria from 11.7% to 12.3%. In some cases, the changes observed in the expatriation rates are not so much related to an increase or a decrease in migration flows, but rather to a change in the national stock of health workers. For example, the expatriation rate for doctors in Angola dropped from 63% to 34%, while the number of expatriate doctors remained stable. This reflects a sharp increase in the number of doctors registered by WHO as working in Angola over the last decade. In Nigeria, the number of expatriate doctors nearly doubled in 10 years (from around 4600 to 8200), whereas the expatriation rate remained stable at around 12%. This again reflects the growth in the number of doctors working in the country. On the other hand, the increase in the expatriation rate of doctors in Zimbabwe (from 28% to 56%) is in large part attributable to the fact that the number of doctors practising in the country fell by more than half.

Despite the sharp increase in the number of health professionals emigrating from India and the Philippines, their expatriation rates remained relatively constant. For example, the number of expatriate Indian doctors jumped from 56 000 in 2000/2001 to around 87 000 in 2010/2011, but the corresponding expatriation rates rose only by one half of a percentage point to 8.6%. In China, the number of expatriate nurses doubled in 10 years (from around 12 200 to 24 400), but the expatriation rate remained at only 1%.

3.3 Impact of emigration on health systems in countries of origin

In its 2006 *World health report*, WHO estimated that 2.4 million health workers were needed in the 57 countries considered to have critical shortages (9).⁶ In 2010/2011, WHO estimated that 54 countries were still facing critical shortages of about 2 million health workers. Most of these countries (31 countries) were in Africa. Progress made in India to close the gap between health worker supply and demand accounted for much of the reduced shortage in 2010/2011. In Africa and

⁶ Countries with critical shortages were defined in the 2006 *World health report* as those with less than 22.8 health professionals (doctors, nurses and midwives) per 10 000 people and where less than 80% of childbirths were delivered by skilled birth attendants.

the Americas, however, the gap widened (10). It should be noted that WHO no longer uses the categorization of countries with critical shortages.

The slightly smaller group of countries having critical shortages saw their health workers continue to emigrate in growing numbers between 2000/2001 and 2010/2011. Emigration therefore appears to have contributed to these critical shortages over the decade. It accounted for 20% of estimated critical shortages in 2010/2011, compared with 9% in 2000/2001. In the decade preceding the adoption of the WHO Global Code, the number of doctors and nurses originating from countries with severe shortages who migrated to OECD countries grew by 84%, while the total number of migrant health workers increased by 60%.

In African countries assessed as facing critical shortages, the number of health professionals born in these countries and working in OECD countries doubled between 2000/2001 and 2010/2011. At the same time, the critical shortages in their origin countries grew, so the migration's share of the estimated shortage rose from 7% in 2000/2001 to 13% in 2010/2011. However, the picture varies from one country to another. Ethiopia was the African country with the most severe critical shortage. There was an estimated shortfall of 175 000 health workers in 2010/2011, but only 6000 doctors and nurses had emigrated. In Nigeria, by contrast, emigrant workers accounted for over 40% of the critical shortage, with 36 000 expatriates for a shortfall estimated at 81 000 health workers.

In the Americas, the high share of the estimated shortage attributed to migrant health personnel is due mainly to the high emigration of nurses from the Caribbean. In absolute terms, the greatest shortage is in the South-East Asia Region. Shortages are particularly acute in Bangladesh and Indonesia, with health worker shortfalls estimated at 260 000 and 240 000 respectively. In the Eastern Mediterranean Region, the increase in emigration – particularly of Pakistan-born doctors – to the OECD area accounted for 17% of the region's estimated critical shortage in 2010/2011, up from 10% in 2000/2001. Cambodia, Lao People's Democratic Republic and Papua New Guinea were the countries where the shortfalls in health personnel were the greatest in the Western Pacific Region. In this region, migration also accounted for a higher share of the shortage in 2010/2011 compared with 2000/2001. Table 6 assesses the relative contribution of emigration for those countries where the density

of health workers was considered too low, and the extent to which such emigration contributed to these critical shortages. The table presents data at a broad WHO regional level; it is important to keep in mind that the actual impact in different countries can vary significantly.

Table 6

Estimated critical shortages of doctors, nurses and midwives,
by WHO region, 2000/01 & 2010/11

Number of countries			in countries with critical shortages				foreign-born doctors and nurses in OECD countries by region of origin			
Total	With critical shortages		Total stock		Estimated critical shortage		Number		% of the estimated critical shortage	
	2000/2001	2010/2011	2000/2001	2010/2011	2000/01 2010/11	2000/01 2010/11	2000/2001	2010/2011	2000/2001	2010/2011
Africa WHO Region										
46	36	31	464 865	579 748	817 992	941 505	61 212	124 824	7%	13%
Americas Region										
35	5	5	82 647	59 695	37 886	49 376	26 917	36 689	71%	74%
South-East Asia Region										
11	6	7	1 763 637	2 318 101	1 164 001	661 267	90 216	177 018	8%	27%
Europe WHO Region										
52	0	0								
Eastern Mediterranean WHO Region										
21	7	6	278 412	344 050	306 031	263 394	29 926	45 703	10%	17%
Western Pacific WHO Region										
27	3	5	20 991	26 443	32 560	38 269	3 577	5 732	11%	15%
Total number of countries with critical shortages										
	57	54	2 610 552	3 328 037	2 358 470	1 953 810	211 848	389 966	9%	20%

Sources: OECD (3); database on immigrants in OECD countries 2010/2011;⁷ labour force surveys 2009–2012; Global Health Observatory (WHO).

⁷ <http://www.oecd.org/els/mig/databaseonimmigrantsinoecdcountriesdioc.htm>.

There are many possible causes behind the international migration of health workers and consequences for the health systems of origin countries. On the one hand, this migration may be interpreted as a symptom rather than a determinant of the problems facing these health systems. The fact that there is a shortage does not necessarily mean that there is a lack of health workers with the required qualifications and skills: it may also reflect the reluctance of these individuals to work under existing conditions (11). On the other hand, the emigration of health workers can indeed be a problem when the volume of outflows is significant, particularly when it concerns skills that are in short supply or when migrants come from regions that are already undersupplied (12). The emigration of even a limited number of specialists can have an important impact on the delivery of health care, especially in rural areas where there is a dearth of health workers (13, 14).

4. Impact of health and immigration policies on international mobility of health workers

The growing international mobility of health professionals must be viewed in relation to other elements that also affect the supply of health workers, primarily the entry to the labour market of new graduates on the inflow side, and the retirement or exit of workers on the outflow side. The main factors influencing inflows and outflows are education and training policies, immigration policies, and changes in economic and institutional circumstances.

4.1 Impact of domestic education and training policies on international migration flows

Policies relating to the education and training of doctors, nurses and other health professionals are among the most powerful tools that countries can use to adjust the supply to projected needs. Training sufficiently large numbers of health workers to curb any dependence on immigration is in fact one of the key principles of the WHO Global Code of Practice. Most OECD countries control in some ways the number of students admitted to medical and nursing schools, mainly through *numerus clausus* policies, and several countries have raised admission levels in these programmes since 2000, either to meet expected growing needs for health services or to reduce their dependence on foreign-trained doctors or nurses.

The efforts to train new doctors have intensified in most OECD countries since 2000, including in Australia, Canada and the United Kingdom, and to a lesser extent in the United States. The number of students admitted to and graduating from nursing programmes also rose sharply in many countries after 2000 (4, 15).⁸

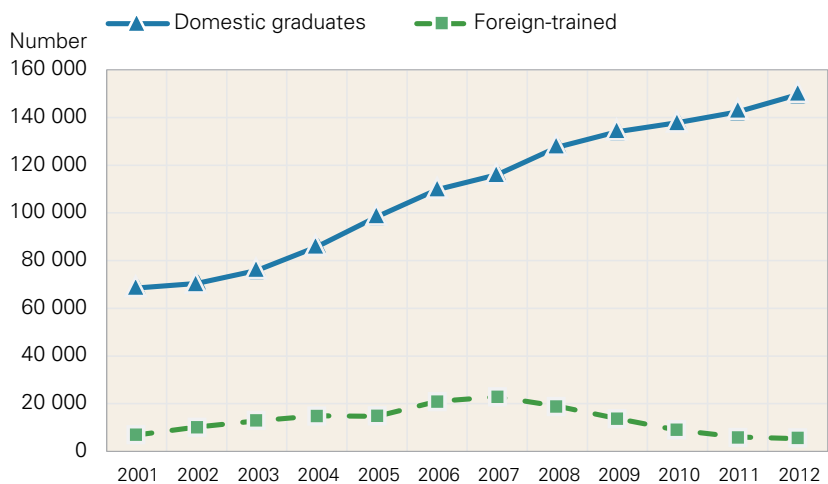
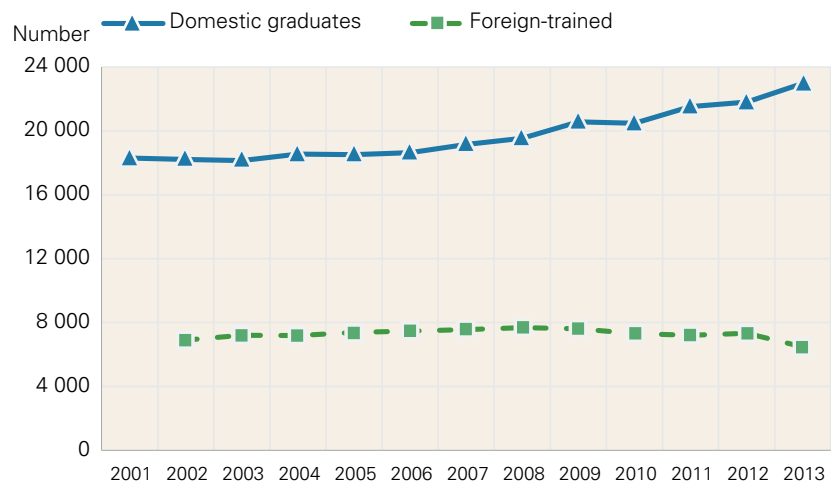
The United States provides a striking example of how a substantial increase in domestic training efforts for nurses has reduced the need to recruit foreign-trained nurses. Between 2001 and 2012, the number of domestically trained nurses passing the certification exam more than doubled, rising from less than 70 000 in 2001 to nearly 150 000 in 2012 (Figure 3, right panel). This was accompanied by a sharp drop in the number of foreign-trained nurses who passed that exam, coming down from a peak of around 23 000 in 2007 to only about 5000 in 2012. Until recently, the number of newly registered doctors who obtained their initial degree in another country has remained more stable, but if the number of domestically trained doctors continues to rise, it is possible that fewer foreign-trained doctors will become registered in the United States in coming years (Figure 3, left panel).

In the United Kingdom, the steady rise in the number of domestic medical graduates since 2002 has also reduced the need to recruit abroad (Figure 4), although the annual inflow of foreign-trained doctors seems to have stabilized in recent years. But the countries of origin of foreign-trained doctors in the United Kingdom have changed considerably over the past decade, with a growing proportion of doctors trained in other European Union countries. Regarding nurses, the inflow of foreign-trained nurses fell sharply between 2004 and 2009, but it has gone up since then, driven mainly by the migration of nurses trained in other European Union countries (for example, Portugal and Spain), to meet growing demands for nurses that are not fully met by the growing supply of domestically trained nurses. It is important to keep in mind that there are also large outflows of nurses trained in the United Kingdom who are emigrating to other English-speaking countries, such as Australia, Canada, New Zealand and the United States (16).

8 See, for example, Figures 3.18 and 3.19 in the *International migration outlook 2015* (4) and Figures 5.7 and 5.16 in *Health at a glance 2015* (15).

Figure 3

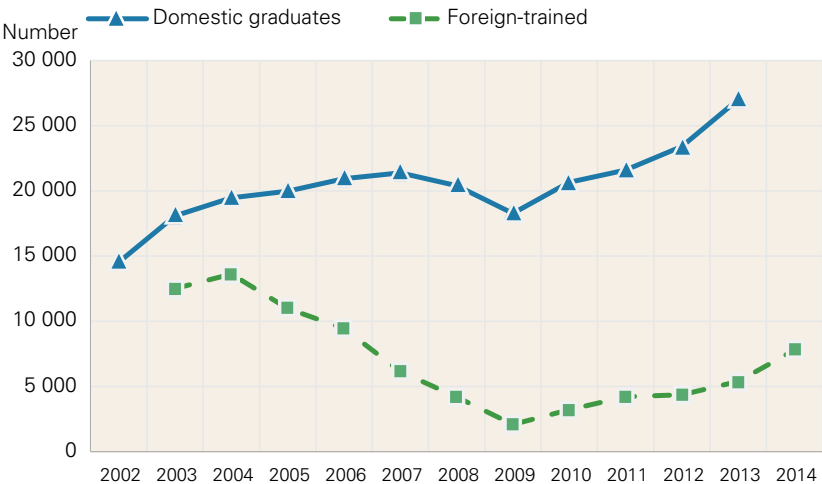
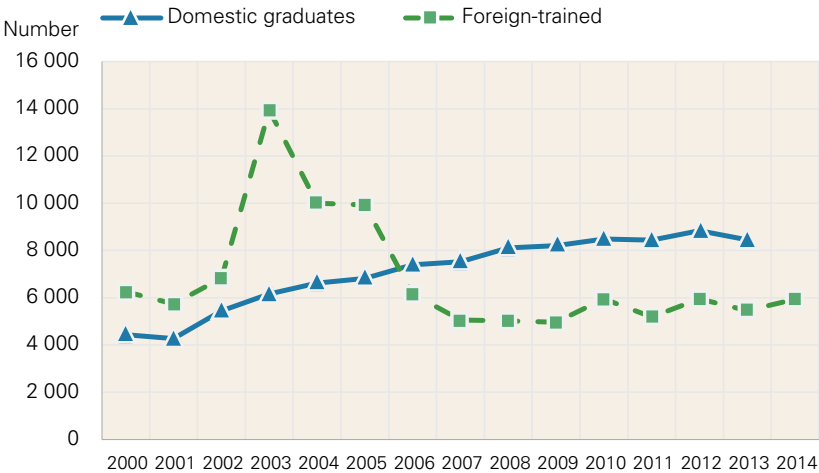
Changes in the number of domestic graduates and inflow of foreign-trained health workers, United States, 2001–2014



Source: OECD, *Health workforce policies in OECD countries: right jobs, right skills, right places*, Figure 8, p. 7 (5).

Figure 4

Changes in the numbers of domestic graduates and inflow of foreign-trained health workers, United Kingdom, 2000–2014



Note: Between 2005 and 2008, data on staff trained abroad correspond to the administrative period ending 31 March of the year indicated. There is a break in 2008 for the graduate series. Data from 2008 onwards are estimated.

Source: OECD, *Health workforce policies in OECD countries: right jobs, right skills, right places*, Figure 9, p. 7 (5).

In most OECD countries, the number of medical and nursing graduates is expected to continue to rise in the coming years, possibly further reducing the need to recruit foreign-trained doctors and nurses, unless the demand for their services exceeds the growth in domestic supply.

4.2 Impact of European Union enlargement on international mobility of health workers

The free movement of people and workers has been a cornerstone of efforts to build the European Union since the Treaty of Rome was signed in 1957. Prior to the accession of the 10 new member countries in 2004, there were concerns about a possible massive inflow of health workers from these countries. These concerns were based primarily on the results of surveys of health workers' intentions to migrate, conducted before 2004. For example, more than a third of Polish health workers and more than half of Estonian health workers expressed their intention to emigrate to find work (17). Yet migration flows have been more modest, all things considered.

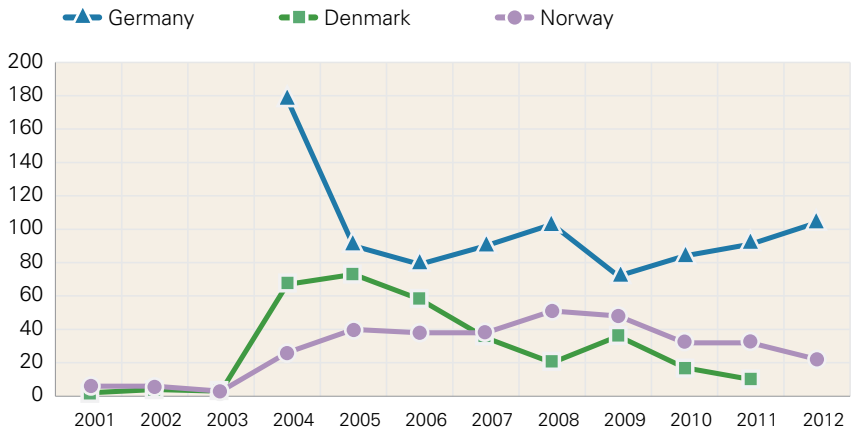
Following accession, a substantial number of Polish doctors obtained a registration in another European Union country in 2004, particularly in Germany (Figure 5). However, this number (fewer than 200) still remained very low in comparison to the total number of doctors practising in Poland then (over 80 000). Furthermore, admissions plummeted after 2005 and have remained very low, despite a slight increase in recent years. Since 2010, Polish doctors have been returning home in sizeable numbers. This trend may reflect the substantial increase in doctors' incomes in Poland following the strikes in 2006/2007, and the increase in financing of the health system.

The available information indicates that there was no sudden inflow of Polish nurses in western European countries in 2004. In Ireland and the United Kingdom, the flows appear to have been affected more by labour market demand, which grew up to 2007 before falling from 2008 onwards.

Romania is a country that joined the European Union in 2007, and from which there are large outflows of health workers. In Italy and to a lesser extent France, there have been steep increases in the recruitment of Romanian health workers over the last 10 years. France has seen a steady inflow of Romanian-trained doctors since 2007, when recognition of their professional qualifications became easier following European Union accession. In Italy, the migration of nurses trained in Romania started to grow around 2002 before European Union accession, and reached its peak in 2007 at the time of accession (Figure 6). While Italy limited access to its labour market to Romanian and Bulgarian citizens, these restrictions did not include nurses; since 2002, nurses who trained outside Italy have been exempted from annual quotas in response to shortages.

Figure 5

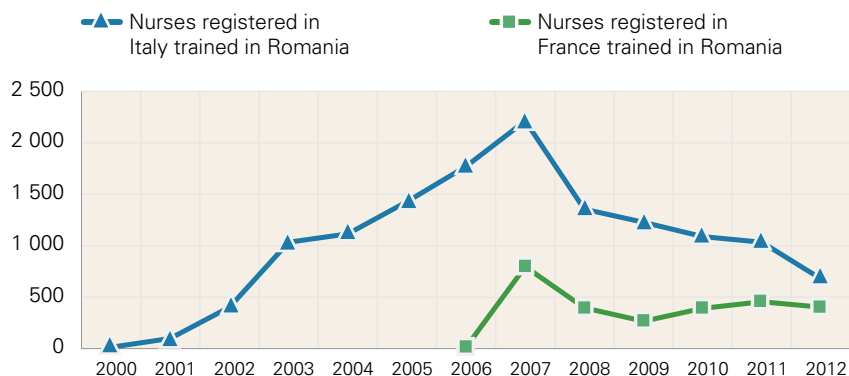
Changes in numbers of new registrations of doctors trained in Poland in three OECD countries, 2001–2012



Source: OECD, *International migration outlook*, Figure 3.27, p. 145 (4).

Figure 6

Changes in numbers of new registrations in Italy and France of nurses trained in Romania, 2000–2012 and 2006–2012



Source: OECD, *International migration outlook*, Figure 3.29, p. 146 (4).

4.3 Impact of the economic crisis and health spending reductions on international migration of health workers in Europe

The economic crisis, which started in 2008 in many OECD countries, had varying effects on international flows of migrant health workers. Some countries recruited fewer international health professionals as they cut health expenditure growth, and some domestic-born health workers came back on the job market. Some countries hardest hit by the crisis, mainly in southern, central and eastern Europe, experienced considerable outflows of health workers after 2008, with most of them going to Germany and the United Kingdom. In some European Union countries, this international mobility helped to achieve a better balance on labour markets and reduced the risks of unemployment and underemployment among health workers. Greece and Italy, two countries particularly hard hit by the crisis, have since 2008 seen a significant increase in the numbers of doctors moving to other European countries, notably Germany and the United Kingdom.

In recent years, Germany seems to be the favoured country of destination for doctors born in Greece and Italy. The number of doctors of Greek nationality in Germany

rose by 50% between 2008 and 2012, from slightly more than 1700 to nearly 2600. Doctors trained in Italy also headed for France, Switzerland and the United Kingdom. At the same time, many German doctors emigrated to other countries. In Switzerland, for instance, nearly 1500 German-trained doctors were added to the professional register between 2008 and 2012. The emigration of doctors from crisis-hit countries to Germany might thus have served to offset the emigration of some German doctors.

As for nurses, there has been a steep rise in emigration from Italy, Portugal, Romania and Spain, with the United Kingdom being the main destination country. Since 2009, nurses trained in these four countries have represented most of new internationally registered nurses in the United Kingdom.

4.4 Impact of bilateral agreements on the training and employment of health workers

The WHO Global Code of Practice encourages Member States to put in place bilateral, regional or multilateral arrangements to promote cooperation and coordination in the area of international recruitment (1). The Code specifies, in particular, that these arrangements should take into account the needs of developing countries and countries with economies in transition. In recent years, several OECD countries have implemented such bilateral agreements for the international recruitment of health personnel.

For example, Germany concluded a bilateral agreement with Viet Nam in 2012, covering pilot projects for the training and recruitment of geriatric care nurses in Vietnam, a country identified on the basis of its strategy of training nurses for the global market. The project was commissioned by the German Federal Ministry for Economics and Technology (BMWi) and is being implemented by German Development Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ), in collaboration with the Vietnamese Ministry of Labour, Invalids and Social Affairs. Some 100 Vietnamese nursing graduates were selected initially to take six months of training in the German language and culture. Participants then travelled to Germany at the end of 2013 to begin two years of professional training, accompanied by a programme of integration and language courses. This pilot project seeks to establish a baseline for future recruitment of skilled foreign personnel to provide care

in Germany (18). At the same time, a pilot project for recruiting nurses in China was launched by the Caregiving Employers' Association (Arbeitgeberverband Pflege). A bachelor's degree, one year of professional experience and eight months of language and cultural training are the conditions for participation in the programme. While they await recognition of their credentials, these Chinese nurses work as nursing assistants. The Caregiving Employers' Association created 150 places for Chinese nurses to participate in this programme in 2014.

The German authorities have also sought to ensure that, consistent with the principles of the WHO Global Code of Practice, its international recruitment activities do not come at the expense of countries of origin. During the July 2013 review of the list of professions in short supply in Germany, the government prohibited the recruitment of health workers in the 57 countries identified by WHO in 2006 as facing a critical shortage. This decision was subsequently reconsidered, as it not only banned active recruitment by an employer or private agency but also prevented health workers from seeking employment in Germany at their own initiative (so-called passive recruitment). This provision was finally eliminated with the revision in October 2013 of the Employment Ordinance, which prohibits active recruitment and the private placement of health workers from the 57 countries mentioned.

In Finland, the Mediko programme (which stands for Recruitment of Foreign Health and Social Care Professionals to Finland) was launched in 2008 and is still in place. Initially coordinated by the municipality of Kotka, the Mediko project was then expanded to cover all of Finland. Since its creation, Mediko has provided counselling to some 80 doctors, mainly Russian, wishing to practise in Finland. Mediko has also begun to recruit nurses in Spain. Following an exploratory visit in 2012 by Mediko to Spain, 2000 Spanish nurses expressed an interest in moving to Finland. Finnish language courses have been organized in various Spanish cities, and since 2012, nearly 150 persons have been recruited via this programme. With a view to longer-term recruitment, intensive language courses before departure are planned as a way of bolstering the motivation to move. Mediko also promotes cooperation between Finnish training institutions and Estonian, Russian and Spanish institutions.

These examples illustrate the proliferation of international recruitment initiatives in the health field within the context of bilateral agreements. For the time being, the

number of people involved in these projects is still limited and represents only a very small proportion of doctors and nurses. They may however play an important role if they are steered towards positions that are particularly difficult to fill. Some stakeholders also believe that a recruitment campaign, once launched, may well grow over time to reach a substantial number of candidates for immigration.

Another feature of several of the recruitment initiatives discussed here is the absence of historical, colonial and linguistic ties that previously prevailed between countries of origin and countries of destination. Countries are being increasingly targeted for recruitment in light of their strategy of training health workers for the international market. Learning the language of the destination country then becomes a central condition of success of such recruitment programmes.

There may also be a need to think about more ambitious approaches to bilateral and multilateral agreements building on the recent example of the Paris Agreement on Climate Change (Box 2).

5. Conclusions

Migrant health workers represent a significant share of doctors and nurses working in OECD countries. The share of foreign-born doctors and nurses increased in most OECD countries between 2000/2001 and 2010/2011, as did the share of foreign-trained doctors and nurses between 2000 and 2012–2014, although it is worth noting that the share of foreign-trained doctors in the two main destination countries – the United Kingdom and the United States – has decreased slightly in recent years, which is also probably the case for foreign-trained nurses, mainly due to greater domestic education and training efforts.

A large proportion of these foreign-born and foreign-trained doctors and nurses were born and trained in other OECD countries (between one fourth and one third in 2010/2011). Two Asian countries are also important places of origin – India for doctors and the Philippines for nurses – although the annual migration flows from these countries to OECD countries has decreased sharply in recent years.

Box 2

Learning from new models of global governance in the area of climate change

The Paris Agreement has been hailed by many as the new model for global governance (20, 21). It aims to address an issue of global concern, with clear recognition of countries that are most vulnerable. It also identifies ethical principles and standards associated with national, international and global efforts. The Paris Agreement does not strictly represent binding international law with strict obligations. Instead, it substitutes a strong focus on “compliance”, determination of legality or illegality, with an “enhanced transparency framework”.

The Paris Agreement also incorporates intended nationally determined contributions (INDCs). Here, monitoring and accountability are linked to voluntary nationally determined commitments, which are to be progressively raised. This voluntary individualized bottom-up approach to changing behaviour, as exemplified in the Paris Agreement, is one that holds significant promise and can lead to deeper action than would otherwise be possible.

A final, important, lesson from the Paris Agreement is a clear rejection of the idea of compensation. While the Paris Agreement speaks to providing support to offset loss and damage in countries threatened by climate change, the associated Paris Decision explicitly states that “Article 8 of the agreement does not involve or provide any basis for liability or compensation”.

The Paris Agreement might provide some useful lessons for formalizing similar dialogue structures through bilateral agreement between key source and destination countries for migrant health personnel.

The group of 57 countries identified in 2006 as having critical shortages saw their health workers continue to emigrate in growing numbers between 2000/2001 and 2010/2011. Emigration therefore appears to have contributed to the critical shortages in these countries over the past decade. It accounted for 20% of estimated critical shortages in 2010/2011, compared with 9% in 2000/2001. In the decade preceding the adoption of the WHO Global Code, the number of doctors and nurses originating from countries with severe shortages who emigrated to OECD countries grew by 84%, while the total number of migrant health workers increased by 60%.

By adopting the WHO Global Code of Practice in 2010, all countries have committed to improving their health workforce planning and to responding to their future needs without relying unduly on the training efforts of other countries, in particular those already having critical workforce shortages. The goal must not necessarily be to achieve self-sufficiency, but to reduce the magnitude of reliance on other countries to fill domestic needs.

Three possible areas for action in both destination and origin countries are proposed:

- OECD countries should adjust their domestic education and training capacity to respond to current and future projected demand where necessary, based on more robust health workforce planning, and promote greater retention rates of currently active health professionals, to reduce their demand for foreign-trained doctors and nurses.
- Lower-income countries that are losing many of their skilled health workers need to address some of the “push” factors by increasing their efforts to retain these scarce resources through improving their working conditions and pay rates. These retention measures will require good governance of the health system and long-term financial commitment, which in many cases may require the support of the international community (22–24), as called for by the WHO Global Code of Practice.
- As called for by the WHO Global Code of Practice, both destination and origin countries should also seek to better manage health workforce migration by negotiating mutually beneficial bilateral agreements, including by possibly

instituting a process of formalized dialogue between key source and destination countries. Until now, most bilateral or multilateral agreements have involved a fairly limited number of doctors or nurses. However, if these agreements provide benefits for both origin and destination countries, there is a potential to increase their scope in the years ahead.

The opinions expressed and arguments employed herein are solely those of the author(s) and do not necessarily reflect the official views of the OECD or of its member countries.

Acknowledgements

The authors would like to thank Professor James Buchan (School of Health Sciences, Queen Margaret University) and Ibadat S. Dhillon (Department for Health Workforce, World Health Organization) for their useful comments and suggestions on a draft version.

Note on data for Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Human resources for health care in the Nordic welfare economies:

Successful today, but sustainable tomorrow?

Tyra Merker, Ivar Sønbo Kristiansen, Erik Magnus Sæther

Abstract

The Nordic countries are “welfare superstars” with high-income economies, no extreme inequality, high life expectancies and well functioning care services. Their health care model is characterized by high proportions of public funding through taxes, providers that are mostly publicly owned and modest co-payments with universal access to care. This chapter presents forecasts that evidence the need to reform these successful health care sectors, even in the wealthiest of Nordic countries, in order to achieve their sustainability.

In Norway, due to income from the country’s pension fund, the current health care model appears to be financially viable towards 2030. But extending the projections makes clear that the current model is financially unsustainable. Projections estimate a shortage of 76 200 FTEs (full-time equivalents) in the Norwegian health care sector, including 28 200 FTE nurses and 1400 FTE doctors by 2035. The numbers are expected to increase further towards 060. Estimates by Statistics Norway suggest that a staggering 38% of Norway’s workforce will need to work within the health sector if the system is not reformed.

This chapter calls for increasing efficiency and patient focus in the sector; introduction of mechanisms to curb demand and reduce the tax burden; and leadership to create a more optimal personnel mix, respecting the WHO Global Code of Practice on the International Recruitment of Health Personnel.

1. Introducing the issue of replicability and sustainability of the Nordic model

The so-called Nordic model aims at equal and universal access to health care. Given that it delivers high-quality services while limiting the financial burden on individuals, the model can be considered a success (1).

In this chapter, we provide a short introduction to the essential aspects of the Nordic model. Subsequently, we discuss the potential of the model, focusing on its sustainability and replicability in oil-rich Norway. We assert that the model is dependent on the financial, demographic and cultural context. We present forecasts of demographic developments, the prevalence of diseases and the extent of care episodes for Norway. Together, these factors will largely influence future demand for health care. Based on the publications of Statistics Norway, we assert that an increase in supply of health care, if it is to keep up with increasing demand from demographic changes and new technologies, will not be financially sustainable – even in a wealthy country such as Norway.

Consequently, the Nordic model is in need of adaptation to a changing demographic and financial environment. This, in turn, raises questions regarding the model's replicability in other countries. We focus on contextual factors needed for the Nordic model to be well functioning, as well as specific policy options in order to ensure its sustainability.

This chapter is based on forecasts of labour demand, presented in a series of articles by Statistics Norway. We use Norway as an example, as it is hard to argue for the Nordic model's sustainability if forecasts show that it is unsustainable even in the wealthiest of the Nordic countries. The model for the estimations, HELSEMOD, utilizes gender-specific demographic projections combined with data on full-time equivalent health personnel (FTEs) per population subgroup. This methodology is described in more detail in the section on forecasting demand below.

The estimation entails assumptions about future demand for health care services and the quality thereof. By relaxing some of the simplifying assumptions of the model, we are able to determine the effects that different factors, such as delayed morbidity and informal care, have on demand.

2. The Nordic welfare state and the context of the Nordic model

2.1 Premises for the welfare state

The four largest Nordic countries – Denmark, Finland, Norway and Sweden – are welfare “superstars” with high-income economies, high life expectancies and well functioning care services. The Nordic model refers to the economic and social policies common to the Nordic countries. This includes a combination of free market capitalism with a comprehensive welfare state. The Nordic countries have a universal, tax-funded, single-payer health care system. All citizens and residents are insured, and the level of co-payment has been relatively low. As a supplement, an increasing share of the population pays out of pocket for private care.

Although there are significant differences among the Nordic countries, they all share some common traits. These include support for a “universalist” welfare state, aimed specifically at enhancing individual autonomy and promoting social mobility. There is a commitment to widespread private ownership, free markets and free trade (2, 3).

Key premises for the Nordic model are transparent societies, democracy, high social capital and low acceptance of corruption. The political model evolved in similar countries with small and at the time homogeneous populations. There is a check and balance between the key stakeholders within a corporatist system involving a tripartite arrangement. The representatives of the labour force and employers negotiate wages, and labour market policy is mediated and supported by the government. The model has been adapted with the globalization of the Nordic countries, but its financial sustainability is threatened by the ageing population, through a relative reduction in the labour force, an increase in the share of recipients and a costly public service production.

The journal *The Economist* (4) discusses the Nordic model with a practical approach focusing on what works and what changes and adaptations have been implemented thus far, dubbing the new, leaner Nordic model “the next supermodel”. The article asserts that “A Swede pays tax more willingly than a Californian because he gets decent schools and free health care.” Despite the model being in need of changes, the

Nordic countries have already pushed far-reaching reforms and proven that market mechanisms can be injected into the welfare state to sharpen its performance. Hence, it is possible for the model to adapt to new circumstances, yet maintain many of its positive traits. However, a premise for the model is high social capital in the country of implementation, defined as a large degree of trust between actors (for example, no significant corruption or vested interests).

3. Health care and human resources

In the Nordic countries, the responsibility for health care lies with the state, but the administration of primary care services is delegated to municipalities, and of secondary and tertiary care services to regions. Some services, such as dental care for adults and optometry, are not a part of the universal package. Long waiting times for elective care continue to be a problem and are the cause of dissatisfaction among patients. All the Nordic countries have introduced reforms or centralization initiatives to increase the quality of care, reduce waiting lists and control the cost growth. The reforms include “patient focus”¹ and various schemes of patient choice, lean production and increased use of private providers.

As a share of their gross domestic product (GDP) (excluding investments), Finland spent 8.6%, Norway spent 8.9%, Denmark spent 10.4% and Sweden spent 11.0% on health care in 2013 (5). Given the Nordic countries’, and especially Norway’s, very high GDP per capita, their health expenditure per capita is higher than that of most countries. The share of private funding is slightly higher in Finland, approximately 25%, versus 15% in Norway. See Nordic Medico-Statistical Committee (Nomesco) (6) and European Observatory for Health Systems and Policies (7) for further details of the health services in the Nordic countries.

1 In markets in general, customers’ preferences have a large impact on the products and services that are delivered. However, when health care is paid for by a third party, the views and needs of patients can be neglected. In this article, the term “patient focus” therefore refers to a political shift towards attention on patients’ needs, for example, through valuing patients’ time when considering queues for treatments. A recent Norwegian reform is termed “patient first”.

Since the 1980s, health economics and institutions for medical priority setting have been part of policy development, especially in the field of financing mechanisms and priority setting for pharmaceuticals.

The Nordic governments introduced a common labour market in the 1950s and a common accreditation for health personnel in 1982. The flow of health personnel between the Nordic countries has varied with the relative attractiveness of the national labour markets. The countries are also members of the joint European labour market, as members of the European Union or the European Economic Area. The high wages in Norway have resulted in a net influx of nurses and physicians from the other Nordic and northern European countries.

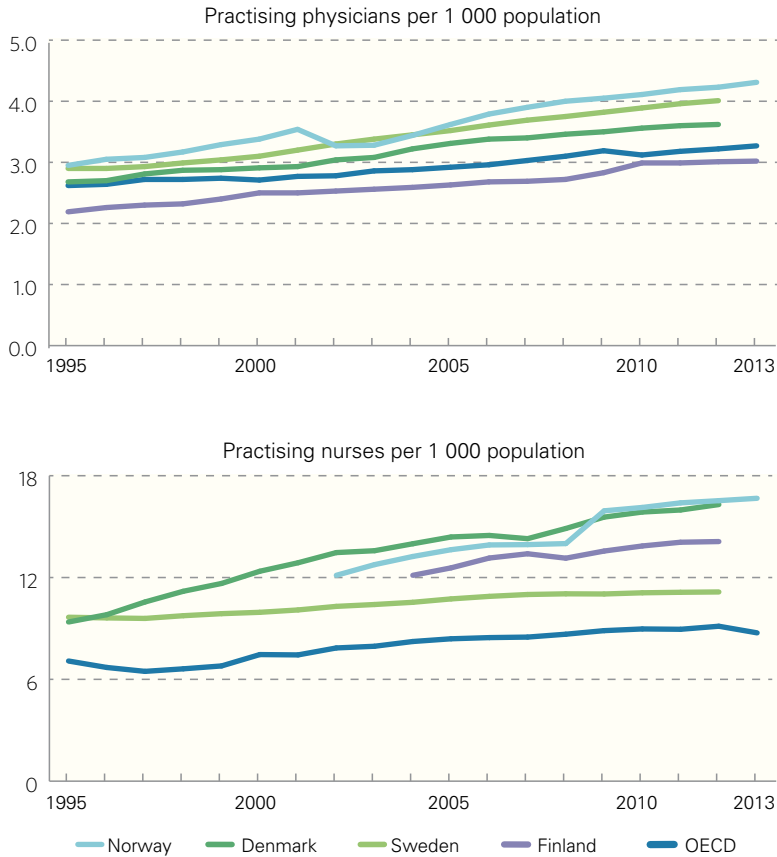
There is ongoing immigration from other non-European countries, and many of these immigrants find employment in the health sector. However, there is no large-scale active recruitment of foreign-trained health personnel.

The number of practitioners in most health personnel groups, including physicians and nurses, has been increasing during the last few decades. Consequently, the number of health care personnel per 100 000 inhabitants is high compared to other European Union countries, as illustrated in Figure 1.² In 2014, immigrants constituted 11.8% of all employed, qualified health care workers in Norway. Of immigrants, 59% were from Europe and 24% originated from other Nordic countries (8).

2 It is noteworthy that the share of workers with part-time positions in the Norwegian health care sector is relatively low. This may reflect good pay rates combined with a backward-bending supply curve, reducing demand for labour as wages increase past a certain threshold.

Figure 1

Density of physicians and nurses in the Nordic countries



Note: The figure for physicians has a smaller scale, in order to better display the differences between countries. However, the difference between the Nordic countries and OECD average is much larger for nurses.

Source: OECD health statistics (<http://www.oecd.org/els/health-systems/health-data.htm>).

4. Forecasting the prevalence of diseases and technological advancements

Among all factors that influence health care demand, health itself is critical. Cardiovascular disease (CVD), cancer and respiratory disease are the three main killers in Norway. Cancer, CVD, mental disease and diseases of the musculoskeletal system are the diseases with the highest health care costs in Norway.

The incidence of CVD is declining, and so is the number of deaths, but no predictions for the future are available. A range of other diseases could also change in terms of incidence or prevalence, and consequently influence the demand for health care. However, no scientific projections are available. The increase in body mass index will probably augment the number of patients with diabetes.

In 2013, 16 482 males and 13 919 females in Norway were diagnosed with cancer (9). NORDCAN, a project that collects incidence, mortality, prevalence and survival statistics from 50 major cancers in the Nordic countries, predicts that by 2033 the crude rate of cancer will have increased by 39.5% among men and 17.1% among women (10). The increase in crude rates is likely to be greater during the period 2034–2060, due to the rapid growth in the number of elderly people during this period. Because innovative cancer therapies will be available over the coming decades, patients will live longer with their disease, and the prevalence of cancer will increase more than the increasing incidence would predict.

The introduction of new medical technologies contributes substantially to the cost of health care. A Hastings report suggests that 40–50% of the increase in United States health care expenditure can be explained by new technologies or increased use of older ones (11). Predicting innovations is inherently impossible. However, cancer treatment is an area where cost increases are likely. During the period 2012–2014, cancer drug expenditure increased by 34.3% in Norway, while total health care expenditure increased by 11.5%. The increased use of cancer drugs requires surveillance with computed tomography (CT), magnetic resonance imaging (MRI)

and laboratory tests. Taking into account that there are at least 34 “promising late stage cancer drugs” that may head for approval by the United States Food and Drug Administration (FDA) or European Medicines Agency (EMA) in the near future (12) and 700 more in the pipeline, we expect a 285% increase in cancer drugs during the period 2016–2019 (13).

The pharmaceutical industry and research institutions focus on treatments for prevalent diseases such as type 2 diabetes, dementia, infections that are resistant to antibiotics, obesity and chronic obstructive pulmonary disease. A breakthrough in any of these areas could increase total health care expenditure by 1–10%.

In addition to new pharmaceuticals, a range of new medical devices and diagnostic and therapeutic technologies – including CT, MRI, positron emission tomography (PET) and robot surgery – have entered the market. The prices of these technologies tend to decline over time, as do drug prices, with generic competition, and the development of more advanced technologies may free labour from certain tasks, but new technologies may simultaneously create new labour tasks. New technologies may furthermore shift demand towards new health care services (diagnostic and therapeutic), resulting in an increase in the total labour demand (14).

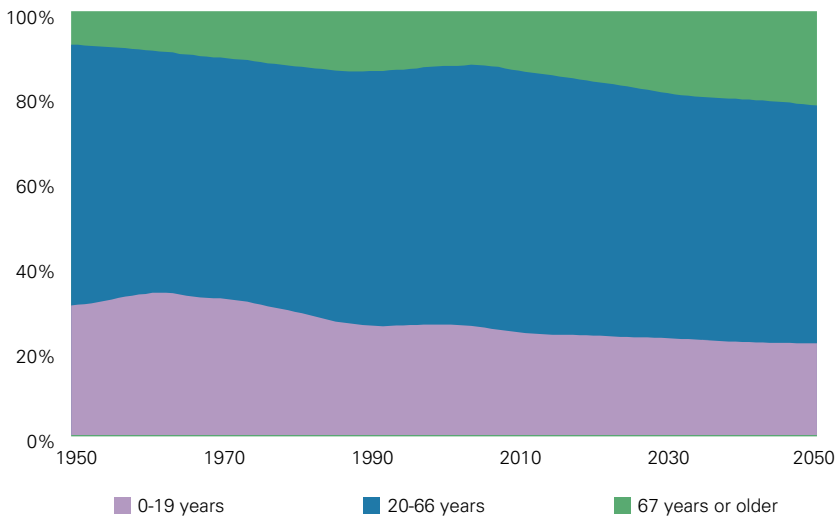
5. Forecasting demand: Norway as a case

5.1 Forecasting demand through demographic projections

As life expectancy rises, the demographic age profile of Norway is changing. The increase in the share of retirees and the reduction in the share of the tax-paying labour force will cause the dependency ratio to rise, despite an expected decline in the share of the population aged 0–19 years. Figure 2 depicts the expected demographic development for Norway.

Figure 2

Demographic development and projection for Norway



Source: Figure 2 is based on two tables from Statistics Norway: Table 10211 (demography until 2015) (<https://www.ssb.no/statistikkbanken/selectvarval/Define.asp?subjectcode=&ProductId=&MainTable=FolkemEttAarig&nvl=&PLanguage=1&nyTmpVar=true&CMSSubjectArea=befolkning&KortNavnWeb=folkemengde&StatVariant=&checked=true>, accessed 6 November 2016); and Table 10212. The latter is no longer available on the Statistics Norway website, and the demographic projections from 2016 onwards have been replaced by Table 11167 (<https://www.ssb.no/statistikkbanken/selectvarval/Define.asp?subjectcode=&ProductId=&MainTable=Frmskr2016T1&nvl=&PLanguage=0&nyTmpVar=true&CMSSubjectArea=&KortNavnWeb=folkfram&StatVariant=&checked=true>, accessed 6 November 2016). The projections may differ from those in Table 10212.

The number of health personnel that countries will need in order to satisfy the population's future demand for health care is dependent on several factors, especially demographic development and changes in morbidity and mortality.

We can forecast how large the supply of health care personnel would have to be to satisfy future demand by dividing the population into subgroups, each group

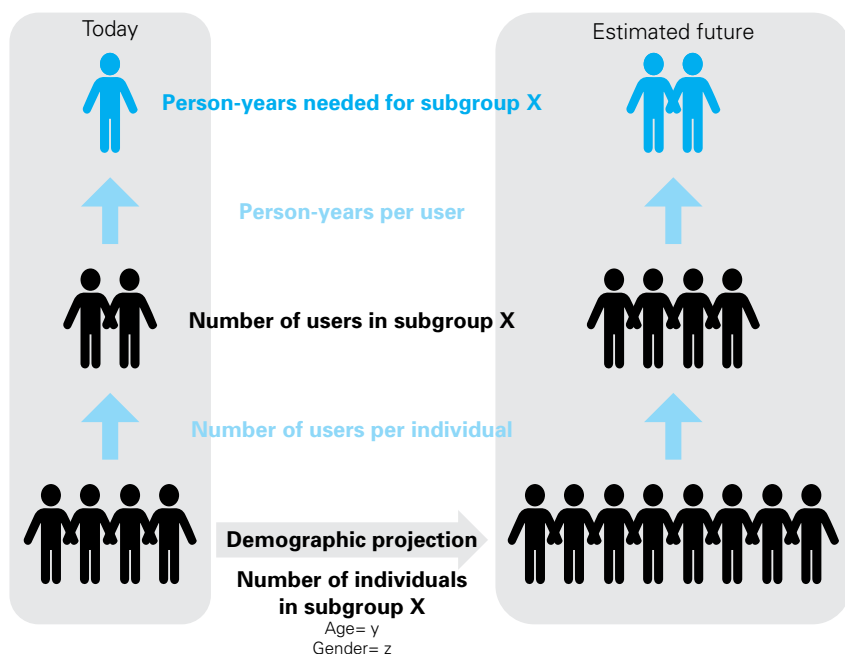
consisting of individuals with the same age and sex. For each subgroup, the following variables are calculated:

- the number of individuals in the subgroup
- the number of users per individual in the subgroup
- FTEs per user of a specific health care service.

The data are then combined with demographic projections to estimate future personnel needs. Figure 3 illustrates this forecasting process for one subgroup.

Figure 3

Forecasting health care demand



Source: Oslo Economics.

The example in Figure 3 illustrates that the forecast with the ratios of users per individual and FTEs per user are both equal to 1 : 2. As an example, assume that there are 4000 individuals in the subgroup today, 2000 of these individuals are users and they require 1000 FTEs in health care. A demographic projection forecasts that the population of the subgroup will double in the future. Assuming that the two ratios remain constant at 1 : 2, this implies that the future demand for health care will be 2000 FTEs.

As illustrated in Figure 3, such estimation assumes that the ratio of users per individual in each subgroup remains unchanged. For example, we assume that informal care (family members taking care of sick or disabled relatives) will increase at the same rate as the expansion of the health care system. However, if informal care should remain at today's level, the number of users per individual for older age groups would increase. Consequently, the supply of health care personnel would have to increase even further.

6. Important factors influencing future demand

Some of the factors that can affect the ratio of users per subgroup are:

- **Delayed morbidity.** A recent study indicates that mortality among older people will continue to decline. This will probably delay morbidity to later stages in life, but it is still uncertain whether this means a shorter morbidity period before death (“compression of disease” and lower costs), or the opposite (15).
- **Increase in standard or “quality of care”.** The quality of health care has been increasing with economic growth. If quality continues to increase over time, more personnel will be needed in the future. This can be modelled as a proportional increase in the number of users per individual in each subgroup or, perhaps preferably, as a proportional increase in FTEs per user.

- **Informal care.** If informal care remains at today's level (in terms of FTEs), a larger share of the ageing population will require health care services. This would increase the number of users per individual, especially for the older subgroups.

Thus, the model for estimating future health care demand is able to relax basic assumptions and include several factors that may influence demand in the future. By testing different sets (or combinations) of these assumptions we are able to estimate different trajectories for future health care personnel demand.

Table 1 shows the results of the forecast of demand in 2060 for health care personnel in Norway. The table provides an overview of the differing results for several combinations of assumptions. For example, the reference case assumes no growth in the quality of health care and no delayed morbidity. These assumptions entail that 17% of all Norwegian FTEs would have to be in health care in order to satisfy the 2060 demand. In comparison, there were 246 000 FTEs in health care in 2010, constituting 11% of total FTEs in Norway (16).

However, if quality were to grow at an annual rate of 1% (which is less than previous growth), the demand for health care would require approximately 28% of total FTEs to be in the health care sector. If people live longer and healthier lives, growing older and getting sick later, this would reduce demand to approximately 15%. Compared to the 17% reference, delayed morbidity thus has a smaller effect on demand than quality growth.

The extent of informal care will also have a large impact on the demand for health care. The bottom rows of Table 1 show the predicted demand given that informal care stagnates at a level of approximately 100 000 FTEs per year. This scenario will occur if, for example, the number of people caring for their parents at home would remain constant, despite the increasing number of elderly persons. Given the ageing demographic composition, a constant share of informal care implies that informal care per dependent has to increase. Furthermore, it is reasonable to assume that there is a connection between

expecting an increase in quality and expecting public services to care for the older generations. The combination of both improved quality and a constant level of informal care would require a staggering 38% of the 2060 population to work within the health sector, almost quadrupling the share from 2010.

Table 1

Projections for health care personnel demand in Norway in 2060 (in thousand FTEs)

	Reference excl. informal care	Reduced mortality	Quality growth (1% annually)	Delayed morbidity
Proportional informal care				
FTEs	485	549	797	428
Share of total FTEs	17%	19%	28%	15%
Constant informal care (100 000 FTEs)				
FTEs	615	723	1077	514
Share of total FTEs	22%	26%	38%	18%

Source: Holmøy, Kjølvik and Strøm (16).

7. Educational capacity: possibilities for health care supply

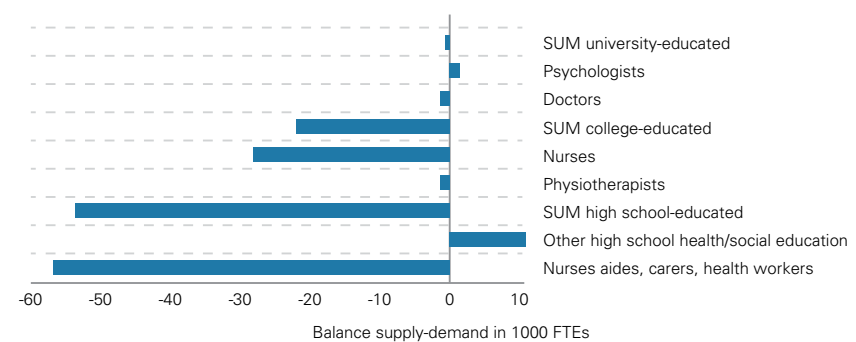
In order to meet future demand for health care services, it is imperative to train sufficient and correct types of health care personnel. Forecasts for Norway indicate that there already will be a deficit of approximately 76 000 health care workers in 2035 (17).

Figure 4 illustrates the projected surplus or deficit of different types of health care personnel in 2035. The grey pillars represent summarized projections for three educational levels: high school, college and university. University-educated personnel include doctors and psychologists; college-educated personnel include nurses, dental workers and bioengineers; and high school-educated personnel include nurses’ aides and general health care educated workers.

While there will be an expected surplus of psychologists and general high school-educated personnel, there is a large deficit of nurses and specialized high school-educated health care personnel, such as nurses’ aides.

Figure 4

Projected balance between supply and demand of health care personnel in Norway in 2035



Source: Statistics Norway (SSB) (8).

As demand for health care increases further towards 2060, the gap between supply of and demand for health care personnel will only widen. Consequently, recruitment of health care personnel will become increasingly challenging.

8. Long-term public finances

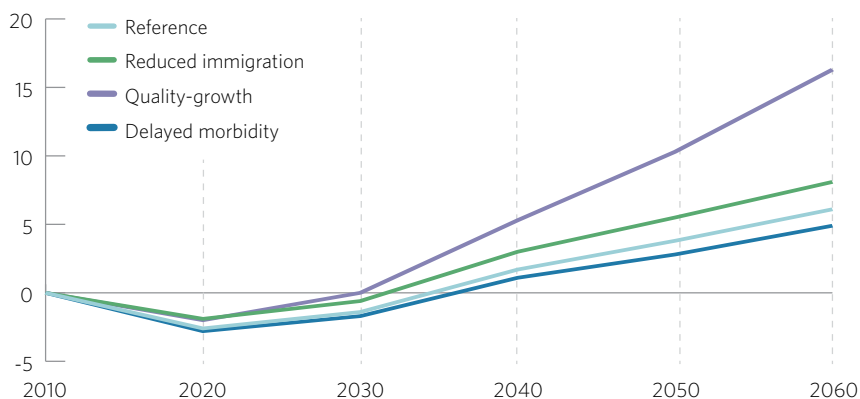
In Norway, public financing constitutes 85% of total health care funding. Consequently, the future demand for national health care services will have a large impact on the country's public spending. Increased wages for additional FTEs is not the only public expense caused by increased demand. Assuming that the shift towards a larger health care sector does not affect the total level of employment, an expanding health care sector will “steal” labour from other sectors. A reduction in the production of the private sector will cause a loss in tax income from labour and business taxes.³ This additional loss of public income amounts to approximately 25% of the reduction in public surplus (16).

Despite increasing expenses, unfunded public spending currently constitutes a decreasing part of Norwegian public finances. This is largely due to income from the Norwegian Government Pension Fund. However, with economic growth, this income will represent a decreasing share of total GDP. Consequently, unfunded public spending is expected to increase in the near future (18). Figure 5 illustrates how predicted unfunded public spending depends on the assumptions we make about developments in the health care sector. The large effect of standard or quality again becomes evident. More importantly, the figure illustrates the importance of a long-term perspective. In 2030, unfunded public spending is negative. However, forecasts until 2060 reveal that a policy change is needed in order for the health care system to be sustainable.

³ In a macro context, labour taxes from public sector employees equal a transfer from one public institution to another. However, labour taxes from private sector employees constitute an income for the government, alongside direct business taxes (16).

Figure 5

Predicted unfunded public spending as percentage of Norway's mainland GDP



Sources: Norwegian Ministry of Finance (18) and Holmøy (19).

9. A sustainable model?

The main challenge concerning the Nordic model is the difficulty of meeting future health care demand, due to a changing epidemiological, technological and demographic context. Thus, adapting the model is essential to ensure sustainable and equitable health care in the future.

