STATE OF THE

WORLD'S NURSING 2020

Investing in education, jobs and leadership

World Health Organization

Nursing now

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FOREWORD

The *State of the world's nursing 2020: investing in education, jobs and leadership* comes as the world witnesses unprecedented political commitment to universal health coverage. At the same time, our emergency preparedness and response capacity is being tested by the current COVID-19 outbreak and mass population displacement caused by conflict. Nurses provide vital care in each of these circumstances. Now, more than ever, the world needs them working to the full extent of their education and training.

This first *State of the world's nursing* report reveals much to celebrate about the nursing workforce. Opportunities for advanced nursing education and enhanced professional roles, including at the policy level, can drive improvements in population health. At the same time, we continue to see vast inequities in the distribution of nurses around the world which we must address.

2020 is the International Year of the Nurse and the Midwife. This is an opportunity to leverage the evidence in the *State of the world's nursing 2020* report and commit to an agenda that will drive and sustain progress to 2030. To this end, we urge governments and all relevant stakeholders to:

- invest in the massive acceleration of nursing **education** – faculty, infrastructure and students – to address global needs, meet domestic demand, and respond to changing technologies and advancing models of integrated health and social care;
- create at least 6 million new nursing **jobs** by 2030, primarily in low- and middle-income countries, to offset the projected shortages and redress the inequitable distribution of nurses across the world;
- strengthen nurse **leadership** – both current and future leaders – to ensure that nurses have an influential role in health policy formulation and decision-making, and contribute to the effectiveness of health and social care systems.

All countries can take action in support of this agenda. Most countries can accomplish these actions with their own resources. For countries requiring assistance by the international community, we must direct a growing share of human capital investments into the health and social care economy. Such investments will also drive progress across the Sustainable Development Goals, with dividends for gender equity, women's economic empowerment and youth employment.

Let us seize this opportunity to commit to a decade of action that begins with investing in nursing education, jobs and leadership.

Message from the Co-Chairs

The Seventy-second World Health Assembly designated 2020 as the International Year of the Nurse and the Midwife not only to honour the 200th anniversary of the birth of Florence Nightingale, but also to recognize the daily contributions of nurses and midwives to the health and well-being of populations across the globe.

With a global spotlight on nurses in the context of the COVID-19 pandemic, we are honoured to present the first ever *State of the world's nursing report* on World Health Day. This report provides the most up-to-date evidence and cutting-edge policy options on the global nursing workforce. It also presents a compelling case for considerable – yet feasible – investment in nursing education, jobs, and leadership, which is required to strengthen the nursing workforce to deliver the Sustainable Development Goals, improve health for all, and strengthen the primary health care workforce on our journey towards universal health coverage.

The *State of the world's nursing 2020* report resulted from remarkable national-level collaboration. In many countries, the drive for data reporting was led by the government chief nursing and midwifery officers, who were supported by the provision of data from ministries of education, labour and finance. Nurse educators and regulators shared and triangulated data. National nursing associations and Nursing Now groups played key advocacy roles in reporting and engagement on the issues that would be addressed in the report. These relationships are critical to robust and routine reporting on nursing and will facilitate even stronger reports in the future.

What we have achieved together is impressive. But what we are yet to achieve is vastly more important. We must use the national, regional and global data and the International Year of the Nurse and the Midwife to foster closer dialogue and collaboration between all sectors on strengthening the workforce to better provide primary care and progress towards universal health coverage. We must catalyse and sustain investments in nursing education, jobs and leadership.

The health of the world requires the commitment of all countries to support and invest in the nursing workforce. We hope you will join this call to action.

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Glossary

The labour market is the structure that allows labour services to be sought (i.e. demand) and offered (i.e. supply). Wages and conditions of employment (for example, adequate infrastructure, supportive management, opportunities for professional development and career progression) play a role determining the choices made by health workers and employers *(1)*.

Demand refers to the jobs being offered on the market. Demand is the number of health workers that a health system can support in terms of funded positions or economic demand for services. It is correlated with the expenditure on health by the government, private insurance, and out-of-pocket payments *(2)*.

Supply. The supply of health workers refers to the pool of qualified health workers willing to work in the health care sector. It is a function of the training capacity and the net migration, deaths, and retirements of health workers *(2)*.

Need is the number of health workers required to attain the service delivery objectives of a health system. Health labour markets are primarily shaped by supply and demand and only indirectly by need *(1)*.

The absorption capacity for health care workers by the health labour market refers to the ability of the health system (which includes both the public and the private sector) to fully and productively employ the pool of available qualified health workers (mainly generated through education and immigration). The absorption capacity is influenced by the efficiency and timeliness of translating economic demand into creating and filling job openings.

Pre-service education refers to a formal learning programme that takes place prior to and as a prerequisite for employment in a service setting *(3)*.

Licensing refers to the process of certifying that an individual can perform the roles and tasks within a defined scope of practice to the required standard and conferring a licence to legally authorize them to exercise a certain profession within a given jurisdiction.

Accreditation refers to the process of evaluation of education institutions against predefined standards required for the delivery of education. The outcome of the process is the certification of the suitability of education programmes and of the competence of education institutions in the delivery of education.

Credentialing is the process of obtaining, verifying, and assessing the qualifications of a practitioner to provide care or services in or for a health care organization. Credentials are documented evidence of licensure, education, training, experience, or other qualifications *(4)*.

Professional certification is the voluntary process by which an entity grants a time-limited recognition and use of a credential to an individual after verifying that he or she has met predetermined and standardized criteria *(5)*.

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EXECUTIVE SUMMARY 2020

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Central role of nurses in achieving universal health coverage and the Sustainable Development Goals

Nurses are critical to deliver on the promise of "leaving no one behind" and the global effort to achieve the Sustainable Development Goals (SDGs). They make a central contribution to national and global targets related to a range of health priorities, including universal health coverage, mental health and noncommunicable diseases, emergency preparedness and response, patient safety, and the delivery of integrated, people-centred care.

No global health agenda can be realized without concerted and sustained efforts to maximize the contributions of the nursing workforce and their roles within interprofessional health teams. To do so requires policy interventions that enable them to have maximum impact and effectiveness by optimizing nurses' scope and leadership, alongside accelerated investment in their education, skills and jobs. Such investments will also contribute to the SDG targets related to education, gender, decent work and inclusive economic growth.

This *State of the world's nursing 2020* report, developed by the World Health Organization (WHO) in partnership with the International Council of Nurses and the global Nursing Now campaign, and with the support of governments and wider partners, provides a compelling case on the value of the nursing workforce globally.

Current status of evidence in 2020

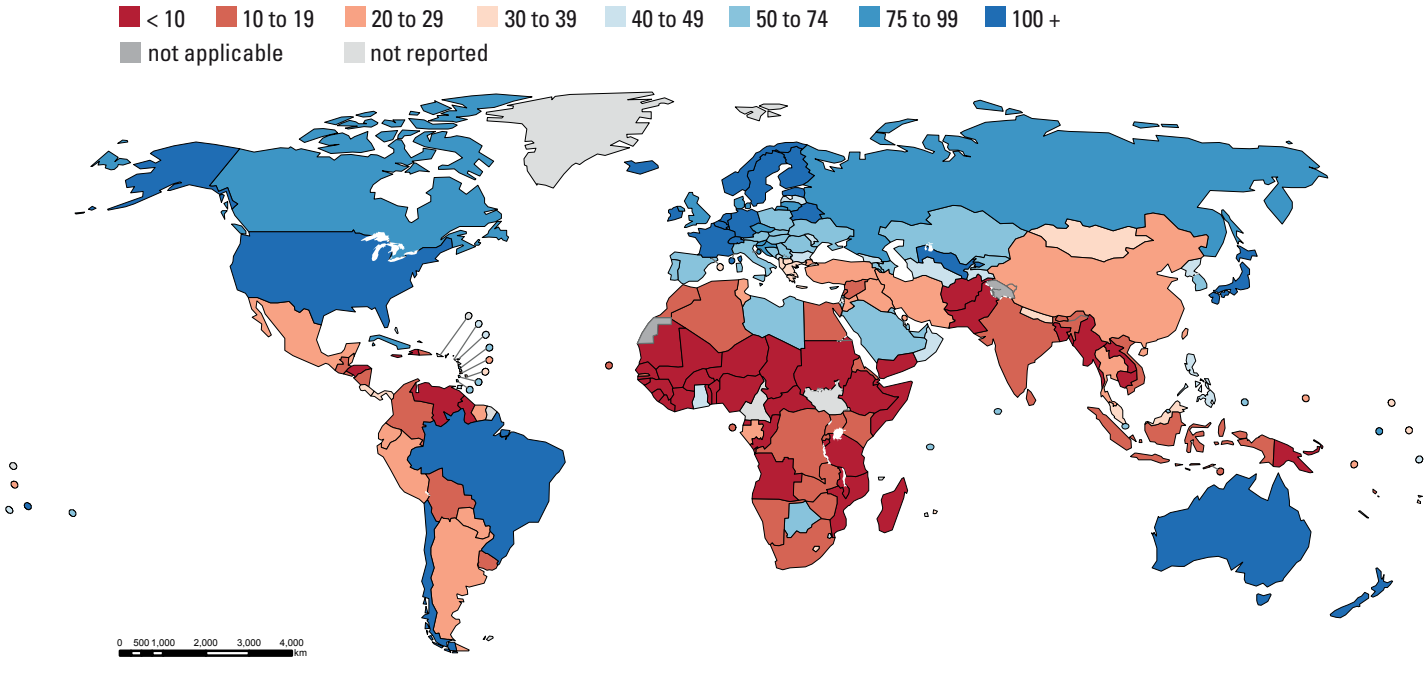
The nursing workforce is expanding in size and professional scope. However, the expansion is not equitable, is insufficient to meet rising demand, and is leaving some populations behind.

191 countries provided data for this report, an all-time high and a 53% increase compared to 2018 data availability. Around 80% of countries reported on 15 indicators or more. However, there are significant gaps in data on education capacity, financing, salary and wages, and health labour market flows. This impedes the ability to conduct health labour market analyses that will inform nursing workforce policy and investment decisions.

The global nursing workforce is 27.9 million, of which 19.3 million are professional nurses. This indicates an increase of 4.7 million in the total stock over the period 2013–2018, and confirms that nursing is the largest occupational group in the health sector, accounting for approximately 59% of the health professions. The 27.9 million nursing personnel include 19.3 million (69%) professional nurses, 6.0 million (22%) associate professional nurses and 2.6 million (9%) who are not classified either way.

The world does not have a global nursing workforce commensurate with the universal health coverage and SDG targets. Over 80% of the world's nurses are found in countries that account for half of the world's population. The global shortage of nurses, estimated to be 6.6 million in 2016, had decreased slightly to 5.9 million nurses in 2018. An estimated 5.3 million (89%) of that shortage is concentrated in low- and lower middle-income countries, where the growth in the number of nurses is barely keeping pace with population growth, improving only marginally the nurse-to-population density levels. Figure 1 illustrates the wide variation in density of nursing personnel to population, with the greatest gaps in countries in the African, South-East Asia and Eastern Mediterranean regions and some countries in Latin America.

Figure 1 **Density of nursing personnel per 10 000 population in 2018**



**Includes nursing professionals and associates.*
Source: National Health Workforce Accounts, World Health Organization 2019. Latest available data over the period 2013–2018.

Ageing health workforce patterns in some regions threaten the stability of the nursing stock. Globally, the nursing workforce is relatively young, but there are disparities across regions, with substantially older age structures in the American and European regions. Countries with lower numbers of early career nurses (aged under 35 years) as a proportion of those approaching retirement (aged 55 years and over) will have to increase graduate numbers and strengthen retention packages to maintain access to health services. Countries with a young nursing workforce should enhance their equitable distribution across the country. As shown in Figure 2, countries with higher proportions of nurses nearing retirement compared to young nurses (the countries above the green line) will face future challenges in maintaining the nursing workforce.

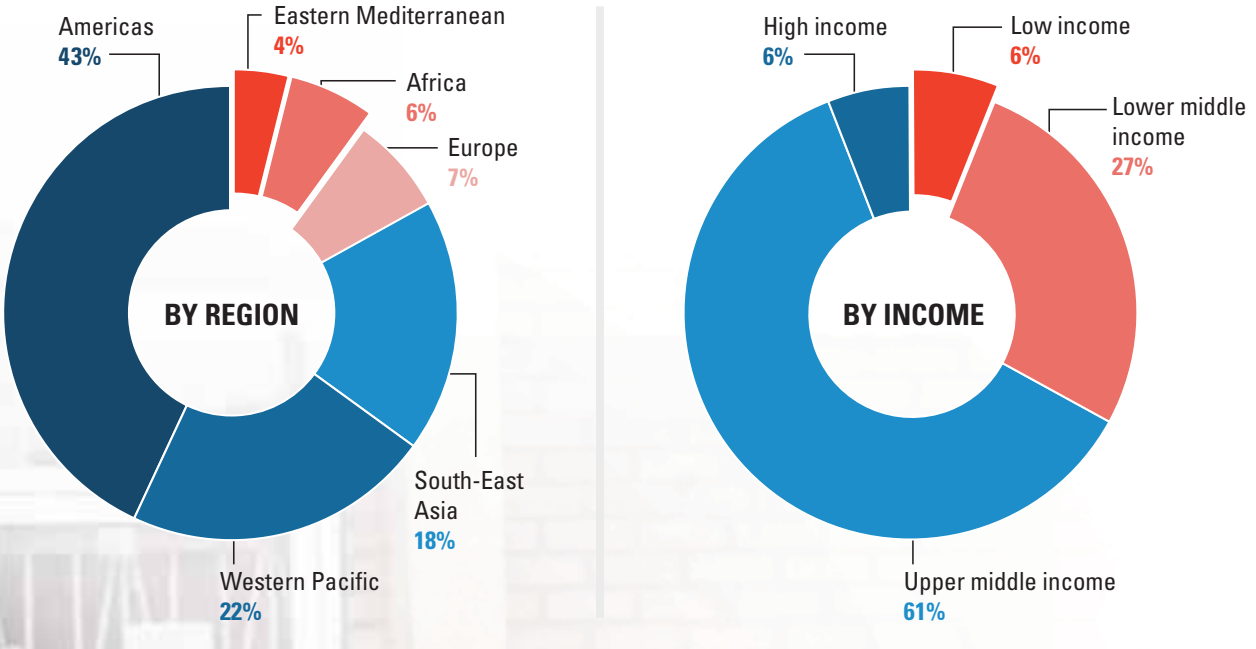
Figure 2 **Relative proportions of nurses aged over 55 years and below 35 years (selected countries)**

**Includes nursing professionals and nursing associate professionals.*

Source: National Health Workforce Accounts, World Health Organization 2019. Latest available data reported between 2013 and 2018.

To address the shortage by 2030 in all countries, the total number of nurse graduates would need to increase by 8% per year on average, alongside an improved capacity to employ and retain these graduates. Without this increase, current trends indicate 36 million nurses by 2030, leaving a projected needs-based shortage of 5.7 million, primarily in the African, South-East Asia and Eastern Mediterranean regions. In parallel, a number of countries in the American, European and Western Pacific regions would still be challenged with nationally defined shortages. Figure 3 shows projected increases in numbers of nurses by WHO region and by country income group.

Figure 3 **Projected increase (to 2030) of nursing stock, by WHO region and by country income group**



**Includes nursing professionals and nursing associate professionals.*

While the patterns are evolving, equitable distribution and retention of nurses is a NEAR-UNIVERSAL CHALLENGE.

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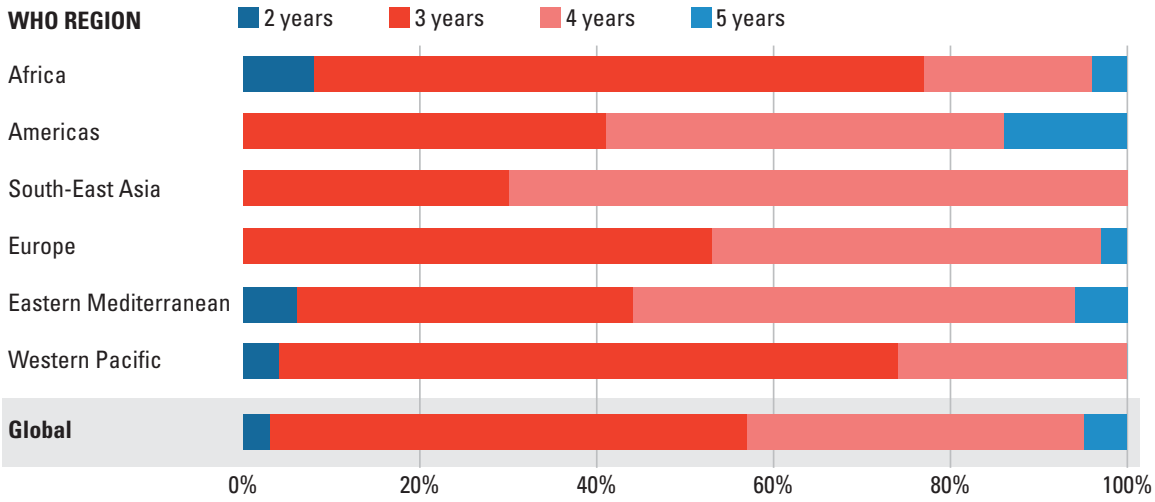
Figure 4 **Average duration (years) of education for nursing professionals, by WHO region**



Source: National Health Workforce Accounts 2019 for 99 countries and Sigma database for 58 countries. Latest available data reported by countries between 2013 and 2018.

The majority of countries (152 out of 157 responding; 97%) reported that the minimum duration for nurse education is a three-year programme. A large majority of countries reported standards for education content and duration (91%), accreditation mechanisms (89%), national standards for faculty qualifications (77%) and interprofessional education (67%). However, less is known about the effectiveness of these policies and mechanisms. Further, there is still considerable variety in the minimum education and training levels of nurses, alongside capacity constraints such as faculty shortages, infrastructure limitations and the availability of clinical placement sites. As shown in Figure 4, the duration of nursing education is predominantly three or four years globally.

A total of 78 countries (53% of those providing a response) reported having advanced practice roles for nurses. There is strong evidence that advanced practice nurses can increase access to primary health care in rural communities and address disparities in access to care for vulnerable populations in urban settings. Nurses at all levels, when enabled and supported to work to the full scope of their education and training, can provide effective primary and preventive health care, amongst many other health services that are instrumental to achieving universal health coverage.

