

BRIDGING METHODS IN HEALTH WORKFORCE PLANNING: COMPLEMENTARY APPROACHES AND THE DATA THEY REQUIRE

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Summary: Health and care workforce planning and forecasting is increasingly critical as health labour markets face rising demand, demographic change and evolving models of care. Many countries project workforce supply and demand but numerical forecasts alone are insufficient. Effective planning also requires understanding skills, roles, productivity and service organisation. Although data on workforce numbers and training are available internationally and nationally, information on skill mix, task distribution and links to service needs remains fragmented and incomplete. Strengthening workforce planning therefore requires integrated, timely and policy-relevant data systems aligned with education, service delivery and long-term health system goals.

Keywords: Health and care workforce planning, Human resources for health, Skill-mix policies, International health workforce data, BeWell

Introduction

Healthcare systems worldwide are suffering from accumulating health and care workforce (HCWF) shortages. Estimations vary, but recently the Joint Research Centre (JRC) published that approximately 30% more physicians and 33% more nurses are needed to 'sustain current health service levels' by 2071.¹ The gap between healthcare demand and supply is often explained by the fact that population ageing, multimorbidity and advancements in diagnosis and treatments drive the demand for care at a faster rate compared to the relatively slow increase of the HCWF.

However, workforce shortages to some extent are contingent upon how they are defined. For instance, if a substantial proportion of existing healthcare services were deemed obsolete or of 'low value' and therefore should not be reimbursed, the apparent magnitude of workforce shortages would immediately diminish. In this sense, shortages can be reduced "by definition" through changes in what the health system is expected to deliver.

Shortages should also not be understood solely as the outcome of an imbalance between supply and demand that is automatically corrected through market mechanisms, such as wage adjustments

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in response to scarcity.^{2 3 4} Healthcare labour markets do not operate as self-regulating systems governed by an “invisible hand.” Rather, they are shaped by a complex interplay of factors, including professionals’ career choices, organisational recruitment and retention strategies, patient behaviour, and broader policy and regulatory decisions. Workforce shortages are therefore better conceptualised as the collective outcome of these interacting dynamics within the health system.

These perspectives have important implications for HCWF planning. If shortages are co-shaped by system design, service scope, and policy choices – rather than by market imbalances only – workforce planning must move beyond numerical supply projections and include developments in service value, skill mix, and organisational strategy. This also implies that addressing shortages requires coordinated action across education, financing, regulation, and service delivery. Simply increasing training places or adjusting salaries is unlikely to be sufficient without parallel changes to care models and system priorities.

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Different perspectives on HCWF planning

Most approaches behind HCWF planning and forecasting nevertheless originate from a systems perspective where the goal is to balance demand and supply on the healthcare labour market. This first assumes that ‘balance’ is clearly predefined, which is actually a matter of definition, as argued above. Second, HCWF planning and forecasting aim to support policies to ‘close’ the gap between

demand and supply, by calculating or simulating what measures or investments are needed in terms of changing important supply factors such as training inflow or outflow. This also assumes that the HCWF labour market functions as a system, with adjustable mechanisms.

These notions do not imply, however, that HCWF planning and forecasting is not of value for policymaking and fighting shortages. On the contrary, it provides insights that are relevant to build (what-if) scenarios and monitor the available and required capacity of the HCWF in any country, region or sector. The critical point is that both planning and forecasting will always remain dependent on assumptions. They can therefore never fully overcome the uncertainties that are typically huge in HCWF planning and forecasting. For example, staffing norms appear as an objective and solid base to determine the level of unmet needs and shortages. But these norms can become quickly unusable in times of unexpected events (such as the COVID-19 pandemic), when quality norms are redefined, or when shortages reach such high levels that they appear unrealistic and unfeasible to overcome. In addition, norms will vary between sectors, professions, and regions, adding further challenges in terms of practice variation on top of other uncertainties that complicate HCWF planning and forecasting.