9.1 Challenges: adapting the model to ensure sustainability and equity

The Norwegian health care system is relatively well funded, and most new pharmaceuticals, devices and other technologies are adopted early. Still, there are challenges such as unmet needs, queuing, and not least discontent among health personnel because of “too small budgets”. One current challenge in the health services lies in funding the great number of cancer treatments.

The short-term challenges lie in developing the optimal personnel mix, as well as adopting new technologies and, importantly, costly innovative drugs.

It is also important to avoid care models that are personnel intensive, as the boom of elderly patients will peak after 2030.

With reduced oil prices and the economic downturn, health care budgets in the Nordic countries could grow more slowly or even experience cuts. In the years towards 2030, the situation seems manageable from a financial standpoint. However, the long-term (2030–2060) projections indicate an increasing gap between supply of and demand for health care personnel in terms of funding. This gap is so large that relatively drastic measures need to be taken, unless some unexpected innovation in technology or productivity is developed.

The example of Finland shows that the situation may become dramatic even in the short run. The current economic recession has forced the Finnish parliament to agree on a 1.9% real reduction in public expenditure on health care and social benefits during the period 2016–2019 (20). While private financing currently lies at 25%, it is expected that this share will increase and that private providers (a range of clinics and smaller hospitals) will expand their capacity. The Finnish Government is now developing a package of basic, necessary health care that all citizens will have access to, while other services will be left to private providers and private funding. The content of the package has not yet been agreed upon.

10. Lessons learned

The Nordic health care model has thus far functioned exceptionally well and has provided, at least in principle, equal access for all. However, the combination of increasing standards (more personnel, increasing types of care included and adoption of newest technologies) and an ageing population will probably make it impossible to raise the necessary funding and number of personnel with current levels of productivity.

The projections presented earlier indicate that health services require production with less use of resources per unit output. Furthermore, a greater share of the funding needs to be from private sources, in order to reduce demand and limit the strain on public finances.

9.3 Policy options

Even though it is difficult to see how it will be possible to keep future supply of health care at a level that is financially sustainable, we see three areas of possible action.

Increasing the efficiency and customer service of health care production represents one policy avenue. Lessons from the airline industry show that increased competition has improved efficiency such that the costs have greatly diminished, the service level is only moderately lower and safety is maintained. The key to higher efficiency in health care may be through education of personnel, technology (including information and communication technology), economic incentives, evidence-based medicine that avoids ineffective care, and competition. Perhaps an increased use of privately owned providers with public funding may create more competition and improve efficiency, but there is still a need for better empirical evidence. It should be noted that hospital efficiency has been a research area for decades, while we know even less about efficiency in primary care, not least in the nursing services. Even though there has been a more than 60% increase in registered nurses per 1000 population over the past 20 years, the discontent among nurses about the “staff shortage” is palpable. This may in part be due to a change in health care services, characterized by shorter patient lengths of stay in hospital, causing increased dependency and a higher workload.

Mechanisms to curb demand and reduce the tax burden, such as gatekeeping, cost sharing and removing services from today’s high-cost universal health care coverage, are another policy option. A greater share of funding needs to be private and some co-payments for almost all types of care will be necessary, with few exemptions. Some types of health care will also need to be left completely for private funding. Surgery for varicose veins and screening procedures are examples of care that could be excluded from the public health care package. Cost-effectiveness analysis is a good tool, for example, to decide which services should fall outside public funding.

The third policy option is to focus on leadership in order to create a more optimal and cost-efficient personnel mix; combining staff with different education and educational levels; allowing for a wider range of tasks per educational group; and increasing retention by limiting shifts towards administrative positions and increasing the share of workers with full-time positions. The Nordic countries should

avoid systematic recruitment of health personnel from low-cost countries as a quick fix, respecting the WHO Global Code of Practice on International Recruitment of Health Personnel.

A leaner Nordic model will be more able to provide sustainable universal coverage of critical health services as well as long-term job security for those considering a career in the health services.

9.4 Implementation considerations

The main implication of our findings is that the context is crucial in order for a health care model to function well. Even with a well-functioning model such as the Nordic model, the circumstances and socioeconomic context are imperative for its success.

Factors such as a homogeneous population, financial capacities of the state, low tolerance for corruption and sufficient, suitable personnel are factors that have been present in the Nordic countries. Changing any of these factors could lead to a situation where the model is no longer sustainable. The fact that the Nordic model may not even be sustainable in the Nordic countries in the future warrants serious consideration of its implementation elsewhere. At the very least, modification and adaptation are needed.

Nevertheless, the policy options presented in this chapter may be part of the solution, allowing the Nordic model to set an example for good health care in the future as well. Perhaps it can even become more valuable, hopefully by demonstrating its adaptability to changing and differing circumstances.

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Global estimates of the size of the health workforce contributing to the health economy:

The potential for creating decent work in achieving universal health coverage

Xenia Scheil-Adlung, Andrea Nove

Abstract

Acknowledging the fact that the health sector is strongly linked to the wider economy, this chapter takes a broad health economy perspective and presents new exploratory evidence on the size and scope of the workforce working towards the achievement of health objectives such as universal health coverage.

It provides evidence that progress towards the health-related Sustainable Development Goals (SDGs) requires the input of both workers in health occupations (HO workers), for example doctors and nurses, and a substantial number of workers in non-health occupations (NHO workers), producing necessary goods and services to support HO workers, for example production of pharmaceuticals and maintenance of facilities. In the latter category, a considerable contribution is also made by workers without payment, particularly women who provide care informally to family members.

We estimate the size of the HO and NHO workforces contributing to economic growth and health goals in the global health economy to show the impact of

(continued on page 140)

ABSTRACT *(continued)*

investments in employment, particularly the multiplier employment effects on jobs for NHO workers arising from investment in HO workers.

It is estimated that NHO workers, including unpaid NHO workers, currently constitute around 70% of global health employment. Throughout the world each HO worker is supported by 2.3 NHO workers. In low-income countries that ratio is 3.4 – thus, each investment in one HO worker will generate 3.4 jobs for NHO workers in the wider health economy. Population growth by 2030 indicates that globally as many as 57 million jobs for NHO workers would be needed to achieve universal health coverage and create inclusive growth through health employment.

These findings highlight that policies for strengthening the health economy workforce must take into account both HO and NHO workers. The chapter specifically calls on policy-makers to address shortages of decent jobs for health economy workers through enabling macroeconomic and labour market policies; to invest in new and better jobs to enhance economic growth by extending health protection towards universal health coverage; and to transform unpaid work into decent paid jobs in order to create inclusive and sustainable growth.

1. The role of workers in non-health occupations in achieving health objectives and contributing to inclusive economic growth

In many countries, the health workforce accounts for a large share of total employment – for example, 11% of total employment in Organisation for Economic Co-operation and Development (OECD) countries (1) – and globally this share is expected to grow significantly over the coming years due to population growth

and ageing (2). At the same time, investing in the health workforce has significant potential to boost economic growth. This will mainly be due to the creation of necessary jobs for the delivery of health care and the increased productivity of a healthier labour force. The related implementation of social protection policies in addressing the lack of access to health care also contributes to attaining Sustainable Development Goal (SDG) 3 in the context of SDG 1 (target 1.3) on national social protection floors, as outlined in the International Labour Organization (ILO) Social Protection Floors Recommendation, 2012 (No. 202) (3) and SDG 8 on economic growth and decent work.

The health economy requires workers with a broad range of skills, including workers in health occupations (HO workers), such as doctors and nurses, but also those in non-health occupations (NHO workers), who provide necessary goods and services to support the work of HO workers. Achieving health objectives and realizing the related potential for economic growth is not possible without the contribution of NHO workers: their work is essential, for example in administration to register patients, the provision of social and long-term care services (including from family members as outlined in Box 1), ensuring clean and sanitized laboratory coats, producing and packaging medicines, operating computers, delivering financial and legal advice, moving goods such as food in the production line, and producing finished products for use in the health sector.¹ Without diminishing the importance of health occupations, the roles of other workers contributing to the health economy seem to be equally crucial for achieving health objectives. Thus, for this study we take a broad approach to identifying workers in the health economy, including workers providing unpaid long-term care, and we thereby cover a larger group than is usually included in the health sector alone.

Projected increases in the number of HO workers due to demographic changes are likely to generate substantial numbers of NHO workers as well, both within and beyond the health sector. Thus, significant returns of investments can be expected, given improved health coverage, creation of jobs and associated economic growth.

¹ A detailed definition of NHO workers is provided in the next section of this paper.

Box 1

The forgotten workforce: female family members filling in for shortages of long-term care workers

Given critical shortages of long-term care workers – estimated by ILO at 13.6 million globally (4) – large numbers of family members are providing long-term care to their older relatives to fill the gap. In fact, family members provide up to 90% of care work in Europe, where their numbers exceed by far the number of skilled long-term care workers. In low- and middle-income countries, these numbers are estimated to be even higher due to the nearly complete absence of long-term care workers.

Shortages of skilled long-term care workers often result from the assumption that “family care” is a “free” service without a cost to the economy. The situation is worsened by age and gender discrimination, which manifests itself in neglect of the need for paid long-term care workers and the perception of such work as a financial burden.

However, many family workers are giving up formal employment, reducing working hours or retiring early to provide care, and thus are not available to contribute to the economy. The work provided is unpaid, physically and mentally demanding and carried out irrespective of national regulations on working time, vacation, occupational safety and health. Even if compensated by minor in-kind or cash benefits, family workers risk poverty and ill health at later stages of their lives, thereby increasing the economic costs of family care.

Finally, accepting the lack of formal long-term care workers as normal fails to recognize the potential for physical and mental improvements made possible by the services of skilled workers and foregoes the potential for economic growth through creating a sufficient number of long-term care jobs.

Source: Scheil-Adlung (4).

Despite NHO workers being an indispensable part of the health workforce, the debates and strategies about health workforce shortages generally do not take them into account. Similarly, the need for decent working conditions of NHO workers, as highlighted in SDG 8 on the promotion of economic growth and decent work, has not been central to the debate. This may be due to the fact that hardly any national or global statistics exist to quantify the current number of NHO workers contributing to achievement of the SDGs.

This lack of data has a strong impact on countries' ability to allocate resources efficiently and devise evidence-based employment policies. Against this background, this paper assesses the employment and multiplier effects of investments in health economy employment, focusing on the following questions:

- a. Globally, how many NHO workers are supporting HO workers to achieve health objectives?
- b. How many decent jobs for NHO workers should be created by 2030 to achieve universal health coverage in the context of SDGs 1, 3 and 8?
- c. What ratio of NHO workers to HO workers is required today and by 2030 to attain the SDGs?

2. Methodology

Few data at global and national level are available on the number of NHO workers, and current data do not permit country-level comparisons to be made, due to differing definitions and categories of workers. We have therefore developed a new methodology to estimate the current ratio of HO workers to NHO workers. From this we can extrapolate the number of NHO workers and the number of NHO jobs that would need to be created in the health economy to achieve universal health coverage by 2030, assuming that the current ratio does not change. The methodology

is based on a broad view of the health workforce taking into account health economy workers, that is, all workers in the health sector as well as in other sectors that contribute to the health sector. For the purpose of this study, health economy workers consist of two groups of workers: HO workers and NHO workers. We identify both groups working within or beyond the health sector to provide goods and services financed through health expenditure or delivered unpaid, for example by family members. For the purposes of this study we define:

- **HO workers** as workers in occupations that require higher or vocational education in a health field based on the International Standard Classification of Occupations (ISCO) (5), specifically workers in paid employment or self-employment in the public or private health sectors or in the broader health economy working as health professionals, health associate professionals and personal care workers (ISCO codes 22, 32 and 532).
- **NHO workers** as paid or unpaid workers not in health occupations within the health sector or in other sectors contributing through the delivery of goods and services to the work of HO workers. They include long-term care workers such as family members, friends or neighbours who provide unpaid services informally to persons needing long-term care.

We estimate the number of workers in each of these categories for 185 countries using the ILOSTAT database (6), World Health Organization (WHO) Global Health Observatory database (7) and national databases, with data taken for the most recent available year for each country. First, we calculate the number of HO workers based on ISCO codes² and the WHO Global Health Observatory data and apply an upward adjustment to balance the data of countries where the WHO Global Health Observatory data are likely to undercount certain professional categories, such as associate health professionals.³ Then we calculate the number of workers in all service industries⁴ and estimate the proportion of these who are formal NHO workers based on a proxy: total health expenditure as a percentage of GDP.

2 This refers to ISCO codes 22 (health professionals), 32 (health associate professionals) and 532 (personal care workers).

3 Further details are available in the methodological annex (Annex 1).

4 The calculations are based on ISIC Rev.4 categories G–U. For details see Annex 1.

Numbers of informal NHO workers are estimated based on long-term care requirements of the population aged 65 and over and recent ILO estimates (4). We assume that the majority of unpaid informal caregiving is carried out by family members and that such work should be converted into formal jobs if paid employment has been given up, working hours have been reduced or early retirement has been taken to provide long-term care in the absence of paid formal long-term care workers. The reference country considered is the United Kingdom (8). We assume we are underestimating the situation in low- and middle-income countries, where family members are more likely to provide long-term care than in OECD countries.

Using the total number of HO workers and both formal and informal NHO workers working across all sectors we compute the current global ratio of NHO workers to HO workers based on workforce-weighted data for each country.

For estimates of the number of HO workers and NHO workers needed to achieve universal health coverage in the context of the SDGs by 2030 we follow earlier methodologies (9) applied to estimate health workforce deficits by setting a threshold based on workforce–population ratios in low-vulnerability countries and comparing the situation in each individual country against this threshold.

Incomplete data necessitated the application of a methodology based on the use of assumptions derived from the limited evidence available. Besides the necessary use of a proxy variable to estimate the number of HO workers beyond the health sector (such as excluding workers in the manufacture of pharmaceutical products and construction workers), both numbers are probably relatively small. Further, we assume that the ratio of workers' wages to material costs would be similar for all service industry sectors; and we also assume that informal NHO workers providing care consist largely of family members. Finally, we base our estimates on a limited number of countries and apply workforce-weighted average ratios to others. This probably introduces some inaccuracies at individual country level, but should not greatly affect the global total.

3. Global estimates of the relative sizes of the HO and NHO workforces

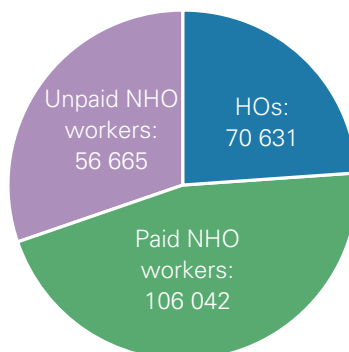
The global estimates provide information on the number of NHO workers working inside or outside the health sector in activities including (but not limited to):

- administration
- social services, including delivery of long-term care
- insurance
- finance
- information technology
- transportation
- education.

Our analyses indicate that, globally, NHO workers account for 60% of all health economy employment and 70% of all paid and unpaid workers, including informal long-term care workers in the health economy (Figure 1).

Figure 1

Composition of workers in the global health economy (thousands), 2015



Source: ILO calculations, 2016 (10).

In more detail, worldwide we find:

- 71 million HO workers;⁵
- 106 million paid, mostly formal, NHO workers;
- 57 million unpaid, mostly female, NHO workers, providing care to older relatives.

The global ratio of NHO workers to HO workers is 2.3, with each HO worker supported by 2.3 (paid or unpaid, formal or informal) NHO workers to achieve overall health objectives. Excluding unpaid NHO workers (mostly female family members), and the necessary transformation of the work into paid employment in formal jobs for long-term care workers, brings the ratio to 1.5, meaning that each HO worker is supported by 1.5 paid NHO workers.

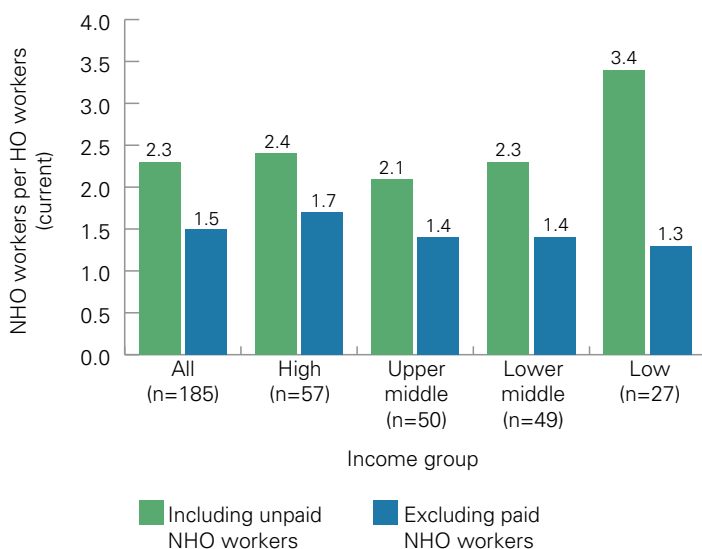
Figure 2 shows how the ratio of NHO workers to HO workers varies by income group. If we consider just paid NHO workers, high-income countries have an NHO–HO ratio of 1.7, compared with 1.4 for middle-income countries and 1.3 for low-income countries.

Taking paid and unpaid, formal and informal workers into account, however, we see a much higher ratio in low-income countries, because these countries tend to have smaller numbers of HO workers relative to the size of their populations. The relatively high ratio in high-income countries, on the other hand, is probably a reflection of the higher proportion of older persons among the populations and therefore greater numbers of long-term care workers.

5 Our estimates of 70.6 million HO workers are different from and larger than earlier estimates from WHO as a result of different approaches, definitions, and data sources, for example including or excluding private health sector employment. Global estimation of HO workers is also a challenging task, as data from various sources differ in terms of the definitions used, and the scope and completeness of the data. The differences show the range of the size of the total health workforce depending on choices about which groups to include.

Figure 2

Ratio of NHO workers to HO workers, by income group, 2015



Source: ILO calculations, 2016 (10).

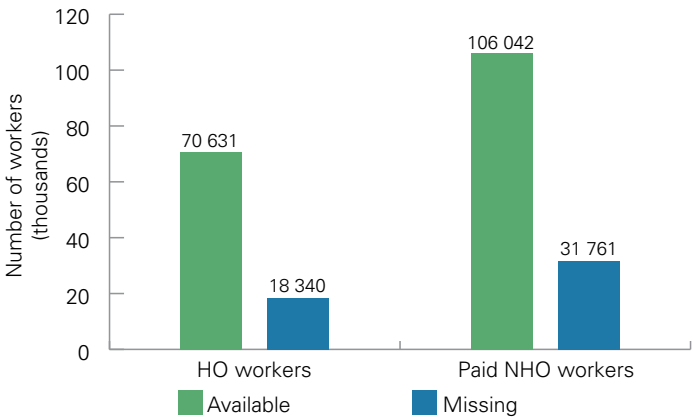
Figure 3 provides estimates that suggest the world is currently short of about 18 million HO workers and 32 million NHO workers to achieve universal health coverage. However, the shortages of workers are not equitably distributed. While some countries have a surplus of HO workers and NHO workers – particularly high-income countries – others show gaps: 89 countries are observed with a shortage of HO workers and 95 countries with a shortage of formal NHO workers.

Adding unpaid workers to the calculations, we find that currently 123 countries have a shortage of 38 million formal and informal NHO workers.

Figure 4 shows that the shortages of HO workers and NHO workers predominantly affect Asia and the Pacific, which reflects the fact that this region contains the most populous countries in the world, with Africa the next most affected. Relative to the population size, however, Africa has the most severe shortages.

Figure 3

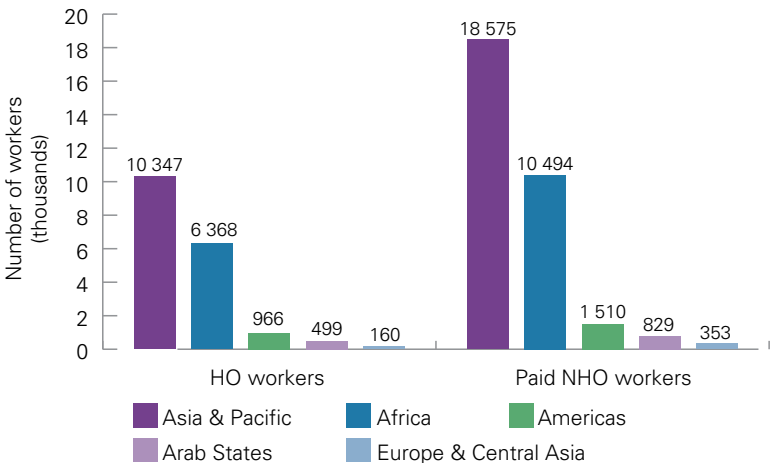
Numbers of formal HO workers and NHO workers currently available and missing, 2015



Source: ILO calculations, 2016 (10).

Figure 4

Numbers of formal HO workers and NHO workers missing in public and private employment, by region, 2015

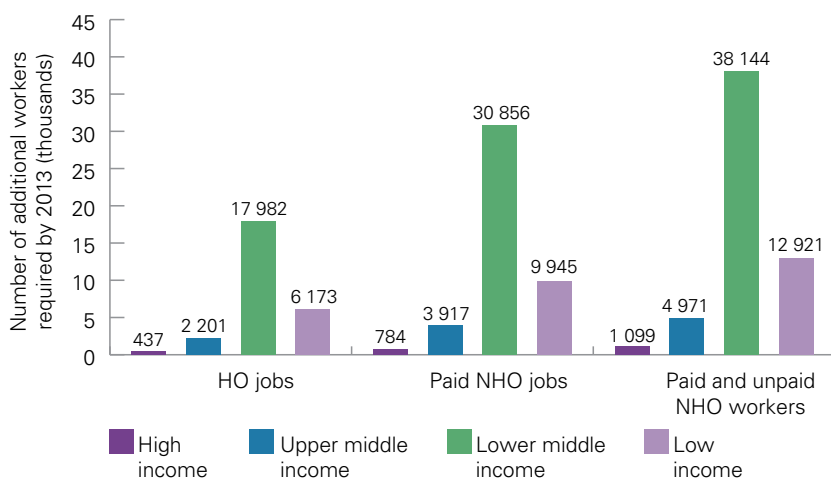


Source: ILO calculations, 2016 (10).

By 2030, population growth means that the world will have to create jobs for an estimated additional 27 million HO workers and 57 million NHO workers in order to achieve universal health coverage. Most of the additional jobs for HO workers and formal NHO workers will be in lower middle-income and low-income countries (Figure 5), and in the regions of Asia and the Pacific and Africa.

Figure 5

Additional HO and NHO jobs to be created by 2030 in public and private employment, by income group



Source: ILO calculations, 2016 (10).

4. Assessment of economic effects from investments in health economy employment

The evidence provided leads to some key observations.

- By applying a health economy perspective, evidence is provided that the global number of NHO jobs required to achieve health objectives such as universal health coverage exceeds the number of HO jobs. This suggests that the size of the health workforce is underestimated, and the contribution of NHOs to economic growth and meeting health needs is overlooked.

This also holds true for the provision of decent working conditions for NHO workers, who often work for low wages. Working conditions that do not respect human rights, including labour rights, social protection coverage, occupational safety and participatory processes through social dialogue, will not address challenges to economic growth such as poverty and inequality. Based on this analysis, investments in decent jobs for NHO workers should be considered alongside investments in HO workers.

- In all countries, investments in HO workers have significant economic multiplier effects resulting, among other things, in the creation of new jobs for NHO workers both within and beyond the health sector.

The data suggest that the economic return on investments in HO workers – or more generally in universal health coverage – has a positive impact on job creation for NHO workers. Globally, the ratio of NHO workers to HO workers is estimated at 2.3. If this ratio were to be maintained, the creation of one HO job has the potential to result in 2.3 jobs for NHO workers. If only paid NHO work is considered the ratio is still 1.5, meaning that each HO job could result in the creation of 1.5 NHO jobs. Thus, a direct effect of additional HO jobs is the generation of NHO employment, from which the resultant incomes are used and reused to contribute to the broader economy, leading to further employment and economic growth.

- High deficits in the number of NHO workers are observed globally, especially in lower-income countries, and demand for NHO workers will increase significantly by 2030.

Despite their importance, evidence suggests that the world is short of 32 million NHO workers, with larger shortages in lower middle-income and low-income countries. The demand for NHO workers will grow significantly by 2030, when 170 million NHO workers are likely to be required to provide goods and services to achieve universal health coverage.

These results suggest that much potential economic growth is foregone due to the gaps in employment. Further, NHO shortages reduce the accessibility of health services, thus creating (a) negative health and economic impacts as the unserved population cannot fully contribute to economic growth due to absenteeism, disability and reduced life expectancy; and (b) increased public expenditure due to higher morbidity.

- The creation of NHO jobs can benefit workers with all levels of qualifications and in areas with limited employment opportunities and thus has the potential to reduce un(der)employment and poverty.

The many occupations included in NHO work provide a wide range of job opportunities for workers at all skill levels. Thus, the creation of decent jobs in non-health occupations can play an important role in areas with high unemployment of low-skilled workers. It can also provide learning and career development opportunities to workers who have missed out on primary or secondary education.

Further, NHO employment effects are likely to occur not only in affluent areas but also in poor and rural areas if investments in decent jobs are made in the context of universal health coverage policies based on equitable access to services, as implied in SDGs 1, 3 and 8. Thus, the multiplier effects of investments in health economy employment might include poverty alleviation and reduced unemployment in such areas.

- Large numbers of unpaid workers providing informal care are filling in for the lack of jobs in formal employment, often without decent working conditions and by reducing or withdrawing their own formal employment.

Shortages of formal jobs for health workers result in informal work, particularly for the provision of long-term care services. These estimates indicate that, globally, there are nearly as many unpaid NHO workers providing informal care as HO workers. Often, these unpaid services are provided without decent working conditions, defined working hours, rights to breaks, holidays, or social protection coverage for sickness, unemployment and old age. This may result in negative health impacts such as burnout and old age poverty among care workers.

Against this background, it is crucial to ensure adequate staffing for long-term care services, which has been estimated at 4.2 full-time equivalent long-term care workers per 100 persons aged 65 years and over (4). Further, it is essential to provide adequate cash benefits and social protection coverage to informal care workers such as family members to alleviate their burden.

5. Policy considerations: achieving inclusive growth by creating decent jobs for HO and NHO workers

Closing the identified gap of HO and NHO workers will be essential for attaining the SDGs. It will help to address the large deficits in decent jobs in countries of all income levels. This should be considered as an asset for the economy through contributing to improved health, economic growth and development, and decreasing inequality.

Closing the gaps requires a rethinking of current health employment policies, which often focus on HO workers in the health sector only rather than considering the macroeconomic dimension of employment effects for all workers contributing to the health economy. Thus, it is important to evaluate where investments are best placed to achieve optimal health, social and economic returns on investment. Evidence from prior studies (11) indicates that investments in medically underserved rural

areas in low-income countries have the greatest impact in terms of improving health coverage and creating jobs.

Policies should not be limited to solely achieving higher numbers of HO jobs, but should also consider decent work for NHO workers as an integral part of health employment. Only if decent working conditions for the entire health economy workforce are considered can sustainable progress be achieved (12).

Addressing these issues and achieving inclusive growth requires strengthened policies that focus on:

- integrating macroeconomic, employment and labour market policies with the potential to realize inclusive and sustainable economic growth due to investments in decent health economy employment for NHO workers based on progress towards SDGs 1, 3 and 8;
- ensuring that sufficient funds for attaining universal health coverage are made available for the workforce, requiring fair social protection financing mechanisms aimed at financial, fiscal and economic sustainability with due regard to social justice and equity, as highlighted in ILO Recommendation No. 202;
- guaranteeing the delivery of services to the population by providing equitable access in the context of social protection floors and universal health coverage policies;
- transforming the informal provision of long-term care (obligated by the absence of formal long-term care workers) into formal jobs.

Policy option 1

Address shortages of decent jobs for NHO workers through enabling macroeconomic and labour market policies

Macroeconomic policies are often detached from employment and labour market policies and the need for decent working conditions, particularly in the health sector. No less important than fiscal and monetary policies are macroeconomic policies that enable raising labour productivity or investments in decent jobs because of their important employment effects. Jobs providing decent working conditions, such as social protection and decent incomes, have immediate beneficial effects for the economy as a result of improved health of the workers and the related increase in their productive potential, and stabilized consumption in the longer term based on regular income.

An essential foundation for policies to ensure that the health economy contributes fully to and benefits from progress towards decent work for all is improved national data on the size and composition of NHO workers.

Against this background, it is important to unlock the positive effects of health economy employment and realize inclusive and sustainable growth based on investments in decent jobs for NHO workers. Labour market and employment policies should be closely linked to employment-friendly macroeconomic policies. Such enabling policies reverse the prioritization of fiscal policies aimed at reducing debts and financial deficits only. By using macroeconomic frameworks allowing for higher budget deficits and inflation, policies have the potential to reduce unemployment, provide for education, training, and skills development, alleviate poverty, and promote investments in social protection in health (13). This can be achieved without jeopardizing macroeconomic stability as the policies are thereby linked to employment-generating growth.

Labour market policies such as public investments in employment or subsidized employment are needed to trigger economic growth through the health economy and to provide incentives for private sector investments. Decent working conditions should be established that include full and rights-based health economy employment, social protection coverage, freedom of association and collective bargaining, resulting in equitable income distribution and thus inclusive growth (3). The exclusion of groups such as women, migrant workers or youths is often rooted in the absence of such enabling policies.

Thus, major efforts are needed to mainstream labour market and employment policies based on decent work into macroeconomic policies aimed at stimulating inclusive and sustainable economic growth.

Policy option 2

Invest in new and better jobs to enhance economic growth by extending health protection towards universal health coverage

It will be important to ensure sufficient investments for increasing the quality and quantity of health employment for workers in health and other occupations in both the public and private sectors. The generation of public funds requires fiscal space that needs to be created based on fair financing mechanisms, including taxes and shared contributions to health protection systems providing for universal health coverage. Resultant funds should be equitably distributed in terms of geography, age and gender, to avoid access deficits. Thus, increased health economy employment will be linked to the needs and demands of the population, who can then access affordable services and will in return be enabled to contribute to economic growth.

Some prerequisites and principles should be met to enable the population to utilize services. These include the establishment of rights and legislation guaranteeing access to health care for the whole population, rather than an approach based on charity. Such legislation should be based on the principles of universality, equity, social inclusion and non-discrimination. Further, it is essential to ensure that quality services are affordable and financially protected, for example by minimizing out-of-pocket payments.

An enabling framework for related policies is provided in ILO Recommendation No. 202, which also provides guidance on achieving coherence with social, economic and labour market policies and highlights the need to coordinate related policies with development policies, such as rural development plans.

Policy option 3

Transform informal work into formal jobs to create inclusive and sustainable growth

Currently, many policy-makers and decision-makers do not anticipate the need to transform informal long-term care work into formal jobs due to the expectation of “free” services – mainly from female family members. Reliance on the informal provision of long-term care is unsustainable in the context of global ageing, particularly given that many informal workers are not trained for caregiving, yet the work can be very demanding, for example when caring for persons with mental disorders. Further, informal caregiving has the potential to aggravate gender inequality as it is often provided without any remuneration or social protection coverage.

It is therefore crucial to transform informal work that is undertaken as a consequence of the absence of formal care workers into formal jobs with decent working conditions. This will allow for acceptable living conditions for those who currently provide informal care, as well as helping to alleviate poverty and promote gender equality. Most efficient and effective measures for formalizing long-term care relate to the creation of decent jobs that provide adequate wages, as well as skills development for the provision of quality care (14).

Acknowledgements

The authors would like to thank ILO colleagues for their contributions: Amber Barth, Thorsten Behrendt, Ekkehard Ernst, David Hunter, Stephen Pursey, Dorothea Schmidt-Klau and Christiane Wiskow.

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ANNEX 1: Methodology

The analyses are based on the conceptual framework illustrated in Table A1.1. Within the framework, the workers of interest fall into five groups.

Table 1

Conceptual framework

	Workers in health occupations (HO workers)	Workers in non-health occupations (NHO workers)	Health economy workers
Employed in the health sector	A	C	A+C
Employed outside the health sector	B	D	B+D
Unpaid informal workers	–	E	E
Total	A+B	C+D+E	A+B+C+D+E

The terms used in Table 1 are defined as follows:

- Workers in health occupations (HO workers) (groups A and B) = workers in occupations that require post-secondary education in a health field.
- Workers in non-health occupations (NHO workers) (groups C, D and E) = workers providing goods or services that support the work of HO workers.
- Health economy workers (groups A, B, C, D and E) = all HO workers and NHO workers contributing with or without pay to the provision of health services, whether within or outside the health sector.
- Employed in the health sector (groups A and C) = employed by an organization whose primary purpose is to deliver preventive, promotive or curative health services, or self-employed in a job with this primary purpose.

- Employed outside the health sector (groups B and D) = employed by an organization that provides goods or services to the health sector, or self-employed workers, in a job with this primary purpose.
- Workers engaged in any activity to produce goods or provide services for pay or profit (groups A, B, C and D).
- Unpaid informal workers (group E) = persons who worked without pay to provide health and long-term care or to provide support to HO workers. In this study we specifically focus on unpaid informal caregiving of family members providing long-term care.

Throughout, we used data based on headcounts rather than numbers of full-time equivalent workers.

Three data sources were used:

- ILO's central statistics database: ILOSTAT (www.ilo.org/global/statistics-and-databases);
- WHO Global Health Observatory workforce statistics (<http://apps.who.int/gho/data/node.main?showonly=HWF>);
- National sources of data.

The steps followed were as follows.

1. Estimate the size of the entire formal health economy workforce (A + B + C + D) for ILOSTAT countries

At present, there is no global data source that will allow the number of NHO workers outside the health sector (group D) to be counted. Only NHO workers within the health sector (group C) usually appear in global estimates, which is a major limitation because NHO workers can and do work in non-health sectors,

and without them the health sector would not be able to operate to its full scope. Therefore, rather than ignoring this important group of workers and their contribution to the health economy, it was judged to be important to attempt to estimate their numbers, as follows:

For the 68 countries in the ILOSTAT database, the number of workers in service industries (ISIC Rev.4 categories G–U or ISIC Rev.3 G–Q) was extracted for the most recent available year. This number includes most types of formal HO workers and NHO workers (groups A–D), as well as people working in other service industries. Five countries were excluded at this stage because their ILOSTAT data were not disaggregated by industry sector (Algeria, Japan, Madagascar, Maldives and Ukraine).

For the remaining 63 countries, workers in ISIC Rev.4 category Q (or ISIC Rev.3 category N) were assumed to represent workers employed in the health sector (groups A + C). Five countries were excluded at this stage because their data showed zero employees in the health sector (Albania, Belarus, Dominican Republic, Indonesia and South Africa).

For the remaining 58 countries, to estimate the number of workers in ISIC Rev.4 categories G–P and R–U (or ISIC Rev.3 categories G–M and O–Q) who are health workers outside the health sector (groups B + D), we used “total health expenditure (THE) as a % of gross domestic product (GDP) 2014” (1) as a proxy variable. Thus, the % of service workers in non-health sectors who provide health services was assumed to be the same as the % of GDP that is the total health expenditure.

Limitations

- It was assumed that the numbers of workers recorded in the most recent year in ILOSTAT still applied. Although the data were fairly recent for most countries (49 out of 63 countries had data for 2014, four for 2013, three for 2012), the data for a few countries were slightly out of date (2009 or 2010).

- People working in the manufacture of pharmaceutical products were not counted (they are categorized under ISIC Rev.4 category C or ISIC Rev.3 category D). However, those involved in research and development and retail of pharmaceutical products were counted.
- People working in construction were not counted (they are categorized under ISIC Rev.4 category F or ISIC Rev.3 category F), so workers involved in construction of health facilities were not included in the counts of NHO workers.
- The lack of empirical data means that the assumption that THE/GDP is equal to NHO workers/all service workers cannot be verified and it should therefore be treated with an appropriate degree of caution.
- It is highly unlikely that the percentage of service industry workers who provide services to the health sector is constant across all service industry sectors G–P and R–U. The proxy variable assumes that, *on average*, the percentage who do is equal to the percentage of GDP that is THE.
- The use of THE/GDP as a proxy variable for estimating B + D means that we assume that the ratio of worker costs to goods/materials costs is similar for all service industry sectors, which may not be the case.

2. Estimate the number of formal HO workers (A + B) for ILOSTAT countries

For the 58 remaining ILOSTAT countries, the number of workers with ISCO-08 code 22 or 32 (or ISCO-88 222, 223, 322, 323 or 324) was extracted for the most recent available year. However, these ISCO codes do not include personal care workers (ISCO-08 code 532). ILOSTAT does not disaggregate ISCO codes to the three-digit level, so it was not possible to identify numbers of personal care workers. Because personal care workers are HO workers as defined in this study, and in many countries represent a significant proportion of HO workers, it was necessary to estimate their numbers. This was done using OECD data (2), which showed that, for the 17 OECD countries with data from 2012, 2013 or 2014 about both total employment in health and social care and the number of personal care workers,

on average 10% of all those employed in the health sector (groups A + C) are personal care workers.

The size of the formal HO workforce (groups A + B) was therefore estimated by taking 10% of the number of workers in ISIC Rev.4 category Q (or ISIC Rev.3 category N) and adding this to the number of workers with ISCO-08 code 22 or 32 (or ISCO-88 222, 223, 322, 323 or 324).

Four countries (Azerbaijan, Bhutan, Botswana and Brazil) were excluded at the stage because they had no data for the relevant ISCO codes, and two more (the Russian Federation and Sri Lanka) were excluded because the number of workers with these ISCO codes was larger than the number of service industry workers counted in step 1. These two situations were taken as indicators of poor-quality data.

This left a total of 52 countries with sufficient data in ILOSTAT to estimate the size of both the total number of health economy workers (groups A–D in Table A1.1) and the number of HO workers (Groups A + B).

Limitations

- The proportion of workers employed in the health sector who are personal care workers varies even within OECD countries, so the estimate of 10% on average may not be representative of all countries.⁶
- The ISCO codes used to identify HO workers probably includes veterinary workers and some other categories that are not relevant for our study for at least some countries. Their numbers are much smaller than numbers of human health workers, so this is not thought to be a major limitation.

⁶ We tried to work out a method of adjusting for this by referring to the WHO Global Health Observatory database, which includes personal care workers within its counts of “other health workers”, but also provides separate counts of personal care workers as well as other health workers. However, only 15 countries had disaggregated data on personal care workers for a comparable year to the data on “other health workers”, of which five recorded more personal care workers than “other health workers”, which caused us to doubt the quality of the data.

3. Estimate the number of formal NHO workers (C + D) for ILOSTAT countries

For the 52 remaining ILOSTAT countries, the size of the paid NHO workforce (Groups C + D) was estimated by subtracting the number of HO workers (see step 2) from the number of service industry workers (see step 1).

4 Calculate the ratio of HO workers to NHO workers ((A + B):(C + D)) for ILOSTAT countries

The ratio of HO workers to NHO workers in each country was calculated by dividing the number of NHO workers (see step 3) by the number of HO workers (see step 2).

Across all 52 countries, the median ratio was 1.62, that is, for every HO worker in these countries, on average there were 1.62 NHO workers. The ratio was disaggregated by World Bank income group, as shown in Table A1.2.

Table 2

Median ratio of NHO workers to HO workers in 52 ILOSTAT countries

Income group	No. of countries	Median number of NHO workers per HO workers
High	33	1.72
Low and middle ^a	19	1.38
All	52	1.62

- a The low- and middle-income categories were combined because there were very few low-income countries in ILOSTAT, and the medians for the low-income, lower middle-income and upper middle-income countries were very similar.

5. Estimate the number of HO workers (A+B)
in countries with other data sources

ILOSTAT does not include data for enough countries to permit global and regional estimates of the number of HO workers. The WHO Global Health Observatory database contained data on health worker numbers for 182 countries, of which 133 were not included in ILOSTAT. The WHO database uses cadre definitions that do not directly match the ISCO codes used for the ILOSTAT countries, so we made assumptions as presented in Table A1.3.

Table 3

WHO database categories and their ISCO code equivalents

WHO category	ISCO-08 equivalent	Our classification
Physician	221	HO
Nursing & midwifery	222, 322	HO
Dentistry	226	HO
Pharmaceutical	226	HO
Laboratory	321	HO
Environmental & public health	226	HO
Community & traditional health	223	HO
Other health workers (which includes personal care workers)	532 + 226 not mentioned above	HO
Management & support	various	NHO

As with ILOSTAT, data were taken from the WHO database for the most recent available year. For one of the WHO database countries (United Republic of Tanzania), the data showed zero physicians, which was taken as an indicator of poor-quality data. An alternative data source was therefore used for the United Republic of Tanzania (3), which used the same health worker categories as the WHO database (see Table A1.3).

Thus, estimates of the number of HO workers were made for 185 countries (52 from ILOSTAT, 132 from WHO and one from a national data source).

The numbers of HO workers in the WHO database were systematically lower than the numbers in the ILOSTAT database. It seems likely that this was due to undercounting of certain categories of worker, most notably associate health professionals (our analyses indicated that the numbers of health professionals were similar across the two databases, whereas ILOSTAT tended to include many more associate health professionals). It is also possible that, for some countries with data provided by national governments (4), private sector workers are undercounted (5) due to public data systems focusing on the public sector. For this reason, an upward adjustment was made to the WHO numbers to make them more comparable with the ILOSTAT numbers. This was done by examining the 49 countries that had data on the number of HO workers in both ILOSTAT and the WHO database. For these countries, the median ratio of WHO to ILOSTAT estimates was 0.59 (that is, on average, the number of HO workers in the WHO database was 0.59 the number in ILOSTAT). For each of the 133 non-ILOSTAT countries, therefore, the number of HO workers in the database was divided by 0.59 to give an estimate of the actual number of HO workers.

Limitations

- The upward adjustment of HO numbers in the WHO database is based on an average, which is unlikely to apply to all individual countries. For this and other reasons, it is not appropriate to present individual country estimates. In all outputs relating to this study, aggregate estimates and regional and global levels only should be presented.

6. Estimate the number of formal NHO workers in countries with other data sources

The median ratio of HO to NHO workers in high-income ILOSTAT countries (1.72) was applied to high-income countries in the WHO database, and the median ratio in low- and middle-income ILOSTAT countries (1.38) was applied to low- and middle-income countries in the WHO database. These ratios were applied to the number of HO workers (see step 5) to give an estimate of the number of formal NHO workers (groups C + D).

7. Estimate the number of unpaid care workers (E)

Estimates of total numbers of unpaid workers for 21 OECD countries were taken from a recent ILO paper (6). For these 21 countries, we calculated the median “informal workers to population over 65” ratio⁷ (on the assumption that most of those in need of informal care workers are people in this age bracket), and applied this ratio to all 185 countries included in the above calculations. This yielded an estimate of the number of informal workers in all 185 countries.

This was almost certainly an overestimate of the number of unpaid workers according to our definition, because not all unpaid work can or should be transformed into formal jobs. To estimate the numbers who fit our definition of unpaid workers, we first assumed that most were family members, then used data from a 2015 United Kingdom survey of family members providing care (7) to estimate the proportion of unpaid work that could be converted to formal jobs. That survey found that 51% of carers had given up work to provide long-term care for a family or household member, 12% had taken early retirement and 21% had reduced their working hours. Of those who gave up work, retired early or took reduced working hours, 30% said it was because there were no suitable care services and 22% because they could not afford to pay for the available services. This indicates that 44% of all informal unpaid workers should be counted as part of the NHO workforce because the work that they do should be transformed into formal jobs $((51 + 12 + 21) * (0.3 + 0.22) = 44)$.

Limitations

- Most of the 21 countries in the ILO paper are in Europe and all are high-income countries, so the applicability of their data to other countries is questionable. It seems likely that the number of informal long-term carers is strongly negatively correlated with the number of paid long-term carers, but very few data were available on the number of paid long-term carers either. It is plausible that in low- and middle-income countries with less developed health and social care systems, a higher proportion of the population is performing long-term care roles, in which case our estimates will be conservative rather than an overexaggeration.

⁷ Estimates of the population aged over 65 years for 2015 were taken from United Nations Population Division (<http://esa.un.org/unpd/wpp/>).

- The situation in the United Kingdom regarding the proportion of unpaid care work that could be transformed into formal employment is unlikely to be typical of all countries, but comparable data from other countries were not located in the time available.

8. Estimate the global number of HO workers to NHO workers and thus the global ratio of NHO workers to HO workers

For all 185 countries, the number of HO workers ($A + B$) and formal NHO workers ($C + D$) were summed to give a global total. The ratio of the global number of formal NHO workers to the global number of HO workers was 1.5. In other words, for every HO worker in the world, we estimate that there are 1.5 paid NHO workers.

Likewise, the numbers of paid + unpaid NHO workers ($C + D + E$) were summed across all 185 countries to give a global total. The ratio of the global number of paid + unpaid NHO workers to the global number of HO workers was 2.3. In other words, for every HO in the world, we estimate that there are 2.3 NHO workers (formal + informal).

Effectively, these global ratios give the weighted mean of the individual country ratios (weighted by workforce size). We can also calculate the unweighted means: 1.5 excluding informal workers and 3.0 including informal workers. In other words, in the average country, there are 1.5 paid NHO workers for every HO worker, and there are 3 formal + informal NHO workers for every HO worker.

9. Disaggregate the global estimates by ILO region and income group

Estimated numbers of HO workers and NHO workers were summed for all countries in each ILO region and each income group. Within each region and each income group, the total number of NHO workers was divided by the total number of HO workers to yield a weighted average ratio for that region or income group.

10. Estimate the number of NHO workers missing

For all low-vulnerability countries ($n = 24$) – countries with low poverty levels and small informal economies (8) – the median number of HO workers per 1000 population⁸ was calculated. This calculation was also done for paid NHO workers and for paid + unpaid NHO workers, and the results are shown in Table A1.4.

Table 4

Median number of workers per 1000 population in low-vulnerability countries

HO workers (groups A+B)	Paid NHO workers (groups C+D)	Paid + unpaid NHO workers (groups C+D+E)
9.2	14.5	20.6

The above numbers were applied to the 2015 population in each of the 185 countries to estimate the number of each type of worker currently missing, and also applied to the United Nations Population Division's medium variant population projections for 2030 to estimate the related level of missing workers in 2030.

The gap for informal NHO workers was estimated by subtracting the gap of paid NHO workers from the gap of paid + unpaid NHO workers.

For each country, the shortage of workers of each type was estimated by subtracting the number currently in the workforce from the number needed. If the result was a negative number (that is, availability was higher than need), the shortage was set at zero.

The individual country shortages were then summed to give global and regional totals.

8 Using United Nations Population Division population estimates for 2015.

Limitations

Changing age structures and changes in epidemiology are likely between now and 2030, which will affect the number of workers necessary per 1000 population. In estimating the gap for workers in 2030 we have assumed that the worker–population ratio thresholds will be the same in 2030 as in 2015.

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PART II

Economic Value and Investment

Pathways: the health system, health employment, and economic growth

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Abstract

The principal purpose of a health system is to provide health care. However, viewed as an economic sector, the health system contributes to growth. Moreover, the health system offers additional benefits that contribute both to economic growth and to health, as well as to non-health welfare. We do not present a complete causal account of the interactions between the health system and the economy, but focus in our discussion here on the pathways that involve the employment of health workers and promote economic growth. The six main pathways of interest are (a) the health pathway, addressing the intrinsic (non-market-valued) health benefits of the health system; (b) the economic output pathway, addressing the intrinsic (market-valued) economic benefits of the health system; (c) the social protection pathway, addressing sickness, disability, unemployment and old age benefits, as well as financial protection against loss of income and catastrophic health payments; (d) the social cohesion pathway, addressing the role of a health system in promoting equity and fostering redistribution and growth; (e) the innovation and diversification pathway, addressing the role of the health system in driving technological development and in offering protection against macroeconomic shocks; and (f) the health security pathway, addressing the role of the health system in protecting against epidemic outbreaks and potential pandemics.

1. Introduction

The principal purpose of a country's health system is to provide health care to its population; this is its defining objective. However, when viewed as an economic sector, the health system also contributes to economic growth. Furthermore, the health system generates a number of additional spillover benefits at no extra cost (that is, positive externalities) that contribute both to health and to economic growth, as well as to broader non-health welfare. All these benefits are realized through distinct pathways of cause and effect. The purpose of this chapter is to enumerate and classify the main pathways that are relevant to the work of the High-Level Commission on Health Employment and Economic Growth. The need for an analysis of these causal pathways was identified during the work of the Expert Group that served as one of the main advisory bodies to the Commission.

The economic concept of “efficiency” and the plain-language term “growth” are in fact interlinked: when an economy produces more with a given quantity of resources, in economic terms it is more efficient. In the following, we occasionally refer to “efficiency” but more usually we employ the term “growth”, with its implicit connotation of efficiency. In the perspective adopted here, “efficiency” refers, first of all, to the objective of producing more benefits, in terms of income, consumption, investment, production, and other forms of (mainly) market-valued benefits. From the perspective of public economics, however, the concept of efficiency is often used as an argument for public sector intervention. The main rationales for public (that is, government) action are to correct market failures, such as negative externalities, but also to provide public goods, such as education and health care, that would not otherwise be produced (at least not optimally) by the market. We therefore adopt a dual perspective: principally that of the economy as a whole, with a focus on the operation of market forces and the outcome of economic growth, but also, as appropriate, that of identifying rationales for correcting inefficiencies, whether in the public¹ or private sector.

1 Inefficiencies in the public sector are sometimes termed “government failure”, that is, government interventions in the market that reduce social or economic welfare.

To proceed systematically, to ensure conceptual clarity, and to avoid the double counting of benefits, the starting point for our analysis is the health system, rather than health employment per se. However, since the primary intention of this chapter is to outline the main health system pathways that are relevant to the work of the Commission because they both involve the employment of health workers and promote economic growth, it is important to note that recognized benefits of the health system that are not related to the themes of health employment and economic growth are not emphasized here, although we acknowledge that they constitute important outcomes in their own right.

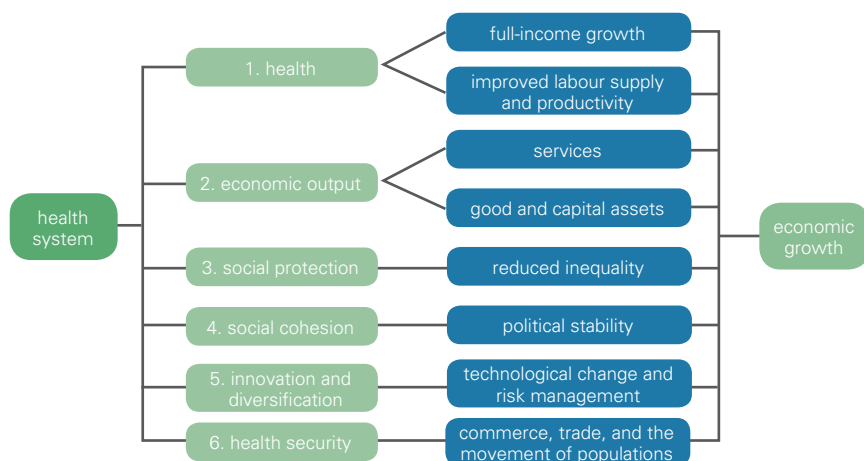
2. The six pathways to economic growth

Figure 1 provides an overview of the main cause-and-effect pathways discussed here, labelled for convenience as the following:

1. The **health** pathway
2. The **economic output** pathway
3. The **social protection** pathway
4. The **social cohesion** pathway
5. The **innovation and diversification** pathway
6. The **health security** pathway.

Figure 1

Pathways to economic growth



In the following, we consider each pathway in turn, identifying and discussing along the way relevant sub-pathways and briefly elucidating how the pathways involve health employment and contribute to economic growth. The pathways identified here are not intended to be exhaustive, or to represent a full causal account of the relation of the health system to the broader economy.

2.1 Health pathway

As previously noted, the starting point is the health system. The “health system” is understood here to include all activities whose primary intention is to improve health. Of course not all health benefits are attributable to the health system, even broadly defined. For example, health benefits also accrue as a result of education, or through general social and economic development, although for reasons of scope we do not consider those aspects here.

The health pathway comprises two sub-pathways, one of which we refer to as the “full-income” pathway. The full-income pathway is perhaps the pathway most

commonly known by health policy-makers and health economists. In this pathway, a shadow price (that is, an estimate of the per-unit value of health) is assigned to a (usually hypothetical) quantity of health benefits so as to evaluate the contribution of an improvement in health to full income. Full income, at least in principle, includes all forms of market-valued as well as non-market-valued income, although we focus here on the health dimension of this pathway.

Despite the use of monetary units for the valuation of health, it is important to note that in this pathway health is conceived of as an intrinsic benefit (something good for its own sake), and not as an instrumental benefit (something good for the sake of something else, such as monetary income). In terms of economic theory, this means that health is considered in this pathway as a direct argument in the preference function of individuals (1). This role of health, as a direct consumption good, justifies the central importance of this pathway in most health-related analyses: health is a fundamental part of what people value as a good life; it plays an integral part in theories of human well-being; and it features prominently in discussions of social welfare.

Most of the uncertainty, therefore, in accounting for health benefits in full income involves not the importance of health per se but rather how to estimate its value. At least in the health policy literature focused on full income (2), health benefits are considered as a flow realized over an individual's lifetime (that is, as a form of income, measured in units of health per time). In the sustainable development and economics literature, however, health benefits are usually viewed as a stock, or endowment (that is, as a capital good, measured in units of health) (1, 3). Both approaches, however, require an estimate of the shadow price of a unit of health. Although individuals in principle will have different shadow prices for health (1), both the full-income and the health capital literature rely on an average of estimates of individual shadow prices as a proxy for the social value of a unit of health. However the shadow price (p) of health is estimated, when it is multiplied by a quantity (q) of health, the product ($p \times q$) represents in these analyses an estimate of the social value of a given improvement in health. This value is, strictly speaking, an economic benefit, although it is not a market-valued one.

As is commonly done, for example, in burden of disease measurements, health status can be partitioned into separable components consisting of longevity on the one

hand and health-related quality of life on the other (1). Though both components are important, the longevity dimension has received greater attention because of the availability of estimates of the value of a statistical life and the related concept of the value of a life-year. Despite the conventional terminology suggesting that a human life can be reduced to a dollar value, in more precise language these statistics in fact represent an estimate of the value to an individual of a small change in their mortality risk (2). When these estimates are averaged, individual valuations of a small change in risk are used to provide an estimate of the social value of risk reduction. The focus on mortality risk, however, does not imply that the direct utility (or disutility) derived from good (or bad) health-related quality of life does not have individual or social value; estimates of the value of small changes in health-related quality of life are simply harder to come by, and those such as do exist are fraught with conceptual and measurement problems.