One nurse out of every eight practises in a country other than the one where they were born or trained. The international mobility of the nursing workforce is increasing. While the patterns are evolving, equitable distribution and retention of nurses is a near-universal challenge. Unmanaged migration

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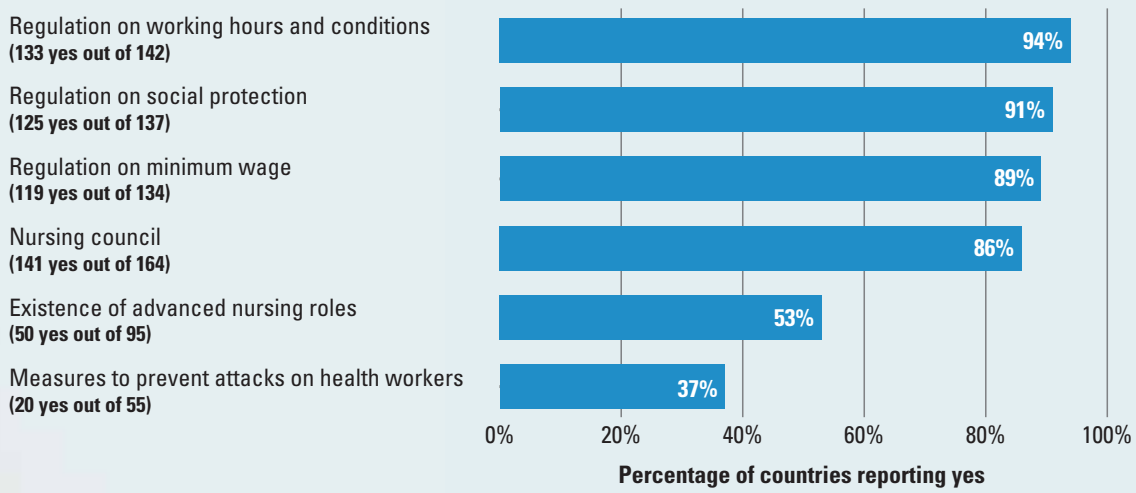
can exacerbate shortages and contribute to inequitable access to health services. Many high-income countries in different regions appear to have an excessive reliance on international nursing mobility due to low numbers of graduate nurses or existing shortages vis-à-vis the number of nursing jobs available and the ability to employ new graduate nurses in the health system.

Most countries (86%) have a body responsible for the regulation of nursing. Almost two thirds (64%) of countries require an initial competency assessment to enter nursing practice and almost three quarters (73%) require continued professional development for nurses to continue practising. However, the regulation of nursing education and practice is not harmonized beyond a few subregional mutual recognition arrangements. Regulatory bodies are challenged to keep education and practice regulations updated and nursing workforce registries current in a highly mobile, team-based and digital era. Figure 5 shows the proportions of reporting countries with regulatory provisions on working conditions in place.

Nursing remains a highly gendered profession with associated biases in the workplace. Approximately 90% of the nursing workforce is female, but few leadership positions in health are held by nurses or women. There is some evidence of a gender-based pay gap, as well as other forms of gender-based discrimination in the work environment. Legal protections, including working hours and conditions, minimum wage, and social protection, were reported to be in place in most countries, but not equitably across regions. Just over a third of countries (37%) reported measures in place to prevent attacks on health workers.

A total of 82 out of 115 responding countries (71%) reported having a national nursing leadership position with responsibility for providing input into nursing and health policy. A national nursing leadership development programme was in place in 78 countries (53% of those responding). Both the presence of a government chief nursing officer (or equivalent) position and the existence of a nursing leadership programme are associated with a stronger regulatory environment for nursing.

Figure 5 **Percentage of countries with regulatory provisions on working conditions**



Source: National Health Workforce Accounts, World Health Organization 2019.

TEN KEY ACTIONS

Future directions for nursing workforce policy

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1 **Countries affected by shortages will need to increase funding to educate and employ at least 5.9 million additional nurses.** Additional investments in nursing education are estimated to be in the range of US$ 10 per capita in low- and middle-income countries. Further investments would be required to employ nurses upon graduation. In most countries this can be achieved with domestic funds. Actions include review and management of national wage bills and, in some countries, lifting restrictions on the supply of nurses. Where domestic resources are constrained in the medium and long term, for example in low-income countries and conflict-affected or vulnerable contexts, mechanisms such as institutional fund-pooling arrangements should be considered. Development partners and international financing institutions can help by transferring human capital investments for education, employment, gender, health and skills development into national health workforce strategies for advancing primary health care and achieving universal health coverage. Investments in the nursing workforce can also help drive progress in job creation, gender equity and youth engagement.

2 **Countries should strengthen capacity for health workforce data collection, analysis and use.** Actions required include accelerating the implementation of National Health Workforce Accounts and using the data for health labour market analyses to guide policy development and investment decisions. Collation of nursing data will require participation across government bodies, as well as engagement of key stakeholders such as the regulatory councils, nursing education institutions, health service providers and professional associations.

3 **Nurse mobility and migration must be effectively monitored and responsibly and ethically managed.** Actions needed include reinforcement of the implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel by countries, recruiters and international stakeholders. Partnerships and collaboration with regulatory bodies, health workforce information systems, employers, government ministries and other stakeholders can improve the ability to monitor, govern and regulate international nurse mobility. Countries that are overreliant on migrant nurses should aim towards greater self-sufficiency by investing more in domestic production of nurses. Countries experiencing excessive losses of their nursing workforce through out-migration should consider mitigating measures and retention packages, such as improving salaries (and pay equity) and working conditions, creating professional development opportunities, and allowing nurses to work to their full scope of education and training.

4 **Nurse education and training programmes must graduate nurses who drive progress in primary health care and universal health coverage.** Actions include investment in nursing faculty, availability of clinical placement sites and accessibility of programmes offered to attract a diverse student body. Nursing should emerge as a career choice grounded in science, technology, teamwork and health equity. Government chief nurses and other national stakeholders can lead national dialogue on the appropriate entry-level and specialization programmes for nurses to ensure there is adequate supply to meet health system demand for graduates. Curricula must be aligned with national health priorities as well as emerging global issues to prepare nurses to work effectively in interprofessional teams and maximize graduate competencies in health technology.

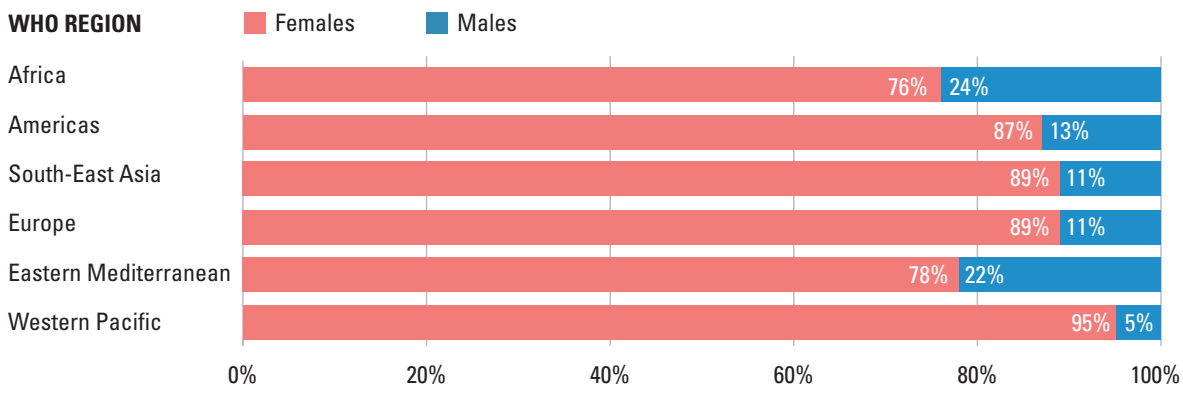
5 **Nursing leadership and governance is critical to nursing workforce strengthening.** Actions include establishing and supporting the role of a senior nurse in the government responsible for strengthening the national nursing workforce and contributing to health policy decisions. Government chief nurses should drive efforts to strengthen nursing workforce data and lead policy dialogue that results in evidenced-based decision-making on investment in the nursing workforce. Leadership programmes should be in place or organized to nurture leadership development in young nurses. Fragile and conflict-affected settings will typically require a particular focus in order to (re)build the institutional foundations and individual capacity for effective nursing workforce governance and stewardship.

6 **Planners and regulators should optimize the contributions of nursing practice.** Actions include ensuring that nurses in primary health care teams are working to their full scope of practice. Effective nurse-led models of care should be expanded when appropriate to meet population health needs and improve access to primary health care, including a growing demand related to noncommunicable diseases and the integration of health and social care. Workplace policies must address the issues known to impact nurse retention in practice settings; this includes the support required for nurse-led models of care and advanced practice roles, leveraging opportunities arising from digital health technology and taking into account ageing patterns within the nursing workforce.

7 **Policy-makers, employers and regulators should coordinate actions in support of decent work.** Countries must provide an enabling environment for nursing practice to improve attraction, deployment, retention and motivation of the nursing workforce. Adequate staffing levels and workplace and occupational health and safety must be prioritized and enforced, with special efforts paid to nurses operating in fragile, conflict-affected and vulnerable settings. Remuneration should be fair and adequate to attract, retain and motivate nurses. Further, countries should prioritize and enforce policies to address and respond to sexual harassment, violence and discrimination within nursing.

8 **Countries should deliberately plan for gender-sensitive nursing workforce policies.** Actions include implementing an equitable and gender-neutral system of remuneration among health workers, and ensuring that policies and laws addressing the gender pay gap apply to the private sector as well. Gender considerations should inform nursing policies across the education, practice, regulatory and leadership functions, taking account of the fact that the nursing workforce is still predominantly female (Figure 6). Policy considerations should include enabling work environments for women, for example through flexible and manageable working hours that accommodate the changing needs of nurses as women, and gender-transformative leadership development opportunities for women in the nursing workforce.

Figure 6 **Percentage of female and male nursing personnel, by WHO region**



Source: National Health Workforce Accounts, World Health Organization 2019. Latest available data reported between 2013 and 2018.

Workplace policies must address the issues known to impact nurse retention in practice settings; this includes the support required for nurse-led models of care and advanced practice roles.

9 **Professional nursing regulation must be modernized.** Actions include harmonizing nursing education and credentialing standards, instituting mutual recognition of nursing education and professional credentials, and developing interoperable systems that allow regulators to easily and quickly verify nurses' credentials and disciplinary history. Regulatory frameworks, including scope of practice, initial competency assessments and requirements for continuous professional development, should facilitate nurses working to the full scope of their education and training in dynamic interprofessional teams.

10 **Collaboration is key.** Actions include intersectoral dialogue led by ministries of health and government chief nurses, and engaging other relevant ministries (such as education, immigration, finance, labour) and stakeholders from the public and private sectors. A key element is to strengthen capacity for effective public policy stewardship so that private sector investments, educational capacity and nurses' roles in health service provision can be optimized and aligned to public policy goals. Professional nursing associations, education institutions and educators, nursing regulatory bodies and unions, nursing student and youth groups, grass-roots groups, and global campaigns such as Nursing Now are valuable contributors to strengthening the role of nursing in care teams working to achieve population health priorities.

CONCLUSION

Investing in education, jobs and leadership

This report has provided robust data and evidence on the nursing workforce. This intelligence is needed to support policy dialogue and facilitate decision-making to invest in nursing to strengthen primary health care, achieve universal health coverage, and advance towards the SDGs.

Despite signs of progress, the report has also highlighted key areas of concern. An acceleration of progress will be required in many low- and lower middle-income countries in the African, South-East Asia and Eastern Mediterranean regions in order to address key gaps. However, there is no room for complacency in upper middle- and high-income countries, where constrained supply capacity, an older age structure of the nursing workforce and an overreliance on international recruitment jointly pose a threat to the attainment of national nursing workforce requirements.

National governments, with support where relevant from their domestic and international partners, should catalyse and lead an acceleration of efforts to:

- **build leadership, stewardship and management capacity for the nursing workforce** to advance the relevant education, health, employment and gender agendas;
- **optimize return on current investments in nursing through adoption of required policy options** in education, decent work, fair remuneration, deployment, practice, productivity, regulation and retention of the nursing workforce;
- **accelerate and sustain additional investment in nursing education, skills and jobs.**

The investments required will necessitate additional financial resources. If these are made available, the returns for societies and economies can be measured in terms of improved health outcomes for billions of people, creation of millions of qualified employment opportunities, particularly for women and young people, and enhanced global health security. The case for investing in nursing education, jobs and leadership is clear: relevant stakeholders must commit to action.

CHAPTER 1

Introduction

1. The nursing workforce, comprising nursing professionals and nursing associates,[1] is the world's largest single occupation in the health sector and is a foundation of the interprofessional health teams that deliver on the promise of health for all.

2. Nurses' responsibilities and roles as advanced practitioners, clinicians, leaders, policy-makers, researchers, scientists and teachers are central to the effective functioning of health professionals' education and practice. Improvements in population health and well-being have been, and will continue to be, ably realized through the industry, innovation and inspiration of the nursing profession.

3. Nursing has existed for centuries and has evolved considerably since the birth 200 years ago of Florence Nightingale, considered the founder of modern nursing. Structured education, clinical standards and nurse professional associations emerged in the 1800s, progressively raising the quality, competencies and working conditions of the nursing profession. The 1900s saw the growth of specializations and autonomy, along with stronger professional regulation to ensure public accountability and safety *(1)*. The first international organization for health care professionals, founded in 1899, was the International Council of Nurses. Currently in its 121st year of operation, the International Council of Nurses is a federation of more than 130 national nurse associations, representing more than 20 million nurses worldwide *(2)*.

4. Since its first years of existence, the World Health Organization (WHO) has recognized the enormous value and contribution of the nursing and midwifery workforces *(3)*. Over the years, nurses and midwives have contributed to major global health

1 As defined by the International Labour Organization's International Standard Classification of Occupations (https://www.ilo.org/public/english/bureau/stat/isco/isco08/).

landmarks, including the eradication of smallpox, the fight against communicable diseases, and the dramatic reductions in maternal, newborn and child mortality and morbidity worldwide *(4, 5).* Their prominent role has translated into an unparalleled level of attention by the World Health Assembly, which has adopted over a 70-year period 10 resolutions to promote the uptake of international standards to educate, employ and retain nurses and midwives as part of broader workforce development priorities *(3, 6).*

5. This *State of the world's nursing 2020* report, developed by WHO in partnership with the International Council of Nurses and the global Nursing Now campaign, explores the contemporary evidence with the objective of providing a vision and forward-looking agenda for nursing policy. As the world celebrates 2020 as the International Year of the Nurse and the Midwife, as designated by the World Health Assembly *(7)*, this landmark report aims to inform national, regional and global actions related to the nursing workforce in the decade remaining to achieve the Sustainable Development Goals (SDGs).

6. The report presents comprehensive, up-to-date evidence on the current nursing workforce globally; takes stock of the main issues, challenges and known evidence regarding the role of the nursing profession in the attainment of health goals; and provides concrete policy options to advance the nursing profession as part of an integrated approach to strengthen the health workforce, primary health care and health systems.

7. An online section available on the WHO website[2] contains individual country profiles presenting the data provided by countries for this report.

2 http://apps.who.int/nhwaportal.

Individual chapter themes

CHAPTER 2 **Nursing in a context of broader workforce and health priorities**

The chapter presents the contributions of the health workforce to the 2030 Agenda for Sustainable Development and, in particular, SDG 3 on good health and well-being *(8)*.

CHAPTER 3 **Nursing roles in 21st-century health systems**

The chapter outlines the role and contributions of nurses to deliver priority health interventions with respect to the WHO "triple billion" targets of achieving universal health coverage, addressing health emergencies, and increasing health and well-being for all *(9)*.

CHAPTER 4 **Policy levers to enable the nursing workforce**

The chapter describes the broader health labour market and workforce policy levers and governance determinants to address the challenges to nurses working to their full potential in health facilities and communities, both in countries and globally.

CHAPTER 5 **Current status of evidence and data on the nursing workforce**

The chapter provides an analytical overview of the current nursing workforce, including the areas of greatest relevance for national, regional and global policy development, namely stock, composition and distribution; production capacity; education, regulation, practice, policy and governance environment; leadership; and labour market factors. It also highlights progress and challenges in relation to the nursing contribution to addressing the projected shortfall of 18 million health workers by 2030.

CHAPTER 6 **Future directions for nursing workforce policy**

The chapter outlines a forward-looking agenda with policy options and a call to action for Member States, education institutions, regulatory bodies, professional associations, development partners, international organizations and other stakeholders.

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CHAPTER 2

Nursing in a context of broader workforce and health priorities

2.1 Role of the health workforce in achieving the 2030 Agenda

8. In 2015, the world ushered in the United Nations Sustainable Development Agenda for 2030 with 17 ambitious and interrelated goals in areas of critical importance for humanity and the planet *(8)*. The SDGs include eradicating poverty (SDG 1), achieving good health and well-being for all (SDG 3), ensuring inclusive and equitable education (SDG 4), achieving gender equality (SDG 5), and promoting decent work and inclusive and sustainable economic growth (SDG 8).

9. WHO leads the global health community's efforts to accelerate progress on SDG 3, which is rooted in the concept of universal health coverage. The progressive realization of universal health coverage is a goal to which all United Nations Member States have explicitly and unanimously committed, including through the United Nations General Assembly's Political Declaration of the High-Level Meeting on Universal Health Coverage *(10)* and the resolution of the International Parliamentary Union *(11)*.

10. Primary health care is the cornerstone of universal health coverage. World leaders marked the 40th anniversary of the 1978 Alma-Ata Declaration on Primary Health Care with the Astana Declaration[3] *(12)* to firmly establish primary health care as the main approach to achieving universal health coverage. WHO has embedded the SDG and primary health care logic in the development and implementation of its own 13th General Programme

3 Astana Declaration on Primary Health Care: From Alma-Ata towards Universal Health Coverage and the Sustainable Development Goals.

of Work, in the form of "triple billion" targets: 1 billion more people benefiting from universal health coverage, 1 billion more people better protected from health emergencies, and 1 billion more people enjoying better health and well-being *(9)*.

11. WHO's 2019 Global Monitoring Report — *Primary health care on the road to universal health coverage* — found evidence of remarkable progress towards improved service coverage, with countries increasingly establishing legal mandates for universal access to health services and products in their national legal frameworks *(13)*. However, progress has been uneven across and within countries, and financial protection for the most vulnerable remains a challenge. Weak health systems and socioeconomic factors are hindering progress; better data and evidence are needed to identify the investment priorities and track progress. Opportunities exist to shift from rigid delivery models and roles to more agile, accessible and articulated systems.