HCWF planning and policies from a professionalism perspective

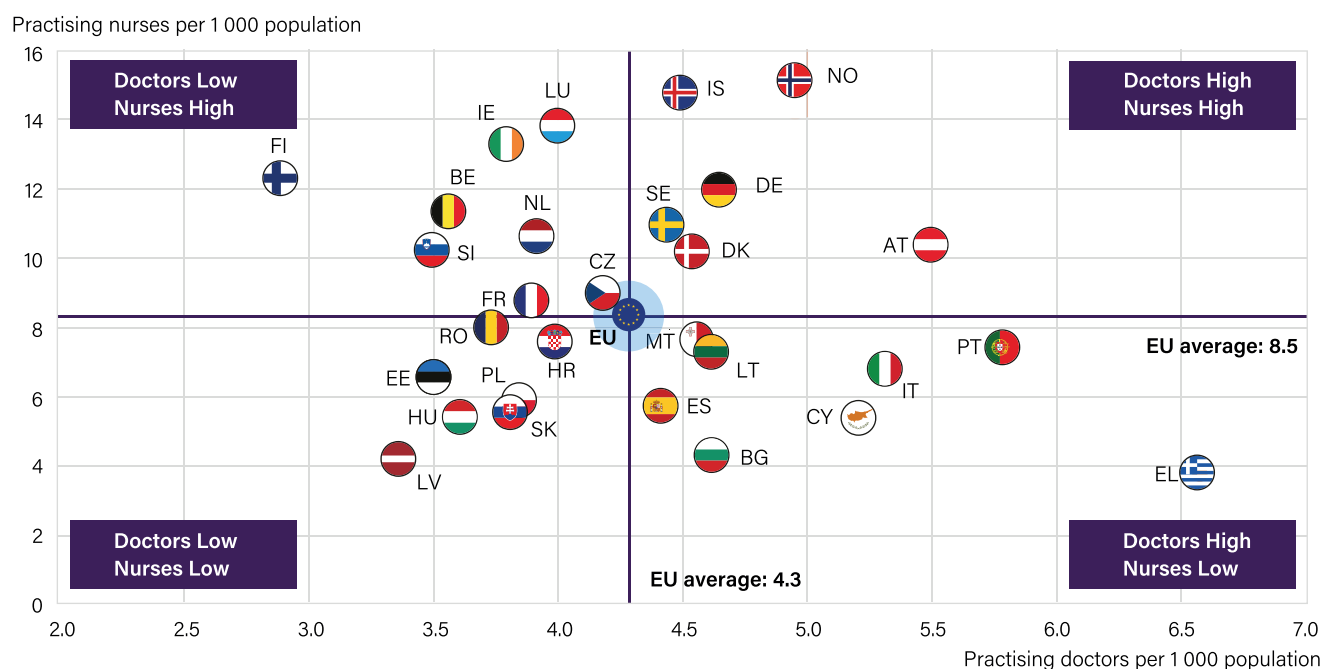
While HCWF planning and forecasting is a fundamental base for HCWF policies, it can be argued from its limitations that other complementary policies are needed that go beyond quantification of health labour market developments and mechanisms. Here we enter the field of professionalism, qualifications and switch to a *qualitative* approach to HCWF policies.⁵ Next to understanding the numbers and full time equivalent (FTE) capacity of health and care professions, it is of equal importance to consider the actual tasks and services they perform, as well as the required knowledge, skills and competencies. In doing so, the HCWF and its labour market is not seen as an economic system that aims to reach equilibrium as the ‘optimal’ and

most profitable situation, but rather as an institutionalised and politically driven system of interests and power positions.

Health and care professions are not simply part of a market that naturally moves toward balance. They operate within long standing professional structures that determine ‘who can do what work’ and how tasks are divided. Freidson⁶ showed that *professionalism* gives occupations the power to set the standards for who is qualified, how performance is judged, and what tasks fall within their scope. In healthcare, this is visible in the strong role of professional bodies, entry requirements, and educational pathways that protect certain areas of practice. Abbott⁷ added that professions constantly negotiate and defend their “jurisdictions”: the tasks or problem areas they claim as their own. This helps explain why changes such as task shifting or new models of care can be difficult to implement as they challenge established boundaries between occupations. Another relevant claim by Abbott⁷ is that no profession can be understood in isolation. It must be examined in the context of a ‘system of professions’ that is shaped by forces that affect the content and control of work.