Both the full-income and the health capital literature refer, however, to a further, instrumental value of improved health. Here, we identify this instrumental value of improved health with the second health-related sub-pathway, one that figures prominently in the literature on the “health investment case” (4)². This pathway is important because improved health implies that individuals can engage in increased levels of activity (that is, in addition to enjoying increased longevity and improved health-related quality of life, individuals can also do more of all the things they want to do). In economic terms, this means that health also enters indirectly as an argument in the preference function of individuals: that is, in this pathway health is considered as an element in individuals’ production functions, one that they use to produce other goods that they value, such as wage income, which is a market-valued benefit. Evidently, health is also instrumental for the transformation of leisure time into non-market-valued benefits such as visits with family, recreational activities with friends, as well as other forms of social participation.

In any case, if the activity resulting from an improvement in health takes place in the labour market, it constitutes a market-valued benefit and will be recorded in the national income as an increased level of economic productivity. In general, part of this increased economic productivity is attributable to an augmented quantity of

2 There is a growing literature on the so-called investment case for health that seeks to measure benefits realized through increased activity, as measured in terms of gross domestic product (GDP). The reference (4) is only intended to be indicative.

labour supplied (through reduced absenteeism, disability and early retirement), but part is also attributable to reduced presenteeism (resulting in improved quality of labour) and increased labour productivity. Both of these benefits are market valued.

If the activity resulting from a given improvement in health takes place in a non-market context, it still constitutes an important benefit (for example, improved performance in family and social roles); however, such activity does not have a market value so a shadow price would need to be estimated for it. As for the intrinsic value of health, instrumental benefits resulting from increased activities that are not market valued inevitably present conceptual and measurement difficulties when it comes to estimating a shadow price.

Presumably for these reasons, at least prior to the introduction of the full-income terminology (2), there has been a noticeable reluctance within the sphere of health policy to “put a price on” intrinsic health benefits such as longevity. Conversely, and for presumably similar reasons, there has been resistance outside the domain of health policy to consider non-market-valued benefits (even such important ones as longevity) as having the same policy relevance to decision-makers as market-valued benefits such as increases in GDP.³ From a purely economic perspective, neither of these positions is particularly helpful.

Since the focus of the Commission is on highlighting a set of mainly market-valued economic benefits deriving from the health system that are realized as a result of increased health employment, under the health pathway we emphasize the sub-pathway that operates through the labour market, namely, through an improved quality and quantity of labour resulting in increased economic productivity. This benefit, properly speaking, constitutes what we have called above a positive externality of the health system; the health system does not exist for the sake of improving either labour supply or labour productivity, but this is nevertheless one of its socially important spillover effects.

To reiterate: our focus on a positive externality of the health system operating through the labour market is not intended to disregard the intrinsic value of health

3 The “Beyond GDP” movement proposes to give more emphasis to the policy relevance of non-market-valued benefits; however, for the reasons of scope previously noted, we do not consider this in further detail here.

or other non-market-valued benefits deriving from improved health, but is intended merely to place emphasis on a particular facet of the recognized benefits resulting from the health system, one that is measured in market-denominated terms and which has special relevance for multisectoral and whole-of-government policies related to health in the context of sustainable development. Likewise, in the pathways discussed below, for similar reasons we focus primarily on market-valued benefits expressed in terms of economic growth as measured in the GDP (or in other income statistics), leaving tacit thereby a number of important non-market-valued benefits.

2.2 Economic output pathway

A substantial justification for focusing on the market-valued benefits of the health system is that they are widely underappreciated in both the health and non-health policy spheres. Indeed, the health system is commonly viewed as constituting a “cost”, with the related view that expenditure on health is a drag on the economy’s productivity. There are some theoretical reasons to suspect that this could be the case: since the health sector relies heavily on labour as an input, for example via the human-to-human interactions of individuals with health workers, some economic theorists believe that it might not be possible for the health sector to keep pace with productivity growth in the rest of the economy, where technological change and automation can potentially play a greater role. This thinking was formalized by the economist William Baumol (5), whose theoretical model consisted of a “productive sector” and an “unproductive sector”. Although in his model the “unproductive sector” – which is said to suffer from a “cost disease” – was originally identified with the performing arts sector, it has subsequently been identified mainly with the health sector, and with public administration. The identification of Baumol’s cost disease with the health sector can in part be attributed to more recent work published by the economist Jochen Hartwig, which proposed to test empirically a particular specification of the Baumol model and which – with that specification – found support for the existence of a cost disease in the health sector, at least in a sample of developed countries (6, 7).

However, this finding (which is strongly dependent on the particular specification of Baumol’s model adopted by Hartwig) has recently been cast into doubt by research done for the World Bank (8), which found, using the same specification employed by

Hartwig, the opposite result in a broader sample of countries, including low-income and lower middle-income countries. In addition, this same paper found – using yet another empirical model – that countries with more developed health systems also have higher manufacturing productivity, in other words, that a developed health sector acts in the same way as productivity-enhancing technological change (8, 9). Both of these findings constitute independent evidence against the idea that the health sector is unproductive, inefficient or a drag on the economy.

Although we do not pretend to resolve these debates, they are important: if the health sector is not an efficient investment, then its growth should be curtailed and its costs contained (to allow other, more productive, uses of resources); however, if the health sector is an efficient investment, then its growth promotes broader economic growth. The reflexive view of the health system as an unproductive sector suffering from a cost disease is now being revisited, particularly with respect to the situation in low-income and lower middle-income countries, where the health system is much less developed than in richer countries and where improvements in the health system potentially have much higher impact, both in full-income and in market-valued terms. Moreover, the weight of evidence for the productive role of the health sector in developed economies is also changing: for example, recent work suggests that each dollar spent in the health sector results in an additional US\$ 0.77 contribution to economic output as a result of indirect and induced effects (10).

We might be tempted to think that the “health system” corresponds in economic terms to what is called the “health sector”. The health system produces market-valued economic output through the employment of staff; through non-staff expenditures, such as the purchase of equipment, supplies and services; through investments in manufactured capital, such as buildings and related facilities; through the development of communications, logistics and supply networks; and through investments in human capital, such as training and education. Although some of these outputs are measured in conventional health sector accounts, not all of them are. Health sector accounts, or, in short, “health accounts”, are generally based on the measurement of expenditures, and they therefore account primarily for the value of health-related billings, including the cost of inputs. However, certain categories of market-valued economic output are ignored in health accounts:

- pharmaceuticals and medical equipment destined for export
- nutritional supplements and “healthy eating” options
- the health, fitness and “healthy lifestyle” industries
- over-the-counter medicines and home care services.

According to our definition of the health system, these latter outputs should be included under the umbrella of the broader health system; but according to conventional health sector expenditure accounts, they are excluded. From an employment perspective, the situation is analogous. Health employment, narrowly construed, might logically be limited to personnel directly involved in the delivery of medical services (including therefore many clinical laboratory staff but excluding, for example, those required for cleaning, laundry, maintenance and catering services in a health facility) (11). However, broader classifications of the health workforce include both members of non-health occupations and many informal and unpaid workers that are required by the health workforce, in its more limited sense, to perform its functions (12). The wages of some of these non-health workers will be captured in health expenditure statistics as constituting part of the cost of inputs; however, due to limitations of data, and measurement problems tied to classifications of both health expenditure and health occupations, not all of them are.

In brief, the health sector that we know from expenditure statistics is not identical to the health system; a better term here for the broader concept we have in mind would be the “health economy”. While, for the reasons mentioned, there are no global statistics corresponding to this broader definition of the health economy, we know that it is far bigger than the health sector per se (as measured by expenditure accounts). So determining how large the world’s health sector is in economic terms can serve as a starting point – and an approximate lower bound – for understanding the size of the broader health economy.

Calculated using Organisation for Economic Co-operation and Development (OECD) estimates (13) of the share of health expenditure in GDP, along with recent World Bank estimates of economic output (14), the aggregate size of the world’s health sector is substantial: at over US\$ 5.8 trillion ($\text{US\$ } 5.8 \times 10^{12}$) per year, the

combined health sectors of merely the 34 member countries of the OECD are larger, in terms of economic output, than that of any country in the world with the exceptions only of the United States and China. Moreover, the health sector of the United States alone is larger than the entire economy of France, making the United States health sector the sixth-largest “economy” in the world. The broader global health economy is therefore at least the third-largest economy in the world, and it quite possibly rivals or exceeds China’s US\$ ~10.4 trillion contribution to gross world output.

As noted, expenditure-based figures for the health sector do not include goods and services related to the nutritional, sports and fitness industries, receipts from over-the-counter medicines or expenditures on home care services, all of which are important constituents of the broader health economy. Nor do expenditure statistics include indirect and induced effects. For example, based merely on a reclassification of existing national accounts, the expanded health economy in Germany is estimated to contribute 11% of gross value added in terms of production, but to contribute an additional 8% in terms of indirect and induced effects on the value of final consumption (10). If these same estimates are applied to the health expenditure data published by the OECD, the size of the health economy in 34 OECD countries would be estimated at US\$ ~10.3 trillion. The global health economy, therefore, is quite possibly the second-largest economy in the world, after that of only the United States.

A distinguishing feature of the pathway of economic output is that, other things being equal, the health system would make the same contribution to economic output even if no health benefit whatsoever were obtained. So the economic output pathway can be identified with a “pure” market-valued benefit that is separable (at least conceptually) from the intrinsic, non-market-valued, health benefit of the health system.

In full-income terms, however, the intrinsic non-market-valued health benefit of the health system is estimated to have a much greater value than the instrumental benefits, mediated through the labour market, of better health on the economy (2, 3). Similarly, at least when relying on expenditure-based calculations of the

value of the health sector in gross world output, the direct economic benefits of the health system are also much larger, in terms of economic value, than the instrumental impact of better health on the economy of the labour market. Therefore, these two benefits – the intrinsic health benefit of the health system in terms of health and its direct impact on economic output – are plausibly two of the largest benefits of the health system that causally depend on health employment.

Moreover, the health sector is a growing part of the economy worldwide (13, 15).⁴ Growth in the health sector is believed to be driven in part by rising incomes that create increased demand for health-related services and products, as well as by the demand for new technologies that create new opportunities to improve health; population ageing, and the associated increase in age-related health problems, is another recognized source of increased demand for health-related goods and services. As a result of these factors, the health sector has generally been growing faster than overall growth in GDP in most economies, and has certainly done so in high-income countries (16).

Finally, it is worth noting that, like the health pathway, the economic output pathway comprises two sub-pathways: the services pathway, and the goods and capital assets pathway. Given the labour-intensive nature of health care, the services pathway usually receives more attention. The contribution of services to output can be measured either through the wages of health workers (through income accounting) or through the value of their billings to consumers of health services (through expenditure accounting). However, the health economy also produces a range of manufactured goods, such as pharmaceuticals and medical devices and equipment, which form part of the second sub-pathway identified under economic output. Manufactured goods contribute to the output of the broader health economy, whether they are included in the cost of health services, are billed separately, or are simply produced for export. Moreover, with the multiplication of medical technologies such as new drugs and therapies, manufactured goods make up an increasing share of expenditure in the health sector (16). Finally, the cost of

4. The importance of the health sector in the economy is the subject of a substantial literature, and institutional investment in systems of health accounts (e.g. <http://www.oecd.org/els/health-systems/health-expenditure.htm>, <http://www.who.int/health-accounts/methodology/en/>) designed to measure and track its growth have been significant (13, 15).

the facilities, infrastructure and human capital (that is, the capital assets) purchased or rented by the health sector also contributes to economic growth through the economic output pathway, whether included in conventional health accounts or not.

In summary, the economic output of the health sector is large but that of the health economy is even larger. Debates about the efficiency of health expenditure are evolving with an awareness of the magnitude of the contribution of the health system to, and the ramifications of health employment in particular for, the broader economy. Assumptions about the health system as a source of costs, rather than of benefits, are being revised, and the traditional focus on the intrinsic value of health improvements to broader social welfare (“full income”) is being supplemented by new arguments and evidence about the economic contribution of health, and of health employment, to economic growth as measured in conventional income statistics such as GDP.

2.3 Social protection pathway

The health system offers social protection benefits that are external to its defining purpose of improving health, which do not directly contribute to market-valued economic output, and which are spillover effects of health employment in particular. At base, health employment means jobs, and decent jobs (17) offer a range of social protection benefits: for example, “child and family benefits, sickness and health-care benefits, maternity benefits, disability benefits, old-age benefits, survivors’ benefits, unemployment benefits and employment guarantees, and employment injury benefits as well as any other social benefits in cash or in kind” (18). Social protection benefits more generally are intended to “provide income or consumption transfers to the poor, protect the vulnerable against livelihood risks and enhance the social status and rights of the marginalised; with the overall objective of reducing the economic and social vulnerability of poor, vulnerable and marginalised groups” (19). As a result of reducing impoverishment and economic vulnerability, social protection benefits offer opportunities for enhanced economic activity and growth.

One important social protection benefit the health system can provide is direct insurance against the financial risk of catastrophic health expenditures. Catastrophic and impoverishing spending on health is the most unambiguous

indicator of inadequate financial risk protection against the costs of health services (20). Moreover, concerns about the financial risk of health expenditures were explicitly cited in the development of major health insurance legislation, such as the Medicare programme (21) and the Affordable Care Act in the United States, and are also understood as being one of the main motivations for the creation of the National Health Service in the United Kingdom in 1948. Specifically, the public financing of health services ensures that individuals (not just those who are employed or who can purchase private insurance) do not have to bear the entire costs of their health care out of pocket.

Out-of-pocket health expenditures have been estimated to drive 150 million people into poverty worldwide every year (22). Additionally, individuals underpurchase necessary health services when they involve high out-of-pocket costs (23), entailing the risk of significant negative externalities, such as the spread of transmissible disease. Out-of-pocket health expenditures also reduce opportunities for other forms of consumption, including the purchase of food and basic amenities (24). The association of the public financing of health services and enhanced financial risk protection explains why some researchers (25) have identified minimum thresholds for the desirable proportion of public financing of, and maximum ceilings for, the allowable share of out-of-pocket expenditures on health services. In the case of certain health services, the benefits of financial risk protection have been found to outweigh the direct health benefits (26), highlighting the important social protection function of publicly financed health services.

There is a strong case to be made for public sector action in health that is redistributive (thereby reducing various forms of inequality). For example, income equality per se is increasingly recognized as an important drag on economic growth. In the words of a recent International Monetary Fund (IMF) report, “inequality ... tends to reduce the pace and durability of growth” (27). This emerging consensus, based on decades of research performed in multiple countries, effectively refutes the view popularized in the 1975 book by Arthur Okun, *Equality and efficiency: the big tradeoff* (28), to the effect that policy-makers face a stark choice between enhancing growth or promoting equality. Recent evidence, amounting to a conclusive rejection of “trickle down”

economics, has shown this to be a false dichotomy (27, 29–31). Not only is there no trade-off between efficiency and equity, but equity is in fact one of the main preconditions of efficiency and growth.

The financial risk of health expenditure, by causing impoverishment, diverting resources from other expenditure, or resulting in the underuse of essential health services, constitutes a powerful force to create persistent, intergenerational inequalities. In addition to the forms of social protection offered by formal employment in the health sector, the financial risk protection offered by a health system with the public financing of a package of essential health services constitutes an important spillover benefit that directly promotes both economic growth and its sustainability (29, 30).

2.4 Social cohesion pathway

Exceptionally, it seems, the second half of the 20th century showed a sustained trend towards more equal shares of incomes across social groups (that is, between labour and capital) in many countries (32). In recent years, however, the trend has reversed towards one of greater concentration of wealth in the hands of a few. In this light, and also in view of persistent slow growth as a consequence of problems such as secular stagnation (due to a high savings rate coupled with low investment) (33), the role of fiscal policy in promoting equality, and thereby economic growth, has become more prominent (34). In addition to the reasons noted in the preceding section, more equal societies are more economically productive in part simply because they have a higher level of political and social stability.

It is practically a truism that political stability is an important precondition for economic growth. What is less obvious is that the uprisings of the “Arab Spring” in 2011 were to a degree motivated by the desire for decent jobs and economic opportunities on the part of sections of the population that had yet to see concrete benefits emerging from post-colonial independence (35–37). In other words, the causality also works in the converse direction: persistent socioeconomic inequalities sparked massive levels of political instability that in turn caused catastrophic hardships, economic and otherwise, for substantial

populations, as well as causing significant negative knock-on effects for neighbouring and regional governments and societies. Health employment in particular offers the possibility of jobs to members of social groups that have traditionally been unemployed or underemployed, such as women and youths, as well as to populations in remote, rural or underserved communities (38–40).

In other words, fiscal policies to promote health employment are not only good for population health, for the economy, and for the social protection of vulnerable individuals, but they also offer an important guarantor of basic social cohesion.

2.5 Innovation and diversification pathway

The economic benefits of innovation and diversification constitute positive externalities that extend beyond their direct contribution to national income and to human health.

Novel genetic and biological medicines are important areas of innovation, and such technologies are capable of providing substantial health benefits (16). Often, but not exclusively, it is the private sector that responds to the demands for better health through innovation in equipment, devices and drugs. Health sector development as such can also be an important factor for economic diversification.

A number of countries, notably in the Eastern Mediterranean region and in Latin America and the Caribbean, have promoted economic diversification of their economies by encouraging the development of their health care systems. One of the benefits of promoting a strong health sector in economies dependent on extractive industries or tourism is that health sector employment tends to be countercyclical. This means that health employment often continues to grow even when other sectors are shrinking, or that it shrinks less in response to economic shocks than other sectors (41–43).

2.6 Health security pathway

The health system provides an important health security function that is external to its defining objective of improving health. Epidemic surveillance and response, in particular, depend on well functioning health systems.

As an example, the Ebola epidemic is estimated by the World Bank to have reduced output in the three hardest hit countries by US\$ 3–4 billion (out of a prior total output of approximately US\$ 50 billion) (44, 45) as a result of the disruptions in trade, commerce and movement of populations, causing the IMF to reduce its growth projections for all of sub-Saharan Africa by 10% (from 5.5% to 5%) (46, 47). Tourism and travel bookings in African countries far removed from the epidemic were also affected. Food production fell, and the United Nations Population Fund (UNFPA) estimated that food security was adversely affected for upwards of 1 million people (48). Human capital and other assets were in some cases directly affected (for example through the death of health workers), but essential refurbishments to or investments in manufactured capital were also postponed or cancelled as a result of the generalized social disruptions caused by the epidemic.

A recent report from the National Academy of Medicine of the United States commented that “framed as a health problem, building better defenses against the threat of potential pandemics often gets crowded out by more visible and immediate priorities.... Yet framed as an issue of human security, the current level of investment in countering this threat ... looks even more inadequate”. The report notes that “the annualized expected loss from potential pandemics is more than \$60 billion”, whereas the costs of preparedness amount only to around US\$ 4.5 billion per year (49). Human resources, including the associated training and salary costs, are an integral part of resilient health systems capable of responding to emerging pandemic threats (50, 51).

3. Virtuous cycles

So far we have identified six main pathways leading from the health system to economic growth. Most, though not all, of these pathways explicitly involve health employment. All of them result in economic growth. The economic growth caused by health employment in turn has a number of knock-on (or feedback) effects whose net result is to promote further economic growth (and increased health employment). We refer to these effects as “virtuous cycles”. In this section we identify briefly a number of virtuous cycles.

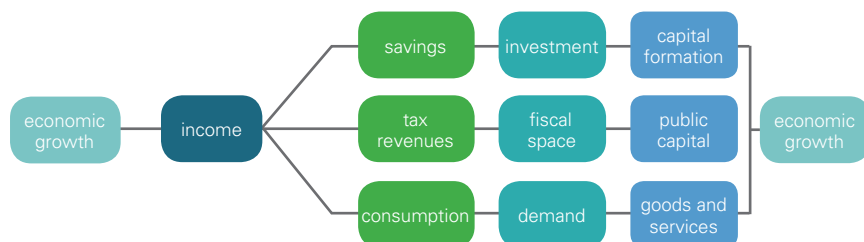
All these virtuous cycles operate through what we term the income pathway (Figure 2). We have in mind primarily household income, but analogous arguments apply to other forms of income. For clarity, we focus on household income. Increased household income has three main effects:

1. increased savings
2. increased tax revenues for government
3. increased consumption.

We identify each in turn with its main outcomes.

Figure 2

Knock-on effects: some virtuous cycles



3.1 Virtuous savings cycle

Increased health employment leads to more jobs, which implies higher levels of household income and therefore also household savings. Increased savings means more financial space for investment, which in turn increases stocks of productive capital and enhances economic growth.

3.2 Virtuous tax cycle

Increased health employment results in more jobs and higher wages, which in turn increases government tax revenues, increasing the fiscal space for necessary government action in the public sector (for example to correct market failures and provide public goods).

3.3 Virtuous consumption cycle

Increased health employment results in more jobs and higher household incomes. Higher incomes means improved opportunities for consumption, which increases aggregate demand for goods and services and enhances economic growth.

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Health and inclusive growth:

Changing the dialogue

Chris James

Abstract

This chapter demonstrates how the health care sector and better health outcomes contribute to inclusive economic growth and how this contribution can be further enhanced. The chapter is largely, though not exclusively, based on experiences from Organisation for Economic Co-operation and Development (OECD) countries.

Health systems are central to the effective functioning of a country's economy. Adults in good health are more productive; children in good health do better at school. This strengthens economic performance and makes growth more sustainable and inclusive. The health care sector is also an important source of employment. On average, health and social work activities constituted around 11% of total employment for OECD countries in 2014. Moreover, the percentage of workers employed in health and social work has steadily risen across much of the OECD over time. This is likely to continue. Health care should therefore not be viewed solely as a cost driver, but as an investment that can offer valuable returns to society. This does not mean that more spending on health is automatically worthwhile. Rather, it requires critically assessing the investment case for different types of health spending, so that employment in the health sector achieves better health outcomes and increases the overall productivity of the sector.

1. Introduction

Health systems around the world not only treat the sick and prevent future illness, they are also central to the effective functioning of a country's economy. People in good health are likely to be more productive than those who are sick or in poor health. In turn, a healthier, more productive population can help strengthen its country's economic performance, and ensure that its economic growth is more sustainable and inclusive. The health care sector is also an important source of employment, particularly for young adults and women, and is likely to provide more jobs in the future.

Health professionals play a fundamental role in delivering the health services that help achieve improvements in health outcomes and population well-being. High-quality health services that are available for the entire population help reduce health inequalities. While there is a growing demand for quality health services across the globe, many countries – particularly low- and middle-income countries – face significant labour shortages in the health sector.

The health sector is often viewed in narrow financial terms – as an expenditure that needs to be controlled – rather than from a broader economic perspective that recognizes the societal value of investing in health. The narrow financial view reflects in part the fact that, in most high-income and emerging economies, health systems are predominantly publicly funded, and in low-income countries they often have substantive donor funding. Both public and donor funding carry the expectation of a closer scrutiny of expenditure than is the case when funding comes from private sources. The narrower focus on expenditure also reflects that the principal outputs of the health sector – better health outcomes – are non-monetary, making the economic returns harder to quantify.

Nevertheless, increased health spending and a growing health workforce should not be seen as ends in themselves. This is because not all health spending provides added value in terms of better-quality and more accessible care. More employment in the health sector should be focused on achieving better health outcomes and increasing the overall productivity of the health care sector.

This chapter demonstrates how the health care sector and better health outcomes contribute to the economy and encourage inclusive growth, and suggests how

this contribution can be further enhanced. The chapter is primarily based on experiences from Organisation for Economic Co-operation and Development (OECD) countries, although examples from low- and middle-income countries are also included. It provides evidence on the importance of health to economic growth and development; discusses the contribution of the health care sector to employment and economic activity in OECD countries; and concludes with some overall policy options.

2. Importance of good health to economic growth and development

Health outcomes are closely linked with economic growth and development. Good health allows individuals to contribute to society to their maximum potential, thus making health throughout people's lives critical to human capital accumulation and labour productivity.

2.1 Health and schooling

2.1.1 Effect of ill health in early life on cognitive development

Infant malnutrition and childhood diseases have lasting impacts on cognitive development and can also lead to stunting, anaemia, and iron, iodine and zinc deficiencies (1). Malnourished children tend to score lower on tests of cognitive function and have poorer motor skills and psychomotor development than children who are well nourished. They also interact less frequently with their environments and are unsuccessful in acquiring skills at normal rates (2).

Three meta-analyses found that iodine deficiency in children is associated with a lowering of intelligence quotient (IQ) by 8 to 13.5 IQ points (3). Interventions that provide iodine to pregnant women may prevent this effect but provision of iodine to school-aged children does not seem to reverse cognitive damage (4). Further, anaemia may affect a child's success in school independently of earlier impaired brain development. More than 40% of children from developing countries who are aged under 4 years are affected by anaemia; addressing this problem is critical to improving schooling outcomes (5).

2.1.2 Effect of ill health in children and adolescents on educational outcomes

Children and adolescents with poor health are more often absent from school and more likely to drop out of school. In developing countries, various infectious diseases, such as malaria and worm infections, have particularly adverse effects on children. For instance, in Kenya, randomized evaluations of intermittent preventive treatment of malaria (6) and deworming drugs (7, 8) found improved cognitive ability and reduced absenteeism among schoolchildren.

In high-income countries, sleep disorders and mental health problems are common health conditions that impact future developmental outcomes for children and adolescents (9). For example, shortened sleep duration, especially among young infants, is associated with hyperactivity-impulsivity and poor test results in cognitive performance (10). Studies focusing on mental health problems show that anxiety and depression are significantly and negatively associated with short- and long-term educational outcomes (11, 12).

2.2 Health and work

2.2.1 People in ill health: adverse impacts on employment, productivity and earnings

Adults in ill health are more likely to be unemployed than healthier people. When unhealthy people have jobs, they are more likely to be absent from work and less productive at work than healthier people. Older adults with chronic diseases and other health conditions are at risk of quitting the workforce prematurely.

Being in ill health adversely affects one's employment prospects. For example, unemployed people in Great Britain are almost twice as likely as employed people to have a long-standing illness or disability (13). Moreover, being unemployed is likely to worsen an individual's health status, largely because unemployment worsens mental health (14). The psychosocial literature suggests this results from reduced social contact, a less defined social identity and loss of an ordered structure to daily living (15). Such insights are supported by data. For example, in Australia, Canada and the United Kingdom, evidence from time series data shows

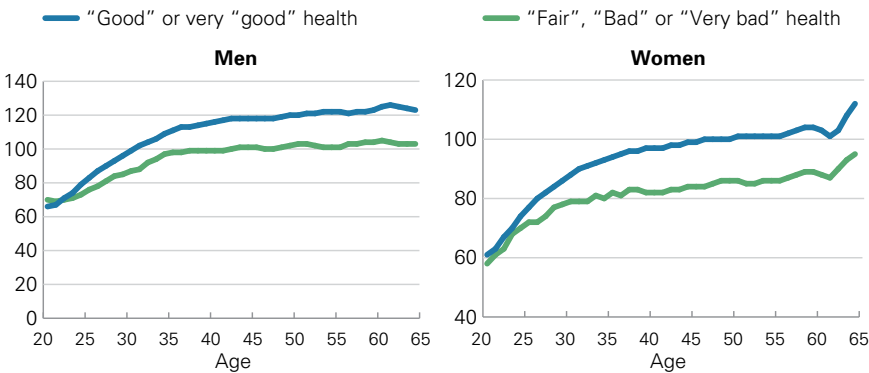
that changing from employment to unemployment significantly increases mental distress (16).

The number of employed individuals who experience absence from work due to illness can be substantial. Across 15 OECD countries, an average of 11 days per employed person were lost from work in 2013. Absentee rates were particularly high in Germany (18 days per person) and Norway (16 days per person), equivalent to approximately 7.2 million working days lost in Germany and 0.42 million working days lost in Norway in 2013.¹ In addition, many workers are less productive on the job than they could be because of poor health – a phenomenon that is commonly referred to as presenteeism. Presenteeism at work was estimated to have cost the United States of America’s economy US\$ 150 billion a year in the early 2000s (17).

Individuals with poor health status have lower wages than healthier workers at all ages, with the wage gap widening as age increases. For example, in 24 OECD countries there was a noticeable wages rise less steeply with age for workers with health problems as compared with their healthy peers, leading to a growing gap in hourly earnings over the life course (Figure 1) (18).

Figure 1

Normalized hourly earning by age and health status in 24 European OECD countries



Source: Boulhol and Scarpetta (18).

1. OECD health statistics: <http://www.oecd.org/els/health-systems/health-data.htm>.

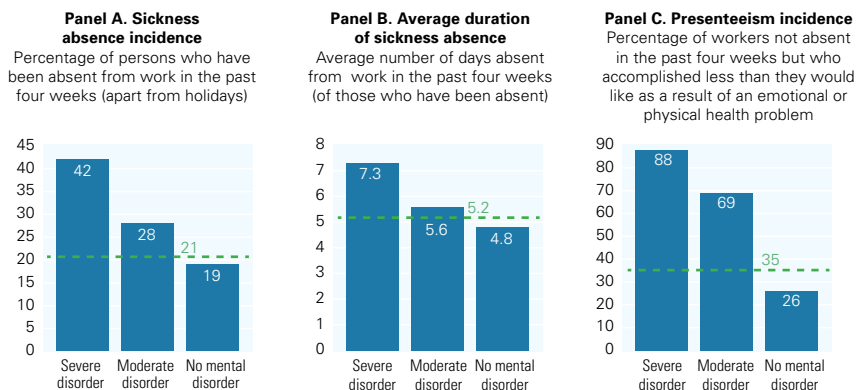
2.2.2 Mental ill health, chronic diseases and poor lifestyles: key drivers of labour productivity losses

Mental ill health is an important cause of absenteeism and presenteeism in OECD countries. This is because people experience the effects of mental illness during their working lives, as opposed to the burden of most other noncommunicable diseases, which commonly affect older individuals who are no longer working. There is also the indirect effect of increased presenteeism, absenteeism and unemployment on the carers of individuals with mental disorders (19).

Data suggest that in over 21 European OECD countries the sickness absence incidence is roughly double for workers with severe mental health problems and 50% higher for those with moderate problems, compared to those with no mental health problems. Sickness absence duration is also longer for those with mental health problems. Many people with mental health problems who do not take sick leave accomplish less than they would like at work due to their health problems (Figure 2).

Figure 2

Incidence of absenteeism and presenteeism (%) and average absence duration (days) by mental health status, average over 21 European OECD countries in 2010



Source: OECD (19). OECD compilation based on Eurobarometer 2010.

The poor labour productivity outcomes for people with mental health problems are a matter of concern, as mental illness is highly prevalent: at any moment in time, one in five people in OECD countries suffers from a mental disorder that is often chronic or recurring. This has a massive impact on labour productivity on an aggregate level. Moreover, the incidence of presenteeism has been shown to have increased in the recent past, which could be a contributing factor to productivity slowdown (19).

Chronic diseases and poor lifestyles can also lower productivity and harm employment prospects and wages. For example, in France the cost of overall productivity losses related to alcohol use and smoking has been estimated at 9 billion and 8.6 billion euros respectively (20). In Germany, sickness absence and forced early retirement due to smoking cost an estimated €4.9 billion and €3.5 billion respectively (21). In the United Kingdom, nearly 11 million working days were lost by alcohol-dependent workers in 2001, and the total cost of absenteeism due to alcohol was estimated to be £1.2 billion (13). In the European Union, alcohol accounted for an estimated €59 billion worth of lost production through absenteeism, unemployment and lost working years through premature death in 2003 (22).

Obesity and diabetes also affect labour market outcomes. For instance, diabetes was significantly associated with a 30% increase in the rate of workforce exit across 16 countries studied (23). The total cost for sick leave and disability pension related to obesity in Swedish women was estimated at 10.5 billion Swedish kronor (US\$ 1.2 billion) per year (24).

In developing countries, infectious diseases have had a major impact on labour markets, in addition to the impacts of mental ill health, chronic diseases and poor lifestyles, with that of the HIV/AIDS epidemic being substantial (Box 1).

Box 1

Labour force impact of HIV/AIDS in low- and middle-income countries

The HIV/AIDS epidemic has a large impact on labour markets in many low- and middle-income countries, particularly in sub-Saharan Africa.

HIV/AIDS limits African countries' productive capacity by damaging human capital development and decreasing the possibility for people to find jobs.

Studies from South Africa found that being HIV positive increases the likelihood of unemployment by 6–7%, with the poor and less educated more likely to be HIV positive (25).

2.2.3 Effective health policies: labour productivity and cost benefits

Preventing and tackling chronic diseases and mental ill health more effectively have pay-offs in labour force participation and labour productivity. For example, prevention policies to tackle harmful use of alcohol help to reduce the occurrence of alcohol-related diseases in the working-age population. In Germany, policies ranging from the implementation of targeted brief interventions aimed at changing behaviour of drinkers to tax increases on alcoholic beverages are projected to prevent thousands of people in the working-age population from incurring alcohol-related diseases, based on OECD modelling (26).

In Europe, potential productivity gains generated with obesity prevention strategies are estimated to be between US\$ 224 million and US\$ 2760 million (purchasing power parity) (27). In most cases, the value of potential productivity gains in addition to the reductions in health expenditures were estimated to be large enough to make policy interventions cost-effective.

The biggest challenge for health systems in addressing mental health problems is the very large treatment gap resulting from considerable unawareness of such problems and the social and self-imposed stigma experienced by people living with mental health conditions. Many of those people receive no or only insufficient treatment, and

treatment compliance is often low. This situation calls for efforts to scale up evidence-based treatments and to invest in psychological therapies and e-mental health to help address the treatment gap for mild-to-moderate mental disorders. The primary care sector can play an important role in delivering better mental health care. Training for primary care practitioners, promoting collaboration between primary care and specialist services, implementing appropriate clinical guidelines and using financial incentives to promote care provision are all key policies to be explored.

2.3 Economic benefits of good health beyond the individual

Good health has benefits that extend beyond the individual, particularly in developing country contexts. Better population health can encourage greater domestic savings and foreign investment, and improve social stability. In countries with high fertility rates, a reduced likelihood of premature maternal mortality (deriving from fewer pregnancies) can positively influence household decisions on family planning. This contributes to a faster demographic transition and its associated economic benefits.

In all countries, poor health affects the ability and motivation to save money. However, the impact is larger in low- and middle-income countries that are still transitioning to universal health coverage. In such countries, incomplete prepayment systems mean households will often have to pay out of pocket for needed health services. This can lead to severe financial hardship and impoverishment (28).

Better population health can also raise per capita income by changing individuals' decisions about expenditure, saving and investment. With increased longevity and the associated greater prospect of retirement, new generations have more incentive to save. At the same time, companies tend to invest in economies where the workforce is healthy and move away from environments with high burdens of disease (2).

The prospect of better health outcomes will also impact family planning and consequently fertility rates. This can create a “demographic dividend” in terms of a lower dependency ratio. That is, as fertility begins to slow, the number of children

shrinks and the proportion of workers increases. This creates a favourable situation of more workers supporting fewer dependents, which is positive for economic growth. Many Asian and Latin American countries have already achieved this shift, and there are indications that some African countries (for example, Ethiopia and Rwanda) are beginning to follow. However, a demographic dividend does not automatically follow from lower fertility rates; investment is also required, in areas such as girls' education and good governance (29).

In summary, better individual and population health can have substantial impacts on economic growth and development. For instance, Bloom, Canning and Sevilla found that one extra year of life expectancy raised steady-state GDP per capita by about 4%, based on a cross-country econometric analysis using data from 1960 to 1990 (30).

3. Health care sector employment and economic activity

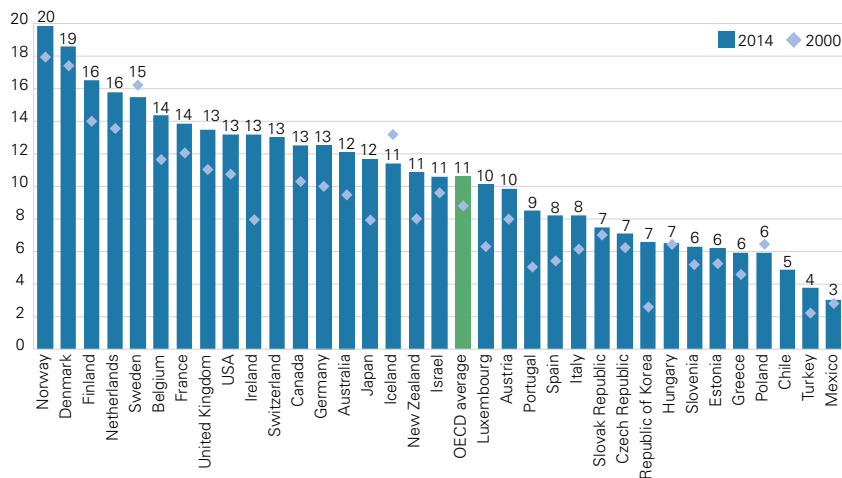
3.1 Health and social care: a large and rapidly growing source of employment

People employed in health care and social work represent a large and growing share of the labour force in many OECD countries. On average, health care and social work activities constituted around 11% of total employment for OECD countries in 2014 (Figure 3). The employment share is particularly pronounced in Denmark, Finland, the Netherlands, Norway and Sweden, where people with jobs in health and social work represent 15–20% of the workforce.

The percentage of workers employed in health and social work has steadily risen in 31 of 34 OECD countries over time. For the OECD overall, there was an average increase of 1.8 percentage points from 2000 to 2014. Some of the greatest increases have taken place in Ireland (5.3 percentage points), Chile (4.9 percentage points), Republic of Korea (4.0 percentage points), Luxembourg (3.8 percentage points), Japan (3.7 percentage points) and Portugal (3.5 percentage points). Three countries have experienced a decrease in share of employment in health and social work: Iceland (-1.7 percentage points), Sweden (-0.8 percentage points) and Poland (-0.6 percentage points).

Figure 3

Employment in health and social work as a share of total employment, OECD countries, 2000 and 2014 (or latest year available)



Note: 2014 data follow ISIC Rev.4, except for Australia, Canada, Chile and Ireland (ISIC Rev.3); 2000 data follow ISIC Rev.3, except for Republic of Korea (ISIC rev.4). Annual Labour Force Statistics data are given for all countries except France, Switzerland and the United States (System of National Accounts data). Data for Sweden and Republic of Korea start respectively in 2003 and 2004 (rather than 2000) due to a break in the series. 2012 data are given for Australia instead of 2014. Information on data for Israel: <http://oe.cd/israel-disclaimer>.

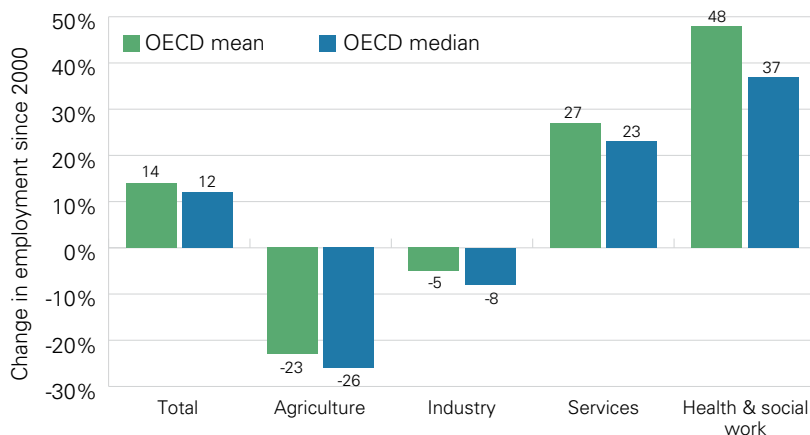
Sources: OECD.Stat, Annual Labour Force Statistics (ALFS), employment by activities and status; and National Accounts, detailed tables and simplified accounts, Table 7A: Labour input by activity, ISIC Rev.4.

The rapid growth of employment in health and social care contrasts markedly with the situation in other sectors (Figure 4). Across the OECD, employment in health and social work grew on average by 48% (with a median value of 37%) during the period 2000–2014. Over the same period, there was a decline in the number of jobs in agriculture and industry in most OECD countries. Employment growth in health and social work was also noticeably higher than employment growth in the service sector and in total employment.

Looking forward, employment opportunities in health and social work are likely to increase as a result of several factors. Ageing populations will change the pattern of demand for health and social services. This could include greater demand for

Figure 4

Employment growth by sector, 2000–2014 (or latest year), OECD average



Note: Average of 30 OECD countries for which data are available in both time periods (excludes Chile, France, Japan and the United States). Health and social work is classified as a subcomponent of the service sector.

Source: OECD employment database, <http://www.oecd.org/els/emp/onlineoecdemploymentdatabase.htm>.

long-term care services, which are particularly labour intensive (31). Over time, rising incomes and new technologies will increase consumers' expectations related to the quality and scope of care (32), with consequent impacts on staffing requirements in the health sector.

It is not only the number of jobs provided by the health care sector that matters for the economy, but also the range and scope of opportunities that these jobs offer. The health care sector offers employment across all localities in a country, rather than primarily in capital cities or commercial centres. Indeed, the health sector can be an important employer in rural and remote locations, where other jobs are scarcer. In addition, the health care sector offers employment for people with a wide variety of skill sets, including low-skilled workers such as care assistants (where much of the training is on the job), as well as those educated in specialized

health-related disciplines. The health sector also provides jobs with non-sector-specific requirements, from information technology and finance positions to drivers and porters (33).

3.2 Productivity gains through innovative workforce policies

Despite ongoing technological advances, health and social care remain labour intensive. This characteristic implies that productivity growth may lag. That is, output gains in health and social care are constrained because labour cannot easily be replaced by capital inputs (a phenomenon commonly referred to as Baumol's cost disease). While the nature of outputs in health care makes productivity hard to measure, some studies have suggested that wage increases over time have been in excess of productivity growth (34, 35). Although evidence on Baumol's cost disease model remains inconclusive, studies nevertheless point to the need to carefully evaluate whether increased health spending is contributing sufficiently to better health outcomes. Studies also suggest the importance of innovative health workforce policies.

3.2.1 Expanding the scope of practice for non-physicians to boost productivity

To boost the productivity of health care, some countries are re-examining the traditional functions of health professionals. For example, between 2007 and 2012 about half of OECD member countries expanded the scope of practice for non-physician providers, such as nurse practitioners and pharmacists. In Canada, the Netherlands and the United States, student intakes in advanced education programmes for nurse practitioners are increasing the supply of these mid-level providers (36). Policies supporting the use of mid-level providers can be part of broader efforts to enhance primary health care in countries. The introduction or expansion of such non-physician roles is often met with initial opposition from medical professionals, which needs to be overcome; integration of mid-level providers into health care delivery may depend in part on the future supply of physicians. It also requires an enabling funding environment, as well as legislative and regulatory support.

Changes to the staff mix within health systems can maintain or increase access to services in a cost-efficient way, thereby increasing health workforce productivity. Indeed, evaluations show that advanced practice nurses with proper training can improve access to primary care services and manage and deliver the same quality of care as general practitioners (GPs) for many types of patients, particularly those with chronic conditions requiring routine follow-up (37). Effective use of advanced practice nurses can also allow doctors to focus on patients requiring more complex medical diagnoses or treatments. For example, projections for the Netherlands estimate that a reallocation of tasks from GPs to nurse practitioners will reduce the demand for GPs by 0.6–1.2% per year (38). Similarly, in Switzerland, promoting greater task substitution between GPs and nurse practitioners is forecast to reduce the growth rate of GP consultations over time, from 13% in a scenario with no substitution to 2% with task substitution (39).

3.2.2 New care models for improved productivity

Digital technology has made the collection, processing and transfer of information efficient and powerful, transforming a range of industries in the public and private sector to improve services. Application of digital technology in the knowledge- and information-intensive endeavour of health care holds great potential. For example, an integrated and interoperable electronic health record allows real-time access to the same clinical information by a team of practitioners involved in a patient's management. Web-enabled portable devices can improve patient self-management and facilitate more accurate diagnosis and monitoring, triggering timely intervention as clinically appropriate. Reliable high-speed Internet and modern telecommunications hardware (for example, the smartphone) have made remote consultations more feasible. Powerful computer processing, analytical techniques and machine-learning algorithms can analyse masses of big data to generate information, enabling better diagnoses while improving the timeliness and accuracy of clinical decision-making (40).

Applied sensibly and with due regard for privacy and security of personal information, digital technology can reduce duplication and errors, improve

coordination between different parts of the health system and better align services with patient needs (41). This can free up time for providers (and patients), thereby boosting productivity.

3.2.3 Innovative provider payments to incentivize more efficient service provision

Provider payment reform (at both the individual and health facility level) can be an important policy lever to drive health system performance. All modes of payment contain financial incentives that affect provider behaviour, and some modes of payment can stimulate the efficient use of inputs. Within OECD countries, payment reforms are being introduced to improve coordination, quality and efficiency of the health care system. Reforms include population-based payments that bundle a wide range of services involving several providers, as well as pay-for-performance add-on payments affecting individual providers. For example, England recently introduced a bundled payment for cataract surgery based on best-practice tariffs that incentivize a shift from performing the surgery in inpatient settings to using outpatient or day surgery facilities. Similarly, the Netherlands introduced bundled payments for diabetes care. Such reforms reward care coordination and better integration of different health services, and consequently have the potential to generate quality or efficiency gains (42). Financial incentives can also be used to redress geographical imbalances in availability of health workers. For example, basic income guarantees are used in Denmark and France, and in the Canadian province of British Columbia physicians working in isolated areas receive annual bonuses (36).

4. Conclusions: reassessing the contribution of health care

Effective health systems can make a substantive contribution to economic performance, enabling sustainable and inclusive economic growth. Good health allows countries' populations to realize their full potential, which directly affects the labour market. Adults in ill health are more likely to be unemployed than healthier adults, and when they have jobs they are more likely to be absent from work and

less productive at work than their healthier counterparts. Good health begins in early life with adequate infant and child nutrition, which is essential to cognitive development and subsequent educational outcomes. The health care sector is central to maintaining and improving health outcomes; it also provides a steadily increasing source of employment in most OECD countries, offering jobs that are highly valued by citizens.

Therefore, health care should not be viewed solely as a cost driver; it is also an investment that offers valuable returns to society. Reassessing health care in terms of its broader economic impacts is a more useful perspective than focusing only on its cost. However, more spending on health is not automatically worthwhile. Critical assessment of the investment case for different types of health spending is required, so that spending can be clearly focused on services that provide the best value in terms of improved health outcomes.

The opinions expressed and arguments employed herein are solely those of the author and do not necessarily reflect the official views of the OECD or of its member countries.

Acknowledgements

Contributions from Liliane Moreira, Francesca Colombo, James Buchan and Luke Slawomirski are gratefully acknowledged.

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Paying for needed health workers for the SDGs:

An analysis of fiscal and financial space

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Abstract

In spite of the projected creation of millions of new health worker jobs in the coming years, achieving the Sustainable Development Goals by 2030 implies a still greater need for health workers of all types. This chapter addresses two questions: Can governments worldwide meet the wage bills of their needed health workers from public revenues (“Is there enough fiscal space”)? and, Can low-income and lower middle-income countries meet the additional wage bills from both public and private financing sources (“Is there enough financial space”)? To investigate these questions, we used estimates of the number of current and projected health workers (“supply”) and of the number of needed health workers (“needs”), and we multiplied these figures by the wages of health workers as estimated from International Labour Organization data on earnings. The resulting wage bills were then compared with different public revenue and health expenditure scenarios. Conditional on current trends in economic development and population growth, sustainable financing for health workers, mostly domestic, can be secured in most low-income and lower middle-income countries. Progressive fiscal policies and the reprioritization of government expenditure can also mobilize additional private financing. With the necessary conditions in place, all but a small number of countries worldwide should be able to meet the recurrent cost of their health workforce. Finally, targeted international assistance can be used to support catalytic investments in developing human capital and skills.

1. Introduction

Efforts to achieve the Millennium Development Goals (2000-2015) revealed substantial shortages¹ in the numbers of needed health workers, estimated to be in the order of 14 million jobs at 2013, with such needs concentrated particularly in low-income and lower middle-income countries. In spite of the projected creation of millions of new health worker jobs in the coming years, in the absence of bold new measures, an even larger shortage of needed health workers – estimated at 18 million missing jobs, again concentrated mainly in low-income and lower middle-income countries – is to be expected by 2030. Yet without these additional health workers it will be impossible to attain the health-related Sustainable Development Goals (SDGs) by 2030 (1).

1.1 The research questions

The objective of this chapter is to assess to what extent governments and other actors can meet – in a sustainable manner and under plausible scenarios – the financing needs implied by the growth in the health workforce required to meet the SDGs. To do so, we examine two related questions:

- Can increased public financing be relied upon to finance health worker wage bills? In other words, is there sufficient *fiscal space* to finance the projected total wage bills for health workers by 2030?
- Can increased public and private financing be relied upon to finance the health worker wage gap? In other words, is there sufficient *financial space* to meet the additional projected wage bills for health workers by 2030?

¹ A “shortage” is a condition of excess demand (that is, when supply is too low). A “deficiency”, on the other hand, is a gap between needs and supply, and suggests demand is too low. Globally, there are both deficiencies and shortages in the numbers of needed health workers, according to setting. In this brief - given the concentration of the need for additional health workers in low-income and lower middle-income countries (which are subject to the substantial emigration of health workers) - we prefer the term “shortage”, while acknowledging that the technical denotation may not in every case strictly apply.

1.2 Fiscal and financial space: definitions and domains

We refer to the term “fiscal space” as first proposed by Heller (2, 3): fiscal space can be defined as “room in a government’s budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy”. Researchers (2-5) have identified a variety of mechanisms that influence fiscal space for health. In the typology adopted here, the mechanisms can be arranged into seven “domains”:

- a. taxation, including raising government revenues or improving tax collection and administration;
- b. fiscal impacts of economic and population growth;
- c. earmarking funds through indirect taxes or social insurance contributions;
- d. borrowing from domestic or external lenders;
- e. monetary expansion;
- f. efficiency gains, through improving allocative efficiency by reprioritizing existing expenditure or through improving technical efficiency;
- g. securing external grants.

The domains are not mutually exclusive – for example, earmarked taxes (c) are a form of taxation (a). Moreover, many of the domains are interacting – for example, monetary (e) and tax (a) policies are determinants of economic development (b). However, with the exception of the fiscal impacts of economic development and population growth (b), the items in the above list are directly associated with public policy levers, that is, they result from actions that a government can in principle undertake. The fiscal impacts of economic development and population growth (b), on the other hand, are sometimes referred to as “conducive macroeconomic conditions” (4), presumably to indicate their (partial) exogeneity from the sphere of government action, at least in the health sector. Note also that all the policy-relevant domains, with the exception of monetary policies (e) and efficiency (f),

are examples of *financing*, in the sense of “raising funds for a specific purpose”. For its part, the domain of efficiency concerns *expenditure* planning and management, while monetary expansion typically involves (though is not limited to) *central bank operations*. Thus, in an alternative classification, the determinants of fiscal space consist of financing, expenditure, or monetary policies (or a combination thereof).

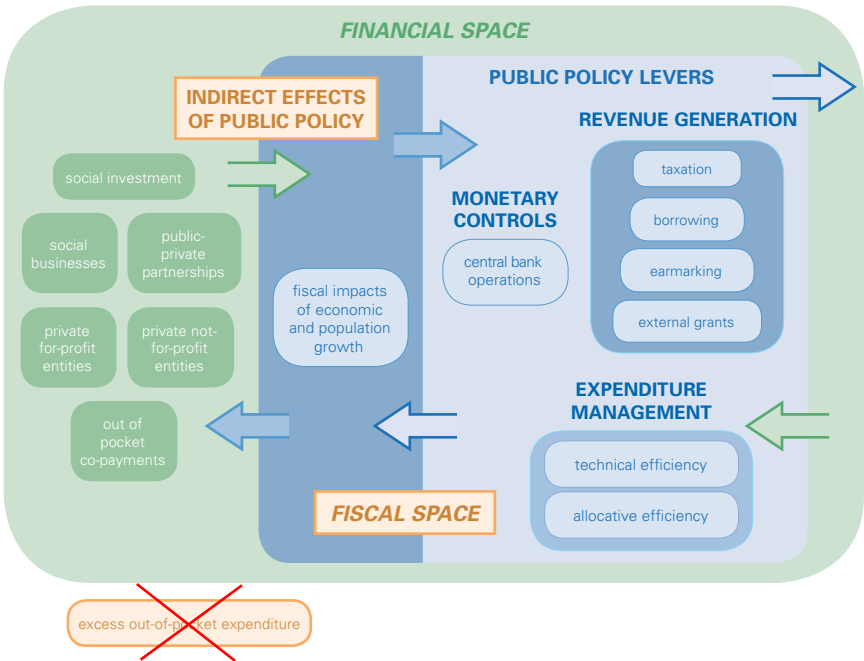
While Heller’s conception (2, 3) focused on four classical policy levers of public financial management, Tandon and Cashin (4) broadened the scope to include the fiscal impacts of “conducive macroeconomic conditions”; they also added “earmarking” as a means of generating fiscal space specifically for health. Barroy, Sparkes and Dale (5), however, focus on expenditure management and in particular identify means for improving technical efficiency to create fiscal space. The concept of “fiscal space” has both broadened and deepened since Heller’s initial use of the term.

To investigate the availability of fiscal space for health workforce expansion, we look at scenarios for taxation (a), economic development and population growth (b) and allocative efficiency (f). However, since economic development and population growth (b) and effective public policies on tax (a) and spending (f) can in addition catalyse investments by the private sector, and since external investments such as (d) and (g) – which can include both private and philanthropic financing – can be instrumental in supporting public policy, we further extend the concept of fiscal space to include the availability of financing from private sources, both domestic and external. We refer to this broader concept as “financial space”. Figure 1 presents a (partial) depiction of the domains and interactions of fiscal and financial space. To show coherence with the categories employed in its historical development, our diagram expands outwards from the original policy-oriented conception of fiscal space to include first the fiscal impacts of the broader economic context, and then the interactions of these domains with non-public actors.