12. WHO estimates that the overall investments needed to achieve the health targets in SDG 3 by 2030 total US$ 3.9 trillion *(10)*. Over the 12-year period, more than 40% of this investment is for the remuneration, salaries and emoluments of the health workforce required to address the projected shortage of 18 million health workers by 2030 *(14–16)*. Estimates that include the additional investment required in the education and lifelong learning needs of the health workforce indicate that an average of more than 50% of health-related investments will need to be directed at developing, remunerating and maintaining the health workforce.

13. Contrary to the long-standing — and erroneous — notion that the health workforce represents a cost to be contained *(17, 18)*, in 2016 the United Nations High-Level Commission on Health Employment and Economic Growth (the "Commission") published evidence that jobs and employment in health promote economic growth and increase the productivity of other sectors *(17, 18)*. Investment in the health system and its workforce substantially contributes to inclusive economic growth (SDG 8), particularly through the employment and empowerment of women (SDG 5) and young people *(19, 20)*. Women account for 70% of the social and health care workforce globally *(21)*, and nearly 90% of the nursing and midwifery workforce *(22, 23)*.

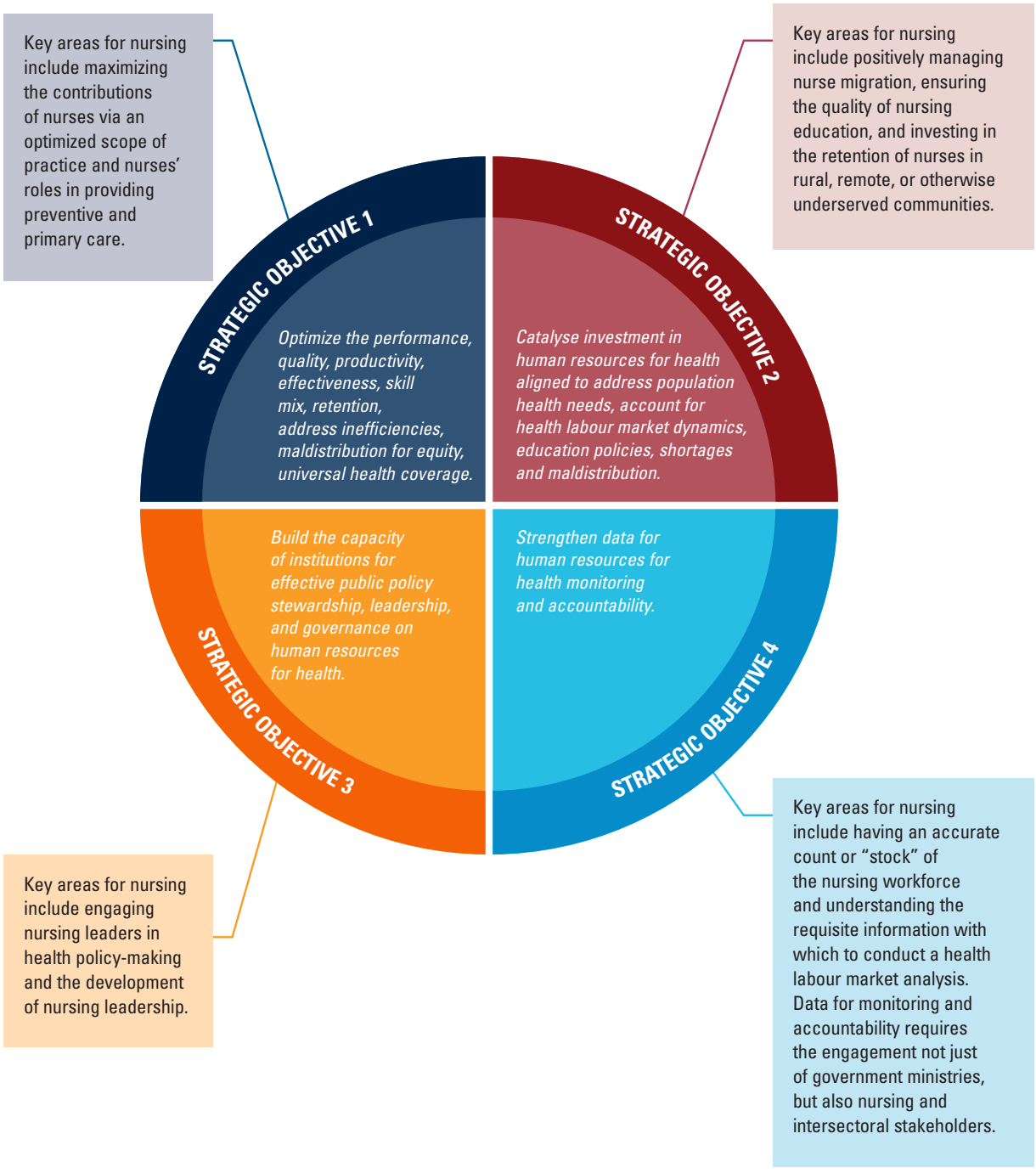
14. The Commission provided a rationale for investment in health and social sectors, and a framework on how that investment can expand education capacity to ensure a sustainable supply of health workers and transform their competencies to meet needs, producing a health workforce with the right skills to fill decent jobs in the right places for better health service delivery, and in sufficient numbers to avert the projected 18 million health workforce shortfall.

15. In 2017, WHO Member States adopted a five-year plan to achieve the Commission's recommendations, encompassed in the Working for Health programme and a Multi-Partner Trust Fund of WHO, the International Labour Organization (ILO) and the Organisation for Economic Co-operation and Development (OECD) *(15, 17)*. WHO implements these recommendations in alignment with the approaches for health workforce strengthening outlined in the

Global Strategy on Human Resources for Health: Workforce 2030 (Figure 2.1) *(16)*.

16. Accelerating progress towards universal health coverage and achieving SDG 3 is possible by refocusing attention on the investment needs for the health workforce. This necessitates a comprehensive understanding and quantification of supply, demand and needs, which are used to conduct health labour market analyses that inform integrated health workforce strategies and plans.

Figure 2.1 **Global Strategy on Human Resources for Health: strategic objectives and relevance for nursing**



17. The nursing workforce faces challenges common to all health occupations, including adequate numbers, equitable distribution and retention, quality education, effective regulation, conducive working conditions, and quality and efficiency within universal health coverage *(24–26).* However, there are challenges that are specific to the nursing profession, including issues of gender bias, policy leadership, regulation, and varied levels of education and practice roles *(25).* A clear understanding of these issues and priorities can facilitate the adoption of appropriate policy and investment decisions.

2.2 Who is a nurse?

18. This report aims to present the best available, internationally comparable evidence and data on the nursing workforce. To that end, it is necessary to be specific about "who is a nurse". The evidence synthesized in Chapters 3 and 4 represents a broad interpretation of nursing as reflected in the published literature. In Chapter 5, which presents the data gathered and analyses conducted specifically for this report, the terminology specifically and singularly refers to two occupational groups defined by the 2008 International Standard Classification of Occupations (ISCO-08): professional nurse (ISCO code 2221), and nursing associate professional (ISCO code 3221).

19. Countries reported data according to who they determined met the definitions for those two occupations; countries were not asked to report on other occupation groups (such as midwives, nursing assistants or other auxiliary health workers). Some countries classify some of their health workers as "nurse-midwives", who have a

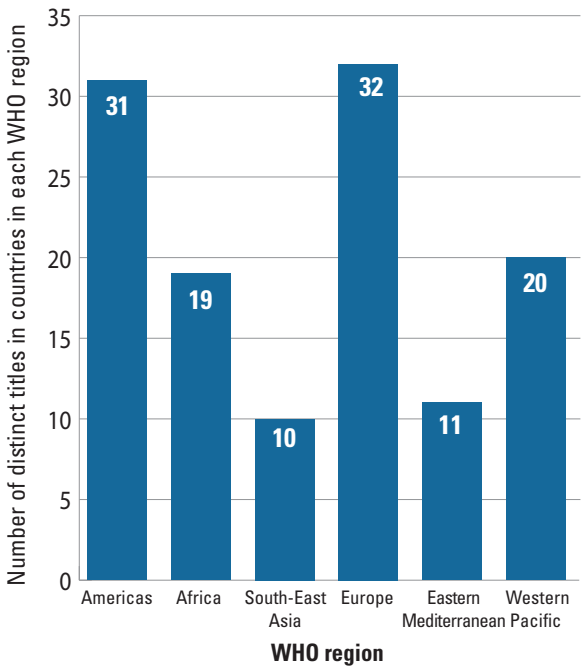
hybrid educational pathway and role. As "nurse-midwife" is not an internationally classified occupational group, the report only included data referring to health workers that countries categorized as professional or associate professional nurses. More information about these definitions and how countries were supported to report on their nursing personnel can be found in the description of methods in Chapter 5, as well as in Annex 1 to this report.

20. Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings; it includes the promotion of health, the prevention of illness, and the care of ill, disabled and dying people *(7, 27)*. Additional key nursing roles include advocacy, promotion of a safe environment, participation in patient and health services management, shaping health policy, education, and research *(27, 28)*. Nurses provide a wide variety of health care services for people in all health care settings, from tertiary hospitals to health posts in remote communities. The title "nurse", in its various forms, should indicate a person who has met the legal, educational and administrative requirements to practise nursing.

21. There are a variety of educational pathways to practise with the title "nurse". After completing an entry-level nursing programme, higher education and specialist qualifications are also often available, usually resulting in different titles and roles. The outcome is an assortment of nursing titles, roles and competencies, even within the same country. The variety seen in any one country is magnified when examined at a regional level and increases further when assessed at a global level (Figure 2.2). Data in the Global Regulatory Atlas *(29)* suggest there are at least 144 distinct titles of nurses around the world that require a licensure examination, including specialist and advanced practice titles. This reflects a range in the number of types of nurses from 10 different titles in the South-East Asia Region to over 30 in the Region of the Americas and the European Region.

22. The role of a nurse in one country may be different from the role of a nurse with the same title in another country. This underscores the importance of internationally standardized definitions to support discussions of who is a nurse, understand nursing functions, and plan health services in which the contributions of nurses is optimized towards achieving population health goals.

Figure 2.2 **Number of distinct nursing titles within each WHO region**



Note: Numbers indicate nursing titles requiring an examination in each country, grouped by region. **Source:** NCSBN Global Regulatory Atlas *(29)*.

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CHAPTER 3

Nursing roles in 21st-century health systems

23. This chapter provides a synthesis of the contemporary evidence base (for a detailed synthesis see web annex) on the roles and responsibilities of nurses contributing to SDG 3 and more specifically with respect to WHO's mission "to promote health, keep the world safe and serve the vulnerable" and the triple billion targets of its General Programme of Work.

3.1 Role of nursing in achieving universal health coverage

24. A Cochrane review has shown nurses to be effective in the delivery of primary health care across a wide range of services for communicable and noncommunicable diseases, including clinical decision-making roles for some conditions, as well as health care education and preventive services *(30)*. The review shows that nursing-led primary care services can, in certain settings and under the right circumstances, lead to similar or in some cases even better patient health outcomes and higher patient satisfaction than other care delivery models; nurses probably also have longer consultations with patients *(30)*. Other Cochrane reviews have shown that nurses are effective in the initiation and follow-up of HIV therapy *(31)*, and that nursing interventions for tobacco cessation increase the likelihood of quitting *(32)*. A further Cochrane review has shown that non-specialist health workers, including nurses, may improve outcomes for general and perinatal depression, post-traumatic stress disorder and alcohol use disorders, and patient and carer outcomes for dementia *(33)*. A Campbell systematic review has shown that sexual assault nurse examiners or

forensic nurse examiners are effective in sexual assault forensic examination and documentation, that these nurses could provide sexually transmitted infection and pregnancy prophylaxis, and that this care represents good value for money *(34)*.

25. Nurses are important to ensuring quality of care and patient safety, preventing and controlling infections, and combating antimicrobial resistance *(35)*. This is achieved through carrying out multiple functions, including monitoring patients for clinical deterioration, detecting errors and near misses *(36)*, implementing infection prevention interventions, control monitoring and mentorship *(37)*, and ensuring that good practices involving water, sanitation and hand hygiene are maintained *(38)*. In outbreaks such as COVID-19 where hand hygiene, physical distancing and surface disinfection are central to containment, the infection prevention and control role of nurses is crucial (Box 3.1).

26. The historical contribution of nurses to prevention, treatment and control of communicable or infectious diseases is also well documented *(4, 49)*. For example, nurse-led interventions can lead to an increase in vaccination rates *(50)*. Nurses have been active across the globe in the management and prevention of tuberculosis, and can engage effectively in both clinical and non-clinical tasks, such as health promotion and psychosocial support *(51–54)*, performing voluntary male medical circumcision *(55–61)*, and designing and implementing HIV pre-exposure prophylaxis programmes *(62)*. Nurses can also be effectively engaged in combating neglected tropical diseases through community education, mass chemoprophylaxis, identifying and diagnosing disease cases, determining disease prevalence, screening and confirming suspected cases identified and referred by community health workers, dispensing drugs, performing certain types of surgery (for example

Box 3.1 Nursing contribution to patient safety

Annually more than 8 million deaths in low- and middle-income countries are attributed to poor quality of care *(39)*. Nurses can contribute to improved quality of care and to patient safety through the prevention of adverse events, but this requires that they work at their optimal capacity, within strong teams, and within a good working environment. Nurses play an essential role in ensuring patient safety by monitoring patients for clinical deterioration, detecting errors and near misses, understanding care processes and weaknesses inherent in some systems, and performing numerous other actions to ensure patients receive high-quality care *(36)*. Burnout amongst nurses and doctors due to high workload, long journeys and ineffective interpersonal relationships has been associated with worsening patient safety *(40)*, whereas good work environments, safe staffing of nurses and education in mixed-skill teams are correlated with reduced hospital length of stay, lower incidence of adverse events such as pneumonia, gastritis, upper gastrointestinal bleeds, pressure ulcers, and catheter-associated urinary tract infections, and reduced overall mortality *(41–48)*.

for trachoma), and providing patient education on managing disease, such as lymphoedema self-care *(63)*. In several settings across Africa, nurses also contribute to improved quality of communicable disease care through the training, mentoring and supervision of community health workers *(63–65).*

27. Nurses play a crucial role in health promotion, health literacy and the management of noncommunicable diseases (NCDs) *(66–72).* With the right knowledge, skills, opportunities and financial support, they are uniquely placed to act as effective practitioners, health coaches, spokespersons, and knowledge brokers for patients and families throughout the life course *(73).* The success of nurses in NCD care and prevention has been repeatedly demonstrated *(66–72)* in a range of NCD tasks, including screening and providing primary health care services for multiple NCDs, such as hypertension, cardiovascular disease, diabetes, mental health, neurological conditions, respiratory diseases and cancer *(70*). In carrying out these tasks nurses have improved health outcomes, such as reductions in blood pressure and lower depression scores, and have offered equivalent care for patients with heart failure or diabetes *(30, 70)*. Nurses have also contributed to behaviour change, such as increased uptake of medications, and patients treated by nurses are more likely to keep follow-up appointments *(30, 70)*. An extended role of nurses within health care teams, enabled by appropriate orientation of nursing education and scope of practice, may support the integration of NCDs into primary care *(74, 75)*. While potentially relevant in a variety of settings, an expanded role of nurses has the potential, in contexts characterized by a shortage of physician specialists, to advance health equity *(73, 76)*.

28. Nurses contribute to care across the life course. Nurses, working with midwives, obstetricians and other physician specialists, provide antenatal, intrapartum and postnatal care for childbearing women *(77)*. Neonatal nurses with specialized skills in newborn care are effective in delivering special support and timely, high-quality inpatient care, supported by other neonatal specialists. In most countries nurses form the backbone of school health services providing care for children and adolescents *(78–81)*. Nurses offer services across the spectrum of sexual and reproductive health; for example, they safely and effectively provide oral and injectable contraceptives, implants and intrauterine devices *(82)*. Evidence also supports the efficacy of nurses in cervical cancer screening and provision of HIV services for women of reproductive age and beyond *(83, 84)*. Provision of information and advocacy with age-eligible adolescents and their parents or caregivers are central components of the nurses' role in expansion of human papillomavirus vaccination services *(83, 85, 86)*. Nurses play a central role in the provision of care for older adults and can be instrumental in the delivery of integrated care, which results in better outcomes for older populations (Box 3.2) *(87)*. As primary providers of palliative care, nurses enable an end-of-life experience characterized by dignity and compassion.

Box 3.2 Nurse-led model of community care for ageing populations

Motivated by Japan's status as a "super-ageing" society, the Sasakawa Memorial Health Foundation began a programme in 2014 to enable nurses to establish and operate community-based home care nursing centres *(88)*. The centres act as community health hubs from which nurses provide services that enable ageing adults to live with dignity at home and to improve the quality of life of people in the community. The Sasakawa Memorial Health Foundation also supports a network to enhance cooperation between centres, collect data, and advocate establishment of community-based home care nursing centres *(89)*.

An eight-month programme in elder care and home care nursing prepares nurses to conduct physical assessments, meet the primary health care needs of community residents, and assist families to provide palliative and end-of-life care in the home. Additional coursework focuses on entrepreneurship, management and business plans to develop and operate a home care nursing centre *(89)*.

By March 2019, 67 nurses had completed the programme and over 56 of them operate home care nursing centres in 23 districts throughout Japan. Staffing at the centres averages 70% nurses and 30% other professionals, attesting to the interprofessional collaborative approach applied in meeting the primary health care needs of the communities served at the centres and in their homes. As a network, the centres averaged 25 000 visits per month. The support of families in providing end-of-life care has contributed to a reduction in health care costs associated with hospital admission and medical procedures *(90)*.

3.2 Role of nursing in dealing with emergencies, epidemics and disasters

29. Nurses are involved in delivering care for clinical emergencies (such as accidents or heart attacks), preventing and responding to epidemic outbreaks, and responding to disasters and humanitarian crises. Nurses are often the first provider that a patient sees in a health facility; their roles may vary depending on context, but often include triage, early recognition of life-threatening conditions, administration of medications, performance of life-saving procedures, and initiation of early referral.

30. Nurses have played a pivotal role as part of teams managing epidemics that threaten health across the globe, including severe acute respiratory syndrome (SARS) in 2003 *(91),* the Middle East respiratory coronavirus (MERS-CoV) outbreak in 2015 *(92),* Zika virus disease in 2016 *(93, 94)*, Ebola virus disease in 2014 *(95, 96)* and the COVID-19 outbreak that began in 2019. Through the WHO Emergency Medical Teams Initiative, nurses and other health workers are trained to better support their own countries' capacity to respond to future disaster and emergency situations *(97)*. This may be particularly important to increase the resilience of health systems that have been made more vulnerable through disasters and conflict *(98)*.