These perspectives are highly relevant for today’s workforce policies. Much of current planning takes an “outside in” view, focusing on recruitment, retention and the overall capacity of the workforce. But an “inside out” view is equally important: the choices workers make about their careers, the ways they protect their scope of practice, and their responses to policy changes can all determine whether reforms succeed or fail. Understanding these dynamics is crucial for designing realistic policies. While an outside-in and systemic perspective focuses on capacities and capacity building of the HCWF (including issues such as recruitment, retention, inflow and outflow), the inside-out and political perspective emphasises understanding the skills of the HCWF (including the role and scope of practice of the different professions that shape the HCWF). A workforce strategy that considers both system level pressures and the lived realities of professional

Figure 1: Ratio of doctors and nurses per population in EU countries, Iceland and Norway, 2023



Note: The EU average is unweighted. The data on nurses include all categories of nurses (not only those meeting the EU Directive on the Recognition of Professional Qualifications). In Portugal and Greece, data refer to all doctors licensed to practice, resulting in a large overestimation of the number of practising doctors. In Greece, the number of nurses is underestimated as it only includes those working in hospital. Source: OECD Data Explorer (DF_PHYS, DF_NURSE). Data refer to 2023 or nearest year.

Source: ⁹

practice will be better equipped to address shortages, support new care models, and build a resilient health workforce.

Data requirements and availability for HCWF planning and policies from a quantitative perspective

Taking both a quantitative and qualitative perspective on HCWF policy, planning and forecasting leads to greater data requirements. Access to timely, comprehensive, and high-quality data is needed for a wider scope of professions to capture not only workforce size but also its composition and distribution. This increases data requirements in terms of granularity, comparability and harmonisation across professions, including headcount, working hours or FTE, inflow, outflow, location and sector of employment.

Next to this, the qualitative perspective requires data on professional development across the workforce lifecycle, including (continuous) education, training, upskilling, reskilling, and intersectoral or occupational mobility. Below we outline these requirements from both perspectives.

From a quantitative standpoint, data availability has grown considerably at the international, national and regional level. Joint efforts by the World Health Organization (WHO), the Organisation for Economic Co-operation and Development (OECD) and Eurostat have made country-level statistics available on indicators needed for forecasting supply and demand. Notably the OECD/Eurostat/WHO Joint Questionnaire on Non-Monetary Health Care Statistics harmonises health system data across countries, aligning definitions, indicators and reporting standards to improve comparability and consistency of data on professions such as doctors and nurses.

In addition, the *Health at the Glance report: Europe 2024* contains two chapters describing trends across EU countries that indicate HCWF capacity, mobility and their determinants.⁸ These statistics enable stock-and-flow modelling for groups of health professions (such as doctors and nurses) by providing annual numbers on licensed and practising workers, inflow from domestic training and foreign trained workers, and outflow through exit rates and age composition. The report also provides other relevant indicators for HCWF supply modelling and forecasting, including student interest in health careers, levels of job strain, and remuneration. However, data availability for these indicators does not always cover all EU countries, applies to limited years, and is often derived from sample-based surveys instead of population databases.

For calculating and forecasting HCWF demand in EU countries, the report provides population statistics, projections

and health worker-to-population ratios. Yet it acknowledges that shortages cannot be calculated solely by comparing population needs with HCWF capacities. Additional indicators such as unmet needs, waiting lists and vacancy statistics are also needed.

Data requirements and availability for HCWF planning and policies from a qualitative perspective

Taking a qualitative approach to HCWF planning and forecasting makes data availability and requirements more complex to define. How do we assess a country's state or development in terms of the 'quality', skills and professional system of its health professions?

A first requirement is to generate data on the composition of the HCWF. For years, the *Health at a Glance* reports and the European Commission/European Observatory on Health System and Policies/OECD *State of Health Country Health Profiles*⁹ have published doctor- and nurse-to-population ratio by country. This gives a first indication of the HCWF structure of a country, for example by showing that Nordic countries typically have higher-than-average numbers of both doctors and nurses per population, while Central and Eastern European countries have lower-than-average numbers (see Figure 1). Southern Europe has ratios of more doctors but fewer nurses per population, while many Western European countries show the opposite pattern.

While this might indicate a 'disbalance' in reliance on nurses or doctors, the report rightly notes that while *"EU averages can serve as useful benchmarks, they do not necessarily reflect the adequacy of health workforce"*.⁹ An obvious limitation is that these ratios cover only two professions, excluding, for example, pharmacists, physiotherapists, dentists, healthcare assistants, and others. Still, the 2024 report adds insight by breaking down the medical workforce of doctors into general practitioners, specialists and other doctors, and the nursing workforce into professional and associate nurses.