Financial space has nearly the same determinants (and restrictions) as fiscal space, except it is not limited to the public sphere. One might object that monetary policy (e) is the exclusive domain of government action; however, private entities such as banks and investors nevertheless play a role in monetary expansion, not of course through the government prerogative of seigniorage but rather as a result of their

Figure 1

Fiscal and financial space, domains and interactions



willingness to lend and to invest. On the other hand, since (lawful) private actors do not raise funds through taxation (a), not only the specific lever of seigniorage – which is a part of (e) – but also any form of “private taxation” – that is, the whole of (a) – should be understood to be explicitly excluded from the scope of action of private actors.

“Financial space” then refers to a situation in which governments and private actors have the flexibility to direct resources to a specific purpose without jeopardizing their financial position or long-term financial prospects; financial space can be said to include fiscal space as a subset. A particular advantage of the broader concept of financial space is that it brings into scope actions that increase the capacity of both public and private actors to spend — and to manage effectively their expenditure of — financial resources. Effective expenditure management for private actors is not limited (as for government actors) mainly to concerns about technical and

allocative efficiency but also includes the constraint of the “absorptive capacity of the economy”. The ability of the economy to absorb new financing without facing harmful bottlenecks is affected by a range of factors mainly falling within the scope of action of private actors (but, to a certain extent, also within the scope of public actors), including the availability of human resources (human capital), the availability of natural and manufactured capital, the availability of physical and social infrastructure, and the availability of administrative capacity, as well as by institutional factors such as the nature and enforceability of contracts and prevailing norms and standards.

1.3 The research questions revisited

We analyse the implications of the wage bills of additional needed health workers from both a fiscal space (public sector) perspective and a financial space (public and private sector) perspective. The period analysed is 2016–2030, corresponding to the time horizon of the SDGs; however, to harmonize with the estimates of projected health worker supply and health worker needs taken from Cometto et al. (1), the base year (that is, the starting point) used for projections (except as noted below) is 2013.

“Additional needed health workers” are defined as “the projected needed health workers minus the projected supply of health workers” (1). The wage bills corresponding to additional needed health workers are termed “the financing gap”.

The fiscal space scenarios examined here rely on assumptions about taxation (a), economic development and population growth (b) and the reprioritization of expenditure (f). The scenarios are described in more detail below (section 3). Given the focus of these scenarios on public budgets, they can be said to represent a traditional, public sector-driven, view of development. As such, fiscal space scenarios represent an upper bound on the scale of demands that could be made on public budgets; that is, even if additional, socially beneficial private financing should become available, the stewardship function of public governance nevertheless makes it interesting to examine the potential implications for specifically public budgets.

On the other hand, the financial space scenarios, which in principle rely on both public and private financing, should be understood in the context of a presumed broad-based health financing reform, one made possible in an environment where continued economic growth, combined with effective public tax and expenditure policies, can catalyse socially beneficial private co-investments (for example, through social businesses, social investments and public-private partnerships), co-investments that in turn can support the objectives of public policy while also extending the scope of the resource base that can be mobilized.

Therefore, in light of the discussion in the previous section – and specifically because the different domains are interacting and not mutually exclusive – the financial space scenarios should be interpreted as relying not only on explicit assumptions about economic and population growth but also on a set of implicit assumptions about the effects of effective public tax and expenditure policies on the other domains of both financial and fiscal space (see Figure 1).

Finally, whenever referring to the potential role of increased private financing in health expenditure, we need to stress an important caveat about out-of-pocket expenditures (which are included in most estimates of private health expenditure). While, for technical reasons, we do not explicitly exclude (excess) out-of-pocket financing in our financial space calculations, increasing reliance on out-of-pocket expenditure is nevertheless to be strongly deprecated since, once it exceeds a certain threshold, out-of-pocket expenditure is associated with negative outcomes for both poverty and health. In other words, the out-of-pocket financing of health expenditure (at least above a certain threshold) cannot be considered to contribute to financial space (see Figure 1) because excess out-of-pocket expenditure is strictly incompatible with the restriction noted above that it must not jeopardize the financial position of economic actors or threaten the stability and growth prospects of the economy as a whole. Therefore, the impact of “effective public policies and broad-based health financing reform” should be further understood to involve strict controls on the reliance on out-of-pocket financing.

2. Data sources

The following estimates were relied on for the analysis presented in this chapter:

- i. estimates of the needs for and the supply of health workers projected to 2030;
- ii. estimates of health worker wages projected to 2030;
- iii. estimates of gross domestic product (GDP) growth projected to 2030;
- iv. estimates of population growth projected to 2030.

Estimates of (i) were obtained from the analysis performed by Cometto et al. (1); estimates of (ii) were derived from wage indexes estimated from country-specific earnings data for health workers and other relevant occupational groups published by the International Labour Organization (ILO) (as described in more detail below); estimates of (iii) are taken from work done at the World Health Organization (WHO) based on figures published by the International Monetary Fund (IMF) in the World Economic Outlook database (and are described in more detail below); finally, estimates of (iv) come from the United Nations Population Division (medium variant). All these estimates are subject to uncertainty; however, as this policy chapter presents a fiscal and financial analysis in which we take externally determined² data as given, we focus our discussion of uncertainty exclusively on (ii), by investigating a plausible range of health worker wages.

2.1 Estimates of health worker wages

Estimates of health worker wages were derived from an econometric model based on available earnings³ data, as described more fully in Bertram et al. (6). Earnings data were retrieved from the ILOSTAT database of reported earnings estimates (7) for a variety of job titles, then classified into occupational levels according to the four ISCO-08 major groups. Data for medical professions were selected wherever available and relevant: for level 4, data extraction focused on earnings for general

2 "Externally determined data" are data obtained from sources external to this analysis, and whose assumptions, strengths, and weaknesses are discussed in the original publications.

3 Here we use "earnings", "wages", and "salaries" as (more or less) interchangeable terms expressing the value of the (gross) remuneration (in cash and in kind) received by employees for their work (but excluding social security and pension benefits). The "cost of employment" to employers will generally be higher than their employees' earnings.

physicians, dentists and professional nurses; for level 3, data extraction focused on earnings for medical X-ray technicians, physiotherapists and auxiliary nurses; for level 2, data extraction focused on clerks and secretaries; and for level 1, data extraction focused on physical labourers. Data from the most recent available year were used. In total, 324 observations from 193 countries were available for analysis.

The health worker wage estimation model employed a Heckman two-stage procedure to model missing country-specific earnings data: that is, a probit model was used to model the probability of observing earnings data, and an ordinary least squares model was used for wage estimation. In the former case, mortality statistics were used to predict the probability of observing earnings, since higher levels of mortality are plausibly associated with lower levels of development, specifically within the health system, and would thus lead to poor data collection.

In this analysis, we assume that the predicted mean of category 4 (equivalent to the second stage of tertiary education) provides an estimate of the average wages of doctors. For the wage estimates for nurses and midwives, we use an average of the predicted means of category 4 and category 3 (the latter being equivalent to the first stage of tertiary education). Although professional nurses are classified by ILO at level 4, auxiliary nurses are classified at level 3, which still demands some tertiary-level training. For “other health workers”, we use an average of the predicted means of categories 3, 2 and 1. While other classification strategies for health worker wages are possible and would potentially be reasonable, we adopted the described strategy as being in our view both plausibly consistent with the actual situation in most low-income and lower middle-income countries and in addition the one most consistent with the available data and therefore requiring the fewest number of auxiliary assumptions.

The resulting monthly earnings estimates for the three cadres of health workers were converted to annual earnings figures and then expressed in terms of GDP per capita indexes (that is, as multiples of GDP per capita). Expression of annual earnings in

terms of units of GDP per capita has the desirable feature that, for projection purposes, per capita wage indexes can be assumed to remain constant, while estimates of GDP per capita change according both to projections of economic growth and to United Nations Population Division projections of population growth (medium variant). Wage indexes therefore also represent a hypothesis about labour market conditions; while wage indexes undoubtedly can change with changing economic conditions, the assumption of constant projected wage indexes (that is, constant relative wages) is a standard form of ceteris paribus restriction. Table 1 gives the estimates of cadre-specific health worker wage indexes (as a multiple of GDP per capita) stratified according to World Bank income groups. Global figures are shown for comparison purposes.

Table 1

Wage indexes for health workers by cadre

World Bank income categories	Health worker cadre	Average wage index (multiple of GDP per capita)
High-income countries	Physicians	1.9
	Nurses and midwives	1.5
	Other health workers	0.9
Upper middle-income countries	Physicians	2.7
	Nurses and midwives	2.2
	Other health workers	1.3
Lower middle-income countries	Physicians	5.1
	Nurses and midwives	4.2
	Other health workers	2.4
Lower-income countries	Physicians	7.8
	Nurses and midwives	6.4
	Other health workers	3.7
Global	Physicians	4.4
	Nurses and midwives	3.6
	Other health workers	2.1

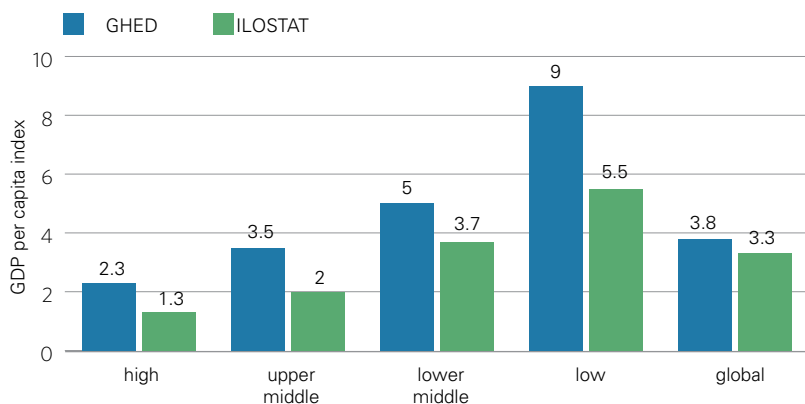
We further calculated a weighted average health worker wage index (for all cadres) for each World Bank income group using the corresponding cadre-specific estimates of the supply of health workers obtained from Cometto et al. (1) as weights. Although there are no alternative sources of data on health worker wages that we are aware of, we were able to cross-check our econometrically derived wage indexes using independently obtained estimates of total health worker wage bills. Again, using the cadre-specific estimates of the supply of health workers obtained from Cometto et al. (1) as weights, average health worker wage indexes (for all cadres) were independently derived, this time from estimates of aggregate country-specific wage bills available in the Global Health Expenditure Database (GHED).⁴ The side-by-side comparison of our econometrically derived estimates with the “top-down” estimates obtained from the GHED is shown in Figure 2.

Estimated wage indexes, by cadre (Table 1) or averaged across all cadres (Figure 2), show an inverse gradient with income, in the sense that higher-income regions show lower estimated health worker wage indexes. In other words, the wages of health workers are higher as a multiple of GDP per capita in low-income and lower middle-income countries than in upper middle-income and high-income countries. This said, wages in absolute terms are clearly higher in the higher income groups, since GDP per capita is higher in those groups. Figure 2 further shows, however, that when aggregate figures on health expenditure from the GHED are used for top-down analysis of health worker wages based on available aggregate wage bill data, the aggregate data imply systematically higher wage indexes than our econometric analysis of wage levels using data published in ILOSTAT.

4 Wage bill data are not reported in the publicly available GHED and were estimated internally at WHO.

Figure 2

Comparison of average health worker wage indexes estimated from ILOSTAT and from the GHED, displayed by World Bank income group



Both the data published by the ILO and those obtained from the GHED are subject to measurement error, and they also both have numerous missing observations. Yet these two sources of estimates of health worker earnings agree in important respects, and in our view they therefore can be used to establish a “plausibility range” for GDP per capita wage indexes for health workers. In our subsequent calculations we employ such “plausible ranges”, relying on our (subjective) interpretation of the strength of the evidence contained in both data sources (ILOSTAT and GHED). As health worker wages are a key parameter affecting the analysis, we return to this point when discussing our results for fiscal and financial space.

2.2 Estimates of economic growth

We used GDP growth projections for 2022 to 2030 prepared at WHO using the IMF’s published GDP projections⁵ to 2021 and each country’s historical data (8). As

⁵ April 2016.

described in that report, a non-parametric bootstrapping method was adopted to obtain expected average GDP growth rates, with lower and upper bounds, for the years 2022 to 2030. A bootstrapping approach was adopted because of its simplicity and the minimal reliance on additional assumptions about the data. Greater weight was placed on more recent years (2011–2021) in resampling, a procedure that gives more prominence to current growth patterns as predictors of future growth out to 2030. A comparison of GDP growth rates obtained using our bootstrapping method with independently estimated GDP growth rates available from other sources showed our estimates to be consistent and robust, especially when interpreted in terms of ranges (that is, estimates from other sources were consistently within our upper and lower bounds) (8). However, in cases where country-specific GDP forecasts to 2030 were available from an official domestic institution, such as the national central bank, these were used in place of the internally produced projections just described.

3. Fiscal space analysis

Fiscal space refers to the availability of specifically public funds (see section 1.2). Here we report on a fiscal space analysis for 183 countries with data available in the GHED. To estimate the scope of what public finance alone might achieve in the expansion of the health workforce, we examined a simple fiscal scenario relying on assumptions about what could potentially be realized in the domains of taxation (a), economic and population growth (b) and the reprioritization of expenditure (f).

More specifically, we make assumptions about the extent to which governments can successfully increase their tax revenues over the period 2016–2030 (“fiscal growth”) and the extent to which health can receive a greater priority within the envelope of government expenditure (“priority increase”). These assumptions are then combined with the estimates of health worker needs and supply, health worker wages, and economic and population growth described above (see section 2).

The fiscal scenario was calibrated to start in 2014 (not in 2013, as for other projections). Results are presented with respect to only the final year of the SDG period, 2030.

3.1 Fiscal space scenario

3.1.1 Baseline

For each country, we assume:

- that general government health expenditure as a proportion of total government expenditure is equal in 2014 to its average value in the GHED during the period 2010-2013;
- that total government expenditure as a proportion of GDP is equal in 2014 to its average value in the GHED during the period 2010-2013.

3.1.2 Fiscal growth

For each country, we assume:

- that the value of total government expenditure in 2030, as a proportion of GDP, increases by 5% from the 2014 baseline if it was not already at 45% of GDP or greater (and that otherwise it remains constant);
- that the estimated 2014 value of total government expenditure as a proportion of GDP increases to the projected 2030 value linearly.

3.1.3 Priority increase

For each country, we assume:

- that the 2030 value of public health expenditure as a proportion of total government expenditure increases by 4% if it was not already at 15% or greater of total government expenditure (and that otherwise it remains constant);

- that, if public health expenditure was between 11% and 15% as a proportion of total government expenditure in 2014, it increases to 15% but not beyond by 2030;
- that the 2014 value of public health expenditure as a proportion of total government expenditure increases to the 2030 value linearly.

3.1.4 Wages

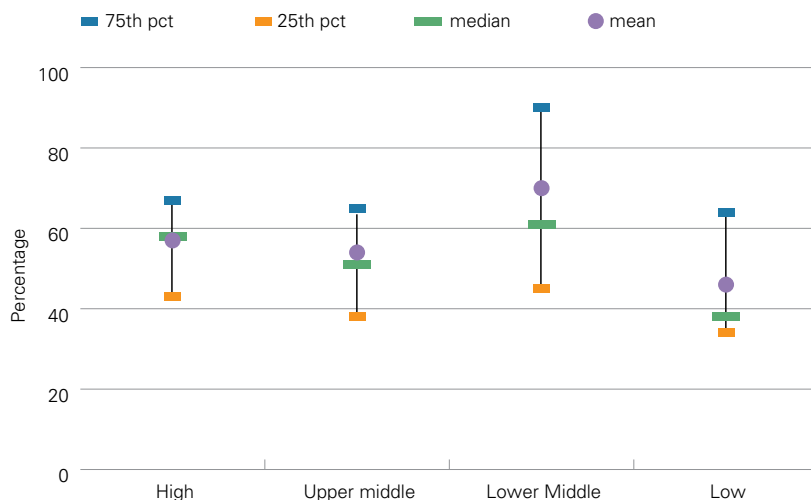
In line with the findings reported above (see section 2.1), we assume that average health worker wages for all cadres in 2014 are either 3 times GDP per capita (plausible lower bound) or 6 times GDP per capita (plausible upper bound).

3.1.5 Wage bill ceilings

There are no accepted international benchmarks for the ratio of wage bills to total public spending on health. Nevertheless, raw calculations (that is, uncorrected for on-budget development assistance) from unpublished data in the GHED reveal that, for 136 countries with available data, the global unweighted average wage bill, expressed as a proportion of public spending on health, is 57%. In high-income countries that are not recipients of development assistance, the figure is also 57%. We therefore take 60% as a (slightly ambitious) “feasible lower bound” for the magnitude of wage bills expressed as a proportion of total public spending on health. For the sake of defining an “upper bound” that might nevertheless be at the extreme limit of feasibility, we assume 90%, noting that approximately one quarter of lower middle-income countries currently show wage bills above this level (Figure 3).

Figure 3

Sample statistics (mean, median, percentiles) for wage bills expressed as a proportion of general government expenditure on health, estimated from unpublished data in the GHED ($n = 136$), displayed by World Bank income group



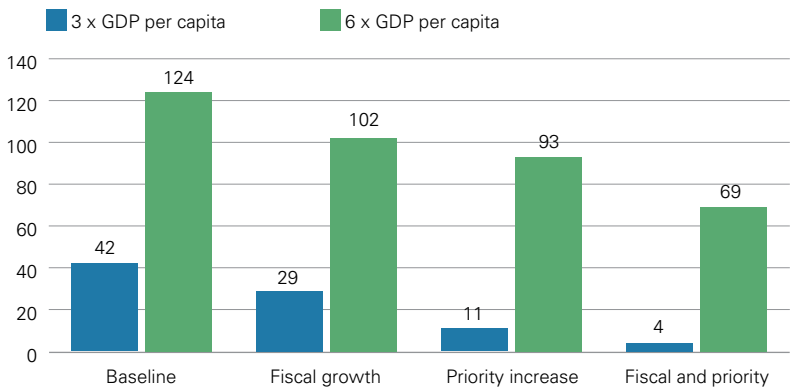
The 60-90% range adopted here for the purposes of this analysis should not be interpreted as a norm or policy recommendation, but merely represents values we are using to draw conclusions about the limits of the modelled fiscal scenario. Indeed, when health worker wages are above 60%, expressed as a proportion of total government expenditure on health, and almost certainly when they are above 90%, there will generally be concerns about the implications for efficiency in the mix of inputs required for service delivery, as well as about the financial burden that a lack of public resources to fund other inputs (such as medicines and supplies) is liable to place on patients who could have to pay for these inputs out of their own pockets. More particularly, the allocation of 60-90% of government health spending to health worker wages should by no means be interpreted as a target. Such high levels of spending on wages might be sustainable only in contexts in which external funding can finance a substantial proportion of non-salary inputs.

3.2 Results for the fiscal space scenario

Assuming both fiscal growth and reprioritization of health as described above, and with an estimate of average health worker wages for all cadres of 3 times GDP per capita, only four countries would require an amount greater than 60% of projected health expenditure from public sources in order to meet their financing needs for health worker wages in 2030. In contrast, with an upper bound for health worker wages of 6 times GDP per capita, as many as 69 countries would require an amount greater than 60% of health expenditure from public sources in order to meet their health worker wage bills in 2030. This is shown in Figure 4 (rightmost bars), along with visualizations of the implications of the individual components of the fiscal scenario, in other words of “baseline”, of “fiscal growth” only, and of “priority increase” only.

Figure 4

Number of countries where the wage bills of meeting normative health worker targets would amount to more than 60% of projected public spending on health in 2030 (*n* = 183)

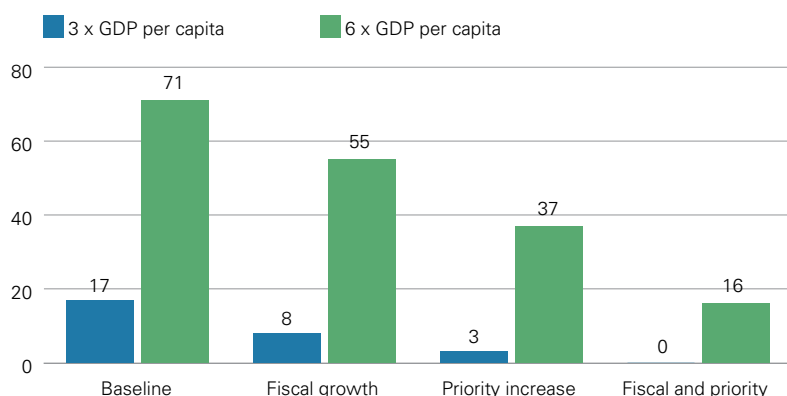


Under the more extreme assumption that health worker salaries can rise to 90%, expressed as a proportion of public expenditure on health, and thus that very high levels of external funding are available to fund the recurrent costs of non-staff inputs,

0 (zero) countries would not be able to meet their projected wage bills for health workers in 2030 for the lower bound of 3 times GDP per capita for average health worker wages (for all cadres). For the upper bound of 6 times GDP per capita for health worker wages, 16 countries would not be able to meet their projected wage bills in 2030 without exceeding the 90% ceiling. This is shown in Figure 5 (rightmost bars), along with visualizations of the implications of the individual components of the fiscal scenario, in other words of “baseline”, of “fiscal growth” only, and of “priority increase” only.

Figure 5

Number of countries where the wage bills of meeting normative health worker targets would amount to more than 90% of projected public spending on health in 2030 ($n = 183$)



Our analysis of fiscal space suggests that, if wage bills are expressed as a proportion of projected public spending on health under our fiscal scenarios, and conditional on estimates of a plausible range of health worker wage indexes of 3–6 times GDP per capita, only a small number of countries (4–16 countries; see Figures 4 and 5) are projected to show wage bills outside the upper range of the distribution of some currently observed wage bills (that is, above the range 60–90%). Therefore,

assuming progress can be made in managing wage bill growth and in improving fiscal capacity and priority setting in public spending, our analysis suggests that all but a small number of countries should be capable of meeting their projected SDG financing needs for health worker wages in 2030, even relying primarily on government expenditure on health. Sustained development assistance may nevertheless be required to meet the investment costs in pre-service training in a larger number of countries (not quantified in this analysis). Finally, for countries where meeting the health worker targets could require more than the more conservative ceiling of 60% of public spending on health (possibly 4-69 countries, depending on wage levels; see Figure 4), additional assistance may be needed to support the financing of non-salary inputs and to ensure access to care, quality of care and the productivity of health workers.

4. Financial space analysis

The analysis of financial space builds on that of fiscal space in the sense that we assume additional resources from non-public sources can be mobilized as a result of economic and population growth, effective public policies on tax and expenditure, and broad-based health financing reform (see section 1.2 for a discussion of the indicative underlying assumptions). For financial space, we restrict our analysis solely to aggregate quantities for low-income and lower middle-income country groups.

We claim that there is sufficient financial space for the necessary expansion of health employment in low-income and lower middle-income countries if the following conditions can be (jointly) met:

- the projected annual financing gap for the wages of needed health workers is a “small” proportion of total annual economic output (i.e. GDP) in those countries;
- the projected annual financing gap for the wages of needed health workers is a “reasonable” proportion of total health expenditure in those countries.

Globally, for 136 countries with wage bill data in the GHED, the health workforce currently is estimated to absorb an average of 2.3% of GDP and 34% of total health expenditure from all sources, public and private; therefore, we take these observed averages as reference points for determining what additional amounts might be considered “small” and “reasonable” in our analysis of financial space.

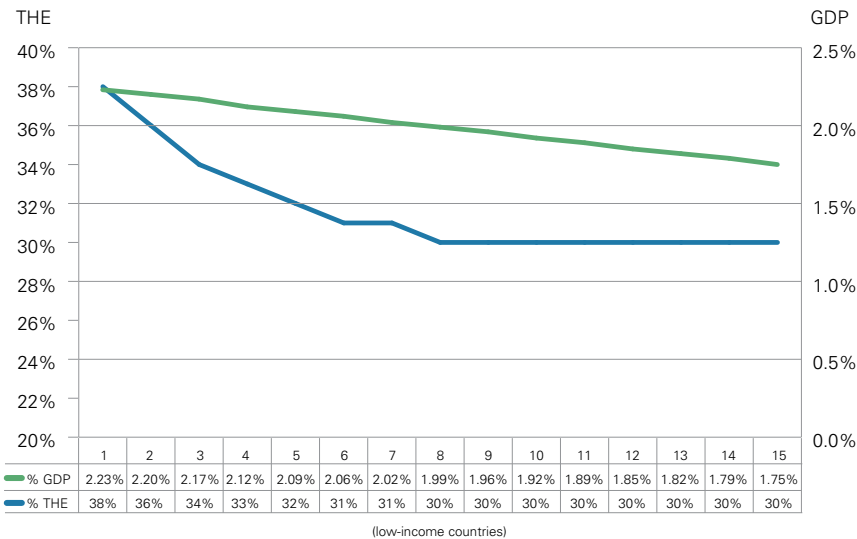
4.1 Financial space for low-income countries

Using projections of GDP growth previously described (8) and population projections from the United Nations Population Division, and assuming an average health worker wage index (for all cadres) of 3 times GDP per capita, the financing gap for needed health worker salaries in 29 low-income countries is projected to start at US\$ 9.5 billion (in constant 2013 US dollars) per year in 2016, and to rise to US\$ 16.9 billion per year in 2030. As a proportion of projected GDP, the financing gap averages approximately 2% of GDP over this period (implying that roughly a doubling of the share of GDP going to health worker wages is required to meet the financing gap). As a percentage of projected total health expenditure, the projected financing gap averages approximately 32%, again implying that, to meet the financing gap, approximately a doubling would be required in the share of total health expenditure going to health worker wages (Figure 6).

If, on the other hand, an average health worker wage index (for all cadres) of 6 times GDP per capita is assumed, the financing gap for needed health worker salaries in 29 low-income countries is projected to start at US\$ 18.9 billion (in constant 2013 US dollars) per year in 2016, rising to US\$ 33.8 billion per year in 2030. As a proportion of projected GDP, the projected financing gap in this less optimistic scenario averages approximately 4% of GDP over this period (implying approximately a tripling of the share of GDP going to health worker wages). As a percentage of projected total health expenditure, the projected financing gap averages approximately 65%, again implying approximately a tripling in the share of overall health expenditure going to health worker wages.

Figure 6

Projected financing gap for wages, and % of GDP and total health expenditure required to pay additional wage bills, in low-income countries over the period 2016–2030, assuming an average health worker wage index (for all cadres) of 3 times GDP per capita



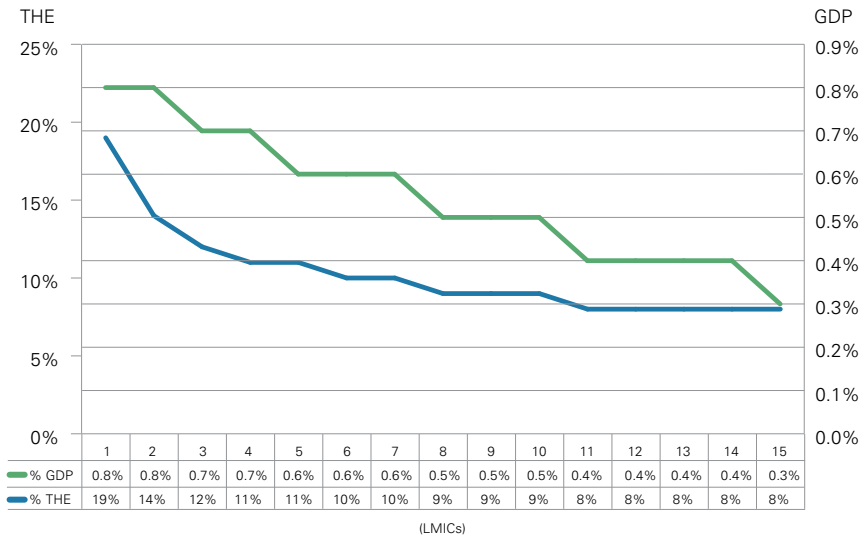
4.2 Financial space for lower middle-income countries

Assuming an average health worker wage index (for all cadres) of 3 times GDP per capita, the financing gap for needed health worker salaries in 46 lower middle-income countries is projected to start at US\$ 52 billion (in constant 2013 US dollars) per year in 2016, and to fall to US\$ 48 billion per year in 2030, implying an average annual growth rate in the financing gap for needed health worker salaries in lower middle-income countries of -0.6% per year. As a proportion of projected GDP, the projected financing gap averages approximately 0.5% of GDP over this period, but falls from an initial value of around 0.9% of GDP per year to a final value of 0.3% of GDP per year. As a percentage of projected total health expenditure the projected

financing gap averages approximately 10% over this period, but falls from an initial value of around 20% of total health expenditure per year to a final value of around 7% of total health expenditure per year (in all cases, these percentages are over and above what would already be spent on health workers in a business as usual scenario) (Figure 7).

Figure 7

Projected financing gap for wages, and % of GDP and total health expenditure required to pay additional wage bills, in lower middle-income countries over the period 2016–2030, assuming an average health worker wage index (for all cadres) of 3 times GDP per capita



If, on the other hand, an average health worker wage index (for all cadres) of 6 times GDP per capita is assumed, the financing gap for needed health worker salaries in 46 lower middle-income countries is found to start at US\$ 104 billion (in constant 2013 US dollars) per year in 2016, falling to US\$ 97 billion per year in 2030. As a proportion of projected GDP, the projected financing gap averages approximately 1% of GDP over this period. As a percentage of projected total health expenditure, however, the projected financing gap averages approximately 20%

per year, although it has an initial value of 40% of total health expenditure per year and falls to a final value of 15% of total health expenditure per year when this much higher salary level is assumed.

5. Discussion and conclusions

The fiscal space analysis looks at fiscal implications mainly at the end point of 2030, whereas the financial space analysis examines the whole financing trajectory from 2016 to 2030. The fiscal space analysis uses “country” as the unit of analysis, whereas the financial space analysis considers only aggregate income groups of countries. The fiscal space analysis examines total wage bills (compared to various “ceilings”), whereas the financial space analysis examines the financing gap of meeting additional required wage bills.

The fiscal space analysis focuses on the role of governments, under a scenario composed of assumptions about projected economic and population growth, projected growth in public funds, and the potential for the reprioritization of health in government expenditure; however, on the assumption that effective public policies will have broader effects on the private economy, the financial space analysis examines projected economic development, population growth and growth in overall health spending (in other words, it includes the full scope of available public and private resources that could potentially be mobilized by effective public policies and broad-based health financing reform).

As the fiscal space analysis focuses on general government expenditure on health, it therefore reveals challenges in a (small) number of countries (optimistically, as few as 4–16 countries; less optimistically, as many as 69 countries) with low baseline levels of government expenditure on health. This finding highlights the important role of adequate general government expenditure on health in meeting the challenges of the SDGs. On the other hand, as the financial space analysis is driven primarily by assumptions about growth in overall economic output (GDP) and total health expenditure, the latter analysis therefore reveals challenges mainly in the group of 29 low-income countries, especially at higher wage levels. Considering both the

fiscal and financial scenarios together, however, one is nevertheless entitled to conclude (at least optimistically) that the number of countries requiring sustained development assistance for wage bills from donor nations is likely to be limited, possibly to as few as 20–30 countries or even fewer.

5.1 Fiscal space

There is the potential for public funds to meet the recurrent costs of needed health workers in many countries. Countries that are projected not to meet their wage bills in 2030 from public finances display the common feature of low levels of general government expenditure on health. For example, the 69 countries reported as potentially not meeting their wage bills in 2030 (Figure 4), even in the optimistic scenario of fiscal growth and increased prioritization of health spending, show an average share of general government expenditure on health of only 2% of GDP in data from the GHED (whereas a target of 5% has been recommended by some) (9).

Available public spending on health nevertheless needs to support a technically efficient mix of inputs to health care, including elements such as medicines and medical supplies that might otherwise be paid for only out of pocket. More generally, there is a need for public finance to support adequately, and as essential public goods, all health system building blocks (not only human resources but also facilities, logistics and supply, monitoring and evaluation, and governance), failing which the effective delivery of health care and the possibility of sustained improvements in population health will be gravely hindered. While a detailed discussion of technical efficiency is outside the scope of this chapter, it is important to note that there is evidence that more could be done with existing resources by introducing efficiency measures such as those described in a recent review of analyses of fiscal space for health (5). Relevant measures discussed there include reforms in public financial management systems, particularly budget execution; reforms in provider payment methods, especially in moving away from input-based financing to output-based payment methods; and reforms in human resource policies and facility management practices, particularly with respect to measures to reduce absenteeism.

5.2 Financial space

At any wage levels, low-income countries show a rising financial gap over the SDG horizon, a gap that grows at an average rate of 4.2% per year. At any wage levels, lower middle-income countries show a falling financial gap over the SDG horizon. This is mainly because the supply of health workers in these latter countries is expected to increase over the period of the SDGs, whereas the supply of health workers is expected to grow much more slowly over the horizon of the SDGs in low-income countries.

At lower wage levels, the implications for financial space of paying additional required health workers appear challenging but potentially manageable, that is, feasible under assumptions of appropriate public policy (including broad-based health financing reform) and international engagement (including targeted aid, where necessary). Low-income countries face a fairly steady demand on available sources of financing, such as growth in output (GDP) and total health expenditure, over the horizon of the SDGs. Lower middle-income countries face falling demands on available sources of financing over the horizon of the SDGs, although both groups of countries face dramatic initial projected financing needs at higher wage levels.

If average wage levels are as high as 6 times GDP, the financial implications of funding the wage gap begin to appear unrealistic in low-income countries (since the additional resources required amount to as much as 4.5% of projected GDP and 75% of projected total health expenditure, at least initially). At such higher wage levels, the implications for total health expenditure are also quite challenging in lower middle-income countries, again, at least initially.

5.3 Implications of health worker wages

The average level of health worker wages is accordingly a major determinant of the availability of both fiscal and financial space. According to available data, average health worker wage indexes may lie anywhere in the range of 1.3 to 9 times GDP per capita, depending on income region and data source.

In this analysis, we adopted two assumptions about health worker wage indexes. First, they could be at a “low” average level (for all cadres) of 3 times GDP per capita, a value that is consistent with global averages shown in available data and also with the values estimated in lower middle-income and upper middle-income regions (see Figure 2). On the other hand, for sensitivity analysis we adopted a “high” average wage level (for all cadres) of 6 times GDP per capita, which is consistent with current values observed in lower middle-income countries and in low-income countries (see Figure 2).

An even higher estimate for average health worker wages than 6 times GDP per capita would not be incompatible with existing data, especially in low-income countries. In economic terms, health workers are “tradable goods”, in the sense that they cross international boundaries in search of better employment conditions, including notably higher (absolute) wage levels (10). There are thus economic reasons to suspect that lower-income countries may have to offer higher (relative to the rest of their workforce) wages in order to retain health workers. In higher-income countries, (relative) health worker wages appear to be much lower, at least in available data. Thus, if the barriers, both fiscal and institutional, to creating the necessary supply of health workers in all countries can be addressed, such that the demand for health workers in rich countries does not result in shortages of health workers in poor countries, it is possible that *relative* health worker wages may stabilize towards the currently observed global mean of 3.3 times GDP per capita (or even lower), especially over a medium-term horizon showing sufficient economic growth in lower-income countries to allow absolute health worker wages in such countries to rise appropriately.

In any case, it is clear that average health worker wages higher than 6 times GDP per capita would pose serious challenges to both fiscal and financial space, in both low-income and lower middle-income countries. Therefore, an implicit background assumption to the scenarios examined here involves the effective management of wage bill growth, not through arbitrary caps, but rather through addressing the shortages of health workers – as well as the persistent mismatches in skills mix and in modes of service delivery as compared with population health needs (11, 12) – that have been affecting low-income and lower middle-income countries, and that will continue to affect these countries in the absence of bold new measures to increase the supply of (and, where appropriate, the demand for) health workers.

Acknowledgements

Jean-Louis Arcand, Hélène Barroy, James Campbell, Francesca Colombo, Giorgio Cometto, Ibadat Dhillon, David Hunter, Chris James, Joe Kutzin, Gaetan Lafortune, Liliane Moreira, Mark Pearson, Christophe Perrin, Stephen Pursey, Xenia Scheil-Adlung, Susan Sparkes and Christiane Wiskow are gratefully acknowledged for their comments.

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Evidence on the effectiveness and cost-effectiveness of nursing and midwifery interventions:

A rapid review

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Abstract

This rapid review considers evidence of (a) effectiveness of nursing and midwifery-related interventions, including studies on the role of nursing and midwifery as determinants of health; and (b) cost-effectiveness of nursing and midwifery-related interventions. In light of what remains a still scarce, underdeveloped cost-effectiveness evidence base, it is especially important to consider evidence on effectiveness. We have focused in particular on two types of policy questions: (a) increasing the number of nurses and midwives; and (b) shifting the skills mix away from more expensive medical staff (especially doctors) to nurses and midwives. The good news is that there is certainly selected evidence to support the effectiveness and cost-effectiveness case for nursing and midwifery. However, we need to acknowledge that the evidence base as a whole appears fairly limited and mixed, if less so in terms of effectiveness than cost-effectiveness. Many of the systematic reviews discussed in this chapter concluded that the evidence base was “inconclusive”. More often than not this was attributed to the several methodological challenges involved in the assessment of (cost) effectiveness of nursing and midwifery policies. What evidence exists is also – not surprisingly – biased towards high-income countries.

1. Introduction

This chapter seeks to provide a rapid review of the evidence on the effectiveness and cost-effectiveness of nursing and midwifery-related interventions or policies. We note the challenge involved in adhering to common definitions of the professions “nurse” and “midwife”. Definitions often vary between countries and between different organizations, but usually include some formal qualification and registration in most countries. According to the Organisation for Economic Co-operation and Development (OECD), nurses are defined as “all the ‘practising’ nurses providing direct health services to patients, including self-employed nurses” (1).¹ Midwifery – according to the recent *Lancet* series on the subject – involves “skilled, knowledgeable and compassionate care for childbearing women, newborn infants and families across the continuum throughout pre-pregnancy, pregnancy, birth, post-partum and the early weeks of life” (2).

The chapter was commissioned as a background note to the High-level Commission on Health Employment and Economic Growth and its Expert Group. Our primary target audience comprises policy-makers and practitioners in the nursing and midwifery domain that are interested in making use of economic analysis to inform decisions about investment in nursing and midwifery, but who may not be fully aware of what economic arguments and analysis best make the case, and how far the relevant, current economic evidence goes. Conducting proper economic assessments of nursing and midwifery investments is important, as it can guide resource allocation decisions towards those investments that provide greatest health gains (or otherwise defined objectives) for a given set of resource constraints. Since no country has unlimited financial resources, informing optimal resource allocation is of universal relevance, particularly in the heavily resource-constrained low-income countries.

¹ Note that definitions used across the studies reviewed in this chapter may also differ, thereby potentially compromising the comparability of the results.

2. What do we mean by “cost-effectiveness”?

In health care, assessing whether a given policy or intervention represents “good value for money” is commonly done via what has become known as cost-effectiveness analysis. There is some subtle but important distinction of terms between cost-effectiveness analysis in a narrow sense and cost-utility analysis. The latter considers someone’s quality of life and the length of life they will gain as a result of an intervention. The health benefits are typically expressed either as quality-adjusted life-years (QALYs) or as disability-adjusted life-years (DALYs) – both indicators that try to capture mortality and morbidity in a single metric. In the United Kingdom, the recommendation is that interventions costing less than £20 000² per QALY are deemed to be “good value for money” or “cost-effective” (this threshold of £20 000 corresponds to about 70% of the value of the United Kingdom’s 2015 gross domestic product (GDP) per capita). Those costing between £20 000 and £30 000 per QALY may be considered cost-effective under certain circumstances. In the absence of country-specific cost-effectiveness thresholds for most countries, the World Health Organization (WHO) has recommended the rule of thumb that an intervention is considered highly cost-effective whenever the cost per DALY saved is less than the GDP per capita of the country considered, and it is still considered cost-effective when it is between 1 and 3 times GDP per capita (3, 4).³

By contrast, cost-effectiveness analysis in a narrow definition expresses effectiveness in terms of a single natural health unit, for instance life-years gained or lost, changes in blood pressure, or body mass index. While these outcomes are more intuitive and often closer to the intervention in question, their limitation lies in the resulting lack of comparability across studies that employ different outcomes.

A further, much less frequently used approach to assessing value for money in health care is cost-benefit analysis. Unlike cost-effectiveness analysis and cost-utility analysis, in this case all consequences of an intervention are converted to a monetary metric, allowing for the expression of the return on investment in purely monetary terms.

2 Around US\$ 25 000 (November 2016).

3 It is important to note that there are limitations to both the United Kingdom approach (3) and the WHO recommendation (4) in terms of how appropriate the proposed thresholds really are. Hence there is ample scope and need for more work to identify appropriate cost-effectiveness thresholds that can be applied in health care in general but also in the nursing and midwifery domain specifically.

While applying suitable prices for most goods and services that are used in a health care intervention is reasonably straightforward, as typically some actual market prices at which they can be valued do exist, this is more controversial when it comes to putting a monetary value on health. Commonly, “willingness to pay” estimates are used for this purpose, based on either implicit or explicit valuations people assign to small changes in the risk of mortality and morbidity, though those estimates can vary considerably between studies.

In this chapter we shall use the more common term “cost-effectiveness analysis” as the overall umbrella concept to include cost-utility analysis and narrowly defined cost-effectiveness analysis. For a brief summary of a broader set of economic evaluations as applied in health care see Annex 1.

3. Empirical evidence on the cost-effectiveness of nursing and midwifery interventions

There is no overarching, overall return on investment or cost-effectiveness assessment of nursing and midwifery – and neither should one expect that there would be, as such a figure would inevitably be quite meaningless. What would be more informative for policy is cost-effectiveness evidence for reasonably specific nursing and midwifery-related interventions or policies. In the (still limited) literature, there have arguably been two important focal points – first, on the impact of nursing and midwifery staffing levels; and second, on the effects (and costs) of differences in skills mix on patient-level health outcomes. In what follows we review the relevant evidence in these two domains, while acknowledging that there are other potential nursing and midwifery interventions that have been examined in the literature or that would merit attention.

As the direct evidence on cost-effectiveness even in these two domains is known to be limited (5), we take into account not only cost-effectiveness evidence but also selected evidence of sheer effectiveness. This is useful because the presence of credible effectiveness evidence is obviously a key precondition for any potential cost-effectiveness argument that might be developed. The effectiveness evidence we consider may draw on both cross-country studies of the relationship between certain nursing and midwifery staffing indicators and health outcomes, or on within-country

analysis of such relationships or of relevant randomized controlled trial (RCT) evidence, where available.

3.1 Empirical evidence on the impact of the staffing intensity or density of nurses and midwives

3.1.1 Evidence on nursing and midwifery staffing as a “determinant” of health

There is a small body of evidence that uses country-level data on (highly aggregate) nursing and midwifery indicators (especially density of nurses and midwives) within a cross-country regression framework to assess its impact on (or at least association with) a range of mortality outcomes. While this evidence contains no economic assessment at all, it is potentially informative for an assessment of the cost-effectiveness of increasing the density of nurses and midwives, in that it can tell us something about the potential effectiveness (in terms of health) resulting from changes in that density.

The existing cross-country econometric evidence on the mortality effects of the staffing density of nurses and midwives is mixed.⁴ For example, in a sample of mostly low-income and lower middle-income countries, one study found that the combined density of nurses and midwives was significantly negatively related to maternal mortality, but not to infant and under-5 mortality (6).⁵ Similarly, Speybroeck et al. (7) found that the density of nurses and midwives only showed the expected, significant negative association with maternal mortality, but not with four other mortality outcomes. Likewise, Carr-Hill and Currie (8) found in a more recent study that the rate of physicians per capita, but not of nurses, was negatively related to these mortality rates, even after controlling for gross national product (GNP) per capita, income inequality and the female literacy rate, including when the sample was restricted to developing countries only. In another study relevant to the context of low- and middle-income countries, Castillo-Laborde (9) found that the density of nurses and midwives was unrelated to the country-level DALYs. They

4 A relevant caveat to most if not all cross-country econometric studies is in the potentially varying definition of what is included in the category “nurses and midwives”, potentially introducing bias in any resulting impact estimate.

5 The authors justified combining nurses and midwives in the sample by arguing that in countries where they exist as separate health worker categories they are trained similarly and undertake similar tasks.

also found that the higher the proportion of physicians to nurses and midwives, the greater the decrease in DALYs. In yet another country-level study restricted to low- and middle-income countries, density of nurses was unrelated to health outcomes such as measles immunization, tuberculosis case diagnosis and care for acute respiratory infection, while the concentration of doctors was significantly related to measles immunization rates (10).

In a more high-income country context, using cross-country, yet more fine-grained, data, a recent *Lancet* study based on data from nine European countries found an increase in the nurse workload by one patient to be associated with an increase of about 7% in the risk of a patient dying within 30 days after hospital admission (11). Another European-focused cross-country study suggested that patient experience is superior in hospitals with higher nurse–patient staffing ratios (12).

Looking at the arguably more relevant individual-level analysis, the evidence is also somewhat mixed but perhaps more encouraging. For instance, in a systematic review of this evidence, Kane et al. (13) concluded that greater levels of staffing of more qualified, registered nurses were positively related to some patient outcomes. Similarly, the review by Griffiths et al. (14) noted that an increasing number of studies have found a negative relationship between nurse staffing levels and adverse outcomes, such as mortality rates. Nevertheless, the authors concluded that causal evidence remains insufficient to infer major claims about the outcomes of nursing, both in terms of sheer health effects and in terms of cost-effectiveness (14).

3.1.2 Cost-effectiveness evidence

While the economic evaluation evidence on nurse staffing is thin, one cost–benefit study evaluated a programme in Massachusetts, United States, where full-time registered nurses provided care for the Massachusetts Essential School Health Services programme, with 477 163 students from 933 schools participating during 2009/2010 (15). While the authors concluded that the programme appeared to provide good value for money, generating a seemingly impressive US\$ 98 million net benefit to society, this finding needs to be treated with caution, as it relied on

several assumptions, including about avoided medical care costs, as well as on the extent of parental and teacher productivity losses. Also, the benefits and costs were estimated compared to the assumed absence of any school services.

Likewise, Dall et al. (16) concluded that adding 133 000 registered nurses to the hospital workforce in the United States would lead to medical savings of US\$ 6.1 billion, or an average of US\$ 46 000 per additional registered nurse per year. Again, while such numbers might sound impressive, once we investigate the underlying distinct assumptions, it remains persistently difficult to make a meaningful judgement as to how “large” or “small” they really are.

In trying to assess the cost-effectiveness of increasing midwife staffing, Sandall et al. (17), in an analysis of a large number of delivery records from the Hospital Episode Statistics in the United Kingdom, National Health Service workforce statistics and the Care Quality Commission Maternity Survey of women’s experiences, as well as National Health Service reference costs, found that greater investment in medical staff did not generally have a significant effect on the chosen outcomes. Interestingly, however, they did find that increased midwife staffing had the greatest effect on outcomes in low-risk women. They also found that some tasks could be shifted from midwives to cheaper support workers for lower-risk women, and in that sense, there is a potential economic case for investing in midwives, as well as in support workers that take care of low-risk pregnant women.

In one notable study (18), the economic value of alternative nurse staffing levels was determined using more traditional incremental cost-effectiveness ratio estimation. The authors found that investing in nurse staffing was cost-effective, comparable to commonly accepted medical interventions such as thrombolytic therapy for acute myocardial infarction and routine cervical cancer screening. On the other hand, in a study from Australia, Twigg et al. (19) concluded in a recent review (focusing on full economic evaluations only, where both costs and outcomes were considered) that the evidence on the cost-effectiveness of different nurse staffing levels was inconclusive, due to the “small number of studies, the mixed results and the inability to compare results across studies”. This conclusion coincides with that of an earlier review of a very small number of cost-effectiveness studies (20).

3.2 Empirical evidence on the impact of shifting the skills mix towards nursing and midwifery

While the evidence on the cost-effectiveness of more intensive nursing or midwifery staffing remains inconclusive, there appears to be greater support for the notion that shifting the skills mix towards nursing and midwifery (that is, away from more expensive medical staff, such as doctors, or potentially from registered nurses to care assistants) could be a cost-effective use of limited resources in health care (5, 14). While cost-effectiveness in a traditional sense is not usually estimated in such studies, evidence to support this case comes predominantly from effectiveness evidence indicating that nurses provide at least as good health care as doctors (as measured by a range of outcomes, including health outcomes). To the extent that one can assume the use of nurses and midwives to be less costly than that of doctors, this would suggest that “some” task shifting towards nurse-provided care could be an efficiency-increasing and hence economically sensible approach, in that it would produce better (health) outcomes for a given budget (or the same outcomes for less resources) (5). One rare cost-effectiveness study that was conducted alongside an RCT in general practices in the Netherlands confirms this hypothesis by finding that average costs, which included both direct costs of care and productivity loss costs for patients, were lower for nurse practitioners than for GPs (21–25).⁶

In terms of effectiveness evidence, a slightly dated Cochrane systematic review (22) concluded that care provided by appropriately trained nurses would be as good as that by primary care doctors, although the authors cautioned that – yet again – the evidence for this was still inconclusive due to lack of sufficiently powered studies, as well as several methodological shortcomings, including short follow-up. Likewise, OECD researchers concluded, based on a more recent review of several evaluations conducted in high-income countries, that advanced practice nurses provided as

6 A caveat is in order here, in that while it might seem reasonable to assume that nurses are cheaper to employ than doctors (while noting that the relative cost of employing a nurse versus a doctor varies significantly in different countries), the impact of nurse–physician substitution on overall resource utilization is still unclear. Laurant et al. (22), for instance, noted that increasing the ratio of nurses and midwives to physicians may lead not only to cost savings attributable to cheaper costs of employing nurses and midwives, but also to cost increases due to potentially lower productivity of nurses and midwives compared to physicians (22). (It may though be that part of the “lower productivity” of nurses and midwives is a reflection of their traditionally narrower range of permissible clinical interventions compared to physicians.) Similarly, Delamare and Lafortune (23) concluded that savings from employing the cheaper nurse workforce may be offset by longer consultations times and higher rates of patient referrals. A modelling study (24) based on two randomized controlled trials conducted in the United Kingdom corroborated this further by showing that there was little difference in costs of employing a nurse practitioner compared to a salaried GP. In addition, a recent systematic review concluded that the available evidence on the impact of nurse-led care on costs was insufficient (25).

good care as doctors for a range of services, with high satisfaction rates reported by patients (23).

Another review article (26) cited evidence that a higher proportion of registered nurses in the health workforce was associated with better health outcomes, and also noted the evidence that registered nurses might provide more cost-effective care than less costly licensed practical nurses, as the former will save both time and money compared to the latter. In another study, Aiken et al. (27) found that a greater proportion of nurses with International Baccalaureate degrees in the hospital staff was inversely related to mortality. However, this does not necessarily prove that investing in the education of nurses is cost-effective from a health care system perspective, as one also needs to consider the cost of education and of higher salaries.

A recent systematic review focusing on RCT studies (25) summarized evidence showing that nurse-led care was associated with higher patient satisfaction and reduced risk of hospital admission and mortality, although the authors commented on numerous methodological limitations (for example, lack of concealment of treatment, small sample sizes, and heterogeneity of reported outcomes and settings).

In one example of a high-quality RCT study conducted in the United States (28), patients randomly assigned to primary care by nurse practitioners or physicians after emergency department and urgent care visits were found to have no significant differences in most measured outcomes, which included patient satisfaction, health status, psychological test results after six months of follow-up, and service utilization for one year after initial appointment. The only exceptions were average satisfaction ratings, which were slightly higher for those assigned to physicians (4.2 versus 4.1 on a 5-point scale); and diastolic blood pressure, which was lower for nursing practitioner patients (82 versus 85 mm Hg).

In a low- or middle-income country context, HIV-positive patients in South Africa received similar standards of care regardless of whether they were randomized to be treated with antiretroviral therapy drugs by primary care nurses or physicians (29), with no difference in health outcomes between the two groups.

Another study estimated the effectiveness of different models of care during pregnancy. A particular interest of this study was the comparison of a “midwife-led continuity model” with alternative, more expensive care approaches (for example using obstetricians, or doctor led), finding that midwife-led models were associated with a superior outcome in several cases (30), including fewer instrumental vaginal births, preterm births less than 37 weeks, cases of fetal loss before and after 24 weeks, and neonatal deaths. A similar positive conclusion applied to the effects of midwife-led care for low-risk women (compared to more expensive doctor-led care), as was found in another review (20). Further encouraging evidence about the positive impact midwifery can make to outcomes can be found in studies by Tracy, Hartz et al. (31) and Tracy, Welsh et al. (32), and in the recent reviews included in the *Lancet* series on midwifery by ten Hoope-Bender et al. (2) and Renfrew et al. (33).

3.3 Methodological challenges

As alluded to several times above when referring to the conclusions of previous systematic reviews in this field, the existing evidence base is fraught with multiple challenges that make drawing relevant, credible conclusions on the effectiveness and cost-effectiveness of nursing and midwifery interventions more difficult than for standard clinical interventions. Here we emphasise and briefly discuss two principal challenges: (a) assessing the causal impact of interventions; and (b) choosing the correct perspective for the cost-effectiveness analysis.

3.3.1 Assessing the causal impact of nursing and midwifery interventions

One of the most important issues common to all studies is the difficulty of establishing causality, as assignment of people to care by doctors or nurses/midwives is typically non-random, and usually depends on the severity of the underlying illness. Thus, nurses are more likely to treat healthier patients (compared to doctors), and midwives tend to focus more (compared to obstetricians) on women who are less likely to have serious complications (34). In their recent systematic review, Twigg et al. (19) could not identify a single RCT that considered both nurse staffing levels and health outcomes simultaneously. In

general, studies should correct for a number of potential sources of confounding, such as the case mix of patients and the competence and training of nurses and midwives, as well as other medical staff (14).