31. In settings affected by fragility and conflict, health workers, including nurses, confront a number of both personal and professional challenges, such as the threat of abduction, having to cope with the death of colleagues, fear of their own death, increased workload, and increased complexity in the workload (for example, having to deal with firearm wounds), as well as the erosion of ethical and professional standards *(99)*. Despite these conditions, nurses and other health workers have shown resilience and commitment in the face of these challenges and have continued to deliver essential services (*99)*. With support, nurses in conflict settings or catering to refugee populations have been able to achieve treatment success for a range of diverse conditions, such as pulmonary tuberculosis *(100)* and other respiratory tract infections, dental caries and post-traumatic stress disorder *(101)*.

3.3 Role of nursing in achieving population health and well-being

32. Enhancing the health and well-being of populations requires nurses and other health workers to address the social determinants of health, and in so doing contribute towards the achievement of the SDGs. The prevention of diarrhoeal diseases through the promotion of handwashing, nutrition and sanitation *(102, 103)* represent areas with emerging evidence of nursing effectiveness in addressing the social determinants of health *(4).* Nurses may be among the first to deal with the impacts of climate change *(104–106),* which will include efforts to strengthen the resilience of the poor and those vulnerable to climate-related events, as well as reducing the mortality from climate-sensitive diseases such as diarrhoeal diseases, malaria, African trypanosomiasis, leishmaniasis, schistosomiasis, intestinal nematode infections and dengue fever.

33. Enabling and sustaining healthier populations is dependent on both ensuring the health of young people through their equitable access to universal health coverage, and ensuring that they are healthy and willing to continue the work of sustainable development into the next generation. Nurses understand and are capable of adopting the approaches needed to be responsive to the expectations of young people, including being trustworthy, non-judgemental, and client centred; meeting them on their own terms; and being accessible *(107–110).*

34. Nurses have shown positive results in areas that represent a particular challenge to women, such as family planning and abortion care *(111, 112).* Optimizing their role in the delivery of these services can lead to better access to reproductive health care for many women. Nurses offer social support to women for maternal health care during critical life events (for example, prenatal

and postpartum periods *(113)* and breast cancer) and are key to ensuring that women receive respectful care in health services settings *(114, 115)*. Nurses are also essential to the fight against gender-based violence: studies on screening for intimate partner violence report nurses and midwives as the health professionals who most often (45% and 24%, respectively) conduct in-person identifications *(116)*. In concluding this chapter, Figure 3.1 summarizes the contribution of nursing to the triple billion targets.

Figure 3.1 **Nursing contribution to the triple billion targets**

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CHAPTER 4

Policy levers to enable the nursing workforce

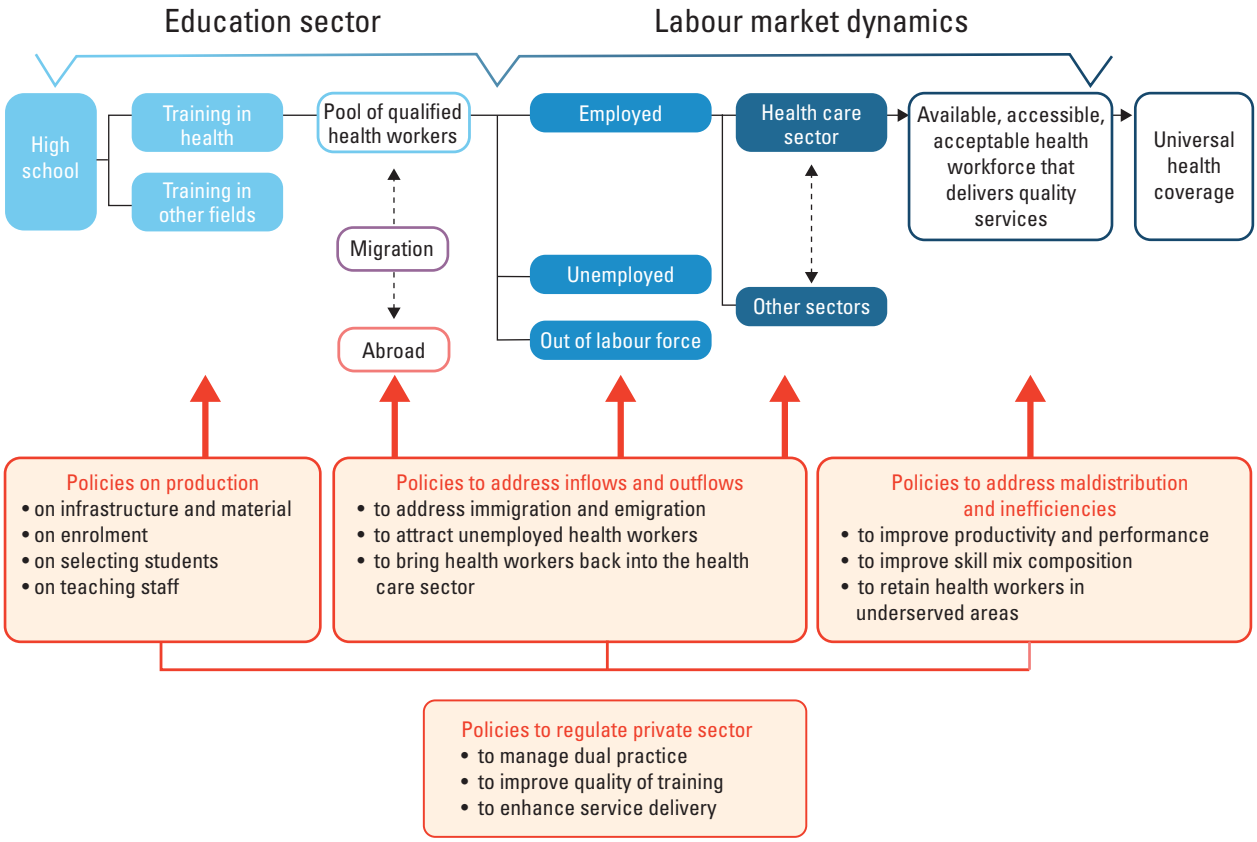
35. Optimizing the contribution of the nursing profession, as described in the preceding chapter, requires a conducive policy and practice environment. Many of the factors that influence the availability, distribution, capacity, enabling work environment and performance of the nursing workforce can be analysed through a public policy perspective, utilizing the WHO health labour market framework *(117)* (Figure 4.1).

36. Based on this framework, the report considers four dimensions that characterize the health workforce policy discourse on nursing, consolidating the evidence base from peer-reviewed literature on (a) pre-service education and training; (b) workforce inflows and outflows; (c) equitable distribution and efficiency; and (d) regulation (including the private sector). Also referenced in the framework are societal, economic and population factors that affect the health labour market. Some of these factors (gender bias, country income level) are discussed in detail in this report, while others, such as demographic trends (ageing, growth patterns) and climate change, should be considered more directly in the national-level context when designing and implementing relevant nursing workforce policies.

4.1 Pre-service education and training

37. The purpose of nursing education is to produce a nursing workforce that can meet the health needs of the population, in quantitative, qualitative and distributive terms. The intake and output of nursing education institutions should

Figure 4.1 **Public policy levers to shape health labour markets**



Source: Adapted from Sousa A, Scheffler RM, Nyoni J, Boerma T. A comprehensive health labour market framework for universal health coverage. Bulletin of the World Health Organization. 2013;91:892–4.

therefore be tailored to the needs and absorption capacity of the health sector. Ensuring there is no mismatch can be facilitated by regular dialogue between and coordination among the health, education, labour and finance sectors.

38. The number of students enrolling in and completing nurse education programmes is affected first by the basic education levels of the population and by the educational prerequisites to enrol in a nursing programme *(118, 119)*. Enrolment in nursing programmes is affected by programme location, cost, programme capacity, clinical affiliations and level of nursing education offered. Each of these in turn is influenced by numbers of qualified faculty to accomplish programme mission and objectives, along with infrastructure and capacity for clinical education *(120)*. Squires et al. reported that "macro" factors such as health system capacity for health workers (hospital beds per population) and gender empowerment also affect the production of nurses in a given country *(121)*.

39. Gender issues can affect enrolment of nursing students and thus impact the supply of nurses. The social and economic undervaluing of nursing work limits nurses' opportunities to participate in decision-making and become leaders within health care systems *(22, 23, 122)*,

which may undermine efforts to recruit qualified applicants to nursing education programmes. Biased perceptions of women's role in caregiving and social gender norms make recruitment of male students an ongoing challenge: while a nursing education for women may be regarded as upward mobility, this may not be so for men *(123–125)*. Furthermore, opportunities for women in other occupational groups may be limited by cultural or systemic constraints, making nursing education the only or most obvious pathway for a career in health care for women, instead of a valued option for aspiring health workers of any gender.

40. In some settings, certain race, ethnic or other vulnerable groups may be underrepresented in nursing education *(126)*. This may have negative impacts on the cultural fit between nurses and the communities they serve. Although there is an increasing focus across the nursing profession on ensuring that education and training incorporate cultural competencies, greater efforts are needed to increase the selection and recruitment of students from underrepresented populations (Box 4.1).

41. The location of nursing schools and training programmes also affects the pool of qualified applicants. Nursing education programmes are primarily situated in urban centres with universities and hospitals, leaving potential students from rural and remote areas with far fewer education options *(129)*. With an increasing focus on the geographical distribution of the health workforce, and the social accountability of training institutions, some programmes are incorporating rural training sites or actively recruiting and supporting students from communities historically underrepresented in post-secondary education. Online distance education programmes combined with appropriate opportunities for clinical education may offer effective options for potential students in rural areas *(130)*; while there should be constant attention to monitoring and preserving quality of education, this approach has potential, in some settings, to enhance the diversity of students in nursing programmes *(131)*.

42. Costs (in terms of both tuition fees and living expenses) can affect student ability to attend or complete a nursing education programme. While the cost

Box 4.1 Australia: engaging underrepresented populations in the nursing workforce

In Australia, Indigenous Australians have been requesting increased care from Indigenous practitioners so as to increase their access not just to care, but to culturally safe care *(127)*. The solution however has not been as simple as increasing the numbers of Indigenous and Aboriginal and Torres Strait Islander students, but also ensuring that the challenges these students face are addressed, such as building an enabling environment, having Indigenous nurse educators, embedding Indigenous content in the curriculum, and addressing the financial needs of students *(127, 128)*.

of nursing education can vary widely (Box 4.2), public programmes are more heavily subsidized and often less expensive than private programmes that rely on student tuition and private contributions. The cost of living, alongside low or no earnings when studying full time, adds to the personal cost of study. Different countries have varying funding schemes, which may include options or incentives for students from underrepresented groups or for those willing to practise in underserved areas upon graduation.

43. There are a variety of entry-level educational programmes that produce nurses with different qualifications and professional roles but who meet the nursing professional and nursing association classification criteria (ISCO-08). Entry-level programmes may prepare nurses at the certificate level, diploma level and degree (bachelor's) level; the academic requirements for an entry-level nursing programme can vary from completion of the ninth grade or below and 17 years of age for a certificate programme to completion of secondary school (12th grade) plus two years of university-level education to enter a degree programme *(135, 136)*. While the variety of programmes and entry requirements can enable a broader range of people to enter the profession, employers often fail to differentiate practice roles based on the level of education, creating a mismatch with the supply system that is producing a generalist and the employer who has structured their services in a specialist or differentiated care context.

44. Some countries around the world educate a substantial proportion of their nursing workforce at the certificate and diploma level, often at stand-alone training institutions that focus on task-oriented clinical skills *(137)*. University degree (bachelor's) programmes typically include additional coursework in leadership, case management, and socioeconomic factors that affect health and patient outcomes in diverse inpatient and outpatient settings; sometimes a research component is also included.

Box 4.2 Cost of nursing education

Around the globe it is estimated that US$ 27.2 billion is spent annually on nursing and midwifery education *(132)*. While nurses and midwives form more than half of the global health workforce, the spending on nursing and midwifery education is around a quarter of the global expenditure on health worker education. Estimates published in 2010 presented an average cost per nursing graduate of US$ 50 000 globally, with a range from an average of around US$ 3000 per nurse in China to over US$ 100 000 in North America *(132)*. This variance can be attributed to the proportional share of the public and private sectors in financing, owning and managing educational institutions, as models for financing nursing education differ both within and between countries *(133)*. Another factor driving variability in the cost of nursing education is the different levels of qualification that coexist and diversity in the duration and prequalification of the education programmes *(134)*. More and better data on nursing and midwifery graduates, and the cost of education and training, are needed to guide investments to meet the estimated shortages by 2030.

These programmes also emphasize "critical thinking skills" that can contribute to more advanced clinical judgements and increase the safety of care provision. Research findings indicate that patients who are cared for by a higher proportion of degree-prepared nurses are less likely to die, stay in the hospital for shorter periods, and face lower health care costs *(46, 138, 139)*. However, most studies indicating better patient outcomes for degree-prepared nurses took place in hospitals and have not been replicated in ambulatory and community settings, limiting the generalizability of findings *(140)*. Additional evidence suggests that baccalaureate-prepared nurses may not use the full complement of their knowledge and skills in the workplace *(141)*.

45. Nurses can also be prepared as post-baccalaureate specialists or at the master's degree level for specialty or advanced practice, or can obtain a doctoral degree in nursing, either the practice-oriented Doctor of Nursing Practice, or the research-oriented Doctor of Philosophy *(142)*. Increasing the educational qualifications of professional nurses will require articulation between different levels of programmes that build on and provide credit for prior learning *(143)*. In countries in which there is demand for degree-prepared nurses, education programmes that "bridge" or "upgrade" an existing nursing credential can represent an important career development mechanism and generate high rates of private return. Of note, preparation of nurses at the bachelor's level is needed for postgraduate education at the master's or doctoral level, which in turn can affect quantity and quality of faculty for entry-level nursing programmes.

46. A critical but often challenging component of nursing education is securing adequate time and exposure for students in clinical practice settings. During clinical practicums, students apply and integrate the critical thinking, clinical assessment and nursing care competencies learned in educational settings. Clinical teaching faculty is required to provide appropriate supervision and conduct clinical skills assessment. Because many nursing programmes are located in urban areas, providing appropriate clinical experiences in rural or remote facilities can be challenging. That exposure can be instrumental to a student's eventual decision on where to practise *(144)*. Some online or distance programmes have been shown to increase access to rural and remote clinical facilities previously not associated with a "brick and mortar" education institution *(145, 146)*. Alternatively, telehealth technology and simulation laboratories can provide appropriate and complementary clinical experiences in primary care *(147–150)*. Online distance education programmes should be monitored and held to the same accreditation and quality standards as other education institutions.

47. Many countries have experienced a substantial growth of private sector health education institutions, both not-for-profit and for-profit *(151, 152)*. The latter group is more often associated with higher tuition fees and may be subject to different regulatory authority requirements and accreditation *(152)*. They may be disconnected from the health and education public policy objectives, and thus may not always be aligned with population–health priorities, especially if the intention is to educate nurses for the growing international

health labour market. When no quality assurance mechanisms are in place, the content and delivery modalities of the curriculum may not meet national standards, including required clinical experience, producing graduates who are not equipped with the knowledge, skills or behaviours to provide safe and quality care *(153)*. A proliferation of private schools not affiliated with hospitals or academic medical centres can place pressure on existing clinical placement sites and call into question the quality of the training provided therein.

48. One of the biggest challenges in nurse education is the recruitment and retention of sufficient numbers of qualified nurse faculty *(19, 20, 154)*. Challenges include their employment setting (educational organization versus clinical agency), which may involve salary differences and protected time for teaching. A report by the American Association of Colleges of Nursing proposed merging education and clinical practice roles of nurse faculty (joint appointments) to increase the status, remuneration and engagement of expert clinicians in nursing education *(155)*. Other strategies include academic–clinical partnerships in which clinicians receive academic training to prepare them to precept students in their clinical settings, as well as incentives to further their education, such as tuition

Box 4.3 Addressing the shortage of nurse educators

The challenge of nurse educator shortage, which is experienced across the globe, may be alleviated through more collaborative approaches such as pooling resources across institutions, and possibly even across countries *(156)*.

In Thailand, a collaborative approach to increasing the academic credentials of nursing faculty is the Programme of Higher Nursing Education Development, conducted at Chiang Mai University and funded by the China Medical Board *(157)*. This programme, started in 1994, focuses on training masters and doctorally prepared nurse educators to teach in the growing number of baccalaureate nursing programmes across China. The programme has subsequently expanded its impact across 10 countries in East and South-East Asia, allowing the expansion of nurse education programmes and mutual recognition of nurse credentials across the region *(157)*.

In the United States, the Veterans Affairs Nursing Academic Partnership programme provides funding for salaries and training of expert nurses as faculty in partner academic institutions to increase the number of graduates prepared to meet the unique health care needs of veterans in acute and primary care settings *(158)*.

In Rwanda, the capacity of nursing faculty was strengthened through continuous education focused on advanced teaching methodologies and curriculum development, among other approaches *(159)*. This initiative was supported by an international academic partnership, recognizing that the programme had to be owned by Rwanda, and that cultural humility needed to be practised through the collaboration *(159)*.

remission and access to additional training opportunities. The success of these partnerships often rests on clinical sites providing adequate release time for expert clinical nurses to supervise or engage with students on site. Examples within and across countries are provided in Box 4.3.

49. The shortage of faculty prepared at the master's and doctorate levels is an impediment to establishing higher degree nursing education programmes, especially when educators' requirements are specified in accreditation or approval criteria. The lack of faculty trained at doctoral level also impacts the ability of the profession to conduct research needed to develop evidence to inform practice, and to assume leadership roles in academic and health care sectors *(20, 154, 160)*.

50. Among all health care disciplines, nursing has been shown to make the most use of interprofessional education *(161)*. This approach to education is also valued by nursing students, who perceive it as facilitating their achievement of interprofessional collaboration competencies *(149, 162)*. Additionally, the integration of educators from different disciplines into the teaching of nursing has the potential to bring specialized knowledge from other disciplines into nurse education, and may enhance nurses' competencies required for team-based patient care *(163)*. Currently, this teaching approach is utilized more in high-income than in low- and middle-income countries *(159)*, but the increasing use of technology, even in low-resource settings, creates a real opportunity to enhance interdisciplinary learning *(162)*.

4.2 Workforce inflows and outflows

51. The number of active nurses (or nursing workforce "stock") is determined by many elements. "Inflows" comprise graduates from domestic nursing programmes who enter practice, nurses who immigrate from other countries and those returning to practice. "Outflows" include nurse graduates who fail to maintain employment in the domestic health sector, nurses who choose to work outside the health sector, retirements and those who migrate abroad.