To enable deeper analysis of HCWF composition by country (or region or sector), more detailed data across the full

range of health professions is needed. This remains difficult due to limited availability, but also comparability and alignment of definitions. The International Standard Classification of Occupations (ISCO) provides a framework, but applying it across countries that have different systems in terms of job and qualification recognition is challenging. Applying ISCO and EU Directives is particularly difficult for health professions that work in different sectors, have shorter training durations and lower entry levels, such as healthcare assistants.¹⁰

International statistics are rich in their coverage of different healthcare systems but are limited in their comparability, specificity and granularity. At the national level, however, examples from some countries can be found where data is available to analyse the composition of the health workforce as a base for skill mix-based policies. For example, in the Netherlands the job composition of general practices has been monitored for the last six years through an annual labour market survey of practice managers and owners. This survey data, representative of the country's 4,600 general practices, enables precise analyses of the diversity and capacity of professions delivering primary care. By tracking the absolute and relative numbers and working hours of around ten professional roles, the data provide detailed insights on *how* the workforce is deployed in addition to *its size*. The survey data is additionally used to develop a 'skillmix instrument', to support general practices in developing strategic HR policy through benchmarking and consulting.¹¹

A second type of data to apply a qualitative approach to HCWF planning and forecasting concerns the actual skills of the HCWF. Here, the 2016 OECD report *Right Jobs, Right Skills, Right Places* is a landmark publication, which recommended *"promoting a better match and more efficient use of the skills of health workers"*.¹² International data used for this report came from the Programme for International Assessment of Adult Competencies (PIAAC) survey held in 2011–2012, showing that 50% of doctors and 40% nurses reported being under-skilled 'for some of the tasks that

they have to perform', while about 70% to 80% reported to be *over-skilled* for some tasks.

In the 2010 European Working Conditions Survey (EWCS) survey, respondents were asked whether their skills generally matched the requirements for their job. Results differed from the PIAAC survey, with 27% of doctors and 28% of nurses reporting being over-skilled, while 25% of doctors and 17% of nurses reported being under-skilled. Unfortunately, neither dataset identifies which skills health professionals feel mismatched in. However, later publications highlight digital skills as a major gap, in particular with the increasing application of Artificial Intelligence (AI),¹³ along with skills to perform well in new health service delivery models, including greater teamwork skills.¹⁴

workforce planning should be understood as a system-level governance task

Next to PIAAC and EWCS, the European Centre for the Development of Vocational Training (Cedefop) conducts the European skills and jobs survey (ESJS), an EU-wide survey on skill requirements, mismatches and learning. The first ESJS wave was held in 2014, and the second in 2021 addressing the long-term effect of the COVID-19 crisis on digital skills needs and new forms of digital and distance learning. A recent Cedefop Policy Brief (2023) projects ongoing HCWF skills upgrading as older care workers are replaced by highly-trained professionals, estimating that 1 in 4 care workers will hold a tertiary qualification in 2035.¹⁵ It also anticipates rising demand for advanced health technology monitoring skills and soft skills such as communication and decision making. One new data source is online

job advertisements, which show that adaptability is the most sought after skills in the care sector, followed by teamwork and language skills.

Conclusion

HCWF planning must move beyond a narrow focus on headcounts by occupation. While projections of future shortages provide an important warning signal, they only address the quantitative dimension of the challenge. Effective workforce planning also requires attention to qualitative factors: whether professionals have the right skills, whether those skills are optimally deployed, and whether human capital is being underused or mismatched. Addressing under-skilling and over-skilling through upgrading, re-registration, postgraduate education and continuing professional development is essential, but it also has implications for service capacity and must be planned explicitly. In addition, projections that treat physicians and nurses as operating in separate labour markets risk overlooking the realities of team-based care, task-shifting, and technological change.

For policy-makers, this implies that workforce planning should be understood as a system-level governance task rather than a technical forecasting exercise. Models must better capture the interaction between professions, health services, training investments, and changing patterns of demand. Although the data required to assess skill gaps, task reallocation and capacity shifts are

more complex and often less robust than traditional supply and demand indicators, investing in improved data collection and modelling is critical. Without this broader and more integrated approach, policies risk expanding workforce numbers without ensuring that skills, roles and service delivery models are aligned.

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