The question of causality in particular is difficult to resolve, but some efforts have been undertaken to apply advanced econometric techniques in order to maximize the degree of causal inference in cases where no RCT evidence was available or feasible. For example, Daysal, Trandafir and van Ewijk (35) exploited a unique policy rule in the Netherlands (using data from 2000 to 2008) requiring that pregnant low-risk women are supervised by midwives when they give birth. By using fuzzy regression discontinuity design, they found that there was no benefit (measured by 7-day and 28-day mortality and Apgar scores) from using more expensive obstetrician care compared to the care by midwives, again suggesting that nurses offer good value for money (at least in low-risk cases) compared to a more expensive workforce, and that their utilization may lead to potential cost savings. Likewise, using a quasi-experimental design, Miller (34) estimated that midwife-promoting public policies in the United States led to a statistically significant drop in neonatal deaths. The author suggested that this could be due to multiple potential benefits of midwifery care, including fewer medical interventions, better health outcomes and better patient experience, which probably comes at lower costs, though they caution that in more difficult pregnancies there is a greater risk of complications, which midwives may be less qualified to deal with than doctors.

Even sophisticated econometric or statistical designs though will struggle to overcome the problem that, as argued by Castillo-Laborde (9), nurses (and midwives) usually work as part of a multidisciplinary team, making their specific contribution difficult to isolate from that of other medical staff, particularly doctors (36, 37).

Estimating the effect of nursing and midwifery on resource utilization (and hence costs) alone is also challenging. This is because these costs may be offset as a result of various events (related to changes in staffing scenarios for nurses and midwives) that are difficult to capture empirically, such as reduced length of stay due to better patient care, fewer readmissions, less sickness absence, less use of emergency

rooms, reduction in the number of adverse events, better staff retention of nurses (who may appreciate staff training opportunities, for example, or a less stressful work environment), or other benefits, such as greater productivity (5, 26, 37–39).⁷

3.3.2 Choosing the “right” perspective to adopt in cost-effectiveness evaluations

Another important issue to consider when assessing the cost-effectiveness of nursing and midwifery is the question of which perspective to adopt (especially with respect to the costs incurred). If, for example, nursing is not directly reimbursed in the hospital setting, then nursing may be considered a “cost” that needs to be controlled from the hospital point of view (26), and lower-than-optimal nursing levels may result. However, such a decision may entail adverse effects on patient safety, potentially causing medical errors (37). There might also be different incentives for different payers. For example, in the United States, Medicaid may pay for nurse staffing in nursing homes, while Medicare would benefit from the resulting reduced hospital expenditures (26). On the other hand, payers may care more about cost savings for patients that may result from the better provision of nursing care (16), and may therefore take into account a wider range of outcomes related to nursing care. Alternatively, changes in nurse staffing levels or skills mix may be judged cost-effective from the societal but not from the payer or provider perspectives (19).

Other challenges include differences in the definition and classification of the workforce of nurses and midwives across different locations, which – at least in cross-country studies – may produce measurement error, leading to underestimation of, for instance, the association between nursing and midwifery staffing levels and health outcomes (7). The results may also vary depending on the population studied and variable definitions and conceptualization of nurse staffing or skills mix (19). Studies in the nursing and midwifery area have also been noted to suffer from a commonly small sample size, variations in cost measurements across locations, lack of consideration of potential indirect costs, and a lack of more widely comparable outcome indicators such as QALYs (5).

⁷ For example, one review found that increased nurse staffing levels led to reduced length of stay by 24% in intensive care units and by 31% in surgical patients (13, 37).

4. Concluding remarks

In this chapter we have tried to convey what is meant by “cost-effectiveness” of investment in nursing and midwifery; and we have reviewed what the current state of the empirical evidence tells us about the extent to which various nursing and midwifery interventions could be considered effective or even cost-effective. We have focused in particular on two types of policy questions: (a) increasing the numbers of nurses and midwives; and (b) shifting the skills mix away from more expensive medical staff (especially doctors) to nurses and midwives.

We have drawn on evidence of both effectiveness (which included studies on the potential role of nursing and midwifery as determinants of health) and – where available – cost-effectiveness. In light of what remains a still scarce, underdeveloped cost-effectiveness evidence base, it is important to consider evidence of effectiveness, in the absence of which there can be no reason to assume that cost-effectiveness could ever result.

On the whole, the good news is that there are certainly selected primary studies that can support both the effectiveness and cost-effectiveness case for nursing and midwifery interventions. However, we need to acknowledge that the evidence base as a whole appears decidedly mixed, if less so in terms of effectiveness than cost-effectiveness (where there is much more limited evidence to start with). Many of the systematic reviews discussed in this chapter concluded that the evidence base was “inconclusive”. More often than not this was attributed to the several methodological challenges involved in the assessment of (cost) effectiveness of nursing and midwifery policies. What evidence exists is also – not surprisingly – biased towards high-income countries. Most of the evidence on the impact of nurse staffing levels was collected in acute care settings, and hence may not be generalizable to health care more broadly (40). The evidence on the impact of the skills mix has been limited mostly to primary care settings in – yet

again – high-income countries, with the focus on the role of nurse practitioners, although in some studies the role of nurses in inpatient care has also been studied (40).

Looking ahead, there is great scope for more work in this area, especially for low- and middle-income countries. As there remain uncertainties in the precise contribution of nursing and midwifery to health outcomes, we recommend as a priority more work on the sheer effectiveness of related policies, possibly trying to exploit natural experiments in this area, along the lines of Daysal et al. (35) or Miller (34).

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ANNEX 1: Brief overview of the most common methods of economic evaluation in health care

1. Cost-consequences analysis

All benefits of an intervention are listed, no matter in which area or in what kind of unit they occur. The same is done with costs. No surrogate benefit unit is built and no ratio is calculated. Therefore it is not considered a full economic evaluation.

Strengths: Shows benefits and costs beyond budgetary boundaries, easy to measure;

Weaknesses: No comprehensive unit, so hard to define the value for money compared to other interventions.

2. Cost-effectiveness analysis

The health benefits in this type of evaluation are measured in a single natural unit (e.g. life-years gained, weight loss, increase in condom use). All alternatives have to use the same natural unit in order to be comparable.

Strengths: Easy to measure

Weaknesses: Focus on one benefit only (hard to choose the most relevant one); comparability of different interventions might be difficult.

3. Cost-utility analysis

Health outcomes are measured in a comprehensive unit representing quantity and quality of life (for example QALYs, DALYs). This surrogate unit is derived from an algorithm using life-years multiplied with utility scores for the respective health states, which represent the quality of life during the time frame under analysis.

Strengths: Comprehensive unit; comparable regardless the intervention; highly relevant to health goal (measure of quantity and quality of life);

Weaknesses: Sophisticated method to derive health states as primary data, therefore often use of theoretical models and secondary data; focus on health benefits only.

4. Cost–benefit analysis

All consequences of an intervention are converted to their monetary equivalent using methods such as “willingness to pay”. Money units become the common currency to compare across alternatives.

Strengths: Most comprehensive unit; interventions even comparable across budgetary borders (e.g. traffic, education);

Weaknesses: Methodological difficulties with the empirical investigation of monetary values for health outcomes; society still has some ethical constraints putting a monetary value on health outcomes.

PART III

Education and Production

The economics of health professional education and careers:

A health labour market perspective

Barbara McPake, Edson Araújo Correia, Gillian Lê

Abstract

Taking a labour market perspective, this chapter investigates current obstacles to and potential policy solutions for the transformation of health professional education that is required to reorientate the health workforce over the next 15 years towards Sustainable Development Goals for health.

At the core of the Sustainable Development Goal for Health is universal health coverage. Universal health coverage is not possible without an adequate volume of educated and trained professionals to deliver quality health care services. The processes by which health professionals are educated, trained and supported throughout their careers are therefore critical. The health care profession is currently facing a triple challenge of changing population health needs, professional preference for specialization and the variable quality of education. An integrative review of 206 academic papers was undertaken to consider these issues.

This chapter argues that the evolution of professional clinical education and health labour markets reflects underlying market failures by which the social return to those health professions most important for responding to population need is undervalued. It calls for policy-makers to recognize the importance of market forces in professional education, training and labour policies; to redirect

(continued on page 262)

ABSTRACT *(continued)*

public investments in education to primary care, low and mid-level providers and innovative pedagogy; to balance professional with public representation in key policy and regulatory bodies that influence the rate of return within all clinical professions; to mobilize private international investment in systems for regulating private training providers; and to prioritize research that includes evaluation of the social rate of return in economic analyses.

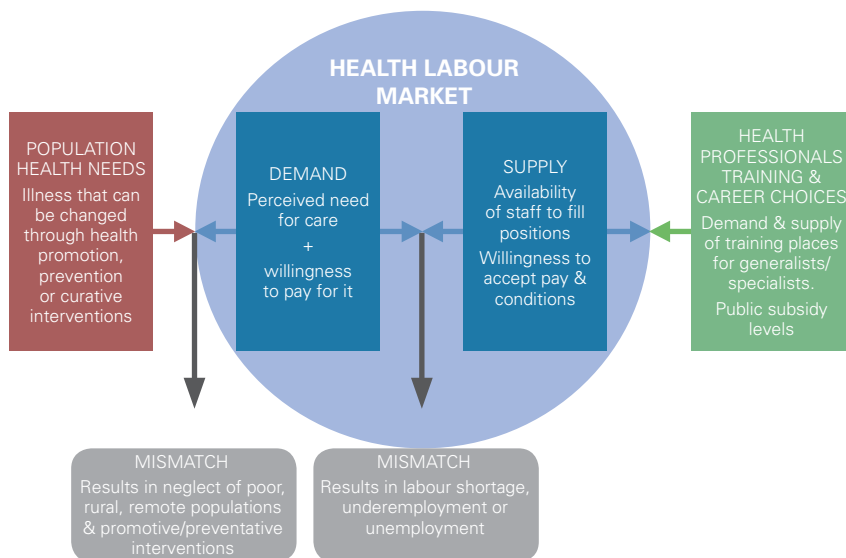
1. Introduction

Sustainable Development Goal 3, under the 2030 Agenda for Sustainable Development, aims to “ensure healthy lives and promote well-being for all at all ages” (1). The goal identifies 13 targets that have universal health coverage at their heart. Universal health coverage is not possible without an adequate number of educated and trained professionals to deliver high-quality health care services. The processes by which professionals are selected for training, educated and deployed are therefore critical. Most governments recognize the importance of these processes and heavily subsidize the education and ongoing training of health professionals, while seeking to regulate the numbers and types of jobs as well as the quality of health workers’ training (2).

However, market forces are often more influential than government policies on professional career choices. The interaction between two markets – the education system and the health system – is mediated by a third, namely the labour market for health workers. Ideally, these intersecting markets produce a balance between the health needs of the population; the numbers and types of health workers required to meet those needs; and the supply of these health workers from educational institutions. But the market for health professional training and its outcomes is skewed by market failures inherent to health care that result in two significant mismatches (Figure 1).

Figure 1

Interaction between education and labour markets, and health systems



Professional wage rates do not reflect the contribution of the work of health professionals to public health (that is, its social return). This is because individuals purchasing health care do not always know what they need to promote their own health, while individuals with high need for primary care tend to have low ability to pay, thereby reducing demand. Government efforts to replace patient ability to pay with public subsidy are hampered by weak fiscal capacity, weak governance or weak political will. Taken together, these conditions contribute to the undervaluing in the marketplace of the social return to the types of health professional work that are most responsive to population need. Trends in the development of the health professions and in health professional training reflect these market failures. This briefing will consider:

- global and regional trends related to the development of health professions, disaggregated by national wealth where possible;

- value and effectiveness of health professional education of different types, particularly in the context of universal health coverage;
- evolution of health labour and care markets and their interaction with health professional education;
- policies to better align education, employment and health labour market forces to meet population health needs.

An integrative review approach was used to synthesize academic literature. The review included all literature relevant to the topic of interest but did not aim to evaluate methods or address study weaknesses. PubMed, CINAHL and SciELO databases were searched using search terms reported in Annex 1. Articles published before 1990 were excluded, along with opinion papers and grey literature. Articles published in English, Portuguese and Spanish were included, and 1334 sources were retrieved. Clearly irrelevant material was excluded. Articles were further reviewed for relevance, coded by clinical profession and geographical region, and categorized according to the four topics listed above. A total of 206 sources remained. To ensure consistency in analysis, only the clinical health professions (doctor, nurse, midwife, dentist) were chosen. This briefing then addresses particularly clinical professions and their development.

2. Global trends related to development of health professions

The most recently available Global Burden of Disease Study shows that declining mortality and consequent ageing of populations is correlated with increased incidence of chronic illness and disability, and with absolute increases in years lived with disability. This is not a phenomenon of high-income countries alone: years lived with disability increased between 1990 and 2013 for 139 out of 188 countries. The fastest growing condition has been diabetes, with back pain, neck pain and other musculoskeletal disorders as the dominant conditions in the disease burden. That increasing numbers of people now suffer from multiple conditions (“multimorbidity”) is an equally important phenomenon (3).

Most of these conditions call for preventive and promotive action in the primary care system and at the community level. By the time such conditions have become acute and require specialist (tertiary) care, opportunities to reduce morbidity are more limited and costs associated with intervention much greater. Multimorbidity challenges the specialist model of care, as the multiple conditions do not fall into a single specialist area and interact in ways that require a breadth (rather than depth) of medical and clinical knowledge. There is, therefore, an increasing need for clinical professionals with broad, general knowledge operating at primary and community levels of the health system.

An increasing burden of multimorbid conditions at tertiary level reflects the failure of health systems to invest adequately in health promotion, primary and secondary prevention and disease management. The average Medicare patient in the United States of America with one chronic condition sees four physicians per year, while those with five or more chronic conditions see 14 different physicians per year, which in 2002 already accounted for 76% of national Medicare expenditures (4).

In countries at all stages of development, there are growing shortages of professionals in community and primary health care. A 27% shortage of adult generalist physicians is projected for the United States by 2025 (4). Similar problems have been identified in Australia and New Zealand (5), and it is determined that Brazil, China, India and the Russian Federation will have to prioritize primary care development and the redistribution of their health workforce if universal health coverage is to be achieved in those countries (6). With the shortage of generalists and the difficulty for government to redirect those with clinical qualifications to generalist primary and community-based roles, greater attention has been paid to task shifting to nursing professions and “mid-level providers” who may be equally competent in delivering a large proportion of the services traditionally provided by primary care practitioners.

In many countries, mid-level providers play a major role in providing primary care services (7, 8). In the United States, both the nurse practitioner and physician assistant professions were originally created to strengthen the primary care workforce. However, these cadres have increasingly themselves specialized and

a declining proportion now enter primary care. For instance, 42% of patient visits to these cadres in the United States were in the offices of specialists, not primary care providers, while the number of graduates fell between 1998 and 2005 (4). By contrast, in sub-Saharan Africa mid-level providers (often known as clinical officers in anglophone countries) work across primary care settings (9).

Parallel with mid-level providers, low-level workers have been increasingly promoted (10). In high-income countries, the roles of unlicensed or unregistered assistive personnel who function as patient care assistants to nurses and allied health professionals in hospital and long-term care settings has expanded. In low- and middle-income countries, community health workers have been used to improve access to care and widen promotion of health education (11, 12).

A growing body of evidence has demonstrated the value of all these low- and mid-level providers to improve patient outcomes in primary care and other settings (7, 8, 13, 14). The shorter training time for these providers has helped health systems respond more rapidly to local demands for preventive and primary care services. The HIV/AIDS epidemic in sub-Saharan Africa illustrates how mid-level provider roles have emerged and enabled primary care and obstetric services to expand (15, 16).

3. Value and effectiveness of clinical education

Trends in specialty preference vary by cadre, and most literature concerns trends for doctors, dentists and nurses. The literature for high-income countries shows an increasing trend for doctor specialization in surgical and medical subspecialties and a declining trend in the popularity of general practice. In the United States, between 2001 and 2010 there was a 6.3% decrease in the number of graduate residents entering primary care but a 45% increase in residents entering subspecialties (17). This led the United States Institute of Medicine to call for major reforms in graduate medical education, including reduced subsidy of specialized training (18).

In the United Kingdom, the proportion of medical graduates choosing general practice decreased from 45% in 1983 to 23% in 2002 (19–21). After reforms in 2004 there have been almost two applicants for every general practitioner (GP) specialty training vacancy, although the trend is in decline (22). In Germany, between 1996 and 2008, the proportion of specialists increased from 45% to 52%, while more than 2000 medical offices for general practitioners went vacant in 2009 (23). In Canada, the proportion of medical graduates in family medicine residencies fell from 32% in 1994 to 26% in 2004 (24).

National-level data on specialization over the course of a medical career in low- and middle-income countries is limited to preference surveys carried out in medical schools or hospitals. These showed high preference for specialization and low popularity of general practice (25, 26). Less than 10% of physicians in emerging markets such as Egypt, India, Jordan, Tunisia and Turkey choose family medicine (27).

Globally among dentists, willingness to undertake specialty training appears mixed. In the United States, one survey showed that only 24% of practising dentists were specialists (28), while in Saudi Arabia the majority of dentists are specialists (in areas such as restorative dentistry), but this includes a specialization in general dentistry (29). Dental students in the United Kingdom and the United States in recent years have showed increasing intent to specialize (30, 31). Likewise, an emerging trend in low- and middle-income countries is specialization, even though significant proportions of their populations are yet to access basic dental services. In Mexico, specialist dentists increased from 5% to 11% between 2000 and 2008 (32), with similar findings in Brazil (33).

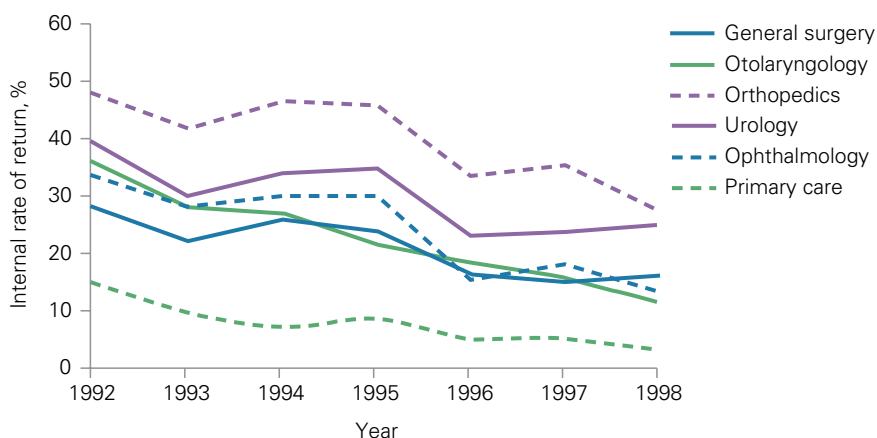
There is little longitudinal evidence that follows graduates through their training and into employment to understand career progression. This is important, because it is known that students in a clinical or primary care phase of their study are more likely to report that phase as a career preference. In Lao People's Democratic Republic, nurse students demonstrated significant differences in their respective

preferences for rural job posting compared to practising nurses (34). Gender has a strong influence on preferences, followed by career motivation and life goals (35). For instance, United Kingdom medical students cited life goals and work–life balance as key reasons for choosing general practice. There has been little evaluation of initiatives that incentivized change between specialties (including a primary care specialization), particularly in relation to continuous professional development. The impact of policy experiments that created a rural GP specialization, such as in Australia (36), is yet to be robustly demonstrated.

The trend towards specialization by doctors appears to be driven by a significantly higher rate of return to specialized education over a general medical education and a widening gap between the two in Organisation for Economic Co-operation and Development (OECD) countries, although there are outliers (37) (Figures 2 and 3).

Figure 2.

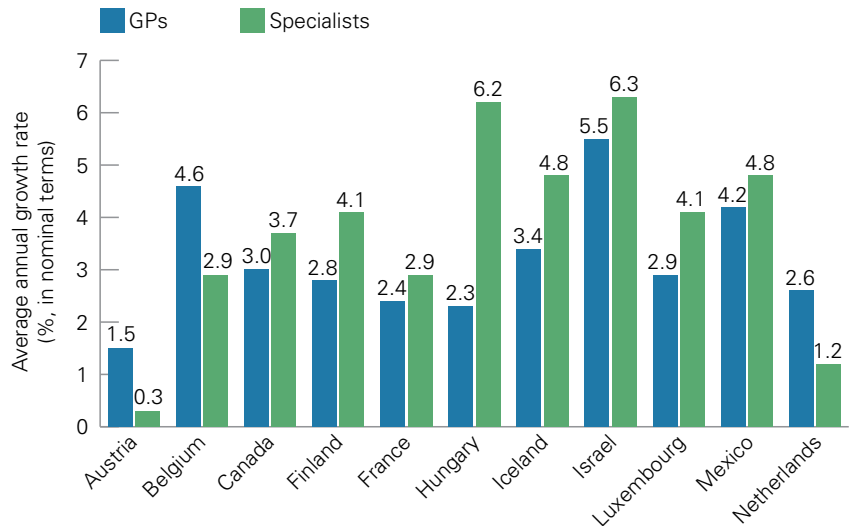
Hours-adjusted internal rate of return on additional training for five surgical specialties and primary care medicine



Source: Reprinted from The Economics of Health Professional Education and Careers: Insight from a Literature Review, World Bank (2015).

Figure 3

Growth in the remuneration of GPs and specialists, 2005–2013 (or nearest year)



Note: Growth rate for the Netherlands and Luxembourg is for self-employed GPs and specialists.

Source: OECD (37).

Studies of financial returns to specialist nurse training show more mixed results, with some types of advanced training evaluated showing negative returns (38). Differences in economic return influence the status and prestige attached to different clinical professions. This includes the influence of technology, in which certain specialist roles are associated with increasing productivity, and the greater role of specialists in institutionalized price-setting processes, such as setting reimbursement levels of major insurers. Training schools reflect those dual pressures, with organizational and cultural influences reinforcing trends towards ever greater specialization and movement away from primary care, particularly for the clinical professions but also for other health professionals.

Few studies have either evaluated separately, or included in any evaluation, the social rates of return to health professional training and specialization. However, changes

in the global burden of disease and illness suggest that social rates of return would favour generalist education, equipping health professionals to work at primary and community levels. There is evidence that training institutions based among rural or other underserved populations, and focused on primary and community care, are more successful in encouraging careers in those areas (39–41).

The market failure by which the health needs of the population are not reflected in relative pay means that clinical professionals are directed away from where they are most needed for universal health coverage. However, it should be recognized that the factors shaping higher returns to specialization are not entirely driven by market forces. Where prices and pay are in some part determined by regulatory systems, such systems are often captured by specialists who clearly face conflicts of interest in that role.

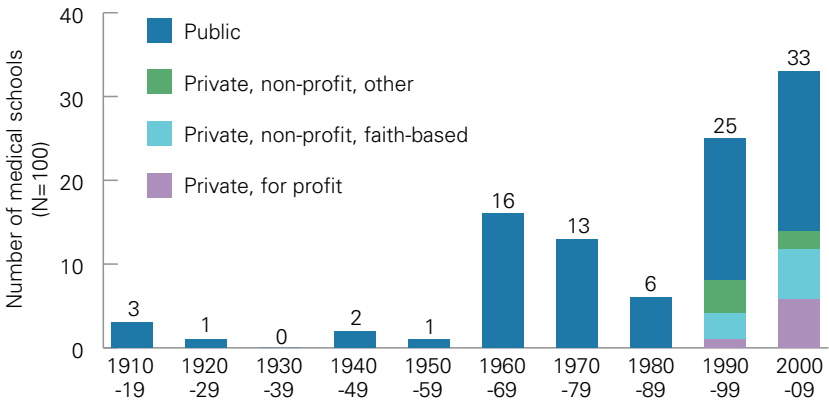
4. Evolution of health labour and care markets and their interaction with professional education

There is a marked difference between market trends in professional education in low- and middle-income countries as compared to high-income countries. Private professional training schools in high-income countries are usually state funded and non-profit-making. In low- and middle-income countries, private educational institutions have proliferated, are dependent on tuition fees, and are profit-oriented (42). Here the focus is on private education.

Private clinical and medical education of doctors has been a relatively new phenomenon in Africa (Figure 4), emerging in the 1990s and strengthening since 2000 (43). In Asia, India has more private medical schools than any other country in the world; more than half of the schools in Bangladesh, China, Japan, Nepal, Pakistan, the Republic of Korea and Taiwan (China) are private; the Islamic Republic of Iran and Mongolia have far fewer private medical training institutions, while the Democratic People's Republic of Korea, Israel, Kuwait, Myanmar, Sri Lanka and Thailand have none. In the Middle East, private medical and clinical training is wholly dominant (44).

Figure 4

Founding dates of medical schools in sub-Saharan Africa by sector



Note: Five schools did not respond

Source: Mullan et al. (43).

The growth of private education for doctors is most documented in India. Privatization of clinical education in India has been rapid, and correlated with inadequate and corrupt regulation and poor quality of teaching (45–49). With such rapid expansion, faculty shortfalls are experienced (50), multiplying concerns about the quality of education on offer. Demand for faculty members in private institutions also attracts staff from public institutions through higher wages. Faculty shortfalls in the public sector result, especially in sectors with acute shortages, such as forensic medicine and radiodiagnosis (51). In addition, public wage regulated systems, which set pay scales by seniority rather than market forces, are undermined. The task of regulation is complex in a large country with a mix of regulatory responsibilities between federal and state levels, and several studies suggest that it is ineffective (46, 49, 52).

India, Kenya, South Africa and Thailand are experiencing increased private sector provision of nurses. South African nurses graduating from private institutions increased from 45% in 2001 to 66% in 2004, while in Thailand this proportion grew from 20% in 2001 to 24% in 2010. In Kenya, 35 out of 68 nursing institutions

were privately run in 2009/2010. Concerns about quality have inevitably arisen. Over 61% of nursing colleges in India were reported as unsuitable for training nurses. Thailand was judged to have lower graduate quality among privately trained students, while in Kenya the tutor–student ratio was nearly 3 times higher in private than in public training institutions (53). In Nepal, opportunities for student nurse placements were a key obstacle to students gaining the requisite experience to graduate, thereby creating a subsidiary market in placement opportunities. Evidence also exists of failures in the licensing authority and external examination system. In addition, high demand for places in training institutions was linked to expectations of working abroad – curricula of both public and private training institutions were reformed explicitly to cater to the international market (54).

The commercialization of clinical professional training appears to be associated with a lowered quality of education that is rooted in market failure. Failures in the health care market, associated with the inability of patients to distinguish between the products of reliable and unreliable health professional training systems, allow demand for poor-quality training to rise. In all settings regulation is essential, but the capacity of low- and middle-income countries to manage the complex regulatory issues involved appears insufficient at this time.

5. Aligning health education, employment and labour markets with population health needs

This chapter has argued that the evolution of professional clinical education and health labour markets reflects underlying market failures by which the social return to those health professions that are most important for responding to population need is undervalued. However, many evidence gaps exist. There is very little evidence particularly in low- and middle-income countries. We have little understanding of the impact of mid-level providers on the health system. And there is little understanding of how the growth in private sector health professional training institutions is impacting on health and education systems generally. Taking these gaps into account, the following five policy options are proposed:

Policy option 1

Recognize the importance of market forces in professional education, training and labour policies

Any policy intended to rebalance the health system towards primary care should seek to align regulatory and market signals to support that intention. Planning and regulatory policies that ignore market forces will fail. There are examples of policies that invested in training of health worker cadres deemed in shortage while maintaining unattractive pay and working conditions, resulting in a supply of trained personnel who were hard to attract to empty posts, difficult to retain, and likely to seek further training to redirect their careers. Evidence from the United Kingdom's experiment with a sharp increase in general practice pay suggests that where market and regulatory signals are aligned, a significant and quick response in favour of primary care can result.

Practically, if the cost of education borne by any one student is deemed too expensive, low student numbers will result, as will student expectations of overall lower lifetime earnings for a career in primary care. This could be offset by redirecting public investments in health professional education.

Policy option 2

Redirect public investments in education to primary care and to low- and mid-level providers

Primary care education should receive higher public subsidy than specialist education on the rationale that public subsidy should be focused where public returns are highest. Students of clinical specializations could fund their own education on the basis that returns on specialization are mostly private. Most countries generally do not distinguish between specialist and generalist training in allocating educational subsidy. The allocation of subsidy should also reflect recognition that students from rural backgrounds are more likely to take up rural general practice, and students from lower socioeconomic backgrounds are more willing to take up community-based practice. This has been established in several contexts. Institutions in such settings should be prioritized for public investment over urban and higher socioeconomic contexts.

Education and training of mid- and low-level providers should be prioritized, as there is good evidence of a high social rate of return. This appears most effective where opportunity to specialize is limited or there is an opportunity to specialize in primary care. It is still essential to ensure that labour market signals align with any such redirection, for instance by ensuring that working conditions are attractive to new cadres. Practically, policy would need to address the ways in which new cadres substitute and complement existing cadres so that effective teams may be configured, with implications for training curricula, numbers and ongoing professional development.

Policy option 3

Balance professional with public representation in key policy and regulatory bodies that influence the rate of return within all clinical professions

A conflict of interest for professional representatives in determining the relative rates of return to specialist over generalist education is apparent if professional representatives on policy and regulatory bodies are predominantly specialists. Decisions about the investment of public resources for the public good should be separated from that of professional vested interest (promoted through professional associations and colleges). It may be difficult to ensure greater representation of generalists given the usual hierarchies within the professions; public representation may provide the more feasible route to balance. Practically, political will is needed for this to occur.

Policy option 4

Mobilize private international investment in systems for regulating private training providers

Private hospitals and training institutions could collaborate to invest in regulatory mechanisms such as accreditation for overseas practice. Current accreditation focuses on evaluating the skills of individuals interested in migration. However, there is an opportunity to improve the quality of locally employed graduates by making use of foreign accreditation standards to educate all students, in part as marketing to the middle classes that they usually serve. In this way, local education standards could be driven up. Funding could be acquired from companies that place graduates

overseas, as they have a clear profit motive to achieve higher education standards and internationally recognized rigour in their regulation.

Policy option 5

Prioritize research that includes evaluation of the social rate of return in economic analyses

Over the midterm, research to ensure that social returns are appropriately evaluated in economic analyses will assist decision-makers in government and influential regulatory bodies to reduce the impact of market failure.

Acknowledgements

This paper draws significantly on Barbara McPake, Allison Squires, Agya Mahat, Edson Araujo (2015): *The economics of health professional education and careers: insights from a literature review*, unpublished literature review prepared for the World Bank.

The Economics of Health Professional Education and Careers: Insights from a Literature Review. World Bank Studies. Washington, DC: World Bank. doi:10.1596/978-1-4648-0616-2.

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ANNEX 1: Literature search strategy

Table 1

Search terms

Entry Barrier	Nurs	Assist	Public
Specialty Choice	Doctor	Role	Private
Career Choice	Physician	Educat	
Education Market	Dent	Auxil	
Training School	Pharmac	Technic	
Vocational Training School	Mid(-)Level		
Technical Training School	Clinic		
Bachelor Training School			
Graduate Training School			
Post(-)Graduate Training School			
Rate Of Return			
Regulation			
Education Quality			
Education Impact			
Curricul			
Health Labo(u)r Market			

Note: Items in the same column were searched using the Boolean term “OR” or its equivalent and those in other columns using the Boolean term “AND”. MeSH terms were searched in PubMed only.

Table 2

MeSH terms

Higher-level heading	Subheading (not all available for all terms)
Nursing specialty	Economics
Medical specialty	Education
Career choice(s)	Manpower
Nursing education research	Supply and distribution
Nurse training school(s)	Statistics and numerical data
Education, professional	Trends
Nursing auxiliaries	

Transforming the health workforce:

Unleashing the potential of technical and vocational education and training

Julian Fisher, Keith Holmes, Borhene Chakroun

Abstract

This chapter argues that special attention should be given to education and training for the achievement of universal health coverage. An intersectoral approach to Sustainable Development Goals 3 and 4 would help to unleash the potential of technical and vocational education and training (TVET) for health workforce employment, economic growth and social equity, supporting the implementation of the 2030 Agenda for Sustainable Development as a whole.

The conventional model of health workforce education, premised upon a narrowing formal schooling pipeline, oriented towards pre-service education and training and founded on a biomedical approach, will be unable to meet the needs of the future health workforce. Significant bottlenecks are the proportion of students attaining upper secondary education and the shortage of qualified teachers, particularly in low-income countries. TVET is a well established and increasingly prominent subsector within education. Its potential for transforming the health workforce has, however, been largely overlooked. TVET, as part of lifelong learning, can facilitate school-to-work transitions, youth apprenticeships, employment and decent work, continuing professional development, recognition of prior learning, and development of the range of skills and competencies required in the health sector. The chapter identifies four related domains of policy action to unleash the potential of TVET through intersectoral collaboration: governance and programming; data, knowledge and research; innovation and technology; and funding and investment.

1. The 2030 Agenda for Sustainable Development: a basis for intersectoral action

Education and training should be a strategic priority for universal health coverage, employment and decent work, and inclusive economic growth. Stakeholders in health and social care, in their actions towards Sustainable Development Goal (SDG) 3 (Ensure healthy lives and promote well-being for all at all ages) should give focused attention to SDG 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) and the associated Education 2030 Framework for Action (1), including target 4.3 (By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university). SDG 4 recognizes that education has a unique enabling role across, between and within the SDGs. As the implementation of the 2030 Agenda for Sustainable Development (2) gets under way, it will be critical to maximize synergies to ensure that efforts towards meeting the SDGs are convergent, coordinated and mutually reinforcing.

It is important to recognize the broad scope and aims of technical and vocational education and training (TVET). According to the 2015 Recommendation concerning Technical and Vocational Education and Training, adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO),

TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn and the development of literacy and numeracy skills, transversal skills and citizenship skills are integral components of TVET (3).

TVET is a well established policy area and increasingly prominent subsector within education. It is attracting increased interest from various sectors, but has been largely overlooked for the health workforce until now. An intersectoral approach to health and education could help to connect TVET systems with strategies on

human resources for health planning, including transformative health workforce education and training, for sustainable development outcomes (4). The development of education plans for health workers aligned with national health plans should consider and take into account TVET and the implementation of the 2030 Agenda for Sustainable Development. These actions would provide diverse learning pathways needed for the expansion and continuous transformation of health and social care services and offer a better choice of courses and other learning opportunities linked to health employment. An integrated, analytical approach that combines economic growth, social equity and sustainability concerns in a balanced and strategic manner (5) could assist governments and relevant authorities to connect TVET systems, including health workforce education and training, with changing needs and demands.

This chapter focuses on the health workforce – those workers with expertise in health and social care. However, it also has relevance for the wider group of workers in health and social sectors and supporting industries (6, 7). It argues that a shift towards intersectoral SDG 3–SDG 4 planning for health workforce education and training is needed to respond effectively to evolving health needs and changes in health labour market demands, health services and local communities, including those resulting from public health emergencies. Such an approach could catalyse and drive new thinking and enhance collaboration and cooperation between ministries of education, health, labour and finance, and other ministries, professional organizations and stakeholders.

The next section of this chapter elaborates on the shortcomings of the conventional model of health workforce education and training and on why focused attention should now be given to education and training systems. The chapter then shows how TVET within a lifelong learning framework could make a powerful contribution towards expanding and transforming the health workforce.

The final section proposes four related domains of policy action to unleash the potential of TVET through intersectoral collaboration: governance and programming; data, knowledge and research; innovation and resources; and funding and investment.

2. Focused attention on education and training systems as an imperative

Globally, the demand and need for workers with expertise in health and social care is growing. Projections developed by the World Health Organization (WHO) and the World Bank identify the need to train and deploy at least 18 million additional health workers, primarily in low-resource settings, by 2030 (8).

The conventional model of health workforce education and training is premised upon a narrowing formal schooling pipeline that continues to tertiary education, and is largely founded upon the biomedical approach to health and illness. This conventional model is oriented towards formal pre-service health workforce education and training and it has limited alignment and integration with in-service training, continuing education and professional development. A rigid and narrowing pipeline model will be unable to adequately expand, enhance or diversify the health workforce sufficiently to meet future demands with respect to workforce quantity, quality and relevance. Hence focused attention on education and training systems, within the framework of lifelong learning, is an imperative.

As authorities reorient their health workforces towards people-centred and integrated health services (9), there will be new and various demands on the skills of physicians, nurses, midwives and other health workers. The conventional pipeline model cannot satisfactorily adapt competencies and skills of health workers to the evolving health needs of communities and populations or allow health workers to acquire competencies and skills necessary for effective cross-sectoral collaboration and teamwork. Furthermore, because of its orientation towards pre-service health workforce education and training, this generally impermeable model has difficulty accommodating increasing occupational and geographical mobility.

The shortcomings of the conventional narrowing pipeline model are most serious in low-income countries. Significant bottlenecks are the proportion of the student cohort attaining upper secondary education – projected to be only 26% in low-income countries by 2030 (10) – and shortages of qualified teachers. Projections for sub-Saharan Africa have indicated that an extra 2.5 million teachers for lower secondary education are needed by 2030 (11, 12). Teacher supply for upper

secondary education and specialized programmes at the post-secondary and tertiary levels is also a constraining factor.

Non-inclusive and inequitable access to formal schooling is a compounding issue. Communities in rural settings suffer disproportionately (13–15). Poorly nourished children are more likely than well nourished children to have lower levels of school enrolment and complete fewer years of schooling (16). Girls from poor backgrounds are particularly at risk of being out of school. The lack of health workforce students from rural areas is a major reason for the inadequate supply of rural health workers in developing countries. Yet a health workforce that is fit for purpose and fit to practice in rural and remote areas will be crucial to instituting and maintaining universal health coverage with primary health care access (17).

A significant barrier to increasing the number of primary and secondary school graduates is the dramatic shortfall in the number of teachers; resultant overcrowded classrooms lead to poor-quality learning, a restricted number of subjects available and very limited, if any, capacity for career guidance.

The uneven geographical distribution of health workforce education and training facilities at national and regional levels reinforces unequal access and lack of inclusiveness, restricting numbers and limiting the diversity of potential health workers (18). University-level health workforce education and training is inadvertently biased towards urban settings and is most abundant in wealthier countries.

The privatization of health workforce education and training in low- and middle-income countries is rapid and insufficiently regulated. Faculty recruitment, retention and increased mobility are also acute challenges for low-income countries. For example, in the Eastern Mediterranean Region, countries are experiencing serious shortages due to out-migration to high-income countries (19).

The critical shortage of health workers is only part of the problem. WHO guidelines include quality and relevance as core issues that must be addressed

in the expansion and reform of health workforce education and training (20). The conventional knowledge transmission approach does not adequately prepare health workers, and the biomedical model of health and illness is not well suited to the development of integrated, people-centred health services. Together, these two approaches act as a constraint to advancing understanding of the social determinants of health (21, 22). Despite the shortcomings of conventional models, health workforce education and training institutions have typically given insufficient attention to advances in education research, pedagogical innovations and lifelong learning. A strong focus on education and training system reforms, and the potential of TVET in particular, is essential.

3. Unleashing the potential of TVET for transforming the health workforce

Because of its roles in the development of skills in a wide range of occupational fields and sectors, TVET is a well established policy area that finds itself at the centre stage of the 2030 Agenda (23). So far the potential of TVET for transforming the health workforce in support of universal health coverage is largely untapped and unfulfilled. This is partly due to the priority that has been given to hospital- and university-based education and training at the undergraduate and postgraduate levels over learning in other settings, through other modalities and at different levels.

It is important to recognize the broad scope and significance of the 2015 Recommendation concerning Technical and Vocational Education and Training (3). TVET can potentially offer future and current health workers inclusive, accessible and flexible interconnected learning opportunities for the development of low-, middle- and high-level skills that are responsive to community needs. For example, social protection or first job programmes could help motivate young people to initiate learning and career pathways in health occupations.

TVET can take place at different levels and sites, and as such might play a role in helping to connect education subsystems, including health workforce education and training. Schools, colleges, universities and other tertiary education institutions, community-based learning facilities, and health workplaces could gradually become integrated learning centres, which together – as learning networks – would become

mutually reinforcing. TVET could also be a strategic modality for addressing inequalities and promoting equality of opportunity in learning and the world of work, thereby promoting gender equality, social inclusion and social cohesion.

TVET within a lifelong learning framework could help to establish diverse learning pathways with multiple entry and exit points, supporting learning and career progression. Learning pathways could enable learners to navigate between different sites or levels and to gain recognized skills and qualifications throughout the life course. Together, such learning networks and learning pathways could form more flexible and responsive lifelong learning systems.

To promote lifelong learning, many countries have developed a national qualifications framework as an enabler of effective education, training and employment policies, and a strategy for strengthening the governance of labour market and qualification systems.

Qualifications frameworks have been adopted to address various policy issues, including coordinating and improving education and training quality; making qualifications more responsive to labour market needs; assisting citizens who have been historically excluded from national education, training and skills development systems; supporting horizontal and vertical mobility within and between countries; and fostering learning and the development of learning and career pathways (24).

The development of national education plans for health workers aligned with national health plans should take into account the strategic potential of TVET. A better choice of courses and other learning opportunities linked to health sector employment should foster the expansion and continuous transformation of health and social care services in support of universal health coverage (25).

Such education plans for health workers would help to promote the role of teachers and students in developing creative and critical thinking in interaction with other actors. This would advance understanding of the synergies between learning pathways and health pathways. Extending the concept of lifelong learning, including the provision of global citizenship education (26), to include early childhood can help harmonize home, family, health and educational environments over time. This

should support intergenerational health and social care and implies a long-term relationship between people, providers and health systems.

Other sectors are already benefiting from TVET in terms of the quality and relevance of their workforces, youth employment and decent work, equity and gender equality, and inclusive and sustainable economic growth (27, 28). Multistakeholder education and health systems would need to be increasingly networked to support learning and complex interactions between their subsystems, as described by the Lancet Commission (29).

Health and education systems are highly contextualized. The shape and form of TVET within a lifelong learning framework should be responsive to domestic circumstances and the evolving global, regional and national health workforce education and training environment. By drawing attention to issues around the development relevance of education, TVET can also promote learning about environmental sustainability as a citizenship and values education issue as well as an important workplace issue.

The 2015 Recommendation concerning Technical and Vocational Education and Training (3) provides policy-makers with guidance and a strong impetus for intersectoral action in the field of lifelong learning. Furthermore, UNESCO's Executive Board has recently adopted a new strategy for TVET for the period 2016 to 2021 (30).

To unleash the potential of TVET for the health workforce, intersectoral policy action could be taken in the following interrelated domains: governance and programming; data, knowledge and research; innovation and technology; and funding and investment.

4. Implications and policy options

The following subsections elaborate upon the four interrelated domains and policy options.

4.1 Governance and programming: key policy messages

A joint intersectoral SDG 3–SDG 4 approach can build and strengthen cooperation within, between and across education and training systems, enabled through multistakeholder governance arrangements, joint planning and accountability mechanisms. TVET could facilitate such an approach and should be prioritized as a modality characterized by diverse programmes, proximity to the world of work, interconnecting learning pathways and career guidance for social mobility. Social accountability mechanisms can ensure that TVET within a lifelong learning framework is responsive to the evolving health needs of communities and attuned to national and local contexts. The skills and skills mix of the future health workforce, and the teachers and trainers required, should be taken into account.

Joint intersectoral SDG 3–SDG 4 planning could catalyse and foster the implementation of TVET for the health workforce within a framework of lifelong learning. This will necessitate a change in approaches to policy and strategy, shifting from prioritizing investment in the rigid, selective and specialized pre-service education and training pipeline towards the development of more flexible lifelong learning systems. Such changes could include intersectoral approaches to the design of learning and career pathways for all levels, and mechanisms for developing learning pathways and school-to-work transition programmes for unemployed youths into the health sector. Policy-makers should examine and reflect upon the processes by which health and education sectors can best cooperate to support the implementation of the 2030 Agenda.

New, more participatory governance arrangements and institutional mechanisms should be implemented that reflect the need for shared accountability between the ministries responsible for health and education and other related ministries, agencies and relevant stakeholders. Efforts in health include the Roadmap for Health Measurement and Accountability and the 5-Point Call to Action supported by

WHO, the World Bank and the United States Agency for International Development (USAID) (31).

Sector skills councils or similar apex bodies could develop plans to admit, educate, train, deploy, develop and retain health workers, according to health and social care needs, the absorptive capacity of labour markets and development contexts. This could include the development of national education plans for health workers – with an emphasis on youth employment and part-time work – that are aligned with national health plans.

The case of India, a country taking significant actions towards transforming the health workforce, is informative here (Box 1).

Box 1

Transforming the health workforce in India

In India, the National Human Resources for Health Cell in the Ministry of Health and Family Welfare seeks to ensure coordinated and collaborative efforts towards generating a skilled and qualified health care workforce. The cell provides constant policy and technical support on overall issues related to human resources for health (HRH), including and going beyond existing cadres in the health system. It assists in quantifying and forecasting the need for various health care professionals and in generating evidence for effective policy formulation in close coordination with the states. The cell advocates and is working towards the scale-up of innovative models on HRH issues, including transforming health workforce education in support of universal health coverage and liaising with stakeholders to build strategic intelligence and strengthen capacity in the relevant departments of the ministry. It aims to facilitate the creation and maintenance of a national health workforce registry. The cell currently works closely with and provides technical

(continued on page 291)

expertise to the departments responsible for medical, nursing, allied health (including pharmacy) and dental education.

The Ministry of Health and Family Welfare is currently considering innovative models of care, including integrated health care teams and greater use of cadres such as physician assistants, nurse practitioners and integrated behavioural health counsellors. It is focusing on standardizing the education, training and practice of various unregulated allied and health care professionals. Experts within various technical teams are working to develop progressive career pathways in health care with desired qualifications and experience in addition to a competency-based curriculum. This involves dialogue and coordination with multiple public and private stakeholders, more than 1000 specialized institutes across the country, professional associations and regulatory structures, including state councils, the Rehabilitation Council of India, the Medical Council of India and the Indian Nursing Council.

Sources: 32, 33.

Lifelong learning is facilitated by systems for the recognition, validation and accreditation of learning and competencies. National quality assurance and accreditation agencies, sector skills councils and other apex bodies can contribute to regulation through accreditation, licensing and registration processes. The relicensing of health workers should be linked to in-service training, continuing education and professional development to ensure that competencies relevant to the evolving health needs of populations are maintained and updated (34, 35).

Particular efforts should be made to ensure lifelong learning opportunities, including through TVET, for all health workers. Physician assistants and similar cadres provide essential services, especially to rural and underserved communities. Box 2 presents the example of clinical associates in South Africa to illustrate the versatility of such cadres.

Box 2

Clinical associates in South Africa

“Clinical associate” is a category of health professional introduced in South Africa in 2008 with the aim of expanding human resources for health capacity within the health system. Since then the focus has been on increasing access to care, not only in district hospitals, but also for rural, underserved communities. The first group qualified from Walter Sisulu University in 2011. Clinical associates provide medical services within their scope of practice, as delegated to them by the supervising physician. Their practice is team based.

The competency-based curriculum is nationally standardized. It is a three-year Bachelor of Clinical Medical Practice degree, which qualifies for registration with the Health Professions Council of South Africa. Currently there are three universities training clinical associates: the University of Pretoria, Walter Sisulu University and Witwatersrand University. Most clinical associate students at the University of Pretoria are recruited from rural areas, where there is a huge shortage of doctors; graduates are required to go back and work in their communities for three years after qualifying. The South Africa Military Health Service also benefits by using clinical associates to help strengthen its medical teams.

Sources: 36–38.

Accreditation standards that include social accountability as an integral element could help to ensure that health workforce education and training is attuned to national and local contexts. As an element of national education plans for health workers, in-service training, continuing education and professional development should take into account national policies, strategies and plans for transforming TVET, and strategies for integrated people-centred health services (39). A social accountability framework, such as that developed and implemented by Training for Health Equity Network (THEnet) schools (40), provides peer-developed strategies

and tools to move educational programmes towards meeting changing health and health system needs.

Job and career mobility across national boundaries and new patterns of knowledge and skills transfer call for policies and mechanisms that recognize, validate and accredit formal, non-formal and informal learning (35). Forecasts of the skills and skills mix needed in the future health workforce, and the teachers and trainers required, should be conducted, taking account of relevant factors, including an understanding of outward and return migration. Transforming education and training for the achievement of universal health coverage will require institutional and instructional reforms (25). At an institutional level, selection and admission policies for health workforce education and training programmes should seek to broaden the socioeconomic, cultural and geographical diversity of students, in line with recommendation 7 of the WHO guidelines on transforming and scaling up health professionals' education and training (41). TVET could build and strengthen capacity to empower and enable the recruitment and training of local students from underserved areas (42, 43). Similar approaches should be introduced for the expansion of institutional teaching staff through the recruitment of community-based clinicians and health workers as educators, as suggested by recommendation 3 of the WHO transformative education guidelines (41). This should be accompanied by reward systems and merit-based career development opportunities with appropriate levels of flexibility and autonomy.

Institutional commitment and leadership are required. Curricula for health workforce education and training programmes should be developed through multistakeholder partnerships and the active participation of communities, with special attention to those in geographically disadvantaged areas, in line with recommendation 4 of the WHO transformative education guidelines (41). This should be accompanied by mechanisms to ensure regular and continuous review of curricula with stakeholders, and programme delivery measured against the attainment of core competencies and national education plans for health workers. Box 3 illustrates how a change of mindset across the Ateneo de Zamboanga University School of Medicine in the Philippines has empowered socially accountable and transformative health workforce education and training.

Box 3

People-centred and integrated health services in the Philippines

In contrast to the conventional approach, Ateneo de Zamboanga University School of Medicine in Mindanao, Philippines, develops and structures learning around local community health problems and priorities. The curriculum combines competency- and problem-based instruction with experiential learning in the community, using an approach that is responsive to the changing patterns of health care development and the needs of communities, and sensitive to the social and cultural realities of south-western Mindanao.

The two notions underlying the approach – that health is produced socially and that health care should include both treating illness and addressing the social determinants of health – have major implications for the training needs of doctors. As doctors have considerable influence in health programmes, any paradigm shift must start with redesigning doctors' training. Ateneo de Zamboanga University School of Medicine is pioneering innovative use of social media to connect, communicate and empower community-based and community-engaged learning.

Ateneo de Zamboanga University School of Medicine is part of the Training for Health Equity Network, which is a growing global movement advocating socially accountable and transformative health workforce education.

Source: THEnet (44).

Strategies for interprofessional education for collaborative practice (IPECP) should ensure that two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes. IPECP should promote a culture of team-based critical enquiry and reflection and should take place in both academic

institutions and workplaces, including in primary health care settings, in accordance with recommendation 9 of the WHO transformative education guidelines (41). IPECP competencies and skills, including cross-sectoral interprofessional collaboration, play an important role during global health emergencies and health crises and can be essential to improving health outcomes (45).

Health workers should be educated on the social determinants of health and use this knowledge in their practice. Education that enables health workers to address and take action on the social determinants of health, including the Health in All Policies approach (46), should be integrated into the assessed health workforce education curricula.

It will be important to recognize the tensions involved in the politics of health and education policy change. Mechanisms for inclusive and transparent dialogue should be an integral part of intersectoral SDG 3–SDG 4 planning and partnerships.

4.2 Data, knowledge and research: key policy messages

Knowledge and information systems for TVET – including research on labour market health and social trends – should be built and strengthened across sectors, and should ensure interoperability and comparability for monitoring and evaluation, including with WHO national health workforce accounts. Performance evaluations should assess how an intersectoral approach contributes to, or influences, health outcomes and sustainable development.

Information and data at all levels will be critical to support evidence-based intersectoral SDG 3–SDG 4 planning, and to monitor and evaluate health workforce education, training and opportunities for lifelong learning. Intersectoral approaches can assist in reducing duplication, as well as in helping to produce dividends in terms of the interoperability of data and comparability for monitoring and evaluation over time and space. Approaches should include analysis of contextual information and data from other SDGs where relevant and appropriate.

Education data collection and analysis within a lifelong learning framework would enable a better understanding of how learning outcomes from early childhood,

primary and secondary education relate to the quantity and quality of potential entrants into the health workforce and their eventual geographical distribution and retention where most needed. Health professional graduate tracking, such as the longitudinal tracking system for graduates of the James Cook University in Australia (47), could provide valuable data on education and employment outcomes. Tracer studies of primary and secondary school leavers are needed to provide a more complete picture to inform and guide health workforce education and training planning (47), including in-service training, continuing education and professional development.

Data are also needed on entry into and participation in health workforce education and training. For many countries, some data are available on graduations from tertiary health and welfare programmes at International Standard Classification of Education (ISCED) level 5 and above (48). However, more data are needed on ISCED levels 2, 3 and 4, which will be crucial for SDG 3 and SDG 4.

WHO national health workforce accounts (49) and health workforce registries are first steps toward standardizing the health workforce information architecture. Efforts have been made to support the lifelong learning approach, including the use of disaggregated data for national and subnational decision-making. The inclusion of TVET and adult learning and education in data collection and analysis for national health workforce accounts would enhance data sharing for the 2030 Agenda as a whole. An example is the Health Data Collaborative, a new initiative working on a common agenda in health measurement and accountability and tracking progress towards SDG 3 and the broader 2030 Agenda (50).

4.3 Innovation and technology: key policy messages

A priority policy action is to ensure that TVET is integrated into transformative planning and reforms of health workforce education and training in order to promote diverse learning pathways; bridging and youth transition programmes; apprenticeships; work-placed learning; the acquisition of transversal employability skills; the recognition of prior learning; certification; career guidance; and other innovative strategies to foster lifelong learning. Information and communication

technology (ICT), open and distance learning, and teleworking will expand opportunities to enter and navigate the world of work.

Joint SDG 3–SDG 4 collaboration should support the development of innovative systems to expand and transform health workforce education and training (51, 52) in support of universal health coverage and lifelong learning. While institution-based programmes will remain important, work-based learning and apprenticeships are part of a growing trend towards hybrid programmes and a diversification of learning pathways. Hybrid approaches should seek to develop both technical and applied experiential knowledge, skills and attitudes that are relevant to the world of work. Institutional commitment should involve synergizing and distributing all the resources available, including open educational resources, by blending face-to-face instruction and digital networking as appropriate (53).

Apprenticeship (54) is a social institution with a long history, having ensured, over centuries, the transmission of work skills from one generation to the next. Around the world apprenticeship takes different forms, including traditional apprenticeships, which are self-organized. Many countries are exploring the option of introducing or improving apprenticeship schemes as a way to better address youth employment and skills mismatches. Efforts are under way to modernize and formalize informal and traditional apprenticeships as a way to expand quality TVET (Box 4). UNESCO notes that promoting learning for the world of work has led to one of the most significant trends in vocational education in recent years: a rediscovery of the value of apprenticeships (55).