52. A fundamental determinant of the inflows of health workers into the health labour market is the country's economic capacity to create funded employment positions (whether in the public or private sector) or opportunities for income through the provision of health services. Job creation is therefore directly correlated with the socioeconomic level of the country, and – within that – the level of prioritization awarded by public sector policy-makers to investments in the health sector and in the health workforce in particular. Other factors that impact demand are demographic changes, such as ageing populations; changing disease profiles, such as growth in chronic disease and multiple morbidities; high rates of nurses leaving employment or shortages of other health professionals; a growth in health facilities, for example through hospital construction or a change in hospital hiring policies; or changes in legislation, such as staffing norms for nurse-to-patient ratios *(140, 164)*. Factors that can reduce demand for nurses include new technologies that affect the need for inpatient or provider care, high levels of retention,

greater productivity (for example, through use of evidence-based practice or greater use of technology), and role delegation from a nurse to a different occupational group *(164)*.

53. The international mobility of the nursing workforce is increasing, with significant effects on the pool of health workers in countries. Reasons for nurse migration include availability of better jobs, salary, working conditions, health infrastructure, clinic or hospital resources, and education opportunities. In addition to these pull factors, destination countries' visa provisions for family petitions may also be an incentive to migrate. Push factors include absence of job opportunities, poor working conditions and terms of service, and insecurity in source countries. Remittances from nurses working abroad can account for a

Box 4.4 Global skills partnerships

Adoption of the Global Compact for Safe, Orderly and Regular Migration in December 2018 by 152 States Members of the United Nations advanced a comprehensive approach to addressing international migration. A central tenet of the Global Compact is building global skills partnerships – bilateral agreements to leverage opportunities from migration through matching the demand for and supply of workers with targeted educational support in countries of origin *(166)*. The format of the partnerships is designed to channel the pressures of migration into tangible, mutual and fairly shared benefits for both source and destination countries, which is consistent with the principles of the WHO Global Code of Practice.

Through such an agreement, the country of destination agrees to provide technology and finance to train potential migrants with targeted skills in the country of origin, prior to migration, while the country of origin agrees to provide that training, and also receives support for the training of non-migrants *(166)*. As part of this partnership, nurses may for example be trained on a "home track" and an "away track", where the home track nurses receive skills training appropriate to the needs of the country of origin, while the away track nurses are prepared for working in the destination country. Depending on the needs of each partner, this partnership may not be limited to single occupations. The partnership between Health Education England (of the United Kingdom National Health Service) and the Government of Jamaica is intended to improve Jamaica's specialist nursing workforce. Jamaican nurses train in critical care in United Kingdom hospitals for a period of two years, then return to Jamaica to transition into specialist roles. In parallel, United Kingdom nurses will spend time in Jamaica to support health system strengthening activities, including service delivery, quality improvement and training. The exchange programme was initiated in 2019.

The International Organization for Migration has similar projects across the globe, linking countries of origin and destination countries through programmes that promote effective management of health worker migration, health systems capacity-building in countries of origin, and skill and knowledge transfer from the diaspora *(167)*. It does so in collaboration with national governments and other stakeholders. The International Organization for Migration is a key partner to the efforts of WHO, endorsing the WHO Global Code of Practice as well as relevant policies and World Health Assembly resolutions *(167)*.

substantial source of revenue for families and a sizable contribution to some source countries' economies. Policy solutions, such as agreements between countries (bilateral agreements), must be mutually beneficial to source and destination countries, consistent with the policy provisions of the WHO Global Code of Practice on the International Recruitment of Health Personnel *(165)* on support and safeguards (see Box 4.4 on global skills partnerships).

54. The number of foreign-trained nurses working in OECD countries increased by 20% over the five-year period from 2011 to 2016, outpacing doctors to reach nearly 550 000 *(168)*. The vastly improved data indicate a blurring of traditionally recognized "source" and "destination" countries *(169)*. While there is still high economic demand for nurses in high-income countries (see Box 4.5 for examples), there are emerging migration patterns from Asia, Africa and the Caribbean to other regions and countries (such as the Gulf States) *(170)*, as well as South–South migration amongst countries within the same region.

4.3 Equitable distribution and efficiency

55. Once in the health sector, nurses are employed in a range of settings across the continuum of health service delivery points, both public and private *(175–178)*. The distribution of nurses in different types of facilities and facility ownership is not systematically documented. However, nurses may prefer to work in hospital and acute care settings as opposed to primary care settings, and in some contexts, nurses choose to work in the private sector due to the better remuneration compared to public facilities *(175, 177)*.

56. Care models should strive for the optimal skill mix in integrated primary health care teams *(179)*, allowing nurses to work to the full scope of their nursing education *(180, 181)*. Nurses are a cornerstone of integrated care teams, often leading care provision and taking on expanded practice roles, including, where relevant, collaboration with and oversight of community health workers *(182–193)*. Allowing nurses to practise at the top of their education and experience can result

Box 4.5 Examples of economic demand for nurses in high-income countries

Demographic, epidemiological and health policy shifts point to a growing demand for nurses in high-income countries. Examples include:

- The Health Foundation in the United Kingdom estimates a need to recruit at least 5000 nurses per year from abroad until 2024 *(171)*.
- In Japan, a new visa programme was enacted to attract up to 245 000 foreign workers, including 60 000 nursing aides *(172)*.
- The German Government reported approximately 36 000 vacancies in elderly and sick care *(173)*, noting that they would need to recruit from abroad *(174)*.

in greater job satisfaction and greater patient satisfaction with care *(194)*. Enabling factors are training in primary health care, development of standardized practice guidelines or standing orders, and data systems to track patient care outcomes *(195, 196)*.

57. Many countries have prescribing as part of the professional or registered nurse's scope of practice *(197, 198)*. Nurse prescribing can be restricted to specific groups or medication schedules established in legislation or the professional regulatory framework *(199)*. In other circumstances, the prescribing of drugs is specific to population health priorities, such as first-line antiretroviral treatment in high-burden HIV countries in sub-Saharan Africa, antimicrobial resistance, or addressing chronic conditions *(200–202)* (see Box 4.6 on prescribing in Poland). Nurses also play an important role in encouraging medication compliance, monitoring prescription decisions and reducing prescribing errors *(203, 204)*.

58. The advanced practice registered nurse role was developed to increase access for underserved and remote populations and to address understaffing in primary care settings *(192, 207)*. The most common type of advanced practice nurse role is the nurse practitioner, with a clinical scope that includes the authority to autonomously order diagnostic tests, make diagnoses, and prescribe treatments and medications *(207)*. Certification by professional organizations and master's level education are usually required *(208)*. In a small number of high-income countries, there is strong evidence on the effectiveness of nurse practitioners and advanced practice nurses in providing quality care, enhancing access to care and improving patient satisfaction with

Box 4.6 Expanding access via nurse prescribing in Poland

Among the national health priorities for Poland was to improve community-level management of chronic conditions and to increase accessibility to treatment and medicines in primary health care settings. Policy decisions around nursing education and regulatory mechanisms effectively expanded the function of nurses in the health care system, and increased patients' access to health services *(205)*.

In 2016, nurses with specific qualifications were granted authority to prescribe medications under certain conditions. To prepare graduating nurses for this role, prescribing was incorporated into every initial nursing and midwifery education programme, and regulations allowed all nurses graduating with a Bachelor of Nursing degree to prescribe a predetermined list of medications *(206)*. In parallel with this, a new national strategy on developing nursing and midwifery introduced organizational standards for the different roles and professional competencies of nurses and improved working conditions.

Since 2016, 10 287 nurses and 4799 midwives have completed training enabling them to prescribe. By December 2018, nurses and midwives had independently issued 2538 prescriptions and authorized the continuation of 363 288 previous prescriptions.

care, when adequately trained *(208, 209),* though data on cost-effectiveness are limited *(208–210)*. The number of masters in nursing programmes and nurse practitioners is growing in other countries as well *(159, 211–214),* though regulations affecting educational preparation and certification or licensing vary significantly *(192)*. Recognition of the definition of the advanced practice nurse role and the related competencies also differ widely by country *(192, 215), t*hough country experience suggests that advanced practice roles increase the attractiveness of nursing as a career *(211, 214).* A nurse prepared at the baccalaureate level with expertise in the care of defined patient populations may also be eligible for certification as a specialist, though not licensed as an advanced practice nurse (see Box 4.7 for an example of a specialist nursing role).

59. The geographical maldistribution of the health workforce between rural and urban areas is a universal challenge. Countries employ a variety of policy measures in multiple domains (education, regulatory, financial and professional) in attempts to equitably deploy and retain health workers in rural or remote areas *(217)* (see Box 4.8 on rural retention). Given that a multipronged approach is required to address this multifaceted problem, understanding the impact of various

Box 4.7 Example of a specialist nursing role in the African Region

A growing number of governments in eastern and southern Africa are investing in a specialist nurse role for children's health as part of strategies to reduce child mortality. A children's health specialist is a registered nurse who has undertaken post-basic training leading to an additional recognized qualification as a specialist paediatric or child health nurse.

The most common route is to specialize after completing basic training (an advanced diploma or baccalaureate degree in nursing) by undertaking a 12-month postgraduate diploma in paediatric nursing. The resulting title and credentials vary by country – typical formulations include registered nurse paediatric specialist, or professional nurse with paediatric specialization.

There are approximately 3650 registered children's nurses in the region, including approximately 750 in Kenya, Malawi, Uganda and Zambia, and 2900 in South Africa *(216)*. The 12 different educational programmes (the majority in South Africa) graduate around 205 children's nurse specialists annually. Three more programmes (Botswana, United Republic of Tanzania and Zimbabwe) are in development *(216)*.

Few country information systems in the region are currently set up to disaggregate by nurse specialism. The Children's Nursing Workforce Observatory supports national planning for an optimized skill mix that meets the special health needs of children in the region. Since 2015, researchers, nursing educators and other stakeholders have been collaborating to capture and report on the role of the children's nursing workforce in eastern and southern Africa.

interventions is key to scaling up and sharing such strategies in different practice settings and geographies *(144)*. In a country study, additional measures were found to be important for rural providers, most notably fairness, transparency, predictability of management of human resources for health by the Ministry of Health, and employment status (permanent versus contract) *(218)*. Studies in middle- and high-income countries found that organizational commitment, as well as intensive support from nurse managers, was linked with nurse retention in rural practice *(219, 220)*. Recruiting nursing students from hard-to-reach communities may result in better retention if they return to work in their community *(146, 221)*.

60. The retention of nurses in their practice settings can be challenging. Nurse turnover is an inevitable consequence of market forces that can have both positive and negative effects on health care organizations, patients, and the nurses themselves *(220, 222)*. For instance, modest turnover rates can be beneficial for professional competency development and organizational alignment, for example when nurses exit their roles to pursue career advancement within an organization or health system *(223)*. On the other hand, job resignations and turnover almost always involve organizational costs and can have negative impacts on patient care.

61. Both organizational and individual factors impact a nurse's intention to leave or stay in a given job. Individual factors include changes in personal or family life or health, educational goals, work stress, job dissatisfaction or, conversely, a sense of empowerment in decision-making *(224, 225)*. Organizational factors that affect retention include work environment, working relationships, working conditions, salary, managerial style and effective supervision *(226)*. In studies covering Australia, Egypt, Islamic Republic of Iran, Jordan and the Philippines, research found that leadership styles of clinical managers and organizational culture directly impact nurses' job satisfaction and turnover, and may affect quality of care, in both hospital settings *(227–229)* and rural settings *(219, 220)*.

Decent work

62. According to the ILO, decent work "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 and equality of opportunity and treatment for all women and men" *(230)*. Typical challenges to the decent work agenda in the context of the nursing profession include gender issues, risk of attacks, excessive working hours and unfair treatment of migrant nurses.

63. Female nurses, together with other women in the health workforce, face more barriers at work than their male colleagues *(21, 231)*. These include biased perceptions of women's roles in caregiving, social gender norms, gender bias and stereotyping, all of which undermine nurses' ability to obtain good working conditions, receive fair pay and equal treatment, participate in decision-making, and become leaders within health care *(21, 22, 122)*. A 2019 WHO report, *Delivered by women, led by men*,

found that there is often a greater burden of discrimination in jobs where women are in the majority: 36% of nurses in one context reported that they were not being respected by their seniors, while 32% of nurses said they would like to be heard or listened to *(21)*. These barriers undermine the well-being and livelihoods of female health workers, and constrain progress on gender equality *(21)*. Gender discrimination also has a direct impact on care, as institutional support and respect for nurses improves the quality of care *(232)*. Sexual harassment in the workplace is a problem faced by women across the health workforce, including nurses (25%) *(233)* and midwives (37%) *(21)*.

64. In some settings, nurses and health workers are at risk of attack. Between 1 January 2019 and 1 January 2020, WHO, through its Surveillance System for Attacks on Health Care, recorded 1005 attacks on health care, resulting in 198 deaths and 626 injuries of health care workers and patients in 11 countries facing complex emergencies *(234)*.

65. Health service delivery requires constant responsiveness to patients, which poses particular challenges in relation to long and irregular hours, with potential negative repercussions for the nurses themselves (including burnout) and for patients (including increased medical errors) *(235)*. The ILO Nursing Personnel Convention, 1977 (No. 149), commits signatories to ensuring that nurses enjoy working hours equivalent to other workers, and that overtime, inconvenient hours and shift work are regulated and compensated.

66. Migrant nurses are also at particular risk of not having decent working conditions. Migrant nurses and nurses from ethnic minorities are at higher risk of work-related injuries and discrimination than nurses from the destination country or from the ethnic majority *(236)*. Discrimination is reported as the leading cause of impaired health amongst migrant and minority nurses *(236)*. However, a lack of decent work at home may also be a push factor in encouraging nurses to migrate *(237–240)*.

Box 4.8 Rural retention guidelines

Attraction, recruitment and retention of nursing staff in rural and remote areas is a growing concern in many countries. In 2010, WHO produced the global policy recommendations on increasing access to health workers in remote and rural areas through improved retention *(217)*.[4]

The recommendations cover four main intervention areas: education, regulations, financial incentives, and personal and professional support. Although research specific to rural nursing is growing, it is still very limited. This evidence comes mostly from high-income countries (notably, Australia, Canada and the United States), but it suggests that financial incentives, personal and professional support, and accelerated health career pathways influence the retention of nurses in rural areas.

4 Note that these guidelines are currently being updated.

4.4 Regulation

67. Regulation serves to protect the public through setting and enforcing conduct, education and practice standards. It can also benefit providers and help advance quality in nursing education *(241, 242)* and practice across the public and private sectors. Regulatory bodies are also increasingly generating and maintaining health workforce data and evidence *(243)*: in the past 15 years there has been a marked increase in the generation of regulatory research evidence across several disciplines, with nursing being the most prolific *(244, 245)*.

68. Education regulation can include setting national standards for nursing education, approval of nursing education and training programmes by the nursing regulatory body, and accreditation of institutions by external agencies. Accreditation, whereby institutions are evaluated against the standards for the delivery of education, incentivizes institutions to produce graduates that can enhance quality, equity, relevance and effectiveness of health services for the population *(246)*. However, standards and accreditation cycles must keep pace with changes in health care science and delivery models and be affordable or cost neutral for institutions. Enforcement of standards is needed to remediate programme deficiencies or, as an extreme but sometimes necessary measure, discontinue programmes that cannot be brought up to acceptable standards. A 2013 study in 17 sub-Saharan African countries found that there was a strong legal mandate for nursing education accreditation; however, accreditation levels were low in the programmes that produced the majority of the nurses in the region and were higher in public programmes than private ones *(247)*. In some cases, the private sector has challenged accreditation findings on the basis that those making the decisions have a conflict of interest; as a result, governments are changing the composition of decision-making bodies to increase lay member participation *(248)*.

69. Within countries, accreditation can vary by type of programme *(249)*. In some countries, government agencies establish and oversee public universities, and only private institutions are required to be accredited; elsewhere, if there is no government mandate, private institutions may not have to be accredited at all. Accreditation can be mandated directly by law or indirectly by requiring that graduates applying for enrolment or registration with the council or sitting for licensure exams have graduated from a programme that was approved by the nursing council or accredited by an appropriate organization.

70. Most standards for nursing education specify the minimum number of clinical hours and minimum competencies to ensure the integrity and breadth of the programme content. The standards for nursing education are often specific to an individual jurisdiction (for example, a country, state, or other area where a particular set of laws or rules must be upheld), which can impact the mobility of nurse graduates. Mutual recognition agreements and harmonized education requirements are increasing standardization and the safe and efficient mobility of practitioners. Examples include the United States Nurse Licensure Compact *(250, 251),* the Caribbean Regional Examination for Nurse Registration *(252),* the European Union Professional Directive *(253, 254),* the

Association of Southeast Asian Nations agreement *(255),* and the Trans-Tasman agreement *(256).* Box 4.9 presents examples of harmonization of education standards and licensure examination.

71. With respect to the individual nurse, professional regulation involves (a) establishing the requirements for initial recognition for the title of "nurse" (that is, registered or registered and licensed), which could include a licensure examination; (b) the requirements for re-enrolment, registration or licensure, which could include a requirement for continued professional development; (c) setting the scope of practice for nurses and the code of conduct and ethics; and (d) facilitating the investigation of and potential disciplinary action against nurses *(259).* Regulatory bodies also increasingly have a mandate and responsibility to maintain an up-to-date registry of the active nursing workforce.

72. Over 60% of countries use a licensure examination to assess and enforce a minimum level of initial knowledge or "fitness for practice" of nursing graduates before credentialing them to enter practice *(29).* Another assessment method for initial fitness for practice is the objective structured clinical examination, which attempts to directly observe competence in a simulated clinical environment; however, this can be expensive and labour intensive to administer *(260–262).* There is debate about whether fitness for practice examinations should be used for re-licensure, for re-entry into the profession, or for foreign-trained nurses.

Box 4.9 Examples of harmonization of education standards and licensure examination

In 1972, the territories of the Caribbean Community created the Regional Nursing Body with the initial task of establishing a shared pool of qualified educators to alleviate bottlenecks in holding competency assessments for graduate nurses *(252).* When analyses indicated that nursing education curricula objectives, content and methods of teaching were similar throughout the subregion, countries agreed to a singular and shared examination for nurses, which began in 1990. The Regional Nursing Body coordinates the examination, which is based on mutually agreed competencies for a registered nurse to practise; governance is shared between the chief or principal nursing officers, nurse tutors, and nursing council of each country, as well as educators from the universities of the subregion *(257).* The examination allows for standardization and improvement of nursing education, as well as reciprocity and ease of movement for registered nurses among the countries of the subregion.

In the European Union, efforts to harmonize the diversity and complexity in nursing degree structures and curricular programmes started with the introduction of the sectoral directives in the late 1970s, and has accelerated with revisions in 2005 (Directive 36) and subsequent updates that introduced a standard set of competencies (Directive 55) *(253, 254).* These changes, coupled with the Bologna Agreement (1999), resulted in a three-cycle educational structure of bachelor's, master's and doctoral qualifications, with harmonized academic qualifications across all disciplines *(258).*

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CHAPTER 5

Current status of evidence and data on the nursing workforce

73. This chapter reports, for the first time in WHO history, data on the nursing workforce for over 190 countries based on a set of standardized indicators and one data reporting process, following the National Health Workforce Accounts (NHWA) approach.

74. Data were collected on the availability, composition, distribution, education and training, skills, management, regulation, financing, and leadership of the nursing workforce.[5] In total, data for over 30 indicators were collected and analysed. The data collection efforts included various stakeholders such as ministries of health, other ministries such as labour and education, human resources for health observatories, national public health institutes, nursing professional organizations, government chief nursing and midwifery officers, and other national, regional and international organizations. Data were collected through a single system for data definition and reporting, the NHWA platform, which serves as an online repository for Member States to report, monitor and use their human resources for health data. Detailed methods are presented in Annex 2.

75. The focus of the analysis was on the current nursing workforce, but the last part of this chapter considers future possible scenarios of the nursing workforce under different assumptions to assess progress towards the objectives outlined in the WHO Global Strategy on Human Resources for Health: Workforce 2030, and in relation to the 2030 Sustainable Development Goal (SDG) and universal health coverage agendas *(16)*.

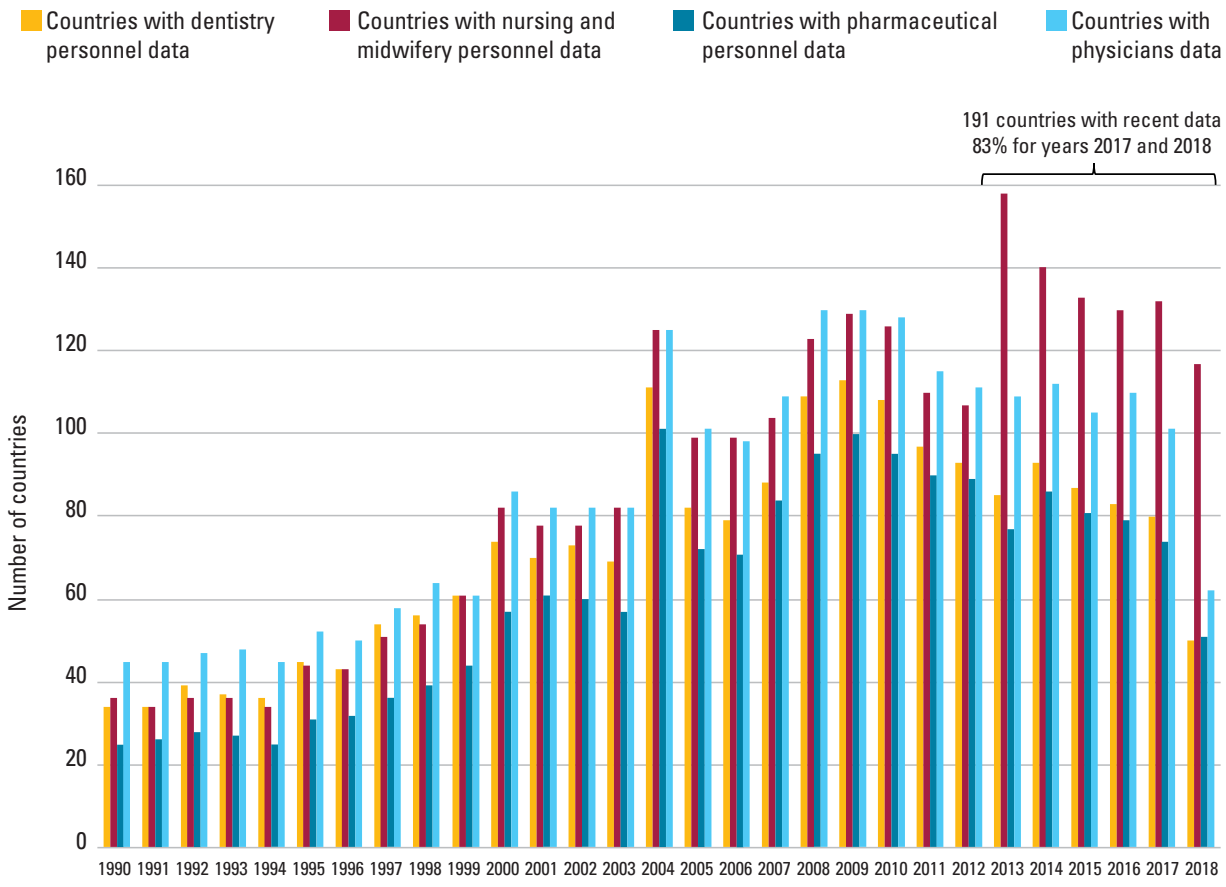
76. The number of countries reporting on nursing stock is unprecedented, representing the most comprehensive

5 Using the ILO definition of the nursing workforce: see Annex 1.

and updated data set on the nursing workforce ever compiled (Figure 5.1). The information on nursing has particularly increased for the period 2013–2018 as compared to other occupations thanks to the momentum created by designating 2020 the International Year of the Nurse and the Midwife. Data on the stock of the health workforce have increased in recent years, not only in quantity of information but also in the timeliness of reporting, with a majority of countries having reported data on the five occupations included in SDG indicator 3.c.1 (medical doctors, nursing and midwifery personnel, dentists, pharmacists) within the last five years. The availability of actual and retrospective data has enabled previous estimates to be updated retrospectively, and the data limitations of prior analyses and reports to be addressed.

77. Of 36 indicators on the nursing workforce used for this report (see Table A2.1 in Annex 2), almost all WHO Member States were able to report data on their nursing stock and the majority on other key indicators, such as age distribution, gender composition and duration of training. Around 80% of countries provided data for at least 15 indicators, and 23% of countries for at least 25 indicators. This chapter reports on selected indicators with a large response rate by Member States (the full list is available in Annex 2).

Figure 5.1 **Number of countries with workforce data available in the WHO NHWA (1990–2018)**



Notes: (a) Considering the last five years, nursing stock data were collected for 191 countries. The latest data point may refer to different years; most countries (83%) provided headcount data from 2017 or 2018. (b) The lag time in data availability and reporting explains the apparent downward trend in recent years; more data points are expected to become available for 2014–2018, maintaining a positive upward trend for nursing workforce stock data.

Source: NHWA 2019.

5.1 Nursing workforce availability, composition and distribution

5.1.1 Key findings

- Data from 191 countries indicate a global nursing stock of approximately 28 million in 2018, predominantly (69%) professional nurses.
- There was a 4.7 million actual increase globally in nursing stock between 2013 and 2018, even after accounting for better availability and quality of data.
- Professional and associate professional nurses represent approximately 59% of health professionals (medical doctors, nursing personnel, midwifery personnel, dentists, pharmacists) in 172 countries with available data.
- Nine out of 10 nurses globally are female, with important regional variations: in the African Region the female–male ratio is 3:1. Male nurses outnumber females in 13 countries.
- There are also large variations in distribution within regions. In the Region of the Americas, more than eight out of 10 nurses work in three countries (Brazil, Canada and the United States), which host 57% of the population. In the African and Eastern Mediterranean regions, the nurse density per population varies 100-fold across countries.
- One out of six of the world's nurses are expected to retire in the next 10 years; this percentage is substantially higher in the Region of the Americas (24%), posing a further replenishment challenge.

5.1.2 Global and regional stocks of nurses

78. Data for 191 countries indicate a global stock of almost 28 million nursing personnel, comprising both the public and private sectors (Table 5.1). This translates to a global density of 36.9 nurses per 10 000 population. However, this global figure masks deep variations within and across regions.[6]

79. While the Region of the Americas and the African Region have similar population numbers, there are almost 10 times more nurses in the Americas than in the African Region, with 83.4 and 8.7 nurses per 10 000 population, respectively. The Eastern Mediterranean and South-East Asia regions have the second and third lowest density (15.6 and 16.5 nurses per 10 000 population, respectively), but this is still almost double the density observed in the African Region.

80. Around 81% of the world's nurses work in three regions (Americas, Europe and Western Pacific), which collectively

6 See section 5.2 on equity.

account for 51% of the world's population.

81. A cautious interpretation is required in comparing this total estimate of 27.9 million nurses for 2018 with the estimation in the Global Strategy on Human Resources for Health, which had estimated 20.7 million nurses and midwives (of which 18.8 million were nurses) using 2013 data. Part of the increase in the number of nurses from 2013 to 2018 is due to improvement of data availability (accounting for 4.4 million nurses), while the actual increase is estimated at 4.7 million nurses (Table 5.2), of which 3.6 million were professional nurses, assuming a constant

Table 5.1 **Number of nurses globally and density per 10 000 population, by WHO region, 2018**

WHO REGION	Number of countries reporting headcount/total	Number of nursing personnel[a] in millions (%)	Density per 10,000 population
Africa	44/47	0.9 (3%)	8.7
Americas	35/35	8.4 (30%)	83.4
South-East Asia	11/11	3.3 (12%)	16.5
Europe	53/53	7.3 (26%)	79.3
Eastern Mediterranean	21/21	1.1 (4%)	15.6
Western Pacific	27/27	6.9 (25%)	36.0
Global	**191/194**	**27.9 (100%)**	**36.9**

[a] Includes nursing professionals and nursing associate professionals.

Note: stock data were not available for Cameroon, Comoros and South Sudan.

Source: NHWA 2019. Latest available density reported by countries between 2013 and 2018. For countries with a headcount reported between 2013 and 2017, to standardize all countries to year 2018, the headcount was reported by applying their latest available density to 2018 populations.

The population size for each country and year used to compute density values was extracted from the 2019 revision of the *World population prospects* of the United Nations, Department of Economic and Social Affairs *(263)*.

Table 5.2 **Changes in nursing stock due to better data and actual increase between 2013 and 2018**

	Nursing stock in 2013		Nursing stock in 2018		Change due to actual increase in stock (millions)
SOURCE	Number of countries with data for 2009–2013	Stock (millions)	Number of countries with data for 2013–2018	Stock (millions)	
Estimate of Global Strategy on Human Resources for Health, 2016	102	18.8[a]			
Estimate of *State of the world's nursing 2020*	174	23.2	191	27.9	**4.7**
Change due to improved data (millions)		**4.4**			

[a] The original publication includes midwives: 20.7 million nurses and midwives. This corresponds to 18.8 million nurses when corrected for share of nurses.

Source: NHWA 2019.

proportion of professionals to associate professionals (Figure 5.2).

82. The total stock of 27.9 million nurses reported for 2018 therefore highlights two separate positive trends:

- improved availability of nursing workforce data, which allow a better interpretation and reappraisal of prior analyses;
- an actual increase in the nursing workforce stock globally, reflecting growing labour market demand for and Member States' investment in this occupational group.

83. When comparing the stock of nursing personnel with the aggregate stock of medical doctors, midwifery personnel, dentists and pharmacists in the 172 countries with available data, nurses represent on average 59% of health professionals, ranging between 49% in the Eastern Mediterranean Region and 68% in the Western Pacific Region (Table 5.3).

84. Sixty-six countries were able to report recent health workforce stock for at least 10 occupations; when considering nurses compared to all of these possible health workers, the nursing stock represented a share of the health workforce ranging between 40% and 50%.

5.1.3 Composition

85. Of the world's 27.9 million nurses, 19.3 million (69%) are categorized as professional nurses (ISCO code 2221), and 6.0 million (22%) as associate professional nurses (ISCO code 3221). This leaves 2.6 million (9%) not classified either way, indicating possible challenges in alignment between national data systems and the ISCO system. These nurses are either nursing professionals or nursing associates, and this category does not include nursing aides or health care assistants. The relative proportions of the different nursing workforce categories vary substantially by region, as illustrated in Figure 5.2.

Table 5.3 Nurses as a percentage of health professionals (medical doctors, nurses, midwives, dentists and pharmacists), by WHO region

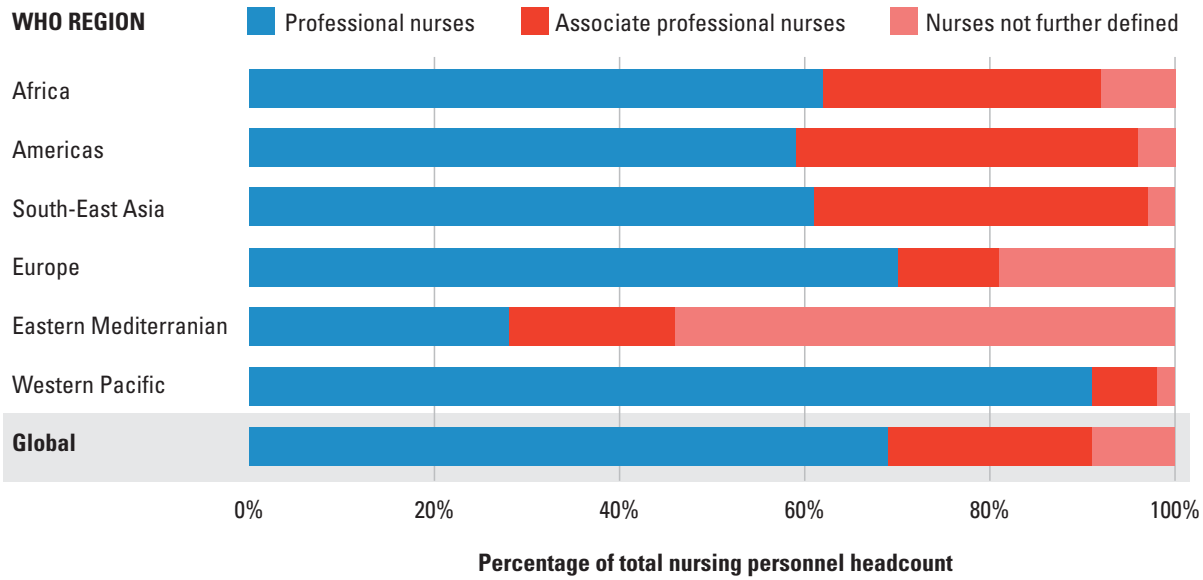
	Nurse stock[a] compared to the stock of SDG 3.c.1 health professionals	
WHO REGION	Number of countries reporting/ total	Average share of nurses
Africa	45/47	66%
Americas	24/35	56%
South-East Asia	11/11	53%
Europe	50/53	57%
Eastern Mediterranean	20/21	49%
Western Pacific	22/27	68%
Global	**172/194**	**59%**

[a] Includes nursing professionals and nursing associate professionals.

Note: SDG 3.c.1 is the indicator used to assess progress on SDG target 3.c.

Source: NHWA 2019.

Figure 5.2 **Proportion of nursing headcount within each occupation group, by WHO region**



5.1.4 Nursing demography: sex and age distribution

SEX DISTRIBUTION

86. Gender mainstreaming in health workforce strategies is needed to ensure that evidence-based gender-sensitive approaches are undertaken in health workforce planning and management. The sex composition and ageing dimensions of nursing have long been overlooked for various reasons, including the lack of quality data for national planning and regional and global comparison. Of 194 WHO Member States, 132 provided data disaggregated by sex, and 106 provided data on age. In these 132 countries, around nine nurses out of 10 (89%) are female, with significant regional disparities. The share of women in nursing is highest (95%) in the Western Pacific Region, and lowest (76%) in the African Region. Thirteen countries reported more male nurses than female (Table 5.4).

AGE DISTRIBUTION

87. Global patterns of population and workforce ageing make it necessary to factor in the age structure of the workforce in projections. In many countries, planners rely on a standard retirement age, but this approach has limitations, given differences in actual retirement age across occupations, sex and grade levels. Data on the age profile from 106 countries were used to illustrate the current trends in nursing demographics. Overall, available information indicates a relatively young nursing workforce: 38% of nurses are aged under 35 years,[7] compared with 17% who are aged 55 years or above (the latter group considered to be retiring over the next decade) (Figure 5.3). Regional variations are however important: in the Eastern Mediterranean Region there are 14 young nurses for every one approaching retirement; by contrast, in the Americas this ratio

7 Herewith called young nurses.

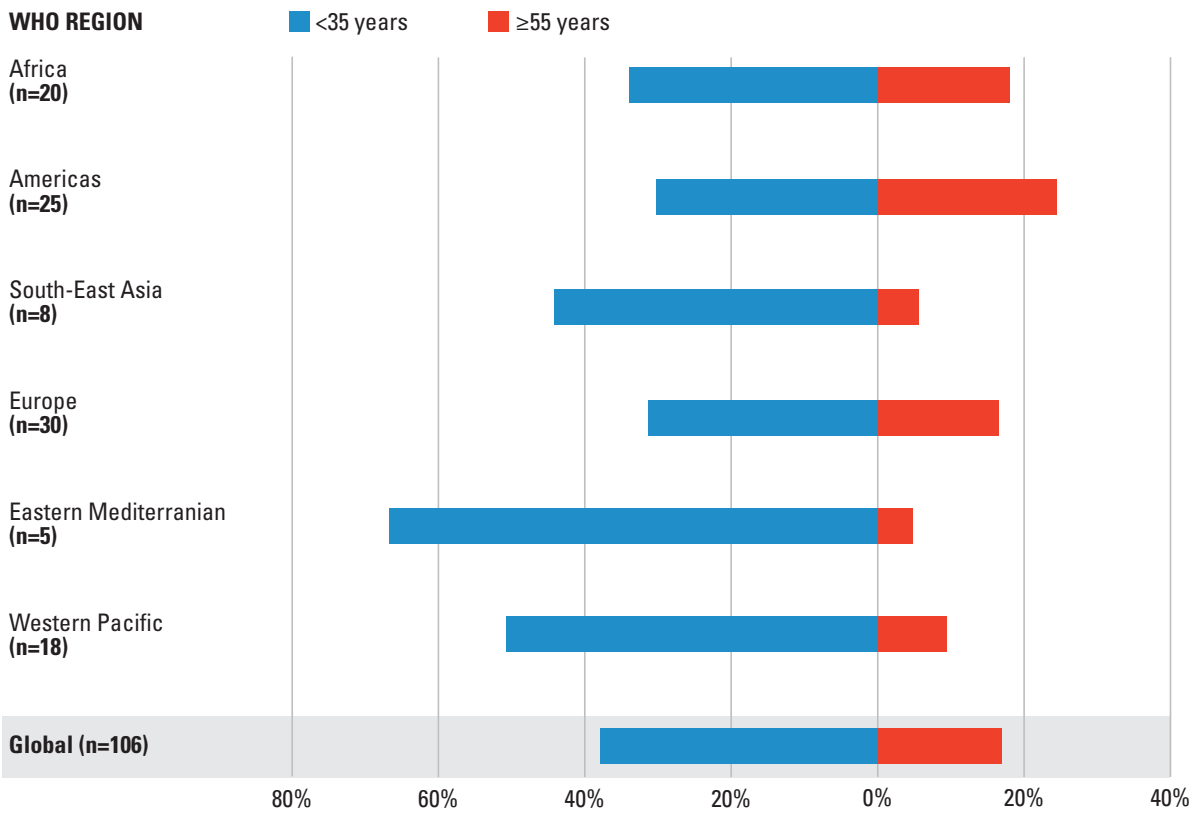
Table 5.4 **Percentage of female nursing personnel, by WHO region**

WHO REGION	Number of countries reporting/total	% female	% male
Africa	30/47	76%	24%
Americas	26/35	87%	13%
South-East Asia	9/11	89%	11%
Europe	32/53	89%	11%
Eastern Mediterranean	11/21	78%	22%
Western Pacific	24/27	95%	5%
Global	**132/194**	**89%**	**11%**

Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.