ICT is a major driving force for change and innovation in the health and education sectors but its relative absence in low-income countries is a significant constraint. Health workforce education and training must take advantage of rapid technological advances, while acting proactively to ensure wider development benefits and equitable learning opportunities. The potential of ICT for education and training, including distance learning and massive open online courses (MOOCs), should be explored for driving learning and innovation by individuals and organizations.

ICT can help to build lifelong learning systems that can enable all actors and providers to be responsive to changing workplace needs and demands (60). However,

Box 4

Apprenticeships in Benin, Malawi and the United States of America

Benin has sought to modernize its traditional apprenticeships into a regulated dual training system that is designed to help young, uneducated individuals to acquire vocational qualifications. The system works through the employment of traditional master craftspersons, who train their apprentices to the level of *Certificat de Qualification Professionnelle*. These trainers are themselves invited to update their skills beforehand, with the intention of improving the quality of the training given to apprentices (56).

In Malawi, traditional apprenticeship is widespread. It is self-organized with apprentices receiving no or little pay during the training period. The quality depends largely on the master craftsmen or craftswomen and the economic fortunes of the business. Trades in which traditional apprenticeship is common include baking, basket weaving, bicycle repair, boat building, construction, tailoring and net mending. Trainees from the traditional apprenticeship system have the option to undergo trade testing in specific trades (57).

The Ready to Work Partnership in the United States of America is an initiative to support and scale up innovative collaborations between employers, non-profit organizations and federal job training programmes to help connect ready-to-work Americans with ready-to-be-filled jobs (58). The partnership supported the District 1199C Training and Upgrading Fund, which launched a Community Health Worker Apprenticeship with local employers and expanded employment of nurses and health information staff at Temple University Health System, the Children's Hospital of Philadelphia, long-term care facilities and physician practices (59).

evidence is emerging of knowledge inequalities, in terms of ICT literacy, access to quality information and the financial burden in paying for access, materials or information. Innovation and expanding opportunities should therefore give due attention to social inclusion, equity and social protection, including gender equality considerations (61). Workplace and home-based learning, especially for women in part-time employment, could be supported and enhanced through the use of blended learning, mobile technologies and the use of social media. Data protection and ethical considerations of patient and learner information and data also deserve increased attention.

A promising strategy for promoting lifelong learning is the introduction of mechanisms for the recognition of prior learning (RPL). The full spectrum of formal, non-formal and informal learning and training outcomes deserve to be valued and validated, and RPL could support entry to and mobility within and between occupational areas. The potential benefits for the health workforce of RPL and other innovations in the area of qualifications should be explored, drawing insights from relevant country experiences. In France, for example, 46 576 people were awarded a qualification in health and social care between 2008 and 2014 through RPL assessment processes (62). In the United Kingdom, the Belfast Health and Social Care Trust took a multi-agency approach to RPL with the aims of improving the qualification level of health care support workers, increasing access to the nursing profession and creating a more diverse workforce (63).

4.4 Funding and investment: key policy messages

Intersectoral accounting methods for disaggregated expenditures are needed. Funding should be mobilized from diverse sources – domestic and external, public and private – and leveraged to reinforce intersectoral cooperation for sustainable development. Effective co-financing and targeted investments can promote health equity and gender equality, especially through prioritizing the development of nurses and midwives.

Ministries of finance have an important role in supporting an effective and equitable financing and investment architecture that should strengthen the intersectoral collaboration between health and well-being on the one hand, and education and lifelong learning systems on the other hand (25).

Domestic public spending on education and training as a percentage of total public spending is below what is required (64, 65). Reviews of 2014 data on aid to education show that there is little sign of that situation changing. Around the world, especially in low-income countries, millions of children and young people are paying the price, in years of lost or low-quality schooling (66).

The proportion of total public expenditure on education dedicated to health workforce education and training is largely unknown. Private finance for health workforce education and training is growing rapidly, but efforts are needed to strengthen the regulatory environment to ensure the quality and relevance of learning outcomes to the world of work and to the evolving needs of communities.

Intersectoral policy dialogue among the relevant ministries, including ministries of education, health and finance, would support the conversations and networking that would facilitate the development of intersectoral SDG 3–SDG 4 skills councils or similar apex bodies. The formation of such apex bodies could support and enable effective channelling of resources and investments to increase the quantity and improve the quality and relevance of the health workforce. Mapping and tracking investments in health workforce education and training should help to inform investment priorities for countries at various levels of development. TVET can facilitate assessment of new economic opportunities and can act as an entry point to wider industrial or trade and investment strategies. However, returns on investment in TVET are not only economic (Box 5).

Measuring the return on investment in TVET

The report of a UNESCO-UNEVOC virtual conference on measuring the return on investment in TVET notes that:

The recent international attention to the importance of education might encourage governments and other stakeholders to explore the return on investment (ROI) from investing in TVET, and understand the different types of benefits individuals, enterprises and governments obtain from investing in training. Although TVET systems are often considered in relation to labour market outcomes, the benefits TVET brings to individuals, employers and society are not only economic. The country context (political, economic and education system) and the types of stakeholders involved also have an influence on the ROI in TVET (67).

The International Labour Organization (ILO) analysed case studies that used cost-benefit calculations to assess returns on investment in apprenticeship. The findings underscored the “overall consensus on the fact that apprenticeships bring value to the companies across different trades, sectors and regions”. The report highlights that such surveys also assess additional qualitative benefits, such as retention and the contribution of apprenticeships to overall work culture, aiding understanding of the hiring motivations of enterprises. It finds that hiring apprentices yields both monetary and qualitative advantages, which are highly relevant to health workforce employment and economic growth (68).

Multilateral agencies could play a critical role in helping countries to navigate different types of innovative finance and facilitate partnerships between the government and private investors interested in supporting education (69), bearing in mind that “education is a public good, a fundamental human right and a basis for guaranteeing the realization of other rights” (1).

Joint SDG 3–SDG 4 planning should identify and coordinate domestic public investment, with public subsidy considered where there is good evidence of high social returns (70), for example in cadres such as nurses and midwives. These efforts could promote health equity and gender equality to ensure that efforts towards the SDGs are convergent, coordinated and mutually reinforcing.

Agenda 2030-wide scoping exercises for financing health workforce education and training could include assessing the merits of innovative funding mechanisms that could deliver a triple win for health, employment and education. While the various options need to be carefully assessed and explored, one option might be measures to reclaim costs from, or to introduce a levy on, the private cross-border recruitment of health workers that have completed publicly funded education and training. The funds generated could be reinvested directly into future health workforce education and training.

Disclaimer

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Enabling universal coverage and empowering communities through socially accountable health workforce education

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Abstract

This chapter presents contemporary evidence on the positive role of socially accountable education in improving the availability, distribution and impact of health workers. Evidence is presented from a variety of country contexts, including Australia, Bolivia, Brazil, Canada, Cuba, the Philippines, South Africa and Thailand.

Key strategies of this agenda include alignment of education curricula to community needs, targeted student selection with priority given to underrepresented populations, interprofessional training in underserved locations and in areas of need, expansion of faculty in rural areas, and close partnership with communities. The socially accountable interprofessional stepladder programme of the School of Health Sciences, University of the Philippines Manila (UPM-SHS), which utilizes these strategies, is provided as one important example. A recent study highlighted that UPM-SHS medical graduates were 10 times more likely to practise in small towns and 8 times more likely to practise in poorer towns than graduates of more traditional medical schools in the same region, with over 80% of UPM-SHS midwifery, nursing and medical graduates choosing to remain in underserved regions.

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ABSTRACT *(continued)*

To reduce inefficiencies and maximize benefit from such strategies, governments and education institutions should engage in cross-sectoral participatory planning, increase their investment in underserved regions, and apply the concept of right-touch regulation to ensure quality.

1. Introduction

The health workforce is increasingly being recognized as central to delivering on the ambition of the 2030 Agenda for Sustainable Development (1). Improving the availability, relevance, distribution and performance of the existing and future health workforce is critical to making progress towards the Sustainable Development Goals (SDGs), including poverty elimination (SDG 1), quality education (SDG 4), gender equality (SDG 5), decent work and economic growth (SDG 8) and reduced inequalities (SDG 10) (1).

The Ebola epidemic in West Africa is a reminder of the devastating consequences to human health, peace and prosperity that results from health systems with too few, poorly distributed, and inadequately trained and supported health workers. The estimated US\$ 2.2 billion loss of gross domestic product (GDP) traceable to the epidemic in Guinea, Liberia and Sierra Leone in 2015 threatens not only health and economic stability but also food security and private sector growth (2).

The Global Strategy on Human Resources for Health: Workforce 2030 highlights the growing mismatch between health workforce demand and supply and population needs (3). It speaks not only to increasing investments in the health workforce but also to the need to optimize the current and future health workforce to better address the needs of populations, particularly those who are underserved. The less educated and the poorest members of society, along with migrants, minorities, and those living in rural and remote areas, are often the most neglected (4).

The disconnect between national health and education systems, as well as the absence of cross-sectoral and multistakeholder collaboration in financing, planning and evaluation, has resulted in health systems that are fragmented, inefficient and costly (5–7). Fragmentation and inefficiencies are also challenges within health workforce education systems (8).

Most efforts to address health workforce shortages have focused on the planning and scaling up of production of health workers without taking into account labour market challenges (9). The effects of institutional and educational strategies on where graduates choose to work and their career choices have also been largely ignored. Several long-standing challenges continue to hamper much needed reforms in health workforce education and regulation. These include education strategies and programmes designed by particular professions with inadequate focus on population health needs; a notable lack of learning in the primary care, community settings where many graduates are expected to work; insufficient focus on interprofessional learning, collaborative practice and teamwork; student admission policies that are not optimized for recruitment or retention of graduates in underserved areas; community-based health workers and unregulated cadres that are not formally supported or incorporated into the workforce; weak or absent accreditation and quality assurance systems; and a lack of education and career pathways that promote recruitment and retention in underserved areas (5, 8, 10).

While the challenges are complex, evidence is emerging that socially accountable health workforce education, which aims to ensure that education programmes are relevant to the local context and that needs are identified in collaboration with key stakeholders, can strengthen health systems and positively influence the availability, distribution and performance of health workers (8, 11–17). For example, an evaluation of schools with a social accountability mandate showed significantly higher graduate deployment and retention rates in underserved communities compared to graduates from traditional schools (18). Another recent study demonstrated that the presence of students and graduates from socially accountable schools in poor rural communities in the Philippines is

associated with significant improvements in the level of care infants receive in their first five years, as well as with an increased utilization rate of local health services (19). Investment in the Northern Ontario School of Medicine (NOSM), a new socially accountable medical school where students spend close to 50% of their time learning in 70 rural and remote communities, resulted in increased graduate retention in rural areas and a total economic contribution of Can\$ 67.1 million (14).

Key strategies associated with social accountability in health workforce education include the alignment of curricula with local needs, targeted student selection, training taking place in the primary care contexts in which graduates are expected to serve, regional postgraduate training and career pathways in underserved regions, interprofessional education and practice, and meaningful partnerships with communities and other stakeholders. The Training for Health Equity Network (THEnet), a partnership of health professional schools committed to social accountability, has identified common effective strategies of their member institutions. These strategies are aimed at preparing a fit-for-purpose workforce that is motivated and empowered to work in areas where the needs are greatest (Box 1) (18).

Box 1

Social accountability within health workforce education

WHO definition of socially accountable workforce education institutions

The World Health Organization (WHO) has defined the social accountability of health workforce education institutions as: “The obligation to direct their education, research and service activities towards addressing the priority health concerns of the community, region, or nation they have a mandate to serve. The priority health concerns are to be identified jointly by governments, health care organizations, health professionals and the public.”

Source: Boelen and Heck (21).

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BOX 1. (continued)

Social accountability within health workforce education

Common health workforce education strategies practised by socially accountable partner schools of the Training for Health Equity Network

1. Education, research and service programmes are designed to meet the health and social needs of the communities the school serves, identified in collaboration with communities and other stakeholders.
2. Students are selected from communities with the greatest health needs or those deemed most likely to be willing to work in underserved areas.
3. Programmes are located within or near the communities the school serves.
4. Much of the learning takes place in the settings in which graduates are expected to work – in communities, instead of mainly in university classrooms and teaching hospitals.
5. The curriculum integrates basic and clinical sciences with population health and social sciences and includes the social determinants of health. Early contact with patients increases the relevance and value of theoretical learning.
6. Learning methodologies are learner centred (including service learning), emphasize teamwork, and are supported by information technology.
7. Community-based practitioners are recruited and trained as educators and mentors.
8. Educators and programmes model commitment to public service.
9. Social accountability is reflected across all departments and in the commitment from the leadership.
10. Schools collaborate with health system partners to produce locally relevant competencies and evaluate the impact of their strategies.

Source: Pálsdóttir and Neusy (22).

The example of Brazil shows that positive change also requires investment and reform at system level. Brazil's comprehensive approach doubled the number of interprofessional primary care-oriented health teams in 10 years. During that period, under-5 mortality dropped from 58 to 15.6 per 1000 live births, and neonatal mortality fell from 26.8 to 9.7 per 1000 births (20).

The remainder of this chapter considers the existing social accountability education strategies that are taking place across countries, as well as emerging evidence of their impacts. Evidence on current reforms at the education institution level is presented first. This includes a focus on transforming curricula; community engagement to better address needs; targeting student admissions; and the recruitment, development and promotion of community-based faculty. The chapter then discusses reforms under way and needed at government and system levels, including a focus on integrated and participatory policy development and planning and prioritization of investments in rural and primary care settings. Evidence is then presented on the reforms required to ensure a health workforce that is of good quality and accountable to those it serves.

This chapter offers as substantive a literature review as possible within the given time frame, including published articles, grey literature, and relevant global reports and guidelines, as required to provide input to the deliberations of the High-Level Commission on Health Employment and Economic Growth. Available evidence on the effect of system- and governance-level reforms, often in their early stages, is scarce. Current research on the impact of education strategies and programmes being conducted in high-income countries tends to focus on medical (and to a lesser extent nursing) education, and on the impact on learners rather than on communities or patient outcomes, thus limiting the available evidence. The evidence presented in the chapter was reviewed by an interdisciplinary panel of health workforce education experts. The panel jointly selected the policy options that are being put forward.

2. Reforms at education institution level

2.1 Transforming what, where and how students learn to better address needs

Curriculum reform must be viewed in terms of what is being taught, how the curriculum is developed and implemented, and where the learning takes place.

In many countries there is a lack of alignment between health workforce education and changing health and health service needs (5, 8). Traditional education approaches have focused more on curing disease than keeping people healthy, and often fail to provide learners with an understanding on the importance of addressing the social determinants of health. For example, the University of New Mexico screens patients for challenges related to the social determinants of health at its primary care clinics. It also trains community health workers to help patients obtain the social services that address the needs that the screening identifies. Identifying and addressing social determinants of health of high-need and high-cost patients resulted in a fourfold return on investment, due to a decrease in emergency room visits, hospitalization, and medication use, and an increase in the use of primary care services (23).

How needs are defined and curricula are developed is also of importance, and community engagement is a key approach of social accountability education. Schools work with community representatives and other stakeholders to design their curricula in line with the needs of the regions they serve. Communities can be involved in selecting students, acting as simulated patients, and evaluating programme impact. Community-engaged education builds social capital¹ (24, 25). Social capital encompasses interdependent and mutually beneficial relationships between education institutions and the communities they serve. Coupled with equitable provision of health services, partnerships involving communities, education institutions, and the health and social service sectors can increase human security and reduce costs by tapping into social capital, local human resources and community assets (25).

¹ Defined by Robert Putnam as “connections among individuals in social networks and norms of reciprocity and trustworthiness that arise from them” (24).

Learning locally relevant competencies is also enhanced by expanding the learning environment beyond university classrooms and hospitals to secondary and primary care settings. Hence, the dental education programme of the University of Tromsø, which focuses on increasing the dental workforce in northern Norway and developing competencies related to the public dental health services in the region, does so through a community-oriented and decentralized education model (26).

At the Ateneo de Zamboanga University School of Medicine in the Philippines, the curriculum incorporates 12 priority health needs in the region it services, and students spend 50% of their time in rural and remote communities, where needs are the greatest. There students gain an understanding of the cross-sectoral nature of health (16).

While sceptics have suggested that moving training away from hospital settings compromises the quality of the education, studies show positive impacts on student competencies and performance in national licensure exams, with rurally based students doing as well as, and many doing better than, their urban counterparts (16, 27, 28).

Moreover, there is evidence that aligning curricula to local needs and training students in the context in which they are expected to work not only prepares a more fit-for-purpose workforce but also increases the likelihood that graduates choose to work in primary care and rural settings (8, 26, 29).

By focusing on needs as well as patient- and community-centred care, social accountability innately calls for building team-oriented competencies. Training in rural and resource-constrained settings, where there is frequently a shortage of health workers and resources, provides students with excellent opportunities to learn how to work in effective interprofessional teams, a strategy deemed by WHO to play an important role in mitigating the global health workforce crisis (Box 2) (8).

In addition, community-engaged learning adds value when students increase the quantity and quality of services in underserved communities (30). A recent study indicates that the presence of students and graduates from social accountability schools in poor rural communities in the Philippines is associated with significant

Box 2

Interprofessional education and collaborative practice

There is now evidence to show that effective *interprofessional education* enables effective *collaborative practice*, which has a direct impact on quality of care (33). The term “Interprofessional” recognizes the indivisible and mutually reinforcing work of the health and social sectors in health systems and improving health outcomes, which aligns with the WHO definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.² Interprofessional education – when two or more students from the broad continuum of health or social care occupations learn about, from and with each other – is a key recommendation for transforming health workforce education (8) and reorienting the health workforce for integrated people-centred health services (34).

Collaborative practice as defined by WHO empowers and engages people and communities to take charge of their own health. A fit-for-purpose worker in the health and social sector is someone who has learned how to work in an interprofessional team for collaborative practice and is competent to do so. Interprofessional education and collaborative practice support the skills mix of the health workforce, and allow health system planners to engage individuals whose skills can help achieve population and community health goals (35, 36). It has been shown in Australia, Canada, Denmark, New Zealand, Sweden, the United Kingdom, the United States of America and other countries that integrated health and education policies can promote effective interprofessional education and collaborative practice and facilitate acquisition of broader skills and competencies for intersectoral action to promote health equity (37). Interprofessional education and collaborative practice support achieving SDG 3 targets, notably universal health coverage, and contribute to other SDGs, particularly SDG 4 (promote lifelong learning opportunities). Interprofessional education has been shown to provide a strong curricular framework within which to situate the teaching and learning of the social determinants of health, as called for in the WHO Global Strategy on Human Resources for Health. The inclusion of interprofessional education in accreditation mechanisms will guide the implementation of World Health Assembly resolution WHA66.23 on transforming the health workforce in support of universal health coverage (38).

differences in the level of care infants receive in their first five years and with an increased utilization rate of local health services as compared to communities served by graduates of traditional schools (31). Community-based service learning can yield important returns on investment. An Australian study found that a relatively small community-based nursing education programme increased access to care for a previously underserved community. Through immediate action and referrals for life-threatening conditions, students' presence resulted in cost savings of 437,000 Australian dollars to the health system (32).

2.2 Putting in place recruitment strategies to increase retention in underserved areas

With academic performance as the major conventional criterion, recruitment policies, particularly at medical schools, tend to favour students from urban areas and higher economic strata, who are less likely to want to work in rural regions. Underserved populations are frequently underrepresented, particularly in higher-paid professions such as the medicine health sector (28, 39). In upholding such recruitment policies, higher education institutions can perpetuate current inequities. This in turn might undermine the empowerment of rural and marginalized populations and hamper inclusive socioeconomic growth and development in disadvantaged regions.

There is convincing evidence that targeted admission criteria – that is, criteria aimed at selecting students deemed to be most likely to address specific health workforce needs or increasing the socioeconomic, ethnic and geographical diversity of students – have positive effects on the distribution and career choices of health workers (40–43). One study of rehabilitation graduates shows that a graduate is 3.3 times more likely to choose to work in a rural or remote community if the student was raised in such a community (44). A study of socially accountable schools identified four distinct strategies that positively influenced students' intentions to practise in underserved areas: quota systems prioritizing rural or underrepresented populations; community involvement; school marketing strategies; and selection based on personal attributes (39). All participating schools offered extra academic support for students from underrepresented groups, and several schools used outreach

2 Preamble to the World Health Organization Constitution, 1946: see <http://www.who.int/about/definition/en/print.html>.

programmes to secondary schools to encourage youths from underrepresented groups to pursue careers in health. With adequate support, students coming from lower-quality secondary schools perform just as well in exams, particularly in the later stages of education or in national licensing exams (28, 39).

In some cases, recruitment strategies focus on mobilizing marginalized populations. Tekove Katu School of Health in the El Chaco region of Bolivia prepares public health professionals, mid-level nursing technicians, environmental health technicians and community social workers for future careers. Students are selected from indigenous youths who have limited opportunities for professional development. The selection, training and support of these health workers resulted in expanded and improved health care to marginalized indigenous populations, along with higher retention of health practitioners. The empowerment of this group further contributes to social inclusion and human security (45).

Who the graduates are, combined with where and how students learn, is clearly important both to retain them as practitioners in underserved areas and to prepare fit-for-practice workers. For example, results for medical graduates from NOSM are impressive, with 92% of all NOSM students coming from Northern Ontario, and with substantial inclusion of underrepresented populations in Northern Ontario indigenous (7%) and francophone (22%) students. In 2015, 62% of NOSM graduates chose to pursue careers in family practice, and 94% of the doctors who completed undergraduate and postgraduate education with NOSM are practising in Northern Ontario (46).

2.3 Recruiting, developing and promoting community-based faculty from across professional cadres

Many schools and regions suffer from a shortage of trained clinical and academic faculty members, who are essential to the training of a fit-for-purpose workforce. Several schools are using innovative approaches to recruit, train and reward community-based clinicians and other health workers to become faculty (12, 41). Many regions also lack trained clinical preceptors whose expertise is needed to maximize learning outcomes and assure the consistent quality of patient services in community and small hospital settings.

For example, NOSM recruits local community-based health professionals from different cadres and appoints them as faculty members with equal status and academic promotion opportunities compared to specialists in tertiary care hospitals. Faculty development opportunities are provided locally in rural communities via distributed learning, distance education and faculty development conferences. NOSM also celebrates the contribution of distributed faculty members through awards for excellence, recognition of promotion, and acknowledgement of other achievements (41).

Several health workforce education institutions, including Walter Sisulu University in Eastern Cape in South Africa and the University of Nairobi in Kenya, train community members and a spectrum of health workers to facilitate learning (47, 48). Recruitment and training of staff committed to social accountability is key to transforming and implementing a social accountability curriculum.

3. Reforms at government and system levels

3.1 Integrated and participatory policy development and planning

Ensuring that socially accountable health workforce education is transformative and actively contributes to the SDGs will also require reforms at government and system levels. Governments must work across sectors and ministries (49) and collaborate with key stakeholders, including communities and the full range of education and service providers.

Systemwide transformation will also necessitate a broader view of who constitutes the health and care workforce. Education is increasingly viewed within a lifelong learning framework – that is, from primary to higher education levels and beyond to in-service education and training (50). This includes technical and vocational education and training (TVET) (51). The United Nations Educational, Scientific and Cultural Organization (UNESCO) argues that incorporating a TVET framework could facilitate the coordination of education for the health workforce

within larger national educationwide policies, strategies and plans. Such an approach supports the harmonization and alignment of social accountability mechanisms for the health professions with those used in TVET programmes, supporting the education of all workers for the health and human services sector (50, 52).

Joint and inclusive health and education sector planning can help stakeholders to identify opportunities for cost savings and efficiencies and to coordinate education plans for all cadres. Such coordinated planning will also equip the health workforce with the optimal skills mix in line with local needs and national development priorities.

Countries such as Brazil, Cuba and Thailand, which have demonstrated sustained improvement towards achieving universal health coverage, have adopted more integrated, equitable and primary care-oriented approaches to policy-making and resource allocation (20, 40). For example, in Brazil, the government works with partners at all levels to reduce inequity through a series of integrated strategies (Box 3).

Australia has made strides in addressing shortages in the rural workforce using collaborative approaches, albeit with most investment in physician education. The success of the approach has been due to “passionate leadership of rural medical and community leaders, government seed funding to encourage rural medicine as an academic discipline, rigorous research and consultation that underpinned each step of the innovation pathway, and a political campaign to invest in rural medical education as a form of rural social capital” (55).

Box 3

Participatory planning to integrate education and health services in Brazil

While challenges remain, Brazil has made significant progress towards universal health coverage over the past two decades through the processes of decentralization and regionalization of the Unified Health System (Sistema Único de Saúde, SUS). Brazil has become a “stellar performer, with nearly universal coverage and limited geographic disparities” (53). The country has expanded community primary health services and strengthened human resource management capacities; implemented a multidisciplinary family health team model of care; scaled up, updated and streamlined health worker education; and matched deployment with health needs. Initially, the family health team included a physician, a nurse, a nurse assistant, and between four and six full-time community health workers; now some teams include nutritionists, psychologists, social workers, psychiatrists, community pharmacists, physical education specialists, speech and hearing therapists, occupational therapists, gynaecologists, obstetricians, geriatricians, general internists, public health specialists and others. Initially, the 2000 primary care teams provided services to 7 million people; as of 2014, they covered 120 million people. Strategies include increased pre-service and in-service training for less skilled front-line health workers, incentives for curricular reform and the creation of new rurally based medical schools. The massive scale-up of service delivery in marginalized communities included temporary incorporation of foreign physicians into the rural workforce in collaboration with the Pan American Health Organization.

Sources: Campbell et al. (20); Macinko and Harris (54).

3.2 Priority investments in rural and primary care settings, including new or adapting workforce roles

The Governments of Australia, Brazil, Canada, Cuba and Thailand, aiming to increase deployment and retention of health workers in rural and remote areas, are learning that success requires investment in health workforce education in these settings. Investment often includes support for clinical sites and information technology infrastructure, incentives for rural clinicians, training these clinicians for faculty positions, and accommodation for students. Already, these investments are beginning to show returns in terms of recruitment and retention in rural areas, thanks to increased professional development opportunities and improved quality of services at clinical training sites (40, 56, 57).

In Canada, a study was carried out of the social and economic impact of NOSM's rurally based, community-engaged education model aimed at producing health professionals for Northern Ontario, after only four years of operation. The direct, indirect and induced economic impact of the operation of the social accountability school is estimated at Can\$ 67 million, excluding construction and renovation. By 2009, each of the 70 communities where students had been placed received a return on investment of Can\$ 7300 to Can\$ 103 900 per pair of learners per placement. The lower amount reflects learner spending during short rotation in rural communities, and the higher amount is spending in larger communities with several programmes for different cadres and up to 30 week-long comprehensive community clerkships, requiring substantial school investment. In the same period, the school generated between 185 and 280 new full-time jobs in the rural and remote regions of Northern Ontario (14). With respect to community engagement, according to a 2015 NOSM report, 1300 trained clinicians served as teachers, preceptors, and members of various committees in over 90 communities (58).

Creating career tracks and stepladder programmes in underserved and rural regions is another important strategy to better address health workforce needs. For example, the School of Health Sciences, University of the Philippines Manila (UPM-SHS), partnered with marginalized communities and health authorities to create a stepladder programme starting with midwives and then training them

as nurses and ultimately as physicians. Decades later, the impact of this approach on retention in underserved regions is impressive (Box 4).

To equip the health workforce in Queensland, Australia, with the skills it needs to address local challenges and create opportunities to pursue a career track in rural and remote health, regional authorities work with rural medical schools to create a rural generalist training pathway for physicians. Early evidence indicates that this strategy generates high returns on investment and creates a training pipeline for rural communities. For example, employing rural generalists with advanced skills in anaesthesiology and obstetrics allowed for a 120% return on the government's

Box 4

Building a career in rural and remote areas: the stepladder programme in the Philippines



Source: J.L. Siega-Sur, with permission.

The socially accountable “stepladder” programme of the School of Health Sciences, University of the Philippines Manila (UPM-SHS), was developed in 1976 to educate a broad range of the health workforce, including midwives with a Certificate in Community Health Work, nurses with a Bachelor of Science in Nursing, and Doctors of Medicine, in one sequential and

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BOX 4. *(continued)*

Building a career in rural and remote areas: the stepladder programme in the Philippines

continuous community-based curriculum. At least 50% of their training takes place in primary care settings, and between each programme level the students return home to their sponsoring communities to render service leaves. The model aims to counteract brain drain from and inadequate health care in rural communities of the Philippines by ensuring students are community oriented, clinically competent and socially conscious.

Five areas of competency are woven throughout the midwifery, nursing and medicine curricula, each building on the previous level. The first area stresses the competencies that students require to become health care providers; the second trains them to become community mobilizers to improve health-seeking behaviours; the third focuses on programme management and supervision; the fourth centres on research skills; and the fifth trains them to become educators.

UPM-SHS builds local capacity by implementing a one-year, two-module programme for mayors and municipal health officers. Municipalities are selected in collaboration with the Department of Health and require the commitment of the mayor to support health reforms. The programme offers training and coaching in local health system development, with a focus on the six building blocks of the WHO Health Systems Framework – leadership/governance, health care financing, health workforce, medical products and technologies, information and research, and service delivery (62).

The targeted recruitment strategies, needs-based curriculum, partnerships with communities and health system authorities, and extensive community-based service learning have significantly contributed to increased recruitment of UPM-SHS graduates to and their retention in rural areas and areas of economic disadvantage. One recent study shows UPM-SHS medical graduates are 10 times more likely to practise in towns of below 50 000 population than medical graduates of more traditional medical schools in the same region, and 8 times more likely to practise in lower-income towns (2–5 income categories), and more than 80% remain in underserved regions (63).

investment, as fewer patients had to be flown out to large cities (59). Thailand also invests in its district health system workforce pipeline, including the creation of advanced practice training programmes for nursing cadres. Between 1991 and 2009, the number of nurses increased by 210%, and workforce deployment differences between the poorest and the most affluent areas were substantially reduced (40).

To address specific health challenges, some countries have created new professional cadres. As an example, to reduce maternal and infant mortality, Bangladesh created a community-based midwifery diploma programme that yielded a return on investment 16.2 times the total education cost, assessed using only the number of caesarean sections avoided as the measure (60). Ethiopia trained more than 30 000 health extension workers for underserved communities; programme evaluations suggest that they have made a substantial impact on key aspects of health and well-being (61).

According to a recent survey, 46 nations responded to critical physician shortages by scaling up the training of advanced/accelerated medically trained clinicians (AMTCs) (64). The term AMTC covers several cadres, including clinical officers, physician assistants and clinical associates. AMTCs are trained in regionally specific, compressed medical models that are less costly than the traditional training of physicians. They have become critical contributors to service delivery in several countries, including in sub-Saharan Africa. Evidence is mounting that they produce impressive patient outcomes and are more likely to remain in rural areas than physicians. Also, their services can be less costly. For example, in Mozambique the cost of a caesarean section is US\$ 513 if performed by an obstetrician, US\$ 207 if performed by a generalist physician, and US\$ 193 if performed by a clinical officer (65). A recent United States study reported that employing a primary care physician assistant or nurse practitioner in a rural clinic had significant economic impact in rural communities. The employment impact showed an increase of 4.4 local jobs and an estimated labour income of US\$ 280 476 in communities without a hospital. For a rural community with a hospital, the total effect increased to 18.5 local jobs and an estimated US\$ 940 892 of labour income (66).

4. Quality assurance and accountability

4.1 Strengthening the regulation of the health workforce

In many countries, there is an urgent need to strengthen both regulations and regulating bodies to ensure that health workforce education standards are developed and enforced through accountability and quality assurance mechanisms. Regulations ensure that health workers receive the quality of training needed for them to acquire the right competencies and qualifications to practise safely and effectively, and to be eligible to obtain a job in the health sector. For patients and communities, regulations ensure that education programmes for health workers meet quality standards, and that the health practitioners who serve them have the appropriate competencies to provide quality service.

There is also a need to clearly define the roles of each cadre in the health workforce and their relationships to each other (3, 67, 68). In many countries, efforts to track and regulate the AMTC cadre have been slow. For example, Ghana's physician assistant-medical cadre, which serves the primary care needs of 70% of the population living in the most remote parts of the country, was established in 1969, but registration, standards and regulations did not become official until May 2011, when they came under the Ghana Medical and Dental Council (68). A lack of regulations and clearly defined roles and responsibilities can create discord, undermine implementation of health policies, and compromise the quality of services (69). However, there are highly divergent approaches to regulation, and cost is certainly a factor. The Professional Standards Authority for Health and Social Care in the United Kingdom advocates "right-touch regulation", an approach that is influencing global discussions (Box 5).

4.2 Increasing accountability through accreditation and participatory evaluation

Ensuring that health workers provide high-quality, patient-centred care requires some form of continuous quality improvement processes, including oversight of professional development and service delivery organizations (71, 72). Continuous quality improvement approaches focus on organizations, processes and systems

Box 5

Right-touch regulation

Right-touch regulation should aim to be:

- **Proportionate:** regulators should only intervene when necessary. Remedies should be appropriate to the risk posed, and costs identified and minimized.
- **Consistent:** rules and standards must be joined up and implemented fairly.
- **Targeted:** regulation should be focused on the problem, and minimize side-effects.
- **Transparent:** regulators should be open, and keep regulations simple and user friendly.
- **Accountable:** regulators must be able to justify decisions, and be subject to public scrutiny.
- **Agile:** regulation must look forward and be able to adapt to and anticipate change.

Source: Professional Standards Authority for Health and Social Care, United Kingdom (70).

rather than the individual, and capture objective data to analyse and improve processes. Frequently, there is no formal authority that ensures a smooth progression through the various stages of quality assurance, including accreditation of education institutions, certification and licensing of health workers, and continuous professional development and recertification (71). While there is general agreement on the need to strengthen and link quality assurance efforts in both education and care (5, 8, 47), there is less agreement on the most efficient ways to do it. Different approaches are emerging, including multicountry and interprofessional or intercadre oversight, and

establishment of independent interprofessional bodies that are tasked with regulating the regulators (73).

Social accountability in accreditation is recommended both in WHO's Global Strategy on Human Resources for Health and in national health workforce accounts (3, 52). Direct references to social accountability in accreditation standards are more prominent in medicine than in other professional cadres. The World Federation for Medical Education has already integrated social accountability into its standards. WHO Member States in the Eastern Mediterranean Region are expected to adopt social accountability in the near future (74), and social accountability values are being applied to national standards in Canada, Japan and the Republic of Korea.³ In some countries, standards are not defined specifically through the lens of social accountability, but are based on the same basic principles. For example, the Australian Medical Council requires schools to have formal agreements with health-related sectors, organizations and communities for educational purposes; to put in place arrangements to recruit, train and support Indigenous staff, including specific recruitment and retention policies for Indigenous Australians; and to provide clinical experiences across urban and rural health settings (75).

The values associated with social accountability – equity, quality, relevance and cost-effectiveness – and interprofessional practice require strong alignment between education and health systems. Hence, accreditation and evaluation of programme outcomes should be interlinked. The results of programme evaluation should inform the accreditation process and support continuous quality improvement of the education process. Evaluation should include tracking of graduates' practice locations and career choices, along with their continued professional development and performance. Training and service delivery sites should also be evaluated and the health, social and economic impact of education programmes should be regularly assessed to guide policy and strategy development. Such actions are aligned with global recommendations to strengthen and streamline data collection.

3 Personal communication with David Gordon, President of the World Federation for Medical Education, 19 June 2016.

To help institutions become more socially accountable, frameworks are available to help them identify the needs they should address; assess governance as well as education, research, and service programmes; and evaluate the impact of their strategies on health services, career choices and retention of graduates. One such framework is built on the successful strategies of socially accountable member institutions of the Training for Health Equity Network (18). The framework is a comprehensive, context-sensitive tool for designing, reforming and evaluating an institution's programmes in collaboration with stakeholders, including communities (Figure 1).

Figure 1

THEnet social accountability framework



Source: Training for Health Equity Network (www.thenetcommunity.org).

5. Policy options to transform education to better meet needs

Based on the review of emerging evidence and promising practice described above, this chapter advances the specific policy options below.

To ensure that health workforce education strategies address population needs, using models that embrace interprofessional education and practice and that maximize recruitment and retention in underserved areas, **education providers** in collaboration with all stakeholders should:

- ensure that curricula incorporate local patient and population needs, including the social determinants of health, and that a significant portion of the curriculum is delivered in the primary care contexts in which graduates are expected work;
- design policies to recruit students from underrepresented populations, along with others deemed likely to choose to work in underserved regions;
- recruit, train and promote faculty across cadres to build competencies that are relevant to evolving health care needs;
- support community-based health practitioners as active faculty members and promote their academic career development.

To ensure that policies are evidence-based, and to maintain high standards for education and service provision and at clinical training sites, **governments and other relevant independent authorities** in collaboration with stakeholders should:

- support national bodies to develop appropriate regulations for health workforce education in a systematic and integrated manner and enforce these regulations across all programmes and training sites;
- build the capacity and quality of education institutions through accreditation mechanisms that include social accountability as an element of the accreditation standards used at national or regional levels;

- support streamlined data collection, implementation research and evaluation of graduate outcomes;
- support the assessment of social, economic, and health returns on investment in health workforce education strategies.

To reduce fragmentation, increase efficiencies and create an enabling policy environment, **governments** should work across sectors and ministries and collaborate with key stakeholders, including the full range of education and service providers and communities, to:

- plan, implement and evaluate a broad continuum of socially accountable workforce education and training programmes that are intrinsically linked to service delivery;
- support implementation research as well as cost-effectiveness and cost-benefit analysis of education investments;
- invest in the infrastructure and strengthening of the provision of health services in rural and primary care settings where needs are the greatest.

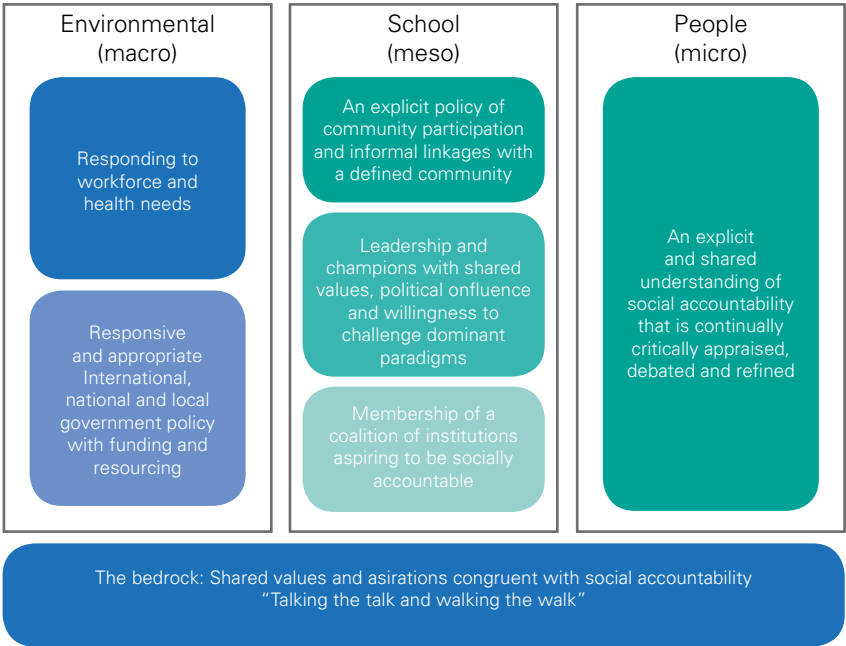
6. Key considerations for implementation of social accountability

Implementing the policy suggestions mentioned above requires interlinked reform, sustained efforts, and investments at all levels.

For education providers, changing the way established institutions work, coupled with changing what, how and where students learn, will be a significant challenge in a context where small changes in curricular content can be a turf battle. Hence the processes of education reform need to be participatory and carefully designed and implemented. Those who deliver education services need to work with a broader range of stakeholders to ensure programmes are aligned with local contexts and address root causes, and to create a sense of co-ownership of reforms. Key building blocks to foster socially accountable health workforce education institutions at macro, meso and micro levels have been identified (Figure 2) (76).

Figure 2

Building blocks for socially accountable health workforce education institutions



Source: Preston et al. (76).

Governments, and other relevant independent authorities, need to support change efforts at education institutions with clear vision, enabling policies, planning, incentives and investments in implementing education reform. This includes support for research that continues to examine what works, how it works, and in what context, which in turn should inform policy and action. Accountability and enforcement mechanisms are of utmost importance to spur reform at education institutions. Hence standards and processes at oversight organizations, such as quality assurance and accreditation organizations, need to lead the way.

How we define return on investment in health workforce education should be expanded to include what communities value, the cost of maldistribution and brain

drain, and the value added by recruiting women and youths from marginalized populations into health sector jobs.

Fragmentation, power differentials and vested interests will pose formidable challenges to the consensus-building process among a broad range of national stakeholders. However, if the process is inclusive, resources are equitably distributed across cadres, and focus is kept on needs, such a national dialogue can reduce fragmentation, achieve stakeholder buy-in, maximize the use of scarce resources, and identify potential bottlenecks.

7. Conclusions

Socially accountable health workforce education can and should be interprofessional and cross-cadre; incorporated into all levels of the health system; and supported by enabling policies, strong regulatory frameworks, and robust quality assurance processes. All of these factors promise to optimize the impact of investment in education.

As highlighted above, for maximum benefit, governments and education institutions need to engage in cross-sectoral participatory planning, increase their investment in underserved regions, and ensure that remuneration and support for health workers are adequate. To optimize impact, curricula should reflect the evolving needs of patients and communities, including the social determinants of health. Significant portions of the curriculum should be delivered in the settings where graduates are expected to work. Education providers ought to recruit students from underrepresented populations and recruit, train and promote community-based health workers and academic faculty with competencies relevant to evolving health care needs.

A growing body of evidence suggests that such investments will yield returns in the form of increased availability and distribution of health workers who have the

skills and the commitment to provide care where it is most needed. This approach can also increase the integration of youths and individuals from underserved and marginalized populations into the health sector, enabling inclusive growth in disadvantaged regions. In addition, social accountability strategies contribute to increased economic activity due to the presence and contributions of students and faculty, an associated investment in infrastructure, the upgrading of clinical training sites, professional development for local clinicians, and new job creation. A resulting sense of community empowerment also feeds collective confidence and furthers economic growth.

However, to address the needs of underserved populations, education providers need to have the leadership, institutional capacity and resources to do so. The process will also entail a careful review of the national and regional policy and operational environment to determine whether current policies enable or hinder the ability of service providers to deliver the desired results. Ongoing programme evaluation and implementation research will also be needed to determine what works, how it works, and in what context.

While more research will be needed to understand these complex interventions, investing in health workforce education that engages with stakeholders, is results oriented, monitors progress, and is accountable for addressing collectively identified needs represents an important milestone in delivering on the promise of universal health coverage and inclusive growth.

Acknowledgements

The authors would like to acknowledge the assistance of the following reviewers: Andreia Bruno, David Clarke, Sandra MacDonald-Rencz, and André-Jacques Neusy.

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PART IV

Addressing Inefficiencies

Equipping health workers with the right skills, in the right mix and in the right numbers, in OECD countries

Liliane Moreira, Gaétan Lafortune

Abstract

This chapter identifies the education, training and service delivery reforms required to transform the health workforce in countries of the Organisation for Economic Co-operation and Development (OECD). While results focus on doctors and nurses, the chapter stresses the need to move beyond traditional professional boundaries.

The chapter identifies policies that support the creation of a health workforce with the right skills, in the right mix and in the right numbers. Skills mismatches waste human capital when health workers are overskilled, and harm quality of care when they are underskilled. Countries need to adapt health professional education and training to better match the skills acquired in training with the skills required at work, and make more effective use of skills through interprofessional collaboration and engagement with digital technology. Moreover, to respond to population health needs, countries will need to train a sufficient number of generalists, prepare non-physician providers to deliver primary health services and make better use of technology to reach underserved populations. Finally, the chapter calls for all countries, particularly countries of the OECD, to educate and train the right number of health workers to respond to their domestic needs. This requires more robust labour market information and health workforce planning models, incorporating impacts of changes in technology and models of care, to guide decision-making.

1. Introduction

Health care provision needs to continuously adapt to respond to new needs driven by demographic changes, the shifting burden of disease, and new opportunities driven by technological changes.

Population demographics are changing rapidly. In the Organisation for Economic Cooperation and Development (OECD) countries, the share of population aged 65 years and older increased from 12% in 1990 to 16% in 2015, and is expected to continue to grow to reach 21% in 2030 and 27% in 2050. This trend has been accompanied by an increased share of the population affected by one or more chronic conditions.

New technologies – such as telemedicine, mobile health, electronic health records, big data analytics and wearable diagnostic and therapeutic devices – are transforming, and often disrupting, health care delivery. Smartphone software applications (apps) are now being used for the diagnosis of health conditions in a cheaper and timelier way than the traditional face-to-face consultation. Wearable devices and sensors are enabling the continuous transmission of a person's vital signs to his or her primary care practitioner in real time, permitting more effective and tailored management of health problems. Telemedicine is also becoming available to an increasing number of patients. Along with these innovations come heightened expectations from citizens and communities, who now have greater access to information than ever before.

Technology is beginning to encroach on professions previously thought immune to disruption. “Deep learning” computer programmes are now able to interpret radiological images and diagnose potential pathology in some cases more accurately and more quickly than trained radiologists. Robotic anaesthesia and sedation is now available for routine surgical procedures. These technologies will not make radiologists and anaesthetists obsolete, but will require a transformation in their skills and competencies, mainly related to their ability to interact with patients and colleagues. Anaesthetists will be able to concentrate their efforts on more complex interventions that require intense collaboration with the surgical team. In the case of radiology, algorithms cannot converse empathically with patients about the meaning and implications of the findings they have detected; knowledgeable and compassionate health professionals will continue to be required in this role into the foreseeable future.

A new policy landscape is emerging, offering tremendous opportunities to deliver better, more effective and more efficient health services. But this evolution challenges the organization of health service delivery and the skills mix required for different categories of health workers. What are the new skills needed in the primary care workforce to better respond to the health care needs of ageing populations? How can health workforce planning methodologies be adjusted to provide better guidance on education and training requirements and the skills mix, in light of rapidly changing technologies and population health needs?

This chapter addresses these questions, shedding light on current challenges and needed reforms in education and training programmes and health service delivery to transform the health workforce. While the chapter focuses on doctors and nurses – due to their predominant role in health service delivery in OECD countries – it also stresses the need to move beyond traditional professional boundaries to optimize the training and scope of practice of different health care providers to better respond to population health needs.

2. The right skills

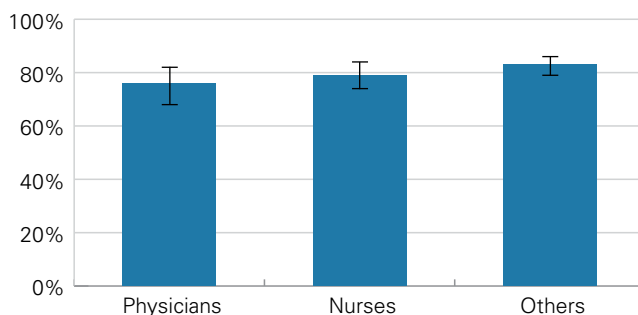
Health workforce skills can be broadly defined as a bundle of knowledge, attributes and capacities that enable professionals to successfully perform different tasks. These skills include technical, communication, management and other general skills (1), which can be acquired through initial education and training programmes as well as through continuous learning.

For both clinical and economic reasons, OECD countries tightly regulate the acquisition, certification and use of skills of health professionals. Entry into medical, nursing and other health-related education programmes is often implemented through numerus clausus policies, which limit access to education to a given number of students. Certification is usually achieved by issuing licences to practise in regulated professions, through exams at the end of education or training programmes, and increasingly also through reregistration procedures throughout the professional's life. The use of skills and scope of practice of different health care providers is usually defined by laws and regulations (1).

Nonetheless, despite all these regulations, there is evidence of a considerable skills mismatch in the health sector as in other sectors of the economy, which is wasting human capital when health workers are overskilled (that is, they have skills above those required in their jobs) and threatening quality of care when health workers are underskilled (that is, their skills are below those required for their jobs). Evidence from the 2011/2012 OECD Programme for the International Assessment of Adult Competencies (PIAAC) survey shows that a large proportion of doctors and nurses reported being either overskilled or underskilled for some of the tasks they need to perform. In this survey, around 70% of doctors and 80% of nurses reported being overskilled for some aspects of their work, while about 50% of doctors and 40% of nurses reported being underskilled for other tasks (Figures 1 and 2).¹

Figure 1

Reported overskilling by physicians, nurses and other occupations, PIAAC survey, 2011/2012



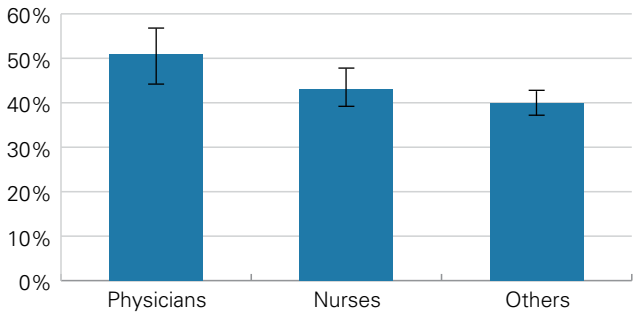
Note: “Others” means workers in other technical and professional occupations (ISCO 2 and 3). The figure depicts percentage responses with the associated 95% confidence interval.

Source: OECD (1).

¹ The OECD PIAAC survey is a comprehensive survey of workers in all sectors of the economy that provides information on the use of workers’ skills and skills mismatch. It includes 23 countries, with responses obtained from 500 doctors and more than 2000 nurses. The survey questionnaire was designed to be fairly general, so it does not allow identifying precisely the specific tasks for which the health professionals report being either overskilled or underskilled. Therefore, self-reports of underskilling do not necessarily mean that health professionals are not able to fulfil their clinical tasks. Rather, it implies that for some aspects of their work, these health workers think that they could benefit from more training.

Figure 2

Reported underskilling by physicians, nurses and other occupations, PIAAC survey, 2011/2012



Note: “Others” stands for workers in other technical and professional occupations (ISCO 2 and 3). The figure depicts percentage responses with the associated 95% confidence interval.

Source: OECD (1).

Addressing skills mismatches in the health sector is crucial to ensure high quality in health service delivery while promoting greater return on the substantial investment of time and money in educating and training health professionals. A recent report by the United Kingdom’s National Audit Office indicates that it takes three years and costs an estimated £79 000² to train a new nurse, 10 years and £485 000 to train a general practitioner (GP), and 14 years and £727 000 to train a senior specialist doctor (consultant) (2).

2.1 Addressing issues of overskilling

Policies to address issues related to overskilling involve, first and foremost, reviewing the scope of practice of different health care providers to promote a more efficient use of their skills. Too many high-skilled health professionals are reporting that they spend a large amount of time doing work that could be delegated to non-physician providers (in the case of doctors) or health care

2 Current exchange rate: £1.00 = US\$ 1.23 (November 2016).

assistants (in the case of nurses). The results from the PIAAC survey reveal that nurses with an advanced university degree are particularly likely to report being overskilled for the job they do (almost twice as likely as those with a bachelor's or lower degree). This raises concerns over the value of providing more education and training if a large proportion of nurses are not using these additional skills in their jobs.

To overcome this challenge, OECD countries are introducing or expanding the role of non-physician providers, including more advanced roles for nurses (for example, nurse practitioners), pharmacists and other categories of health workers. In 2012/2013, at least one third of OECD countries reported having used this strategy in the previous five years. In Canada, the Nordic countries and the United States of America, advanced practice nurses and other non-physician providers have often been deployed initially to address the needs of populations living in rural or remote areas that are underserved by doctors (3). They then spread out more widely across the health system as their role and the quality and safety of their work become more broadly accepted by physicians and patients.

However, expanding the scope of practice of non-physician providers alone might not be a productive strategy. As new technologies are subsumed into health service delivery, policy-makers will need to consider the technologies' impact on the current overskilled workforce and adapt the strategy accordingly. One may even dare to ask: does the introduction of ehealth in health service delivery lead to an accentuation of overskilling issues by substituting health workers in certain tasks? If so – taking this possibility to the extreme – could this mean that some health job categories might even become superfluous?

To ensure health workers are fit for purpose in the 21st century context, policy-makers ought to conduct an in-depth review of skills indispensable for the new generation of health workers, and adapt education and training models accordingly. At the same time, as new technologies start facilitating the performance of certain tasks, a range of skills become expendable, and should therefore be discarded from health professionals' curricula.

2.2 Addressing issues of underskilling

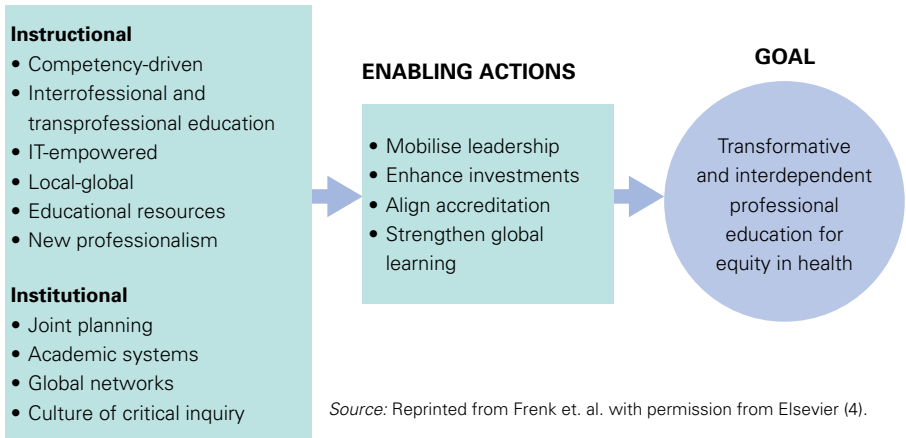
Three key reforms or policy levers can be used when addressing an underskilled health workforce: modify education and training programmes, strengthen continuous professional development (CPD), and reap the benefits of technology innovation.