Source: NHWA 2019. Most recent available headcount reported by countries between 2013 and 2018.

Figure 5.3 **Percentage of nursing personnel aged below 35 years and 55 years or over, by WHO region**



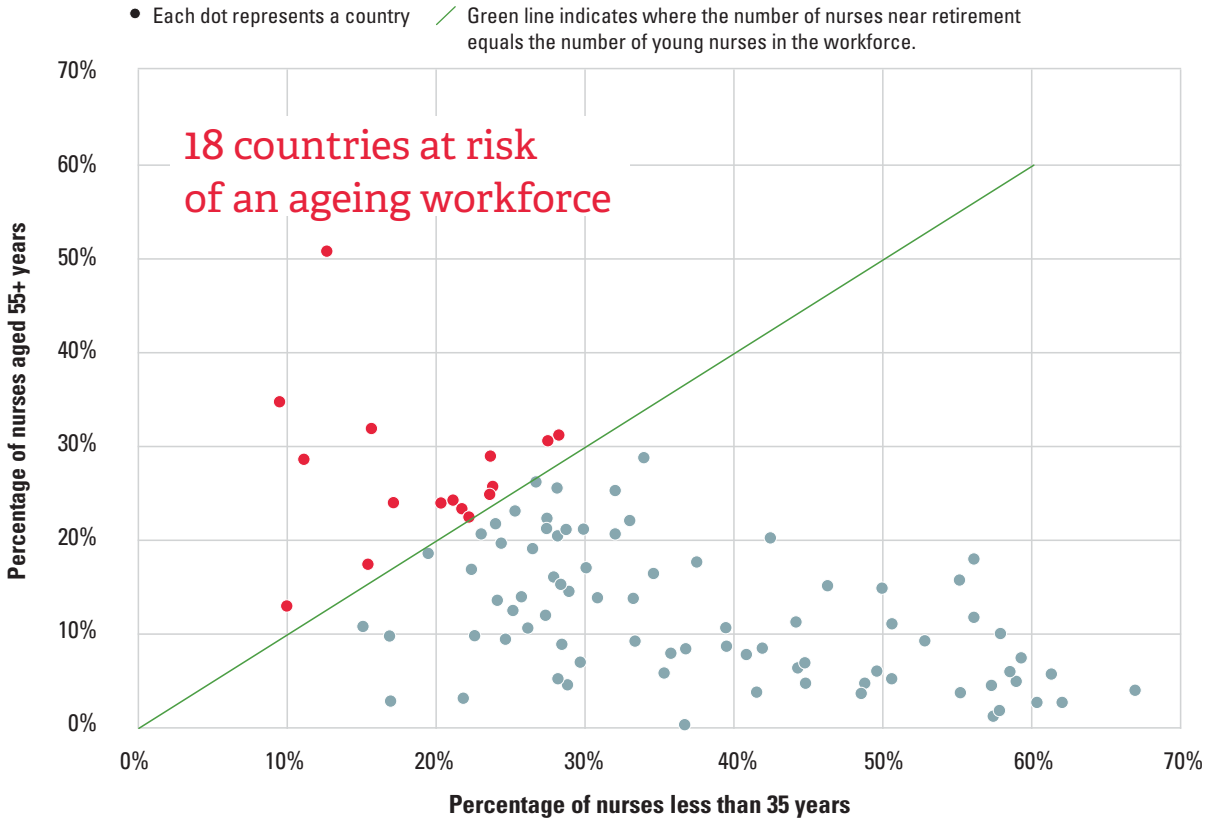
Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.

is 1.2:1, and in Europe and Africa it is 1.9:1, indicating a much smaller replacement pool.

88. As 17% of nurses globally are aged 55 years or over – and therefore expected to retire within the next 10 years – 4.7 million new nurses will have to be educated and employed over the next decade just to maintain the status quo. To keep pace with population growth and eliminate nursing workforce shortages, even more will be required (see section 5.8).

89. To illustrate the ageing of the nursing workforce, the ratio of the younger to the older nursing workforce is reported in Figure 5.4. While several countries have a high proportion of young nurses, several are barely at equilibrium (similar proportions of nurses aged less than 35 years and over 55 years, as indicated by the green line in Figure 5.4), and 18 countries (one in six of those with available data) face a particularly challenging situation, having an ageing workforce with fewer young nurses than nurses approaching retirement.

Figure 5.4 **Relative proportions of nurses aged over 55 years and below 35 years**



Note: "Nursing workforce" includes nursing professionals and nursing associate professionals from 106 countries with data disaggregated by age.
Source: NHWA 2019. Most recent available headcount reported by countries between 2013 and 2018.

5.2 Equity in availability of and access to the nursing workforce

5.2.1 Key findings

- Around 81% of the world's nurses are found in the American, European and Western Pacific regions, which account for 51% of the world's population.
- Individual countries experiencing low densities of nurses are mostly in the African, South-East Asia and Eastern Mediterranean regions, and parts of Latin America.
- Global inequalities in availability of nursing personnel are largely income driven, with a density of 9.1 nurses per 10 000 population in low-income countries compared to 107.7 per 10 000 population in high-income economies.
- There are significant disparities within countries: in 35 countries with data disaggregated by urban–rural area, 36% of nurses are deployed in rural areas, where 49% of the population lives. In 76 countries with available data, 75% of nurses are employed in the public sector, with the remaining 25% in the private sector.

90. The path to universal health coverage requires addressing demographic, geographical and skills disparities in availability of and access to the health workforce.

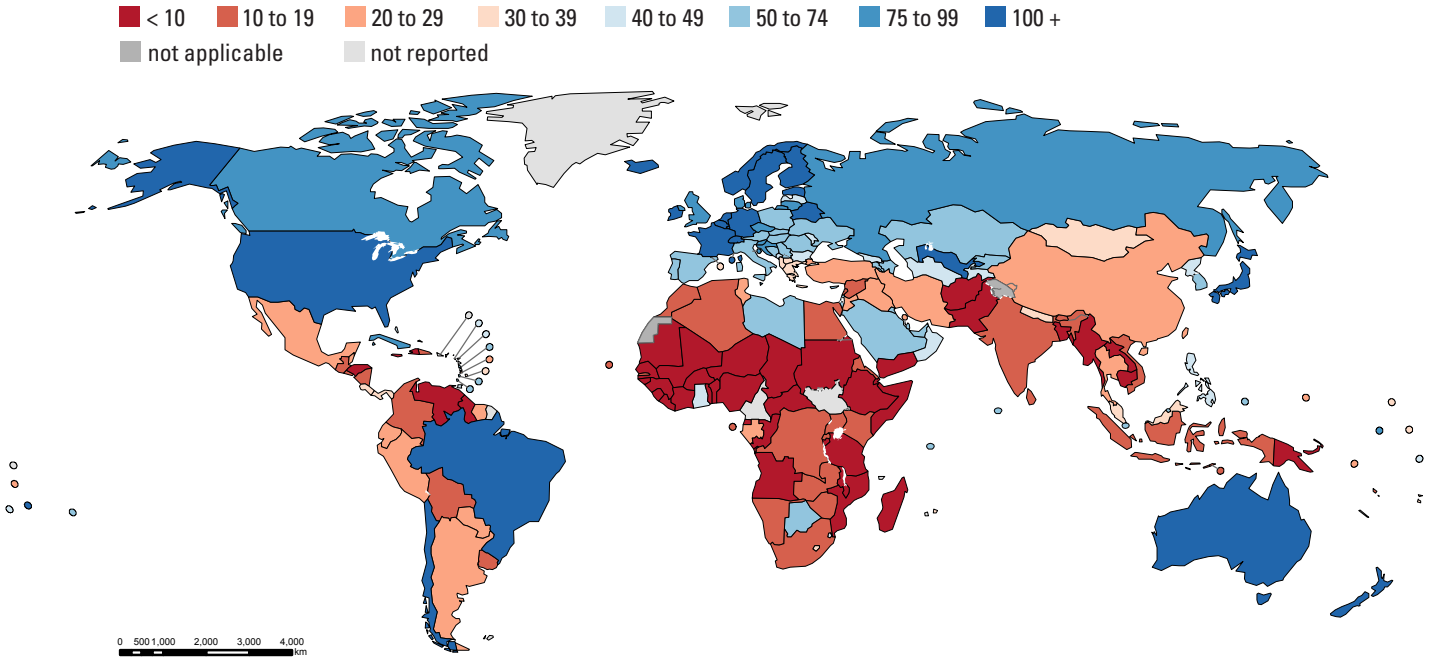
5.2.2 Equity across regions

91. Figure 5.5 shows the global variation in nursing personnel density per 10 000 population, with the greatest gaps concentrated in the African, South-East Asia and Eastern Mediterranean regions and some countries in Latin America.

5.2.3 Equity in nursing availability within regions

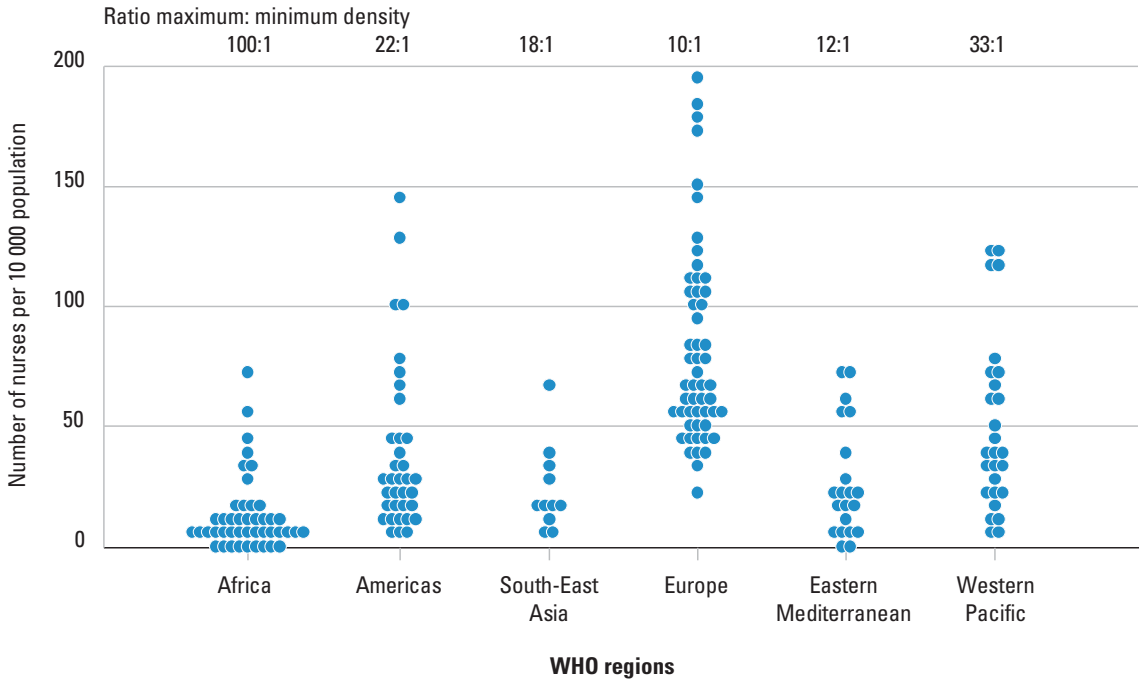
92. Figure 5.6 illustrates the variation in nurse density within regions: each dot represents a country. All regions show significant variation in nursing density, but the disparity is greatest in the Eastern Mediterranean Region, with a ratio of highest to lowest density of 121 to 1, and in the African Region, with a ratio of 100 to 1. Also, in the Region of the Americas a few large countries have high densities of nursing personnel while most of the other countries have relatively low densities: 87% of the nurses in this region are located in Brazil, Canada and the United States, which account for around 57% of the population. Lower density disparities – 10 to 1 – are observed in the European Region. Countries in the African Region are clustered at the lower end of the column, indicating that only a few African countries have a density of over 25 nurses per 10 000 population. Similar patterns are observed in the South-East Asia and Eastern Mediterranean regions. The density variance is largely driven by income levels, with a density of 9.1 nurses per 10 000 population

Figure 5.5 **Density of nursing personnel per 10 000 population in 2018**



Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.
Source: NHWA 2019. Latest available data over the period 2013–2018.

Figure 5.6 **Regional disparities in density of nursing personnel per 10 000 population (2018)**



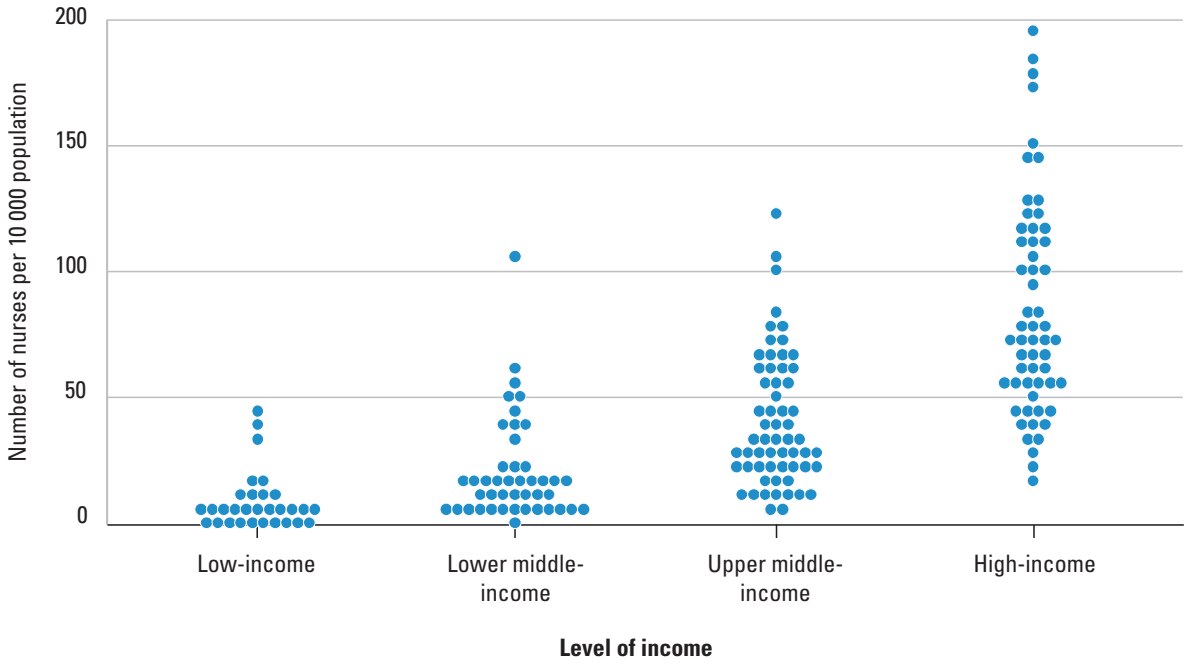
Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.
Source: NHWA 2019. Latest available headcount reported by countries between 2013 and 2018.

in low-income countries versus 107.7 per 10 000 population in high-income countries (Table 5.5 and Figure 5.7).

93. When considering the 46 countries classified as least developed by the United Nations Committee for Development Policy as of December 2018, the density of nursing personnel is 6.4 per 10 000, which is six times less than the average for all other countries, and substantially lower than the average for low-income countries. The great majority of these countries are also considered as vulnerable ("high warning" or "alert" categories) according to the Fragile States Index.[8] Box 5.1 presents further information on equity within countries.

8 Countries with a Fragile States Index score of 80+. Source: https://fragilestatesindex.org/.

Figure 5.7 **Density of nursing personnel per 10 000 population by income group (2018)**



Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.
Source: NHWA 2019. Latest available headcount reported by countries between 2013 and 2018. Income grouping is from the World Bank classification as of 2018.

Table 5.5 **Density of nursing personnel per income group (2018)**

INCOME GROUP	Number of countries reporting/total	Density per 10 000 population			Ratio highest to lowest
		Overall	Low	High	
Low-income	30/31	9.1	0.6	42.0	68:1
Lower middle-income	44/46	16.7	1.8	104.6	57:1
Upper middle-income	60/60	35.6	5.0	124.2	25:1
High-income	57/57	107.7	19.4	196.1	10:1
Global	**191/194**	**36.9**	**0.6**	**196.1**	**319:1**

Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.

Source: NHWA 2019. Most recent available headcount reported by countries between 2013 and 2018.

For Cook Islands and Niue, income group classifications were not available. They were therefore classified as upper middle-income, similarly to other countries in the same area. Income grouping is from the World Bank classification as of 2018.

Box 5.1 Equity within countries

Nursing availability in rural areas

The distribution of the nursing workforce within countries is equally important in relation to equity of access. A total of 35 countries (mostly in Latin America and Africa)[9] provided data on the proportion of the nursing workforce in rural areas. On average, in these countries, some 36% of nurses work in rural areas, compared to 50% of the population residing there.

Nursing availability in public and private sectors

Within countries, another potential source of inequity is distribution by public versus private sector. In 76 countries providing data, an average of 75% of nurses worked in the public sector, with relatively low variability among regions.

9 Antigua and Barbuda, Belize, Brazil, Brunei Darussalam, Cambodia, Ecuador, Egypt, El Salvador, Eswatini, Gambia, Ghana, Guinea-Bissau, Guyana, Honduras, Iceland, Kenya, Lao People's Democratic Republic, Madagascar, Marshall Islands, Mongolia, Myanmar, Pakistan, Paraguay, Peru, Samoa, Serbia, Sierra Leone, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Uganda, United Republic of Tanzania, Uruguay, Venezuela (Bolivarian Republic of).