Reforming the initial education and training programmes of health professionals is crucial. It is during these formative years that health professionals acquire important skills that will be required throughout their professional lives. Supporting this argument is the strategy proposed in 2010 by the Global Independent Commission on Education of Health Professionals for the 21st Century. The Commission called for 10 major reforms to transform the education of health workers and strengthen health systems. Six of these reforms concern health professional training, including the need to develop competency-based curricula that are more responsive to rapidly changing needs and the promotion of interprofessional and transprofessional education that breaks down professional silos and enhances collaborative and effective teamwork. Four other reforms relate to actions that institutions could take, such as establishing joint planning mechanisms and nurturing a culture of critical inquiry within universities and institutions of higher learning. The Commission also identified four long-term enabling actions to create an environment conducive to implementing these specific reforms (Figure 3).

Figure 3

Recommendations for reforms and enabling actions

REFORMS



CPD can ensure that the skills of actively practising doctors and nurses are kept up to date during their professional lives. Awarding a licence to practise at the end of medical or nursing education is no longer sufficient to ensure the delivery of high quality of care throughout a professional's career. With the speed at which new technologies are being incorporated into health service delivery, certain skills will become more relevant. For instance, communication skills are increasingly important as modern health care provision moves from an individual pursuit to a team effort, driven partly by an increasing range and complexity of interventions and the growing number of patients with unique and complex needs.

Policies and regulations concerning CPD vary greatly across OECD countries. There are variations regarding whether participation in CPD activities is mandatory and whether relicensing requirements are in place. Where there are relicensing requirements in place, there is variation in whether (and how much) CPD is a mandatory part of the relicensing or reregistration process. In at least a dozen OECD countries, participation in CPD activities for doctors is combined with relicensing or reregistration requirements. In the United Kingdom, CPD is linked to relicensing or reregistration procedures, although CPD provisions for doctors do not follow a uniform nationwide system (1).

Regardless of whether mandatory or voluntary systems are in place, some key common barriers to greater participation in CPD activities for doctors, nurses and other health professionals are lack of time and related cost (5). Hence there is a need for more systematic and organizational support that will allow professionals to take time off for CPD, to ensure that the costs are not prohibitive and that CPD activities are well designed to address important skills gaps. CPD should thus be designed and aligned with identified needs and delivered in effective ways. Evidence suggests that certain types of CPD are more effective than others. In particular, when compared with more traditional learning forms, interactive forms of improving medical knowledge seem to be more effective in terms of changing physician care and patient outcomes (6).

Digital technology can be used to tackle an underskilled health workforce. Digital technology refers to generating, storing and processing data in a fast and efficient way. It enables much more efficient transfer of information between two or more parties than older forms of data sharing. Given that health care is an information-intensive industry, the use of digital technology in health service delivery can help manage the complexity and uncertainty associated with health and illness. By providing necessary information and permitting fast, reliable communication, this technology can complement health workers' skills and enable health professionals to make more accurate and timely decisions in otherwise uncertain situations. For instance, evidence suggests that diabetes health workers (or community health workers in low-income countries) – when supported with information and communication technology (ICT) and clear protocols about what to do when symptoms are not within a prescribed range – can be trained to ensure that treatment regimes are followed correctly, leaving health professionals with more expertise to focus their attention on more problematic cases.

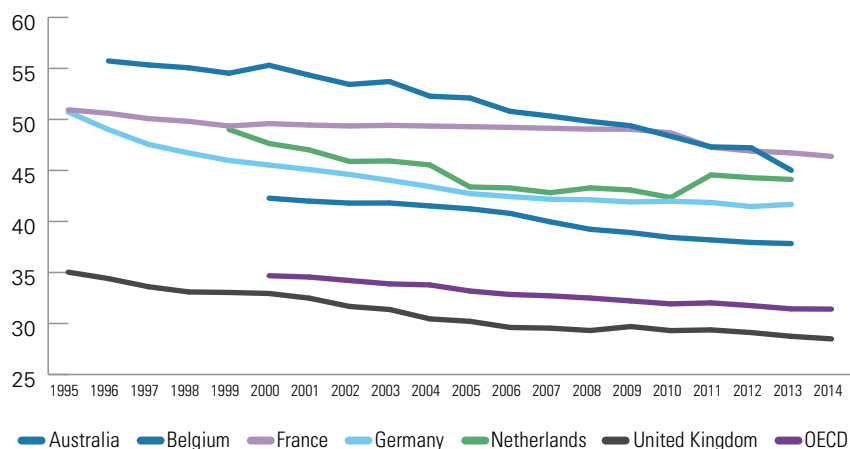
3. The right mix

Across OECD countries, addressing current and future health care needs – characterized by an increased burden of chronic diseases, ageing populations and quicker discharges from hospitals – will require building stronger primary care systems. Current demographic and epidemiological shifts are rapidly increasing the demand for an adequate supply of generalists³ who were properly trained to work in multidisciplinary teams and make smart use of technology to connect with people, providers and places. However, over the past two decades, the share of generalists has declined in nearly all OECD countries. On average across OECD countries, in 2014, only one in three doctors were generalists (Figure 4).

3 For the purpose of this paper, the term “generalists” refers to general practitioners or family doctors.

Figure 4

Generalists as a share of all physicians, selected OECD countries, 1995–2014



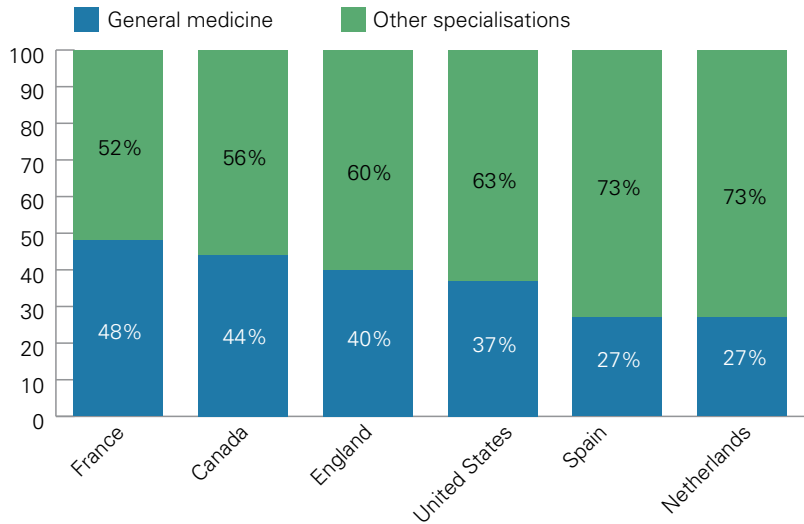
Note: Generalists include general practitioners (“family doctors”) and other generalists (non-specialists).

Source: OECD (1).

To address this challenge, a few OECD countries have started to train more generalists or use other health professionals to fill the gaps in primary care. In Canada, France and the United Kingdom, the number of postgraduate training places in general medicine has been increased. In Canada, the proportion of medical students admitted to postgraduate training in general medicine is 44% of the total entrants, while this proportion is 40% in England and 48% in France (Figure 5). However, it has not always been easy to attract a sufficient number of new medical graduates to fill these places. Numerous factors affect the choice of medical specialization training beyond increasing the number of posts available. Complementary actions are needed to make general medicine a more attractive option for new doctors, including narrowing the remuneration gap with other medical specialties and reducing time on duty by promoting group practices (1).

Figure 5

Share of students admitted in general medicine versus other specializations, selected OECD countries, 2013 (or nearest year)



Note: In the United States, general medicine includes students admitted to both family medicine and internal medicine.

Source: OECD (1).

OECD countries are also expanding nurses' roles as a way to strengthen primary care services. Evaluations have shown that properly trained advanced practice nurses working in primary care can improve access to services and deliver the same quality of care as GPs for various patient groups (for example, those with minor illnesses or those requiring routine follow-up for chronic conditions). When advanced practice nurses take on some of the tasks previously performed by doctors, it helps free up the time of GPs and provides these services at a lower cost (3).

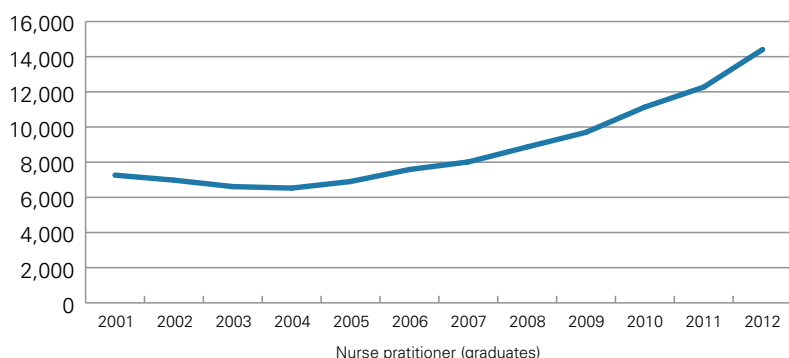
In Canada, the Netherlands and the United States, the number of students admitted to nurse practitioner (NP) programmes has expanded and increased the supply of these mid-level providers in primary care and other settings. In the United States, the

number of graduates from NP programmes more than doubled between 2001 and 2012, rising from around 7000 in 2001 to over 14 000 in 2012 (Figure 6), and this number increased further to 15 000 in 2013 (7).⁴

While training more generalists or expanding the scope of nurses' roles requires substantial resources, digital technology and ICT can offer countries cost-effective means to expand access to primary care services. For instance, telemedicine or mobile health (m-health) – both already being used in OECD countries – can be accessed through smartphone apps, wearable monitors and portable devices.

Figure 6

Graduates from nurse practitioners programmes, United States, 2001–2012



Source: OECD (1).

The potential of telemedicine – clinical services, mostly medical consultations, that are provided remotely – is undeniable. Not only can it bring high-quality and specialized care to underserved populations by connecting patients to providers, it can also

4 For the past 20 years, a master's degree has been required to become an NP, or any other recognized advanced practice nurse (APN), in the United States. However, in 2004, the American Association of Colleges of Nursing and the National Council of State Boards of Nursing proposed that the minimum requirement for advanced practice nursing (to be imposed from 2015 onwards) be raised to a "Doctor of Nursing Practice" degree. While this change will not have any consequence on current NPs and other APNs with a master's degree (they will still be able to practise), this will add more years of education and training for the new generation of advanced practice nurses and further delay their entry into practice.

connect local nurses and paramedical staff with GPs, who offer advice and support for diagnoses and prescriptions as needed.

The cost-effectiveness of telemedicine has sometimes been questioned and the infrastructure around using this technology is going through significant change. While consultations used to require complex videoconferencing equipment, they can now be done via smartphones. In addition, the cost of high-speed Internet is also decreasing, making telemedicine more affordable. Across OECD countries, the number of initiatives using telemedicine is growing.

Governments can also strengthen the investment and incentive structure around the use of mhealth. Giving people more control to manage their own health decreases the need for medical or nursing consultations. Wearable devices and sensors can continuously transmit a person's vital signs to his or her primary care practitioner in real time, permitting more effective and tailored management of health problems. According to one estimate, more than 165 000 health apps were available in 2015, a figure that has doubled since 2013 (8). These apps perform a wide range of functions, such as medication reminders, tracking movement and activity, and monitoring progress in pregnancy. For example, diabetes management apps allow glucometers to be plugged into the smartphone to track insulin levels and send alerts if necessary.

However, a greater use of these technologies does not necessarily guarantee improvements in access to health services for all the population. As with any technology, potential benefits should be considered against possible risks or limitations. Users must be competent and possess a minimum level of digital literacy to navigate the new mobile tools correctly. Risks include unequal access to these tools driven by cost and lack of awareness, which may discriminate against the very people who stand to benefit from them the most.

4. The right numbers

As health needs continue to change and technologies become a more integral part of health service delivery, policy-makers will need to carefully consider the number and types of health workers needed in the system.

In OECD countries, one of the most powerful policy levers governments use to adjust the supply of doctors, nurses and other health professionals is through *numerus clausus* policies,⁵ which regulate the number of students admitted to medical and nursing education programmes each year. While limiting student intakes is clearly a powerful tool, the effects are not felt immediately, as it takes several years to train new health professionals.

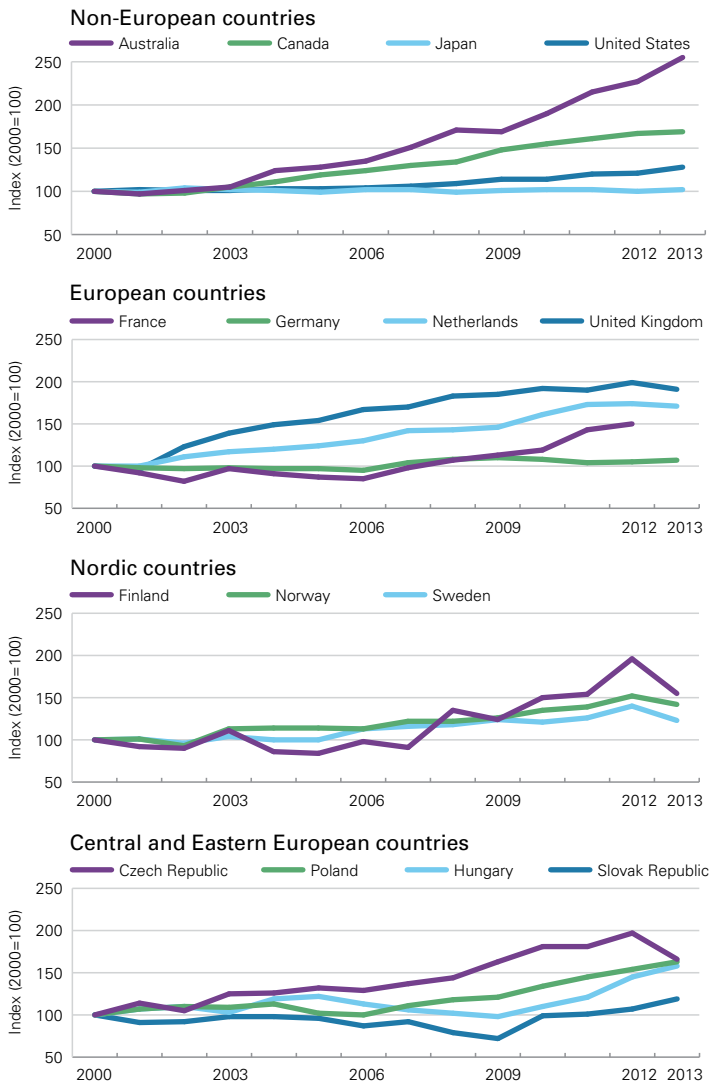
Since 2000, most OECD countries have increased, often quite substantially, the number of students admitted to medical and nursing education, in response to concerns about current or future shortages. Increased intakes have led to growing numbers of medical and nursing graduates entering the labour market, contributing to the continued rise in the number of doctors and nurses that has been observed in nearly all OECD countries over the past decade, both in absolute number and on a per capita basis (9).

The number of medical graduates has increased particularly rapidly in English-speaking countries such as Australia (increasing by 150% since 2000), Canada (increasing by 75% between 2000 and 2012) and the United Kingdom (doubling during that period) (Figure 7).

5 Ever since *numerus clausus* policies were introduced to control entry into medical education in the 1970s, both their legitimacy and management have been questioned. *Numerus clausus* policies have often been characterized by increases or decreases in the number of students admitted, as a response to concerns over future shortages or surpluses of health care providers. Determining what may be the right number of students to admit each year has proven to be challenging for governments, given the wide range of factors that affect the future demand for and supply of health workers and political pressures from different interest groups. At least one country, Australia, has recently decided to abandon *numerus clausus* policies for most health-related university studies (with the exception of medical education) in an effort to open up entry into university education.

Figure 7

Rising number of medical graduates, selected OECD countries, 2000–2013

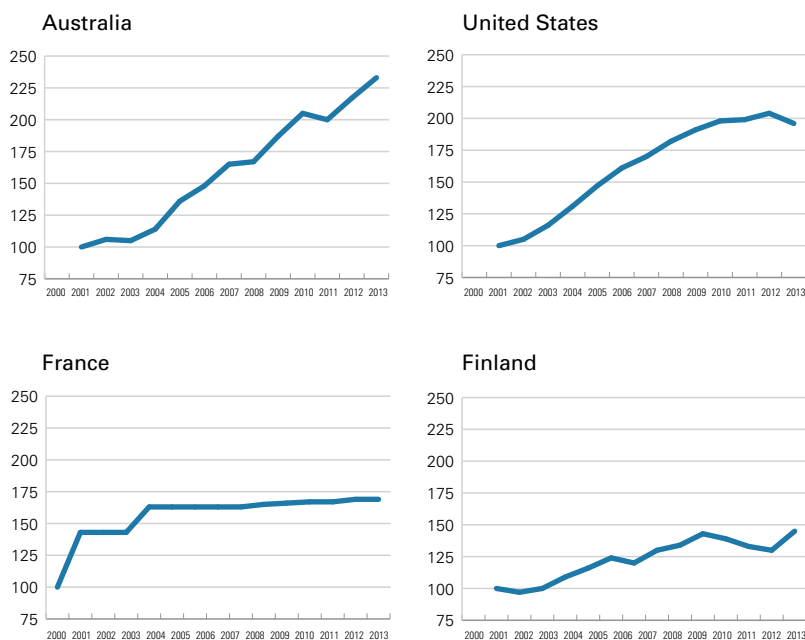


Source: OECD (9).

The number of students admitted to and graduating from nursing education programmes has also increased strongly since 2000, particularly in Australia and the United States, but also in European countries such as Finland (although a reduction occurred in the years following the economic crisis) and France (most of this increase occurred in the early 2000s) (Figure 8).

Figure 8

Rising number of nursing student intakes (or graduates), selected OECD countries, 2000–2013 (index: baseline year = 100)



Note: For the United States, the number of graduates is used as a proxy for the number of students admitted to nursing education. For France, the annual quotas established by the government are used as a proxy for the number of students admitted to nursing education.

Source: OECD (1).

In the United States, the number of graduates from registered nurse (RN) programmes nearly doubled between 2001 and 2013, rising from around 100 000 to 200 000 per year. This strong and steady rise was a response to former projections pointing towards expected RN shortages by 2020 (10). As a consequence, around 100 000 additional RN graduates are now graduating from United States universities each year compared to the early 2000s. There is concern that the supply of nurses may soon exceed the demand if student admission rates remain at their 2013 level (11). The recent sharp increase in the number of domestically trained nurses in the United States has been accompanied by a sharp drop in the number of foreign-trained nurses who pass the exam to work in the United States (1).

The above example illustrates the need to conduct regular assessments of labour market prospects based on more robust health workforce planning models that do not overreact to cyclical fluctuations, given the time that it takes to train new health professionals.

In addition, health workforce planning models will undergo substantial changes as digital technologies become a more integral part of health service delivery. Digital technology is currently changing health service delivery (and will continue to do so in future), with a consequent shift in the number and types of health workers needed. For instance, digital technologies are prompting the emergence of coordinators liaising across teams of health and social care providers and coaches that empower people to manage their conditions effectively. More health professionals will be needed to promote healthy lifestyles and disease prevention among individuals and populations; more generalists and nurse practitioners will be needed to manage multiple chronic conditions. As the role of ICT and data analytics grows with the use of digital technology, so will the necessity to add professionals specializing in bioinformatics as key members of care teams.

Box 1 summarizes some of the main recommendations that arose from a 2013 OECD review of health workforce planning models to improve the management of numerous countries' policies based on more robust health workforce data and sophisticated health workforce planning models.

Box 1

Recommendations to improve health workforce planning in OECD countries

Health workforce planning is not an exact science and needs regular updating. Assessing the future supply of and demand for doctors, nurses or other health professionals 10 or 15 years down the road is a complex task, fraught with uncertainties on the supply side and even more so on the demand side. Projections are inevitably based on a set of assumptions about the future; these assumptions need to be regularly reassessed in light of changing circumstances, new data and the effect of new policies.

We need to know where we are before we can know where we are heading. The first step of any good health workforce projection is gathering comprehensive data about the current situation. One of the main benefits of strengthening health workforce planning efforts is that it often triggers improvements in this crucial first step.

Health workforce projections should help avoid a “yo-yo” approach to student intakes and entry into medical and nursing occupations. Available evidence shows that employment in the health sector tends to be less sensitive to economic cycles than employment in other sectors, and there is also a long time lag between decisions about medical student intakes and the actual entry of those students into the labour market. Hence, health workforce planning should keep an eye on long-term structural factors and avoid being overly sensitive to cyclical fluctuations.

5. Conclusions

Ensuring that the health workforce becomes fit for purpose for 21st century health needs will require that policy-makers, professional associations and educational institutions support the necessary transformations in education and training programmes and in health service delivery models. The need to adapt is driven by

Supply-side improvements need to focus more on retirement patterns. Most health workforce projection models have focused their attention on new entry into different professions, but have paid less attention to exit through retirement. There is a need to consider more closely the complex issue of work-to-retirement patterns, particularly for doctors but also for other professions, as a large number of health care providers are approaching retirement age and their retirement decisions will have a major impact on supply in the coming years.

Health workforce planning requires a multiprofessional approach. Health workforce projection models need to be able to assess in a more integrated way the impact of different health care delivery models, as many countries are looking at ways to reorganize the delivery of services to better respond to population ageing and the growing burden of chronic diseases. Moving from uniprofessional to multiprofessional approaches to health workforce planning is particularly important in the primary care sector, where the roles and responsibilities of different providers (doctors, nurses and other providers) are rapidly evolving in an increasing number of countries.

Health workforce planning models need to adequately address the geographical distribution of health workers. Any nationwide balance of health workers does not necessarily mean that regional shortages or surpluses do not exist. A proper assessment of gaps between supply and demand needs to go below the national level to assess the geographical distribution of health workers and how this might evolve over time under different scenarios.

Source: Ono, Lafortune and Schoenstein (12).

changing population health needs as well as a rapidly transforming technological landscape, particularly in the area of digital innovation.

So far, OECD countries have focused mainly on ensuring there will be sufficient health care providers (notably doctors and nurses) to replace those who will be

retiring in the coming years. This has often been done without taking into account two longer-term objectives: first, promoting the transformations needed in education programmes and health service delivery to better respond to changing health needs of the population and new technologies; and second, making fuller use of the skills of different providers at all levels. In responding to pressures to achieve the short-term replacement goal, policy-makers need to make sure that their decisions will not make it more difficult to achieve the longer-term strategic objectives.

Policies around education and training of health professionals in OECD and non-OECD countries need to be adapted to achieve the goal of providing the right skills and competencies to a more diverse workforce, with a particular focus on promoting greater access to primary care based on teamwork. Policies also need to promote greater support for continuous professional development and skills reassessment to ensure that health care providers remain fit for purpose throughout their professional lives. To achieve this ambitious agenda, four key objectives are proposed:

1. adapt education and training programmes to more competency-based curricula, and optimize the scope of practice of different categories of health professionals to ensure effective use of their skills;
2. ensure an efficient supply of primary care providers, and provide sufficient incentives to attract and retain general practitioners and other health workers in primary care;
3. develop more robust health workforce planning models – including the potential impact of new technologies in changing the roles of and requirement for different health professionals – to guide the decisions of prospective students and public investments in education and training programmes;
4. provide greater support for continuous professional development activities and implement regular skills reassessment to ensure that the skills of health care providers are kept up to date throughout their professional lives.

The opinions expressed and arguments employed herein are solely those of the authors and do not necessarily reflect the official views of the OECD or of its member countries.

Acknowledgements

The authors gratefully acknowledge contributions from Francesca Colombo and Luke Slawomirski (from the OECD Health Division) and James Buchan (from Queen Margaret University).

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The role of decent work in the health sector

Christiane Wiskow

Abstract

This chapter focuses on the importance of decent work in the health sector for the achievement of Sustainable Development Goals 3, 5 and 8. It considers all workers in or contributing to the health sector as part of the health workforce, including a broad range of skill levels and occupational groups. Referencing the normative work of the International Labour Organization and recent literature, the chapter summarizes decent work challenges and opportunities, and suggests strategies to create quality jobs in the health sector.

The chapter emphasizes the need for and value of investment in decent work in the health sector, as related to attracting and retaining health workers and enabling the provision of quality health care. Core issues addressed include secure employment, safe and healthy work environments, fair pay and benefits, social protection, and education and professional development, with particular attention paid to the gender dimensions of each issue. The chapter calls for a rights-based approach to health employment, with collective bargaining, organizing, and freedom of association rights as fundamental. It additionally highlights the positive contribution of social dialogue, as an integral part of decent work, to health sector development and reforms; and consensus-based responses to health sector challenges, resulting in policies that are more effective and sustainable.

1. Introduction

The Sustainable Development Goals (SDGs) underscore the critical role of decent work in ensuring inclusive economic growth and its contribution to social progress. SDG 8, on promoting full and productive employment and decent work for all, is closely linked to the part of SDG 3 that calls for increasing the recruitment, development, training and retention of the health workforce to ensure healthy lives for all, and to SDG 5 on gender equality (1).¹

The health and social work sector² has remained a relatively stable employment sector, with annual growth rates even in times of slowing economic growth and increasing levels of unemployment, particularly for women, who constitute more than 70% of the workforce (2).

Notwithstanding the global growth trends in health employment, significant health workforce shortages exist in many countries. These shortages, which are most pronounced in rural areas and in low-income economies, constrain the ability of countries to achieve universal access to essential health services for all in need, especially as they primarily affect the poorest and most vulnerable populations by excluding them from access to health services, thereby exacerbating a country's health inequities (3–5).

While the care economy has been identified as a source of future job growth due to ageing populations, many existing needs for care go unmet because of financial constraints on the individual in need, or because the care needs are met by underpaid or unpaid carers (6).

The Ebola outbreak in western Africa demonstrated the harsh consequences that inadequate investments in public health systems and their workforce can have on societies, economic development and international health security (7). The high

1 SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. SDG 3: Ensure healthy lives and promote well-being for all at all ages (target 3.c: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States). SDG 5: Achieve gender equality and empower all women and girls.

2 The health and social work activities sector is defined according to ISIC Rev.4, section Q: Human health and social work activities.

death toll among health workers³ sheds further light on the lack of protection against exposure to occupational hazards and the poor conditions of work that confront health workers in their daily tasks (8, 9).

Workforce shortages, high staff turnover, increasing health worker migration and early exits from health professions are symptoms of decent work deficits and dysfunctional health systems. Investments in health need to provide for employment with decent working conditions if they are to yield the intended result of effective and sustainable health care systems.

This chapter focuses on the importance of decent work in the health sector for the achievement of SDGs 3, 5 and 8. It considers all workers in or contributing to the health sector as part of the health workforce, including a broad range of skill levels and occupational groups. New estimates suggest that a significant number of workers in non-health occupations⁴ are contributing to the provision of health care (10). With reference to International Labour Organization (ILO) normative work and recent literature, the chapter summarizes decent work challenges and opportunities, and suggests strategies to create quality jobs in the health sector.

2. Importance of decent work

Health workers are the backbone of health systems. To perform effectively they need secure jobs, fair pay, safe and healthy working conditions, adequate education, continuing professional development, career opportunities, equal treatment and social protection for themselves and their families (Box 1).

3 WHO reported the deaths of 513 Ebola-infected health workers (as of October 2015) in the course of the outbreak in the three most affected countries – Guinea, Liberia and Sierra Leone (8).

4 Examples of workers in non-health occupations in the health sector include information technology workers, cleaners, catering and maintenance personnel, and accountants. For a more detailed definition of workers in health occupations and workers in non-health occupations in the context of estimating the size of the workforce contributing to the health economy, see Scheil-Adlung and Nove (10).

Box 1

What is decent work?

Decent work is productive work for women and men in conditions of freedom, equality, security and human dignity. It involves:

- opportunities for work that is productive and delivers a fair income;
- security in the workplace and social protection for families;
- better prospects for personal development and social integration;
- freedom for people to express their concerns, organize and participate in the decisions that affect their lives;
- equality of opportunity and treatment for all women and men.

Source: International Labour Office (11).

Yet, in the face of reforms focused on cost containment, policy-makers face major and growing challenges in responding to the increasing demand for health care. While existing workforce shortages already result in overburdened workers, there is a risk that extending access to health care without expansion of health employment will lead to further intensification of workloads and deteriorating working conditions for the workforce.

Virtually all countries face challenges in recruiting, deploying and retaining sufficient numbers of well trained and motivated health workers where they are needed. The reported causes for high turnover and attrition rates of health workers in many countries are mainly poor employment and working conditions, including low salaries and weak career prospects. Despite differences across countries and occupational groups, health workers' job dissatisfaction is directly linked to motivations to leave the profession (12, 13).

Working conditions and income remain common key motivations for individual health workers to move abroad. For example, the association between income levels in origin countries and intentions to migrate was observed in 17 European countries, where health professionals were attracted to countries offering higher income, while outflows decreased in countries where salaries were improved (14). Income, however, is not the only motivation to leave. More important is an overall dissatisfaction with working conditions, such as excessive workloads, long hours of work, inadequate infrastructure and medical equipment, lack of control over work, poor work relations, and lack of professional development and recognition. The search for better protection against exposure to occupational hazards, such as infectious diseases, is also a motive to migrate, particularly in Africa (15–17).

Working conditions influence the quality of care. Patient outcome indicators such as morbidity and mortality are closely associated with appropriately determined staffing levels, staffing stability and the education levels of health workers (18). Research in some European countries shows that an increase in a hospital nurse's workload by one patient increases the risk of inpatient mortality by 7%; while inversely, each 10% increase in the proportion of nurses with a bachelor's degree is associated with a 7% decrease in patient mortality (19).

Thus, decent work in the health sector has a dual critical role: ensuring both the sustainability of the health workforce and the provision of quality care. Improving employment and working conditions will attract and retain health workers while also enabling them to perform more effectively.

3. The Decent Work Agenda

Job creation and employment, rights at work, social protection and social dialogue form the pillars of decent work. These main elements build the basis of the ILO's Decent Work Agenda and its four strategic objectives, which are equally important, interrelated and mutually supportive; they are outlined in the following subsections (20).

3.1 Promoting productive employment

Sustainable institutional and economic environments will encourage investments in health employment. Health employment policies need to consider the specifics of health labour markets: they have to balance demand and supply with a view to meeting population health needs for effective access to health care. Policies have to address the diversification of employment in the health sector. Important in this context is the transition from informal to formal jobs, for instance in the care economy, and addressing vulnerable employment in the health sector to ensure productive employment and inclusive economic growth, in line with SDGs 3 and 8.

3.2 Guaranteeing rights at work

All aspects of decent work have a legal dimension: international labour standards and national labour laws help to clarify what decent work implies in concrete terms and are preconditions for its achievement (21). Fundamental rights at work include freedom of association, the right to organize and collective bargaining, equal remuneration, the elimination of discrimination in employment and occupation, and provision of safe and secure working environments for all workers, including migrant workers.

International labour standards provide guidance for decent work policies. The Nursing Personnel Convention, 1977 (No. 149) and its Recommendation (No. 157) outline key standards, also relevant for other occupational groups in the sector, including standards for education and training appropriate to the exercise of functions; professional regulation; occupational safety and health legislation adapted to nursing work; hours of work, leave and social security at least equivalent to other workers; and voice and participation (22). Box 2 presents ILO Conventions and standards of relevance to the health sector.

With a view to international recruitment and migration, the protection of migrant health workers' rights is important. In line with international standards,⁵ migrant

5 Notably: Migration for Employment Convention (Revised), 1949 (No. 97); Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143); Nursing Personnel Recommendation, 1977 (no. 157) (all ILO); and International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families, 1990.

Box 2

ILO Conventions and standards relevant to the health sector

- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
- Right to Organise and Collective Bargaining Convention, 1949 (No.98)
- Equal Remuneration Convention, 1951 (No. 100)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
- Nursing Personnel Convention, 1977 (No. 149)
- Nursing Personnel Recommendation, 1977 (No. 157)
- Labour Relations (Public Service) Convention, 1978 (No. 151)
- Social Security (Minimum Standards) Convention, 1952 (No. 102)
- Social Protection Floors Recommendation, 2012 (No. 202)

Source: International Labour Office. NORMLEX: information system on international labour standards (www.ilo.org/normlex) (22).

health workers should enjoy, without discrimination, equality of treatment with national workers regarding remuneration and working conditions, social security and the right to organize. The World Health Organization (WHO) Global Code of Practice on the International Recruitment of Health Personnel promotes the protection of health workers' rights as an integral part of ethical international recruitment practices (23).

Appropriately applied and enforced in national legislation, according to country situations, these international labour standards protect workers as well as supporting the effectiveness of health services. This rights-based approach to decent work is anchored in the Universal Declaration of Human Rights (24).

3.3 Extending social protection

The implementation of national social protection floors with basic social security guarantees aims to ensure universal access to essential health care and income security for all in need, at a nationally defined level.⁶ It is based on the human right to health and social protection (24). Because health workforce shortages constrain access to health care, an effective social health protection system is important in providing fiscal space for investing in decent health employment to ensure universal access to health care (4). It is important to include the protection of health workers when extending labour protection measures that address wages, working hours, occupational safety and health, and maternity protection (25).

3.4 Promoting social dialogue

Social dialogue may include all types of negotiation and consultation, ranging from exchange of information to collective bargaining and mechanisms for dispute settlement. It operates at various levels, from national institutions, through regional coverage to individual workplaces. Effective social dialogue requires strong, representative and independent social partners who recognize the legitimate roles of each other. Social partners in health services are public authorities as regulators or as employers, and employers' and workers' organizations in the sector. Increasingly, other stakeholders within and beyond the health sector have been involved in dialogue on health policy development, while matters concerning negotiating and collective bargaining remain a prerogative of the social partners (26).

Social dialogue contributes positively to the development and reform of health services, and is particularly important in times of structural change. Based on values and principles, including patients' needs, professional ethics and affordable and universal access to health care, social dialogue facilitates consensus building on issues such as health reforms, social protection, financing, quality of health services, working conditions, skills, career development and pay systems (26–28).

The freedom to participate and to express their concerns are critical for enabling health workers to actively contribute to enhancing positive work environments

6 In line with the Social Protection Floors Recommendation, 2012 (No. 202) and the Social Security (Minimum Standards) Convention, 1952 (No. 102) (22).

and shaping quality health services, and are guaranteed in fundamental rights at work. Social dialogue plays an important role in promoting decent work and better health care. For example, the European Sectoral Social Dialogue Committee for the Hospital and Healthcare Sector was established in 2006 (29). The social partners – the European Public Services Union and European Hospital and Healthcare Employers' Association – have adopted a range of joint documents and agreed on joint work programmes for their implementation.⁷ Another example is from South Africa, where the Public Sector Coordinating Bargaining Council's Resolution 2012 sets out to review working time schemes and rearrange working time organization to facilitate improvement of health service delivery (30).

4. Major challenges to decent work and responses

4.1 Changing patterns of employment relationships

Health sector reforms, in response to cost and efficiency concerns, have resulted in growing diversification in forms of employment. The sector increasingly uses non-standard forms of employment, including fixed-term work, temporary work, temporary agency work, dependent self-employment and part-time work (31).

Across countries, a common trend in public health services is to replace permanent employment with fixed-term contracts for all employees, and to use outsourcing. Agency workers often have no employment security, are excluded from collective bargaining coverage, and may not receive the same pay as their permanently employed colleagues (32). The use of zero-hour contracts⁸ has increased. In 2013, for instance, an estimated 27% of United Kingdom health care employers were using zero-hour contracts, and 307 000 workers in the care sector were on such terms of employment in England alone (33).

In South Africa, the use of agency staff and related different contractual arrangements within the same institutions has been identified as a growing problem,

7 Such as: Guidelines and good practice examples "ageing workforce healthcare sector" (2013); Framework of action on recruitment and retention (2010); Multi-sectoral guidelines to tackle third-party violence and harassment related to work (2010); Framework agreement on the prevention from sharp injuries in the hospital and healthcare sector (2009); Code of conduct on ethical cross-border recruitment and retention (2008). All documents available from www.epsu.org and www.hospeem.eu.

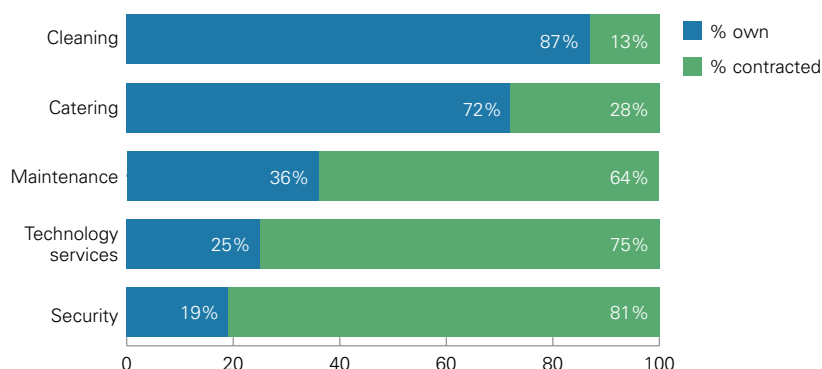
8 Zero-hour contracts are employment arrangements without guarantee of a minimum number of work hours.

compromising service delivery, continuity of care, and health and safety, and contributing to greater inequality (Figure 1). Outsourced ancillary services jobs are mostly temporary, part time and insecure, with agencies supplying workers on demand to the public health service (34).

Figure 1

Subcontracting of ancillary services in all public hospitals in South Africa, 2011

Source: Kisting and Dalvie (34).



While well regulated non-standard forms of employment can allow organizations to respond to changing demands, and workers to reconcile work, life and family responsibilities, workers in such employment tend to be more exposed to deficits in decent work, including job insecurity, lower pay, gaps in access to social protection, higher risks of safety and health, and limited power for organizing and collective bargaining (31). Employment policies have to provide protection for workers in such vulnerable contractual arrangements.

The case of the Brazilian Unified Health System – Sistema Único de Saúde (SUS) – provides an example of how institutional openness to dialogue and negotiation can create a way to decrease the instability of outsourced work through

the development of ways to guarantee the rights of these workers or by the adoption of policies to replace outsourced workers with public servants through public selection (Box 3) (35).

Box 3

Examples of improving conditions of work and organizing care work

In Brazil, in response to the concern of the “precarization” (increasingly precarious work status) of the workforce in the Unified Health System (Sistema Único de Saúde, SUS), the Ministry of Health created the National Interinstitutional Committee on Deprecarization of Work in the SUS, composed of government representatives (federal, provincial and local) and trade union leaders. It aims to promote the creation of employment relationships that guarantee rights and job stability to workers as well as the quality of the health services. Today, due to these efforts, there is an institutional plan to regulate labour relations in the health sector and to substitute outsourced and informal temporary workers for permanent public servants.

Source: Verma and Gomes (35).

Cooperatives are emerging as a type of care provider, generating access to better terms and conditions of work for the largely informal care workers. In addition, cooperatives foster integrative, participatory and people-centred care by privileging equitable inclusion and democratic decision-making across the care chain. As a result, care workers, care beneficiaries and their families, and other stakeholders have a voice in the nature of service provided and the operations of the care provision enterprise. In Rwanda, for example, community health workers have been organized in cooperatives.

Sources: International Labour Office (36); Condo et al. (37).

4.2 Safe and healthy workplaces

Health workplaces can be dangerous. Workers in the health sector face a range of occupational risks related to biological, chemical, physical, ergonomic and psychosocial hazards.

In the European Union, health workers had the fourth-highest rate of serious work-related problems across economic sectors. The sector ranked highest with regard to exposure to biological and chemical hazards and work-related stress, violence and harassment (38). Of concern to health workers are needlestick and sharps injuries as sources of infection of hepatitis B, hepatitis C and HIV (39).⁹ Violence and harassment are persistently high in the sector in both developed and developing countries (40–42). Discrimination against health workers related to their status with regard to HIV, Ebola or other infections, their gender or other reasons is a concern.

During the Ebola crisis in western Africa, the infection and mortality rates among the national health and emergency workforces were exacerbated (8) due to lack of personal protective equipment, supplies for hygiene, infection prevention and control, and occupational safety and health measures.¹⁰ Once those measures were in place, the infection rate among health workers dropped significantly (9).¹¹

Health workers are increasingly under attack in emergencies and situations of conflict: 159 workers were killed or wounded between 2008 and 2010; between 2012 and 2014, 760 health workers were affected by violence, including those killed, wounded or beaten, threatened or subjected to arrest (43, 44). The number of victims may be higher as there is no global system for documenting and reporting these attacks (45).

The complexity of ensuring 24-hour services seven days a week, involving shift work, night work and weekend work, poses enormous challenges for workers' health and organizational performance. Excessive workloads, long hours, sleep-disruptive shifts, night work, overtime, short rest periods and work–life conflicts are associated with

9 In 2003, WHO estimated 3 million needlestick accidental injuries in health workers, leading to 37% of all new hepatitis B cases in health workers, 39% of new hepatitis C cases and around 5.5% of new HIV cases (39).

10 WHO reported 881 confirmed or probable cases of Ebola-infected health workers, of which 513 had died, as of October 2015 (8).

11 Health workers' risk of infection was between 21 and 32 times higher than in the general population at the beginning of the outbreak (9).

staff health problems and chronic fatigue, leading to poorer individual performance, including risks of medical errors and accidents. Resulting absenteeism and high turnover are costly for health services.

Improving how working time is organized can lead to a better reconciliation of workers' well-being with individual and organizational performance requirements, when inputs from all parties are integrated into the design of working time arrangements. More flexible schedules and participatory approaches improve staff control over their working time, and help them better balance work and family responsibilities. Promising examples include compressed work weeks, flexitime schemes, time banking systems, part-time work, job sharing and matching shift schedules to circadian rhythms (30, 38).

Employers have overall responsibility to ensure that all practicable measures are taken to ensure occupational safety and health. Health-care workers are responsible for following established occupational safety and health procedures. National legislation on occupational safety and health should be adapted to health workplaces.¹² Effective labour inspection is necessary for ensuring compliance with standards protecting workers.

In non-health sectors, the economic return on prevention has been estimated at 2.2, supporting the business case for investment in occupational safety and health in the health sector as well (46).

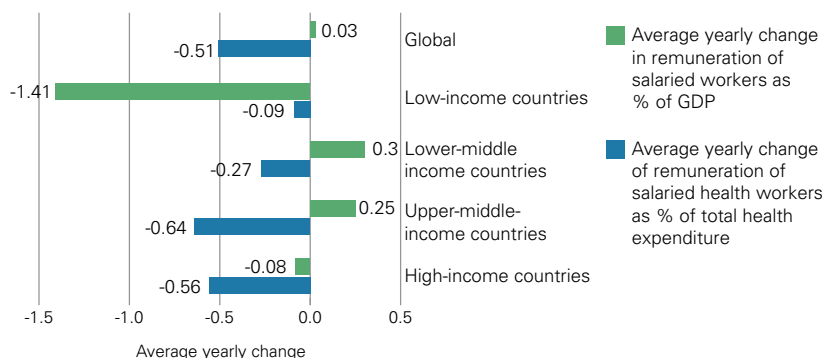
4.3 Remuneration

Over the first decade of this century, the remuneration of salaried health workers as a proportion of gross domestic product (GDP) remained nearly unchanged globally and decreased in terms of total health expenditure (Figure 2). In some countries, for example Egypt, Myanmar and Sudan, workers in the lowest paid categories received wages on average 1% above the poverty line (47). To make up for low wages, health workers often resort to working multiple jobs or increasing shifts or overtime (30, 48).

¹² In line with ILO Convention No. 149 and Recommendation No. 157.

Figure 2

Yearly change of health workers' remuneration compared to total health expenditure and GDP by country income level, 2000–2010 (%)



Source: International Labour Office (47).

In response to the global economic crisis, some European countries reduced salaries drastically or froze them, also affecting benefits such as pensions. These measures contributed to increasing wage disparities, further stimulating health worker outflows from some countries. Austerity measures induced a radical transformation in the hierarchy of wage levels between the public and the private sector, resulting in wage penalties for public service workers in some countries of the region (49–51).

Wage levels across occupations vary widely: among 16 health occupational groups across 20 countries, medical doctors were paid the highest and personal care workers the lowest wages, while the nursing and midwifery groups ranked in the middle. Wage differentials between countries were also significant (52).

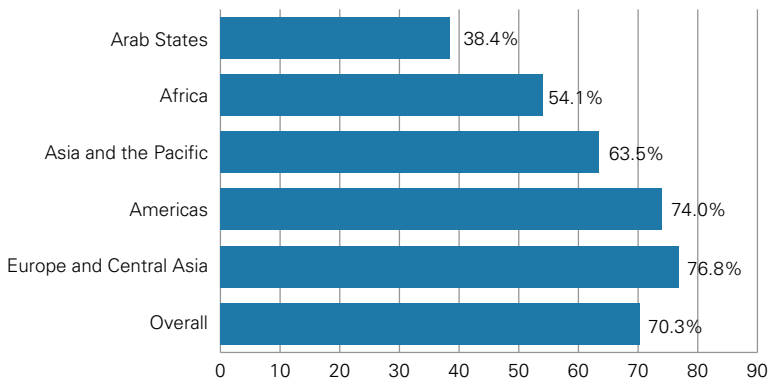
Pay is a major factor for recruitment, retention and motivation. As remuneration reflects the level of recognition and value attached to a person's work, the level of pay for health workers should be comparative to and competitive with occupational groups of similar skill levels and responsibilities in other economic sectors. Adequate pay is important for the independence of health workers in exercising their responsibilities according to their professional ethics.

4.4 Gender aspects

While around 70% of the global health workforce is female (Figure 3), paradoxically women in the health and social sector tend to remain in lower-skilled jobs, with less pay and at the bottom end of professional hierarchies (53). In the United Kingdom, female employment in care is mostly related to direct care work, while managerial jobs tend to be held by men (54). In particular, long-term care is mainly performed by women (90% in Organisation for Economic Co-operation and Development (OECD) countries), often in part-time arrangements, while the training and skills development of formal long-term care workers is often at very low levels compared to other health workers (54).

Figure 3

Female share of employment in the health and social services sector by region, 2013



Source: ILO (2).

The number of informal long-term care workers in care of the elderly, often unpaid female family members, by far exceeds that of formal long-term care workers (55). Informal carers, including migrant workers, have less favourable working conditions, lack social security and receive lower wages (38).

Because care work involves tasks that women have traditionally performed without pay, the skills required for it and care provision in general are undervalued or

overlooked in national measures of the economy (56). It has been argued that the labour market devalues so-called “female” tasks and skills, as shown by the fact that when women’s participation in the workforce in an occupation increases, wages often are lowered (52). Women’s contribution to health care has been estimated to account for nearly 5% of global GDP, equivalent to over US\$ 3 trillion, but nearly half of this is unpaid and unrecognized. This informal and volunteer work in families and communities is considered a hidden subsidy to health systems and societies that should be recognized and compensated (53).

The gender pay gap,¹³ globally estimated at an average of more than 20% in the overall economy (6), appears even more marked in the human health and social work sector, where the unadjusted wage gap has been estimated at an average 26% in high-income countries and 29% in upper middle-income countries.¹⁴

Employment and social policies conducive to women’s participation in the labour market, including measures to ensure equal pay for work of equal value, as well as equal opportunities in professional development, career progression, and balancing work with family responsibilities, are particularly important for the health sector. Strategies to attract young people to care professions should address the needs of both women and men in adequate ways.

4.5 Professional development

Education, vocational training and lifelong learning, as central pillars of employability¹⁵ and productive employment, are indispensable for ensuring decent work and inclusive economic growth (57). Rapid technological changes,

13 The gender pay gap refers to differentials in earnings between women and men. While being explained by a number of factors, such as level of education, hours worked, and type of occupation, these factors are consequences of broader gender inequalities in labour markets, including occupational segregation, hours spent in unpaid care and household work, and part-time work due to family responsibilities (56).

14 This refers to an unadjusted gender wage gap, that is, the simple difference in average wages, not taking into account the different characteristics of male and female employees. The reasons for the unadjusted wage gap need to be further studied. Data available from 40 countries (27 high-income; eight upper middle-income; four lower middle-income; one low-income); latest available 2011–2013. Source: ILOSTAT, based on national labour force surveys and official estimates of each country (<http://www.ilo.org/ilostat/>).

15 The term “employability” relates to portable competencies and qualifications that enhance an individual’s capacity to make use of the education and training opportunities available in order to secure and retain decent work, to progress within the organization and between jobs, and to cope with changing technology and labour market conditions. See ILO Recommendation concerning Human Resources Development: Education, Training and Lifelong Learning, 2004 (No. 195) (22).

demographic transitions, epidemiological developments and scientific advancement require continuous health workforce development to meet current and future health needs.

Fragmented professional health education inadequately prepares young people for practice as members of interprofessional teams delivering people-centred integrated care. Entry-level employment at lower skill levels is particularly important for addressing youth unemployment. Recruitment and retention of young people in health occupations are improved when career development paths are well designed through technical and vocational education and training (TVET), in-service training and continuing training. Collaboration of education and health sectors, academia, regulatory bodies, and employers' and workers' organizations is essential to develop up-to-date curricula that result in the required skills and competencies, to promote professional development and to open career paths beyond traditional roles. Sustainable skills development systems are able to anticipate skill needs; engage social partners in decisions about training provisions; maintain quality and relevance of training; make it accessible to all in need; ensure viable and equitable financing mechanisms; and evaluate the economic and social outcomes (57).

Education and professional development opportunities are major factors for recruitment and retention as well as motivators for health worker migration (15, 17, 18). To mitigate the adverse impact on source countries of the loss of their skilled health workforce, international standards, including the WHO Global Code of Practice on International Recruitment of Health Personnel, suggest that mechanisms of international cooperation be established to help strengthen health workforce development systems in countries of origin (23).¹⁶ Recognition of skills, competencies and qualifications in the context of negotiated agreements can be beneficial by facilitating skills transfer to source countries as part of fair migration policies.¹⁷ Timely information is vital for raising awareness on health workers' rights during the migration process (Box 4).

16 See also ILO Human Resources Development Recommendation, 2004 (No. 195), article 21.

17 See also ILO Nursing Personnel Recommendation, 1977 (No. 157), articles 62–67; ILO Human Resources Development Recommendation, 2004 (No. 195), article 21(f); and WHO Global Code of Practice, article 5.3.

Box 4

Raising awareness on labour rights for prospective migrant nurses in the Philippines

Spearheaded by the Philippines Commission on Higher Education, a course on migration and decent work has been developed for inclusion in the country's nursing and health science curriculum. The course consists of seven context-specific modules covering the health care system in the Philippines, decent work for Filipino health professionals, international agreements for the mobility of health professionals, migration and ethical recruitment issues and multiculturalism in the health sector. As prospective migrant health professionals, students learn how to protect and exercise their labour rights, and are thus better prepared to avoid the pitfalls of international migration.

Source: ILO (58).

5. Policy options

Policy option 1

Invest in decent work in the health sector so as to attract and retain health workers and enable the provision of quality care

- To attract and retain skilled personnel where they are needed, investment in health employment must be founded on decent work. Core issues to be addressed include secure employment, safe and healthy work environments, fair pay and benefits, social protection, education and professional development, and a voice for health workers and their organizations.
- It is important to take into account gender dimensions when developing strategies for health care to address the challenges for women in health work, including measures reconciling work with family responsibilities, equal opportunities and pay, career paths for women and the recognition and compensation of unpaid care work.

- Conducive work environments enable and support the provision of quality health care. Participatory approaches to improving workplaces and practices, involving management and worker collaboration, have proven their effectiveness.

Policy option 2

Promote a rights-based approach in health employment and social dialogue in the health sector

- International labour standards incorporated in national legislation set the legal frame for implementing decent work. At the health sector level, general standards need to be adapted to the nature of work in the sector with means for effective regulation or collective agreements. The protection of all health workers, particularly those in vulnerable employment situations, is critical.
- Migrant health workers should have equal treatment with nationals. Agreements between origin and destination countries should cover such issues as social security entitlements, recognition of qualifications and funding of training.
- Promoting social dialogue is a means to facilitating consensus building among governments and social partners on relevant economic and social policies affecting the health sector. The use of social dialogue with a view to negotiating terms and conditions of employment by means of collective agreements should be encouraged and promoted.
- Recognizing and respecting the rights to freedom of association, to organize and to collective bargaining are fundamental to enabling health workers to express their views and participate in the development of decent work in the health sector.
- Intersectoral collaboration is indispensable for effective health care. All relevant stakeholders should be involved in social dialogue, taking account of the context and issues to be addressed.

6. Implementation considerations

The decent work approach to health employment puts an emphasis on social dialogue and on respect for rights at work. Based on these principles, successful recruitment and retention policies consist of comprehensive interventions addressing interrelated health workforce challenges. Combining financial incentives with improved working conditions has proven to meet health worker aspirations for decent work. Strategies have to be context specific according to country situations and local needs, informed by evidence and lessons learned and backed by political commitment through involvement of all stakeholders (59, 60).

Box 5

Brazil: Decent Work Agenda in the health sector

In November 2015, the Brazilian Ministry of Health and social partners signed a protocol for the Permanent National Negotiation Table of the SUS (Mesa Nacional de Negociação Permanente do SUS) to establish a Decent Work Agenda for Health Workers in the National Health System (Agenda Nacional do Trabalho Decente para Trabalhadores e Trabalhadoras do SUS, Protocolo No. 009/2015). It builds on four priority action areas:

- generate more and better jobs in the national Unified Health System (SUS);
- strengthen health workforce management;
- strengthen dialogue and negotiation of working conditions and labour relations in the SUS;
- combat all forms of discrimination at work, with special attention to gender, race and ethnicity.

Sources: International Labour Office (61); text of the Protocol available from Ministério da Saúde, Secretaria de Gestão do Trabalho e da Educação na Saúde Mesa Nacional de Negociação Permanente do SUS (<http://u.saude.gov.br/images/pdf/2015/dezembro/02/protocolo-mesa009.pdf>).

In Brazil, for example, the Ministry of Health and the social partners engaged in dialogue on decent work for workers in the national health system, resulting in the adoption of the National Decent Work Agenda in the health sector, setting out an action plan for implementation (Box 5) (61).

Monitoring the impact of policies on the health workforce with a view to improving work quality, access to health care and health outcomes is a next step requiring the development of assessment tools adapted to the health sector.

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A hidden human resources for health challenge: personnel posting and transfer

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Abstract

Posting and transfer (P&T) encompasses initial health worker deployment and subsequent transfers. Irrational P&T refers to deployment and transfer that is inconsistent with population health needs. This chapter is based on a comprehensive literature review to uncover the actual practices and informal regulations characterizing P&T in low- and middle-income countries.

Irrational P&T in the health sector is described in many diverse low- and middle-income countries. Existing data suggest that irrational P&T affects many cadres of health care workers and administrators, from specialist doctors to outreach workers. P&T is intimately related to the distribution of power at multiple levels of governance. Negotiations often occur in a context of official and informal regulations and incentives, lack of adequate human resources for health, political patronage and networks, personal networks and corruption. Irrational P&T can contribute to maldistribution and absenteeism, undercutting efficiency and health worker morale. Often, the poorest regions are the most affected.

Despite its relevance to global health goals, P&T remains a largely unnamed health system governance function. The chapter calls on policy-makers to improve health worker deployment as a core system function; to introduce direct accountability to communities around health workforce deployment; and to improve collaboration between health-specific and broader public administration actors.

1. Introduction and outline of methods

Achieving universal health coverage requires adequate numbers of skilled health care workers in functioning health facilities. However, in many countries there are too few skilled personnel in the public sector, and the existing public sector workforce is inequitably distributed. This maldistribution results in part from poor posting and transfer (P&T) practice (Box 1).

Box 1

Irrational posting and transfer

Posting and transfer (P&T) encompasses initial health worker and administrator deployment, and subsequent transfers. In general, “irrational P&T” refers to P&T that is inconsistent with population health needs. While a provider obtaining a post in a more desirable area may be rational from the provider’s point of view, it is not rational from the perspective of health system requirements for meeting health goals.

Even when governments have P&T policies that are intended to guide the distribution and movement of health personnel, these policies are not always followed. This may be because the policies are unknown to those tasked with implementing them, because of management and communication challenges or because their enforcement would interfere with entrenched informal practices.

While further research is required, existing quantitative and qualitative data suggest that irrational P&T practices contribute to maldistribution and absenteeism, undercutting efficiency and the morale of health workers as well as governmental efforts to improve access and quality. Often, the poorest regions are the most affected by irrational P&T. These challenges are widespread; irrational P&T is prevalent among different cadres of health workers in many different countries (1, 2).

Given its determinative role in reaching universal health coverage, P&T is a fundamental health systems governance function, necessitating political and resource commitment among stakeholders at subnational, national and global levels. Providers and patients on the front lines of the health system attest to the relevance of P&T. Yet, perhaps due to the fact that actual P&T practice often comprises a “parallel system” (2), and because national-level data often fail to capture the actual distribution of health workers, P&T remains largely below the radar in research regarding human resources for health (HRH). Consequently, the informal rules and patterned practices that constitute such a parallel system – although well known and intimately understood by those workers who participate in it – are rarely seriously considered when opportunities to develop new strategies and policies arise. As the Sustainable Development Goal (SDG) era begins and the Global Strategy on Human Resources for Health: Workforce 2030 takes shape, this chapter aims to consolidate and synthesize existing data about irrational P&T practice and to propose ways to promote P&T as a crucial element of health systems and health workforce stewardship.

This chapter is based on a comprehensive literature review conducted to uncover the actual practices and the informal regulations characterizing P&T in low- and middle-income countries. We searched Google Scholar and PubMed for terms related to posting and transfer in the health sector, including “posting”, “deployment”, “turnover” and “transfer”. We started with a broader review that some of us had conducted in 2012 (1) and then added resources that had been published in the subsequent four years. We consulted both peer-reviewed and “grey” literature, as many of the existing data and conceptual studies on P&T and related issues have not been published in peer-reviewed journals. We also consulted relevant global health strategies, particularly the Global Strategy on Human Resources for Health. Though our findings refer to related phenomena, such as maldistribution and absenteeism, we did not conduct separate reviews on these topics; these phenomena have determinants and implications well beyond the scope of the discussion here.

We also conducted limited academic and grey literature reviews of policy interventions that emerged in the initial review or that were identified as part of an ongoing transnational discussion among researchers and policy-makers on P&T. We looked at approximately 10 peer-reviewed articles related to each area; we did not

conduct systematic reviews. These areas included transparency in deployment and transfers; public service reform; civil society engagement and social accountability; and the creation of new human resource processes, such as those related to recruiting new cadres and emergency hiring.

2. Findings

HRH-related studies suggest that there may be significant gaps between policy and practice. Actual P&T of health providers and administrators is shaped by factors at individual and health system levels. Some of these factors, such as urban preference, are well explicated in the retention and HRH distribution literature; others are not. On the individual level, health providers and administrators may have locational preferences for several reasons, including standard of living, proximity to family, access to further education, access to promotion opportunities, opportunities to use one's skills, opportunities to generate additional licit or illicit income, and access to development projects or other activities that might entail additional income or professional support (1–8). Several studies report that providers fear being posted to a rural area, where they can be “forgotten” and overlooked for transfers or promotions. Thus, while some of these workers might be willing to spend two years in a rural area, they may be wary of posts that are theoretically two years, but much longer in reality (5, 8–10). The World Health Organization (WHO) has developed global policy recommendations on how to address these challenges by increasing retention of health providers in rural areas (11). For their part, actual decision-makers (who may or may not be the persons with decision-making authority as per official policy) may have preferences about P&T related, for example, to a desire to punish a particular worker, to make a dysfunctional system function better or to ensure that an ally is well placed (1, 4, 5, 12).

P&T as it occurs on the ground goes well beyond the negotiation of individual preferences. Negotiation can occur in a context of official and informal regulations and incentives, lack of adequate HRH, political patronage and networks, personal networks and corruption (1, 2, 4, 5, 8, 10, 12, 13). Thus, P&T is related to the distribution of power at multiple levels of governance. For example, individuals who hold power in a certain context, for example when their political party is in power, may be able to draw upon networks as resources, such as when they pay for a post

or rely on a political ally to obtain a desired post (1, 5). Indeed, in contexts where political figures exert considerable control over the public sector, the distribution of posts and transfers may actually be used as a tool in political contests. Harris et al. describe how, during the constitutional crisis in Nepal, political parties essentially sold posts to generate income. Professional unions were associated with political parties, and they systematically interfered with P&T (5). On the other hand, individuals lacking power in a certain context may have little room to negotiate their own or others' placement, as they are arbitrarily moved to make room for someone else or because they are "forgotten" in a rural area where they were officially supposed to serve for only a limited duration (1, 8).

Irrational P&T in the health sector has been described in many diverse low- and middle-income countries, including the Dominican Republic (2), Ethiopia (9), Ghana (6), Guatemala (13), India (2, 4, 10), Indonesia (3), Nepal (5), Niger (13), Nigeria (12), Sierra Leone (8) and the United Republic of Tanzania (7). National perception surveys conducted by the World Bank with households, businesses and public officials revealed that significant percentages of public officials – ranging from 9% in Benin to 50% in Zambia – report that purchasing posts in the health sector is relatively common (14). The scope and breadth of the challenge is probably large, with articles from many other countries obliquely referring to irrational P&T.

Research in non-health domains of the public sector has described irrational P&T, some of which has contributed to the understanding of how P&T may function in the health sector. For example, Wade illuminated the system for purchasing posts in India's irrigation sector, with the price of posts being based on opportunities to generate income, with an adjustment for the standard of living (15). There are some anecdotal data suggesting that the dynamics of P&T may be different for women. First, women may experience different personal and social expectations around proximity to family (8); second, they may face greater threats to their physical security in rural areas (5, 7, 8, 16, 17); and third, they are often concentrated among lower-level work cadres. Existing data suggest that the deployment of many cadres of health care workers and administrators – from specialist doctors to outreach workers – is affected by irrational P&T, with some indications that there are fewer transfers among the lowest level cadres, who are often hired locally (5, 7, 18, 19).

While there are sufficient peer-reviewed articles that describe irrational P&T, there are no studies or reports that purport to provide prevalence figures for irrational P&T. Moreover, there are few articles that discuss informal P&T practice as a palliative practice of “making do” or as a way to correct staffing problems so that services function better (for example, ensuring that a surgeon is posted with an anaesthetist so that they can work as a team to ensure that safe surgery can happen). One recent article suggests that palliative practice may be significant in certain contexts; qualitative research in Nigeria shows that primary health care managers may redistribute existing human resources to put strong clinicians in sites that are in need (12). Lack of analysis stems in part from poor-quality data. The system in reality may bear little resemblance to the system on paper, with people at posts who do not appear in formal statistics, the widespread use of public infrastructure and human resources for private services, and extensive absenteeism (20).

It is also important to highlight that P&T practice is overlaid on an official system that may not be capable of addressing population health needs for at least two reasons. First, in many countries, even if all health care workers were equitably distributed, the health system would still suffer from inadequate numbers of these workers. Second, the number and distribution of “sanctioned” or “established” positions may not correspond to population health needs. Thus, P&T can be both a means of exacerbating, or of “making do” with, inefficient HRH governance and workforce planning (4, 12).

Within the global health community, P&T is a largely unnamed health system governance function, though P&T more broadly is frequently discussed within the public administration world. Given its links to retention, equitable distribution, public administration reform and corruption, P&T relates to many global and national strategies and policy-setting priorities. The fact that actual practice is often tacit, and the fact that irrational P&T is not yet high on policy agendas, means that P&T is rarely explicitly addressed in these forums. Yet, given the increasing focus on HRH governance, health systems, universal health coverage and delivery of quality care in the SDG era, there is ample opportunity to address P&T.

3. Discussion

3.1 Challenges

The following subsections outline the challenges faced in addressing the gaps between P&T policy and practice.

3.1.1 Deeply ingrained nature of P&T practices

As a health systems governance function that is shaped by individual preferences and health system attributes, actual P&T practice is deeply embedded and not amenable to “quick fixes” (13). For example, if obtaining better postings is tied to ability to pay (illicitly) for them, then providers may realign their efforts away from their public sector jobs towards the private practice that can generate revenue (2). In this context, attempts to better regulate absenteeism or dual practice are unlikely to be successful. Indeed, some researchers describe P&T as a “collective action problem” (5), that is, in situations where irrational P&T practices prevail, there is little incentive for an individual to follow the official rules and refrain from participating in the informal, “irrational” system. The person who follows the formal rules will suffer by being assigned to the most undesirable posts, while those who continue to “play the game” will do better.

In these contexts, mechanisms for supervision and accountability might perpetuate irrational practice, rather than disrupt it. For example, personnel evaluations may be perfunctory or biased (1, 5), or they may even be predetermined by a P&T decision that has already been made (1). Similarly, actors in the system may utilize policies and procedures to their advantage, for example by taking medical leave to avoid an unwanted post (2).

This is not to say that the system is so ossified that there is no subnational variation or that informal P&T is never positive. There are scattered examples of both, although the peer-reviewed literature in this area is slim (2, 5). For example, P&T practice may vary significantly among different states in India, perhaps determined in part by degree of health worker scarcity, state-level laws and regulations, and the political party in power (2). Research in some contexts has found that health workers

may ignore official deployment orders to work at adequately staffed facilities to instead work at a facility where they know they are needed. Recent, unpublished, research conducted by the Averting Maternal Death and Disability programme at Columbia University has found that particular cadres may be more likely to make these “prosocial” choices, even in a context where the majority of health providers overall are part of the P&T “game” (21).

3.1.2 Linkage of P&T to sensitive questions of political power and possible corruption

Irrational P&T is often linked to broader dynamics of political competition and professional power (1, 2, 5, 13). Thus, there are powerful interests in maintaining the status quo, as well as potential stigma or fear for people who might reveal corrupt and illegal practices. This undermines reform as well as research and learning.

3.1.3 Balancing individual preferences with community needs

Individual health workers and administrators have preferences about where they live. In the context of significant human resource shortages, these preferences frequently clash with the needs of underserved communities. Health workers who lack power can end up languishing in posts they do not want, or be arbitrarily transferred, undermining their morale, professional satisfaction, sense of organizational justice and, ultimately, their retention in the workforce (13). Though it may make short-term rural postings more feasible, increasing the absolute number of health workers is probably insufficient to remedy the clash between individual preferences and system needs.

3.2 Action under way and previous efforts: lessons learned

3.2.1 Broad public sector reform

As a cross-cutting issue, efforts to address P&T can be part of a larger reform effort.

Starting in the 1980s, many countries implemented broad public sector reforms that aimed to promote better public sector governance, administrative devolution, enhanced management, customer service and efficiency (22). These reforms were often guided by New Public Management (NPM), a philosophy and set of policies developed in the 1970s and 1980s in Nordic and Organisation for Economic Co-operation and Development (OECD) nations. A common theme was the transfer of responsibility from the core public sector to “agencies”.

Key components of “agencification” include the creation of mission-specific agencies, performance-based contracting and deregulation (23). NPM was hypothesized to reduce political influence by distancing an agency from ministries, increasing decision-making autonomy, professionalizing management cadres, using data for planning, and focusing on results through performance contracts. Results have been mixed. For example, in 1997, the United Republic of Tanzania undertook NPM-inspired reforms in order “to create a smaller, affordable, efficient and effective civil service” (24). However, evaluations highlight the lack of performance-based accountability, weak evaluation systems and continuing presence of the traditional civil service system. A lack of political will and commitment and weak public demand for better public services may explain, in part, this hybrid system (24). On the other hand, more recently, global budget support in the United Republic of Tanzania was conditioned on the improved distribution of nurses and midwives. Over the period assessed, the proportion of districts with three or more midwives or nurses per 10 000 people improved (25, 26).

Beyond NPM, policy-makers have focused on reforming the governmental organizations that are usually charged with designing and implementing P&T across the public sector (often called public service commissions or civil service commissions). These bodies were generally created to ensure fair and consistent recruitment, posting and transfers. For example, in 2001, Sri Lanka’s Constitution was amended to halt the ruling party’s influence in the Public Service Commission

and permit involvement from opposition political parties (27). In Namibia, government posts are publicly advertised, and the Public Service Commission oversees appeals from individuals denied civil service appointments (28). In Mauritius, civil sector employment decisions focus more on merit than on ethnic group representation (29). These reforms suggest that there are a variety of policy options that may distance a public service commission from political interference.

As is contextually appropriate, other labour and auditing authorities might be engaged to promote accountability across government agencies for stronger HRH governance (2). In some countries, labour ministries, local governments or auditing institutions might be engaged productively to improve the P&T oversight process, particularly when the public civil service commissions are functioning poorly. For example, civil servants in the United Republic of Tanzania have brought disciplinary appeals to the Ombudsman (30).

3.2.2 Transparency

Given that whole system public sector reform is an ambitious and politically challenging undertaking, many propose “within-system” solutions. For example, health care providers and administrators, researchers, and international agencies, including the World Bank, have advocated transparent recruitment and deployment (1, 14, 31–33). The WHO Global Strategy on Human Resources for Health: Workforce 2030 recommends transparent HRH regulatory mechanisms (34). Indeed, transparency is widely considered to be an integral attribute of robust health systems governance (15, 35), and essential to development more broadly (36). Some countries and states, particularly some states in India, have tried to introduce greater transparency into the process.

In the Indian state of Tamil Nadu, a “counselling” procedure has replaced many mechanisms of the traditional P&T process. Under the revised system promotions are largely based upon seniority, and there is a transparent process of advertising vacant positions and explaining transfers (1). Eligibility for transfers is determined by a transparent, detailed set of personal and district-specific characteristics. Counselling appears to have undermined parallel systems, due

in part to strong leadership in the Health and Family Welfare Department and a committed and powerful physicians' association (2). Yet, to some extent, health care worker maldistribution continues. In 2011, a division bench of the High Court ordered the government to repeat the counselling and transfer process for over 100 physicians, citing shortages in some areas (37). La Forgia et al. studied a reform in a different – unnamed – Indian state, and found that “the incidence of de facto parallel HRM practices ... where there is more specification of rules and processes ... and special units to enforce disciplinary practices ... displays only marginal differences from a pre-reform context” (2). It appears that high-level commitment and capacity to implement this within-system reform is key.

3.2.3 Civil society monitoring

Civil society engagement in monitoring the delivery of government services is often recommended as one way of improving health systems governance (2, 14, 38). In regard to health care worker P&T, community monitoring most frequently entails tracking and reporting the related phenomenon of absenteeism and, in one example, transfers.

Several programmes in India and Uganda have equipped citizens to monitor health centres and report provider absences. A variety of outcomes – ranging from lower absenteeism to no change – have been reported. Community members in Rajasthan, India, were compensated for monitoring nurse and midwife attendance at a government health clinic. While individuals accurately recorded the absence rate, communities did not implement sanctions for absent workers, and absenteeism, relative to a comparison area, did not decrease (39).

Similarly, in Udaipur, India, a nongovernmental organization (NGO) monitored nurse attendance through unannounced visits and time/date stamping machines. While the programme initially reduced absenteeism (compared to a control group), administrative changes from the local government weakened the programme, leading to a rebound of absenteeism (40). In both instances, health care worker behaviour was characterized by seemingly random, non-predictable patterns of attendance and absence, as opposed to rejection of the assignment and total absence from the post. The sporadic presence of a health care worker

may be more easily monitored by a community. However, if they have data on the number of providers who have been posted to a facility, communities should be able to monitor and report the complete non-appearance of workers as well.

In Uganda, similar programmes had somewhat positive outcomes. A randomized field experiment enabled communities to determine priority health issues and monitor local facilities based on these priorities; compared to control facilities, absences decreased, utilization of health services increased, and a wide variety of health outcomes improved (41). In northern Uganda, citizens used a toll-free number to report health centre issues, including staff absences and “uncoordinated health workers transfers without replacement”. An evaluation conducted by the implementing agency concluded that the programme led to a 30% decrease in staff absence compared to pre-programme figures (42).

While it would be quite difficult to envision a community monitoring programme addressing P&T in its entirety, the examples above addressed important manifestations of irrational posting. These community monitoring programmes are consistent with the participatory principles of the SDGs (specifically, targets 16.6 and 16.7). However, they have to contend with several challenges that undercut citizen participation and programme effectiveness, including citizen distrust and reluctance to engage with the health system, lack of citizen ability to levy sanctions, and lack of adequate knowledge about health system standards (43, 44). For their part, health providers may feel that the community is inappropriately policing them (8). Integrating opportunities for trust and relationship building between communities and providers may be crucial to enabling accountability (45, 46). Moreover, transparency programmes are argued to be more effective when integrated into existing decision-making structures (47). As such, programmes that streamline data into a functioning monitoring or supervisory system may be more successful.

3.2.4 Routine and extraordinary human resource interventions

Conventional best practices in human resource management have sometimes effected improvements in HRH. Such practices may include improving human resource information systems, audits to identify ghost workers, supportive supervision, performance management, streamlined recruitment procedures, and career and development reviews (48–51). While these techniques are widely regarded as necessary for overall organizational success, their ability to counter irrational P&T practices depends upon multiple factors.

First, the techniques need to be fully implemented and integrated into existing decision-making routines. A systematic review of human resource information systems found that few countries actively used the information systems for staffing decisions (51).

Second, existing political support and receptive staff are necessary for reforms to take root. This can be a challenge in contexts where there is interest among both political actors and health providers to maintain the status quo of irrational P&T. Unions may present a formidable obstacle to reform (5). On the other hand, it has been argued that some human resource reforms (particularly supportive supervision) can garner effective political support, as politicians can easily understand the impact of supervision on organizational function (52). Qualitative research in Benin and Kenya found that weak or non-functioning management structures (particularly supervision structures) were related to staff motivation and self-efficacy. Thus, if management reforms respond to the perceived needs of staff on the ground, then staff may embrace such reforms (33).

Due, in part, to the challenges in fully implementing best practices in human resource management, some countries have opted for special or emergency staffing procedures. The intent is to circumvent challenges inherent in national hiring protocols. Kenya, Malawi, Namibia and Senegal have implemented unique programmes characterized by financial incentives, greater staff flexibility and the use of foreign-trained health care workers (53–56). There have been varying degrees of sustained success within these programmes.

Beginning in 2005, an Emergency Hiring Plan was instituted in Kenya to quickly hire, train and deploy previously unemployed nurses to areas experiencing a high disease burden and reduced workforce (53). Working with the Kenyan Ministry of Health, Deloitte Kenya supervised recruitment, deployment and payroll responsibilities, while Amref Health Africa, the Kenya Medical Training College and the Kenya Institute of Administration assisted with training (53). Nurses were recruited from geographical areas experiencing staff shortages, thus reducing long-distance deployments (57). After one to three years of donor-funded contracts, nurses were integrated into the Kenyan health ministry system. The average recruitment time decreased from approximately 12 months to less than 3 months. After three years, 94% of the Emergency Hiring Plan nursing staff were retained in the programme; qualitative interviews suggest that nurses recruited locally were motivated to remain at their posts (58). Facility data demonstrate that following implementation of the Emergency Hiring Plan, family planning, HIV and child health services were offered more frequently in health clinics, as compared to the pre-deployment period (58).

Emergency and special hiring procedures address health care worker postings in rural areas without modifying existing legislation on hiring and transfer. These temporary programmes have clear policy implications, as they have focused national attention on professional human resource departments, routine HRH planning and leadership development (58). Successful elements from the hiring programmes (recruitment from rural areas, special financial incentives) may be incorporated into permanent policies.

4. Policy options

The following policy options are suggested to address the challenges surrounding P&T, particularly irrational P&T.

Policy option 1

Improve health worker deployment as a core system function

Improving health worker deployment, particularly in the context of strengthening public sector health systems, involves advancing norms for effective and accountable

workforce deployment that build on promising practices on the ground and on professionalism among providers. In other words, rather than creating new policies that may encounter fierce resistance and implementation challenges, reformers might seek to identify and expand promising practices and professional norms. These could be expanded using problem-driven iterative approaches, which entail learning by doing and local-level experimentation (59). For example, empirical evidence suggests that commitment to serving patients and the community can be – though is not always – widespread among health workers (7, 8, 10, 60). The pervasiveness of these sentiments suggests that health workers would be willing to serve in rural areas if they knew the assignment was time bound. Working with unions and health care workers to leverage these values for reliably short-term rural postings might dilute the resistance to rural postings.

Policy option 2

Introduce direct accountability to communities around the deployment of health workers

Rather than looking at deployment only as a top-down function, this policy option aims to engage existing decentralized and local governance mechanisms that are accountable to local communities in the local deployment and, where relevant, monitoring of health workers. As described, many of the top-down efforts to reform P&T and the public sector more broadly have faced significant resistance. Bottom-up community monitoring and accountability approaches address some of the intractable determinants of irrational P&T. For example, village health committees, facility committees, locally elected officials and other entities can be engaged in addressing absenteeism and other P&T-related concerns. Health systems should be accountable to people for the delivery of responsive, equitable services, and communities should have a say in who serves them.

Policy option 3

Work with national and provincial/state labour departments, public or civil service commissions and other related bodies

As noted, policies regarding public sector recruitment and P&T are often made by labour authorities. In general, however, there is inadequate expertise about

the particularities of the health sector among those formulating guidelines on public sector recruitment and P&T, and inadequate expertise about public sector recruitment and P&T among some key health sector stakeholders (22). Health actors, such as health ministry officials, international organizations and NGOs, may not engage broader authorities in public administration. Yet, P&T practices should be fit for purpose for the health sector. Issues such as skills mix, retention in rural areas, gender-specific security concerns, and access to further education may be considered in revised P&T guidelines. In brief, collaboration across health-specific and broader public administration actors could improve P&T-related policies and practice.

5. Implementation considerations

There are few data about actual P&T practice, and in some cases, little transparency about formal P&T policies. Effective HRH information systems would be the most effective way of learning about the actual distribution of the workforce and informing reforms. In the absence of such systems, national and subnational data gathering may be advised in certain contexts. Data collection is challenging due to the hidden nature of prevailing practices. Partly for this reason, bottom-up approaches may be particularly appropriate.

In some contexts, actual P&T practice may be linked to political factors and not openly discussed. Any efforts at assessing the situation and proposing reform will need to navigate these challenges.

HRH-related strategies and programmes are important areas for addressing P&T. Depending on the context, anticorruption strategies, community participation strategies, broad public sector reform efforts and other development initiatives may need to explicitly engage the actual dynamics of P&T practice.

Acknowledgements

James Buchan provided helpful peer review comments.

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Geographical variations in outpatient physician supply in Germany:

Encouraging a more even distribution of outpatient health care services in rural and urban areas

Stefan Scholz, Wolfgang Greiner

Abstract

This chapter provides empirical evidence on factors associated with spatial variations in the supply of and demand for outpatient physicians in Germany. There are substantial district-level differences in physician–population ratios within the country, with higher physician densities evident in urban areas and other favoured locations, for example close to the Alps. Statistical links to both demand-side factors (population, morbidity and financial incentives) and supply-side factors (health care system, cultural variety, labour and economy, attractiveness, and infrastructure) are examined.

Among the demand-side factors, physician–population ratio evidenced the strongest association, positively for specialists and negatively for general practitioners, with the population density of a district. No significant association was found between physician–population ratio and morbidity. Supply-side factors – as listed above – show significant correlations with both general practitioner and specialist densities.

The results presented in this chapter could only be achieved due to the availability and accessibility of a broad range of data in Germany. A further and essential improvement of evidence is possible if more disaggregated data on physicians (for example, geographical or demographic data) were made accessible in the public domain.

1. Introduction and outline of methods

1.1 Problem statement

Spatial variations in the physician–population ratio are a reality in most countries, even in those with social health insurance or a national health service financing the health care for a vast majority of the population (1). Those spatial variations represent the status quo in Germany and are intensified by the fact that many young physicians prefer entering the labour market in urbanized areas (2). This preference causes shortages in the health care workforce in the outpatient sector of rural areas and accelerates demographic changes in the rural health workforce, as ageing outpatient physicians are not being replaced by younger colleagues. Given a general trend of urbanization of the general population (3), an urban location preference among outpatient physicians does not automatically cause problems in the provision of health care. However, a preference for urban locations among more highly qualified or skilled workers, such as medical professionals, due to better employment possibilities (4) may lead to an inequitable distribution of health care professionals between urban and rural areas. The resulting risk is twofold:

- Financial resources are drawn from the financing system by overfulfilled health care needs in urban areas (supplier-induced demand; oversupply).
- The corresponding shortage of health care professionals may cause health care needs to be unmet in rural or remote areas (undersupply).

This may also affect the equity principle of many health care systems, if the rural population contributes the same share of their income as the urban population to the financing system but has less access to physicians.

Theoretically, in a free market, spatial variations in the distribution of physicians could be explained either by differences in population distribution or by differences in the personal preferences of physicians for certain locations. In the first case, higher numbers of physicians would simply follow the higher population numbers that exist in urban areas, in accordance with economic theory, by which greater demand is met by greater supply. In the second case, physicians choose a certain location for personal reasons (for example, cultural characteristics or family preferences)

and may accept financial losses to have their geographical preferences met. A broad economic literature applies the concept of supplier-induced demand in this context, according to which physicians aim to compensate for financial losses by using information asymmetry to provide patients with unnecessary services (5, 6). Thus, physicians may choose to practise wherever they please, and the resulting uneven geographical distribution of physicians may be considered a market failure calling for government intervention.

From these theoretical findings, two common measures – both adopted in Germany – are derived that governments or regulatory bodies can take to counteract the geographical differences in physician–population ratios. One measure is to implement a regulatory system to control the number of practices, or the establishment of new practices, in defined locations. If a certain threshold in the physician–population ratio is reached, no additional practices are allowed in that location. The second measure is to incentivize physicians to work in areas with low physician–population ratios, either by reimbursement schemes specific to those areas or by financial support for opening new offices. (In Germany, these latter measures are not applied nationwide, but are rather implemented at lower administrative or non-governmental levels.) For both measures to be properly implemented, it is necessary to know if the extent of spatial variation in physician numbers corresponds to the variations in population numbers (“demand-side factors”), and to what extent “supply-side factors” representing physicians’ geographical preferences shape the spatial distribution of physicians. Empirical analyses can provide this information, focusing on revealed preferences of physicians (that is, observing their actual behaviour).

1.2 Methods

The present chapter analyses the association of physician–population ratio with several factors on both the demand side and the supply side in Germany. The German health care system is based on the Bismarckian system of compulsory health care insurance. This statutory insurance covers the health care services of roughly 90% of the German population. Only persons with higher income, entrepreneurs and federal employees are allowed to be privately insured. In contrast to most other health care systems, specialized and general ambulatory health care services in Germany are mainly provided by office-based physicians. Only emergency and highly specialized ambulatory services (for

example, for rare diseases) may be performed by hospital physicians. The statutory reimbursement system for ambulatory services in Germany is based on a fee-for-service scheme, but it is restrained by subnational budgets and an increasing number of services are being reimbursed by lump sums. Fees for privately insured patients follow a higher reimbursement scheme without restrictions. Most outpatient physicians are self-employed, although physicians are allowed to employ other physicians. The budget set by the statutory reimbursement system is not increased for employed physicians.

Following the establishment of a regulatory system in 1993 (the so-called needs-based planning system, see Box 1), Germany's current geographical distribution of physicians is a mixture of unregulated and regulated openings of practice locations, given that physicians who have settled before 1993 are not subject to restrictions on their practice location. Population density also plays a major role in the regulatory system as it affects the geographical differences in physician–population ratio. As specialists usually tend to have larger catchment areas than general practitioners (GPs), separate planning systems are deployed for the respective physician groups. Figure 1 depicts the geographical differences in physician–population ratios at district level in Germany in 2010. Given that the smaller districts represent major cities, higher physician densities are found in urban areas and other favoured locations, for example close to the Alps.

To explain those differences, a statistical (regression) analysis was performed to find factors besides population density that were associated with a higher or lower density of GPs and specialists in Germany in 2010. Screening of the scientific literature (2, 8–11) provided a comprehensive list of factors representing physicians' preferences. As the literature revealed, income maximization is not exclusively responsible for physicians' decisions regarding the location of their practices. Factors such as the professional environment for physicians, a labour market for their spouses, the accessibility of cultural and recreational activities and the attractiveness of a district also contribute to their decision.

In the statistical model, a variety of variables were used to explain the differences in the geographical distribution of GPs and specialist doctors in 2010. They were combined with the findings in the literature under the topics “population”, “morbidity” and “financial incentives” for the demand-side factors; and “health

Box 1

Regulatory planning system in Germany

Since 1993, the permission to open a practice within a certain area has been regulated by 17 Associations of Statutory Health Insurance Physicians (ASHIPs)¹ within each of the 16 states of Germany (North Rhine-Westphalia is covered by two ASHIPs). For each of the country's 412 districts (which represent the second smallest administrative level), a physician supply rate is calculated as the current physician–population ratio in relation to the baseline ratio in 1990 (specialists) or 1995 (general physicians). A time constant ratio between physicians and population therefore corresponds to a supply rate of 100%.

Physicians are only allowed to open a new practice within a district whose supply rate lies below 110%. Following new legislation (GKV-Versorgungsstrukturgesetz) in 2012, this planning procedure is not only based on the absolute number of persons living in the planning area, but is also supplemented by its demographic structure (share of persons aged over 65 years) to calculate the number of physicians allowed to practise in the area. Nevertheless, there are still significant, historically derived geographical differences in physician supply.

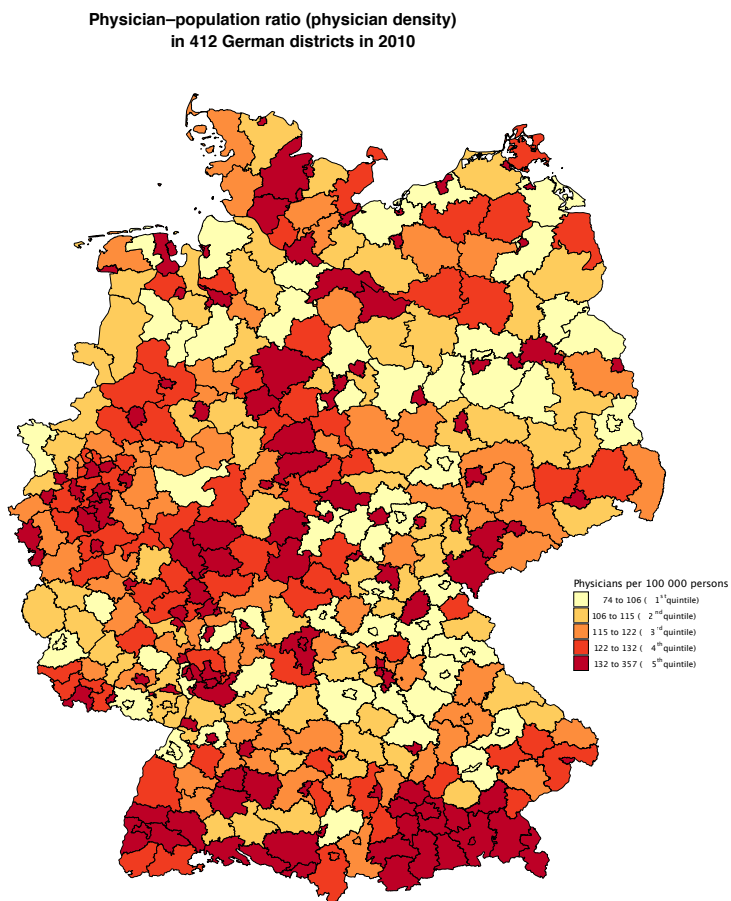
The average supply rate in Germany was 126.5% for all groups of physicians in 2010, with a minimum of 93.0% for general practitioners in Saxony-Anhalt, and a maximum of 266.2% for surgeons in Mecklenburg, Western Pomerania (7).

1. In German, Kassenärztliche Vereinigungen.

care system”, “culture”, “labour/economy”, “attractiveness” and “infrastructure” for the supply-side factors (Box 2). The data sources were the federal ASHIP for the number of GPs and specialists in 412 German districts in 2010; the German Federal

Figure 1

Physician–population ratio as physicians per 100 000 inhabitants at district level in Germany, 2010



Source: Author presentation based on data from the federal ASHIP, 2010.

Box 2

District factors possibly affecting physicians' choice of practice location in Germany

DEMAND-SIDE FACTORS (representing higher need in a district)

Population	<ul style="list-style-type: none">• Number of inhabitants/population density (persons/km²)
Morbidity	<ul style="list-style-type: none">• Old-age dependency ratio• Life expectancy• Age-standardized mortality
Financial incentives	<ul style="list-style-type: none">• Household income• Rate of privately insured persons

SUPPLY-SIDE FACTORS (representing physicians' preferences for a district)

Health care system	<ul style="list-style-type: none">• University hospital• Number of hospital beds per inhabitant• Number of nursing home beds per inhabitant
Labour and economy	<ul style="list-style-type: none">• Unemployment rate• Rate of highly qualified workers• Gross domestic product (GDP) per capita
Cultural variety	<ul style="list-style-type: none">• Number of middle-order centres• Number of high-order centres• City in district• State capital in district
Labour and economy	<ul style="list-style-type: none">• Unemployment rate• Rate of highly qualified workers• Gross domestic product (GDP) per capita
Attractiveness	<ul style="list-style-type: none">• Touristic attractiveness (overnight stays in hotels)• Building area attractiveness (price)• Migration balances
Infrastructure	<ul style="list-style-type: none">• Travel time to middle-order centre• Travel time to high-order centre• Travel time to high-speed train station• Travel time to airport• District in former East Germany

Statistical Office (12) for the population numbers; literature for the number of privately insured patients (13); and the INKAR² data set of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (14) for all other variables. Annex 1 presents the data on which the analysis is based.

2. Findings

2.1 Demand-side factors

The following demand-side factors were considered in analysing physicians' choice of practice location in Germany.

2.1.1 Population

The population density (defined as persons per km²) is the most basic proxy for the demand for health care services in a district, as one can assume an increasing need for health care services with an increasing number of inhabitants in a district. The respective densities of GPs and specialists show strong associations with the population density of a district. While the results from the specialist model suggest a positive correlation with the population density, GP density seems to be negatively associated with population density, contradicting the theoretical assumption of higher GP density in more densely populated areas. In all models, significant interactions are changing the coefficient of the population density substantially. This means that the association between physician–population ratio and population density differs according to whether a city is present in a district or not. Where no cities are present, the GP density decreases while specialist density increases with increasing population density. Where cities are present, population density has nearly no effect on the physician–population ratio. These findings might suggest that specialist density and the specialist–GP ratio increase and GP density decreases with increasing population density until some level of urbanization is reached.

2. Indikatoren und Karten zur Raum- und Stadtentwicklung.

2.1.2 Morbidity

The actual need for health care services is hard to define and hard to measure. But as a population with higher morbidity is assumed to have a higher need for health care, proxies for morbidity are often used to represent need in statistical analyses. The “old-age dependency ratio”, calculated as the share of persons aged over 65 years divided by the number of persons aged between 15 and 65 years, can be seen as a proxy for age-related morbidity. Age-standardized mortality and life expectancy are additional variables capturing morbidity, assuming a relation between morbidity and mortality. Surprisingly, according to 2010 data, none of the above proxies for morbidity of the inhabitants is significantly correlated with the density of GPs or specialists. This might be due to the fact that government regulations did not incorporate the population age structure as a proxy for morbidity in regulatory planning until 2012 (15). It might also indicate that the differences in health service utilization are not captured by age, or that the morbidity is more evenly distributed than life expectancy or mortality.

2.1.3 Financial incentives

Following the categorization by Ono, Schoenstein and Buchan (16), financial incentives can be introduced as non-wage-related payments (for example, one-time payments for setting up practices) or wage-related payments (for example, higher reimbursement schemes in rural areas). Non-wage-related payments in Germany can be in the form of subsidies for opening a practice in an underserved area. The conditions under which these subsidies are paid, as well as their amount, vary markedly. They are provided by states, ASHIPs and small municipalities in a non-centralized and uncoordinated manner, which made it impossible to include them in the statistical analysis. However, we controlled for variables in ASHIP areas by using a random effect model to capture unobserved characteristics of these areas. There are no official wage-related interventions in Germany, but physicians can charge higher fees for their services if they are providing them for privately insured patients or patients who want to be billed directly. Thus, a greater share of private patients can be seen as a wage-related incentive for physicians. To test this hypothesis, household income and the share of privately insured persons were used and were found to be significantly associated with a higher physician–population ratio, although these proxies of the financial incentives play only a minor role.

2.2 Supply-side factors

The supply-side factors represent the different aspects of physicians' preferences for certain locations and are therefore more widespread than the demand-side factors. The coefficients of the supply-side variables indicate that geographical preferences have an effect other than pure income maximization.

2.2.1 Health care

Health care institutions play different roles in the possible attractiveness of a district for physicians. Hospitals often serve as education centres in the last stage of medical training, which coincides for many physicians with the stage in life in which they start a family. Medical institutions such as hospitals can also serve as centres for medical networks and collegial exchange of knowledge. It is not possible to separate the effects of health care institutions, but the number of hospital beds was found to be highly associated with the number of outpatient physicians in a district. University hospitals were not significantly associated with a higher density of GPs and specialists; nor was the number of nursing home beds.

2.2.2 Culture

Other than the higher population density, urban areas tend to offer a broader spectrum of cultural facilities and activities that might meet the preferences of physicians. The analysis included the number of middle-order centres (defined as cities providing specialist doctors, shopping malls, cinemas, hospitals, public swimming pools and legal counsellors) and high-order centres (defined as cities additionally providing special shops, specialist hospitals, and cultural, educational and administrative institutions) as well as state capitals. The results show an increasing effect of the cultural variables, with the strongest effect for state capitals. This result is more clearly defined in the model for specialists. Although the cultural variables are not defined in terms of population density, there are some correlations.

2.2.3 Labour and economy

A strong economy in a district might also correspond to physicians' preferences. This may be due to employment possibilities for highly qualified spouses, the higher variety of cultural and leisure possibilities, and better earning opportunities in economically strong districts. The analysis shows a positive association between physician–population ratio and the rate of highly qualified workers in a district, whereas GDP per capita was not significantly associated with the number of physicians per 100 000 inhabitants. Surprisingly, the unemployment rate showed a positive correlation, meaning that a higher unemployment rate coincides with a higher physician–population ratio. As there is evidence that unemployment causes negative effects on mental health (17) and physical health (18), the unemployment rate may serve as a proxy for morbidity.

2.2.4 Attractiveness

Besides the culture and economy of a district, there might be other factors representing its attractiveness to physicians. For example, a higher touristic attractiveness, measured by the number of guest-nights in tourist enterprises per capita, might represent the recreational value of a district. Building area prices and migration balances capture other aspects of a district's attractiveness. However, these factors show only minor associations with the physician–population ratio, with touristic attractiveness being positively correlated with GP density, and the migration balance of the past five years positively associated with specialist density. Building area attractiveness and the migration balance of the past 10 years show no significant effect.

2.2.5 Infrastructure

The final category of supply-side factors representing physicians' preference for their practice location consists of variables depicting the infrastructure. The variables concerning travel times to the nearest high-speed train station, airport, middle-order centre and high-order centre indicate how well a district is connected to other districts offering more of the above described characteristics. The travel time to the nearest middle-order centre is negatively associated with physician–population ratio (especially for specialists), indicating that a shorter travel time coincides with more physicians. The travel time to the nearest airport is only significant for the number of

GPs and counterintuitively indicates a smaller number of GPs the closer a district is to an airport. The travel time to the next high-speed train station, the travel time to the next high-order centre, if a district is in former East Germany and if a district is considered an urban district do not show a significant correlation with the physician–population ratio.

2.3 Summary

In summary, the findings provide some evidence that a higher density of physicians per 100 000 population can be found in districts with a higher population density per km². As we have controlled for factors associated with physicians' geographical preferences, a relevant part of the differences in physician–population ratios can be solely explained by differences in patient demand. Compared to the density of GPs, the density of specialists is generally more strongly associated with the population density and other variables describing an urbanized district. For example, a higher household income and a higher travel time to the next middle-order centre indicate a higher density of specialists in comparison to the population parameters alone. These results support the hypothesis that a higher density of specialists is associated with urban districts than is the case for the density of GPs. Box 3 summarizes the factors showing a significant association with physician–population ratio.

2.4 Limitations and generalizability

There are several limitations that need to be considered when interpreting the results. Importantly, although the results represent a complete survey of German outpatient physicians, no causal interpretations can be made, as the analyses were carried out using cross-sectional data. Not all the data used in the model were available for the same year. However, the maximum difference is one year, and it is assumed that no drastic changes of the independent variables occurred within this short period of time. Finally, districts are politically administered units, and district sizes vary widely in different states. Therefore, homogeneity of the explaining variables may be smaller in larger districts, reducing effect sizes and leading to an underestimation of the coefficient sizes.

Box 3

Factors showing a significant association with physician density

General practitioners

Strong	<ul style="list-style-type: none">• Population density (–)• State capital (+)
Moderate	<ul style="list-style-type: none">• Number of hospital beds (+)• Travel time to middle-order centre (–)
Weak	<ul style="list-style-type: none">• Travel time to airport (+)• Touristic attractiveness (+)• Share of privately insured patients (+)• Number of high-order centres (+)

Specialists

Strong	<ul style="list-style-type: none">• Population density (+)• Number of hospital beds (+)• State capital (+)
Moderate	<ul style="list-style-type: none">• Travel time to middle-order centre (–)• City in district (+)• Unemployment rate (+)• Share of privately insured patients (+)• Rate of highly qualified employment opportunities (+)
Weak	<ul style="list-style-type: none">• Household income (+)• Number of middle-order centres (–)• Migration balance, five years (+)• Number of high-order centres (+)

Besides the regulatory planning mechanism, there may be other factors limiting the transferability of the above results to other countries. In Germany, the health insurance system leaves the possibility for doctors to provide health care for privately insured persons, which shows a weak to moderate association with physician–population ratio. In addition, many explanatory variables may be fundamentally

different in other countries (for example, travel times, unemployment rates), raising the question whether the linear trend found in the German data could be extended to those countries. Also, the effects of some variables from the supply side might be correlated with population density. For example, urban areas tend to have more labour in the tertiary sector, requiring highly qualified workers or generating higher household income.

3. Discussion

3.1 Measures to counteract the imbalance in physician distribution

Following the global policy recommendations of the World Health Organization on improving recruitment and retention of health care workers in rural areas (19), several measures can be taken to counteract the imbalance in the geographical distribution of physicians. These are categorized into the fields of education, regulatory interventions, financial incentives, and personal and professional support. Using the results of the analysis, potential measures can be evaluated using the German setting as an example.

3.1.1 Education

The primary institutions for the education of physicians in Germany are university hospitals and cooperating teaching hospitals. Outpatient training lasts four weeks for specialists and GPs, and further general practitioner training is optional for older GPs. As university hospitals did not show a significant association with the number of physicians per 100 000 inhabitants, bringing those major education centres closer to rural areas might not be an effective measure to decrease geographical imbalances in Germany. However, the observed moderate to strong effect of the number of hospital beds on physician–population ratio might also be due to the number of beds in teaching hospitals (roughly one third of German hospitals other than university hospitals), indicating some association between a higher number of physicians in areas where training takes place. In Germany, a rural background is not a criterion in medical student selection and there are no mandatory internships in rural areas as part of the curricula. However, there

are financial incentives by some ASHIPs to motivate medical students to do their internships in rural areas. Unfortunately, there are no data available on the number of students accepting those internships. Therefore, the results cannot provide evidence on the effect of recruiting medical students from rural areas, although this could represent a cost-efficient intervention (16).

3.1.2 Regulatory interventions

There is mixed evidence regarding the effect of the German regulatory system and planning mechanism. Population density, the main parameter in the first phase of the planning process, shows the expected positive association with specialist density, but a negative association with GP density. The old-age dependency ratio, introduced as an additional parameter when the planning mechanism was reformed, does not show a significant association with GP and specialist density. These findings might indicate that the effectiveness of regulatory interventions can only be measured in the long term, as it takes time for the disparities that have arisen to disappear.

3.1.3 Financial incentives

The association between the number of privately insured persons and the respective GP and specialist densities may be interpreted as the effect of financial incentives on the decision of practice location. As reimbursement of health services for privately insured persons is higher than for statutory health insurance, this can be seen as an example of higher income attracting more physicians. Nevertheless, the association is moderate and weak, indicating that financial incentives in the form of additional income may need to be very high to overcome physicians' preferences for urban areas and attract them to practise in rural areas. This interpretation is supported by findings from Günther et al. (2). In their study, physicians were given the choice between a practice location with a monthly income of US\$ 6600, two on-call duties, on-site career opportunities for the partner as well as child care and leisure activities, and a practice location in the same area but with 30 minutes travel time to a location providing those opportunities. The results indicate that physicians would have to be compensated by an additional US\$ 11 938 per month to opt for the second choice.

3.1.4 Personal and professional support

Personal and professional support can include a variety of measures influencing physicians' preferences for a practice location. The association between hospital beds and physician–population ratio, for example, can be seen not only in the context of education but also the access to professional support for outpatient physicians by hospital doctors. Medical networks surrounding hospitals can also provide support and contribute to a higher physician–population ratio. But there are also indications that personal support may be associated with higher GP and specialist density. For example, the positive association between the rate of highly qualified workers and specialist density may be triggered by physicians' partners finding employment opportunities. Moreover, for both physician types, the travel time to high-order centres is weakly associated with a higher physician–population ratio, and the travel time to the nearest middle-order centre is moderately associated. Thus, infrastructure improvements, bringing rural and remote areas closer to urban areas, may not only affect the general economy in those areas, but also allow physicians to practise in rural areas without being deprived of cultural or leisure activities offered in urban areas.

3.2 Policy options and implementation considerations

The findings of the present analysis indicate that supply-side as well as demand-side factors are associated with physician–population ratio. The parameters included in the German planning mechanism for outpatient physicians do not seem significant. This might be due to the long time it takes newly introduced regulatory systems to overcome historically derived geographical imbalances, especially if no relocation of physicians takes place. The findings also indicate that professional and especially personal support might help to increase the number of physicians in underserved areas. Education centres such as university hospitals do not seem to be associated with a higher physician–population ratio, but no conclusions can be drawn concerning other educational interventions, for example, choosing a rural background as a selection criterion for medical students, as these interventions have not been adopted as policies.

However, it is important to recognize that different interventions have varying cost implications, and that it will take time before effects can be seen. Further

study is needed on the appropriate balance of interventions, including regulatory interventions, financial incentives and infrastructure development. Systematic evaluation of interventions implemented by subnational planning authorities could yield a deeper insight into their effectiveness, including their strengths and weaknesses. Funding of education interventions in different locations and their evaluation might reveal the most effective and cost-effective interventions, creating best-practice models to be adopted nationally.

The present analysis was only possible due to the availability of a broad range of data. Federal ASHIPs were able to provide detailed numbers on GPs and specialists, and the INKAR data set provided measures from a wide field of variables that are potentially linked with physician–population ratio. However, the evidence could be improved substantially if more spatial demographic data on physicians were made accessible to science and the public. In particular, data on the age of physicians would allow analysis on future shortages caused by retirement, and potential changes in retirement patterns could be assessed and influenced by targeted support for older, pre-retirement doctors.

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ANNEX 1: Presentation of data

Table 1

Dependent and independent variables at district level ($n = 412$)

Metric variables by topic	Mean	Standard deviation	Minimum	Maximum
Dependent				
Density of GPs (per 10 000 inhabitants)	6.32	0.99	1.52	12.58
Density of specialists (per 10 000 inhabitants)	3.14	1.35	0.51	8.99
Ratio GPs–specialists	2.30	0.99	0.75	12.80
Demand/need factors				
Population				
Population density (per km ²)	518.68	674.91	37.09	4 355.28
Morbidity				
Old-age dependency ratio	32.14	4.22	22.03	45.53
Life expectancy women (from 60 years)	25.08	0.63	23.10	27.10
Life expectancy men (from 60 years)	21.56	0.94	19.40	24.60
Mortality (deaths per 1000 inhabitants)	10.91	1.59	6.90	15.40
Financial incentives				
Household income (in £, per month)	1 548.93	199.31	1 157.90	2 585.00
Rate of privately insured persons (%)	13.46	4.32	3.53	27.00
Control factors				
Health care system				
No. of hospital beds (per 10 000 inhabitants)	64.49	38.70	0.00	215.90
No. of nursing home beds (per 10 000 inhabitants)	108.94	28.83	47.10	256.60
Cultural				
No. of middle-order centres	2.24	2.16	0.00	11.00
No. of high-order centres	0.39	0.56	0.00	4.00

Table 1 (continued)

Dependent and independent variables at district level ($n = 412$)

Metric variables by topic	Mean	Standard deviation	Minimum	Maximum
Labour/economy				
Unemployment rate (%)	7.41	3.31	1.90	17.40
Rate of highly qualified workers (%)	8.23	3.80	3.00	26.50
GDP per capita (in 1000€)	27.58	10.24	13.20	83.60
Attractiveness				
Touristic attractiveness	5.27	7.56	0.00	90.60
Building area attractiveness	125.47	117.34	0.00	1 031.80
Migration balance (past 10 years)	4.54	46.13	−171.40	100.30
Migration balance (past 5 years)	−3.98	21.85	−69.80	61.80
Infrastructure				
Travel time to airport	54.41	24.11	7.60	161.50
Travel time to high-speed train station	22.36	14.42	0.00	61.60
Travel time to middle-order centre	8.26	6.40	0.00	36.60
Travel time to high-order centre	26.56	17.83	0.00	76.20
Binary variables	Frequency		Percentage	
Cultural				
State capital	16/412		3.88	
City > 100 000 inhabitants	68/412		16.50	
Health care system				
University hospital	33/412		8.01	
Infrastructure				
District in former East Germany	86/412		20.87	
Urban district	206/412		50.00	

Table 2

Results of the three zero-truncated, negative binomial GLMs for GP density, specialist density and ratio of GPs–specialists

Coefficients by topic	General physicians		Specialists		Ratio GPs–specialists	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	1.736	0.000***	1.919	0.000***	−0.178	0.003**
Population						
Population density (per km ²) (z-score)	−0.136	0.005**	0.349	0.000***	−0.453	0.000***
Financial incentives						
Household income (z-score)	0.018	0.255	0.093	0.001**	−0.088	0.001**
Share of privately insured persons (z-score)	0.042	0.008**	0.123	0.000***	−0.063	0.033*
Health care						
No. of hospital beds (z-score)	0.073	0.000***	0.253	0.000***	−0.206	0.000***
Cultural						
No. of middle-order centres (z-score)	−0.005	0.703	−0.074	0.004**	0.052	0.038*
No. of high-order centres (z-score)	0.036	0.003**	0.057	0.022*	−0.022	0.336
City in district (binary)	−0.021	0.476	0.146	0.005**	−0.140	0.008**
State capital in district (binary)	0.127	0.000***	0.278	0.000***	−0.096	0.244
Labour/economy						
Rate of highly qualified workers (z-score)	0.019	0.264	0.106	0.001**	−0.099	0.001**
Unemployment rate (z-score)	0.052	0.064	0.139	0.006**	−0.073	0.142
Attractiveness						
Touristic attractiveness (z-score)	0.046	0.000***	−0.004	0.861	0.036	0.116
Migration balance (past 5 years) (z-score)	−0.012	0.478	0.072	0.025*	−0.113	0.000***

Table 2 (continued)

Results of the three zero-truncated, negative binomial GLMs for GP density, specialist density and ratio of GPs–specialists

Coefficients by topic	General physicians		Specialists		Ratio GPs–specialists	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Infrastructure						
Travel time to the nearest airport (z-score)	0.049	0.000***	0.021	0.420	0.016	0.548
Travel time to middle-order centre (z-score)	−0.064	0.007**	−0.177	0.000***	0.115	0.004**
Interactions						
Population density: city in district	0.099	0.044*	−0.422	0.000***	0.464	0.000***
GoF measures						
Sigma (global deviance)	−8.177	0.000***	−3.763	0.000***	−3.892	0.000***
BIC-score first model	3 260		4 125		3 979	
BIC-score final model	3 162		3 828		3 751	

Powerful demographic and economic forces are shaping health workforce needs and demands worldwide.

Effectively addressing growing population need and economic demand for health workers stands as one of our foremost global challenges. It also represents an opportunity to secure a future that is healthy, peaceful, and prosperous.

The contents of this book give direction and detail to a richer and more holistic understanding of the health workforce through the presentation of new evidence and solutions-focused analysis. It sets out, under one cover, a series of research studies and papers that were commissioned to provide evidence for the High-Level Commission on Health Employment and Economic Growth.

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ISBN 978 92 4 151240 4



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