5.3 International nurse migration and mobility

5.3.1 Key findings

- Based on data from 86 countries, one nurse out of eight (13%) was born or trained in a country other than the one in which they currently practise.
- Among the responding countries, there was significant reliance on foreign-born nurses in high-income countries, where 15.2% of nurses were reported to be foreign born or foreign trained.
- Despite improvement in availability, data on migration and mobility are still insufficient to enable a comprehensive assessment of the complexity of migration patterns.

5.3.2 Challenges in quantifying international nurse mobility

94. Demographic, epidemiological, financial and health policy trends have driven an acceleration in the international mobility of health workers in recent decades, and this mobility is expected to increase *(18)*. The WHO Global Code of Practice on the International Recruitment of Health Personnel, adopted by the World Health Assembly in 2010, is a key international legal instrument to strengthen ethical management of international health worker mobility.

95. The movement of health workers from lower-income to higher-income countries, as well as associated challenges, has long been recognized and debated. Data to inform policy decisions have however been largely limited to select high-income countries. Recent improvements in data availability, particularly through the system of NHWA, suggest a less clear-cut distinction between origin (in the global South) and destination (in the global North) countries than previously thought.

96. As of 2018, a total of 86 countries had provided data on the proportion of nurses who are foreign born or foreign trained as a proxy indicator of the magnitude of the migratory phenomenon (Table 5.6) through the NHWA and the OECD, Eurostat and WHO Regional Office for Europe reporting systems. Among countries reporting, one in every eight nurses (13%) was born or trained in a country other than the one in which they currently practise. Applying this share to the stock of nursing personnel gives an estimated 3.7 million nurses foreign born or trained globally. Foreign-born or foreign-trained nursing personnel are mainly found in high-income countries, with a share of 15.2%, compared to a share of less than 2% in countries of other income groups.

Table 5.6 **Percentage of nursing personnel foreign born (or foreign trained) per income group**

INCOME GROUP	Number of countries reporting/total	% of nurses foreign born or trained
Low-income	3/31	NR
Lower middle-income	18/46	0.4%
Upper middle-income	27/60	0.7%
High-income	38/57	15.2%
Total	**86/194**	**13.2%**

Note: "Nursing personnel" includes nursing professionals and nursing associate professionals. "Foreign trained" was used as a proxy for 30 countries that could not provide data on the percentage who were foreign born.

Source: NHWA 2019. Latest available stock reported by countries between 2013 and 2018. Income grouping is from the World Bank classification as of 2018.

NR = not reported because of the small number of countries.

5.4 Regulation of nursing education and practice

5.4.1 Key findings

- Nearly all countries reported on indicators for regulation of nursing education, and more than 50% of countries responded positively to each of the nine related indicators.
- The existence of regulatory mechanisms and processes was reported as high in the African, American and European regions.
- There is more attention to regulation of the contents of education (such as standards for duration and content or education institution accreditation mechanisms) than to education leadership and governance.
- Nursing education systems appear more regulated in the European Region and less regulated in the South-East Asia, Eastern Mediterranean and Western Pacific regions, particularly in relation to fitness for practice examination and standards for faculty qualification.

5.4.2 Analysis of results

97. The Global Strategy on Human Resources for Health: Workforce 2030 includes a milestone for the year 2020 stating that countries should have regulation and accreditation mechanisms for health workforce education. This section provides a synthesis of nine self-reported indicators relating to regulation of nursing education and training (Figure 5.8).

98. The vast majority of countries reported having standards for the duration and content of nursing education, accreditation mechanisms for education institutions and a master list of accredited education institutions (91%, 89% and 81% of responding countries, respectively). Of responding countries, 77% reported having standards for faculty qualifications and 73% reported having continuing professional development systems. About two thirds of responding countries had standards for interprofessional education, fitness for practice examinations and a national association for pre-licensure students (67%, 64% and 62%, respectively). Of 95 countries responding, 53% reported having advanced practice nursing roles. The existence of these regulatory processes or systems does not necessarily mean, however, that they function adequately.

99. Table 5.7 presents data on the existence of regulatory mechanisms and systems on education and training in the different WHO regions. Countries in the African, American and European regions more frequently reported existence of regulations on education than did countries in other regions. In

Figure 5.8 **Percentage of responding countries indicating existence of nursing regulations and standards**

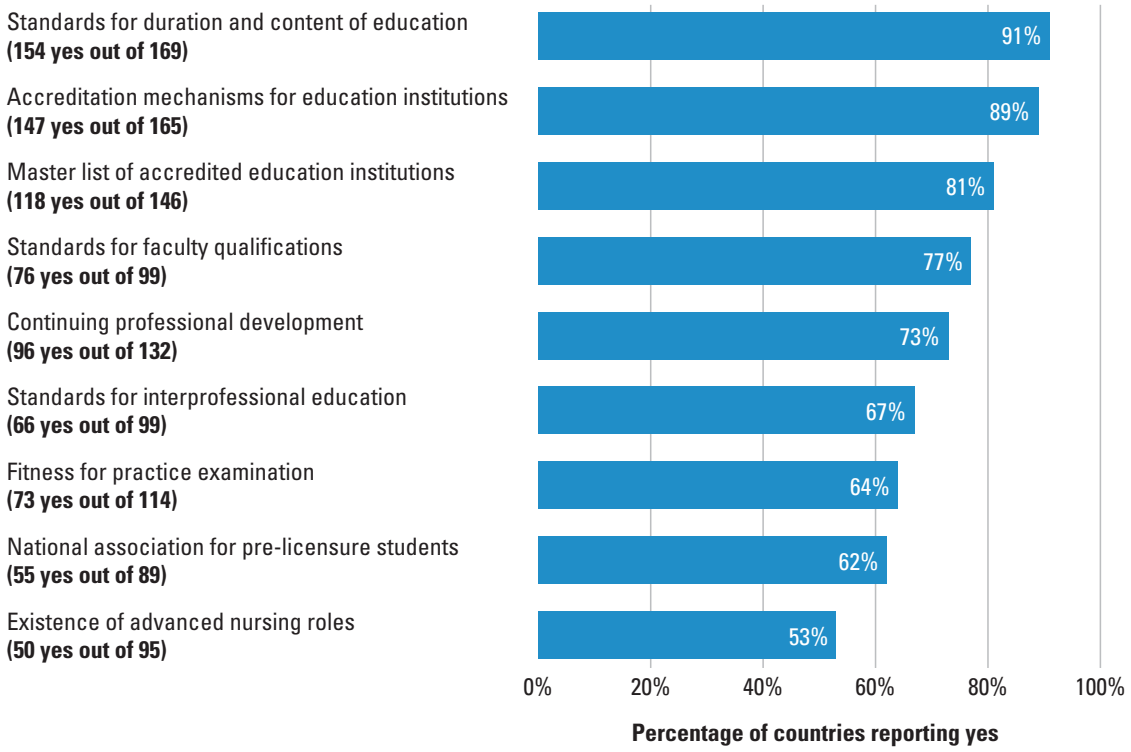


Table 5.7 **Percentage of responding countries reporting existence of nursing regulations on education and training, by WHO region**

WHO REGION	Master list of accredited education institutions	Standards for duration and content of education	Accreditation mechanisms for education institutions	Standards for interpro-fessional education	Continuing professional development	Existence of advanced nursing roles	Fitness for practice examination	Standards for faculty qualifications	National association for pre-licensure students
Africa	91%	100%	90%	81%	68%	74%	68%	78%	66%
Americas	77%	91%	94%	49%	71%	55%	57%	75%	91%
South-East Asia	69%	85%	78%	60%	61%	75%	72%	64%	38%
Europe	85%	94%	98%	87%	91%	30%	64%	94%	67%
Eastern Mediterranean	80%	80%	70%	20%	50%	50%	70%	80%	30%
Western Pacific	70%	77%	78%	52%	63%	52%	56%	71%	35%
Global	**81%**	**91%**	**89%**	**67%**	**73%**	**53%**	**64%**	**77%**	**62%**

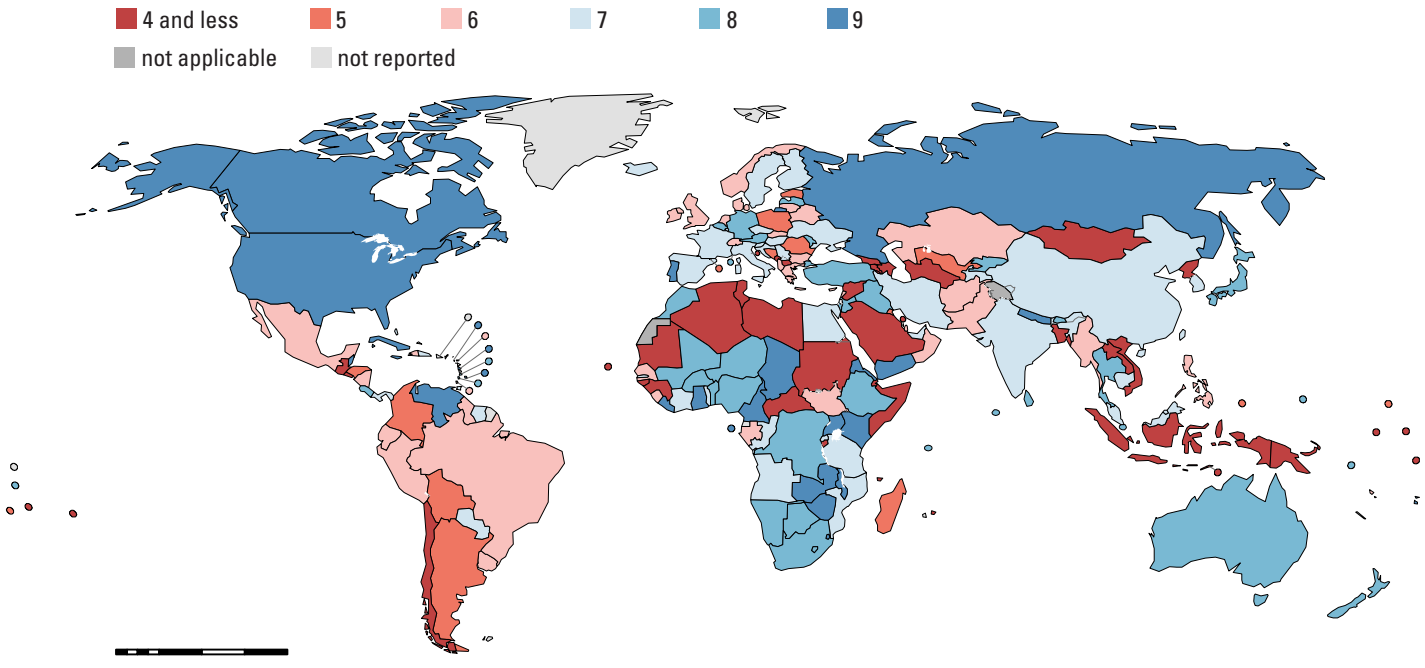
Source: NHWA 2019, and *State of the world's nursing 2020* specific indicators for the last three factors. Latest available data reported by countries between 2013 and 2018.

the Eastern Mediterranean Region, countries reported greater availability of fitness for practice examinations and the existence of advanced nursing roles. Fewer countries in the South-East Asia Region reported existence of continuing professional development systems, national associations for pre-licensure students or standards for interprofessional education than did countries in other regions. These regional variations may to some extent reflect different interpretations of these indicators.

100. Data for the nine indicators were used to derive a composite "regulation of education and practice" score for each country (see Annex 2). Each indicator could be scored from 0 (absence) to 1 (presence), with a value of 0.5 for partial; missing answers were considered as 0. These scores were then summed up to a maximum of 9. Because the analysis implicitly considers that a missing answer for an indicator gives a score of 0, a sensitivity analysis was conducted to explore the implications of classifying the missing values differently, and this did not change the interpretation of the results. Figure 5.9 reinforces the finding that the reported existence of regulatory mechanisms examined in this report points towards a relatively stronger education regulatory environment in North America, western Europe and sub-Saharan Africa.

5.5 Education and nursing workforce supply

Figure 5.9 **Map of nursing education regulation scores, by country**



Note: Combining education capacity questions, raw score from 0 to 9.
Source: NHWA 2019.

5.5.1 Key findings

- A total of 88 countries, mostly from South-East Asia and Europe, reported data on the number of nursing workforce graduates per year.
- Regions with the lowest density of nurses (African, Eastern Mediterranean and South-East Asia regions) also had the lowest graduation rates (7.7, 7.1 and 12.2 per 100 000 population, respectively).
- Relative to their population, the Region of the Americas had 10 times more graduates than the African and Eastern Mediterranean regions.
- Among countries reporting data, the average duration of nursing professional education in the African and Western Pacific regions was two to three years for approximately 75% of countries, while it was four to five years for over half of the countries in the American, South-East Asia and Eastern Mediterranean regions.

5.5.2 Education pipeline

101. Significant investment in education and training is required to match current and anticipated needs of health systems and meet national and subnational needs.

102. To assess the adequacy of the education pipeline, countries were asked to provide the number of nursing graduates in the most recent available year. In total, 88 countries, of which almost half (41) were in Europe, reported on this indicator. The "total" figures in Table 5.8 should therefore be interpreted with the utmost caution, as they are skewed by the data from South-East Asia and Europe, and are not representative of the situation in other regions.

103. Similar to the association with nursing density, the level of income was a factor associated with an increased number of graduates per 100 000 population.

104. A simulation based on the available data and applying to the world population the overall density of 22.6 graduates per 100 000 population would yield an estimate of 1.72 million nursing graduates per year. This analysis should be viewed as a pure illustration, as stemming from a small number of countries per region, with the exception of the European Region. However, the data, while limited in coverage, did not show a wide variation in the ratio of graduates to nursing stock. In addition, these results estimated on stock were compared to the share of the age group aged under 35 years, that is, roughly the workforce starting employment within the previous 10 years. Using one tenth of this younger category as a proxy to stock entering the market annually, this would correspond to a stock of 1.06 million to be compared with the present estimation of 1.7 million graduates. As not all workers are employed, the order of magnitude seems plausible.

Table 5.8 **Production of graduate nurses, by WHO region and income group**

BY WHO REGION	Number of countries reporting/total	Mean number of nursing graduates per 100 active nurses			Number of graduates per 100 000 population
		Overall	Low	High	
Africa	14/47	8.8	2.8	23.7	7.7
Americas	14/35	9.8	0.8	30.8	81.2
South-East Asia	8/11	7.5	3.9	13.8	12.2
Europe	41/53	4.0	1.0	31.9	31.9
Eastern Mediterranean	5/21	4.6	0.6	16.5	7.1
Western Pacific	6/27	5.7	3.4	12.0	20.6
BY INCOME GROUP					
Low-income	8/31	13.8	4.1	31.9	10.4
Lower middle-income	15/46	7.7	2.8	13.8	12.8
Upper middle-income	26/60	6.4	0.6	30.8	22.7
High-income	40/57	3.6	1.5	7.6	38.7
Total	**88/194**	**6.2**	**0.6**	**31.9**	**22.6**

Source: NHWA 2019. Income grouping is from the World Bank classification as of 2018.

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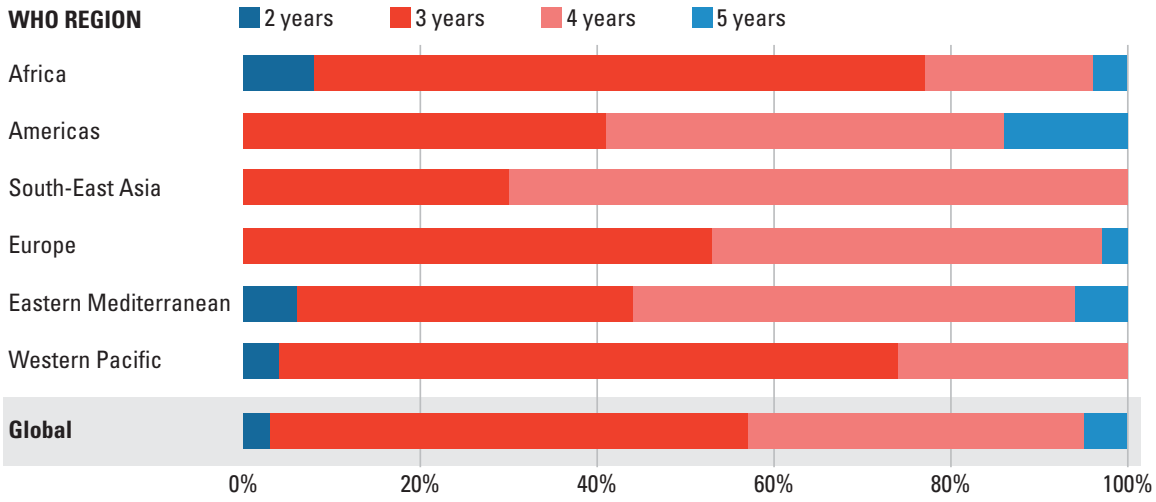
5.5.3 *Duration of pre-service education*

105. Data on the duration of nursing pre-service education programmes were obtained for 157 countries from various sources. A few countries, mainly in the African, Eastern Mediterranean and Western Pacific regions, have two-year programmes, while the majority of countries in all regions have three- or four-year programmes; five-year programmes are rare across regions (Figure 5.10). In the African and Western Pacific regions about three quarters of countries have three-year programmes, and in the South-East Asia Region almost three quarters of countries have four-year programmes.

106. In an era of expanding nursing scopes of practice, nursing education beyond pre-service is important to consider, as well as variable entries via direct entry pathways (with defined prerequisites). Reporting pre-service education programme length is affected by these inherent limitations, constraining the ability of the data presented to describe the rich variety of nurse education globally, particularly for advanced practice roles.

5.6 Regulation of employment and working conditions

Figure 5.10 **Average duration (years) of education for nursing professionals, by WHO region**



Source: NHWA 2019 for 99 countries and Sigma database for 58 countries. Latest available data reported by countries between 2013 and 2018.

5.6.1 Key findings

- The African, American, European and Eastern Mediterranean regions reported high levels of existence of regulatory mechanisms relating to working conditions for nurses.
- Some countries, mostly in the South-East Asia and Western Pacific regions, but also in the African Region and South America, reported lower levels of these regulations.
- Just over a third of countries (37%) reported having in place measures to prevent attacks on health workers, mostly in the South-East Asia and Eastern Mediterranean regions.
- The existence of an advanced nursing role (reported by 53% of the 95 responding countries) is more frequent in countries with a low density of medical doctors, suggesting that more professional autonomy for nurses might be a policy response to mitigate the shortages of medical doctors.

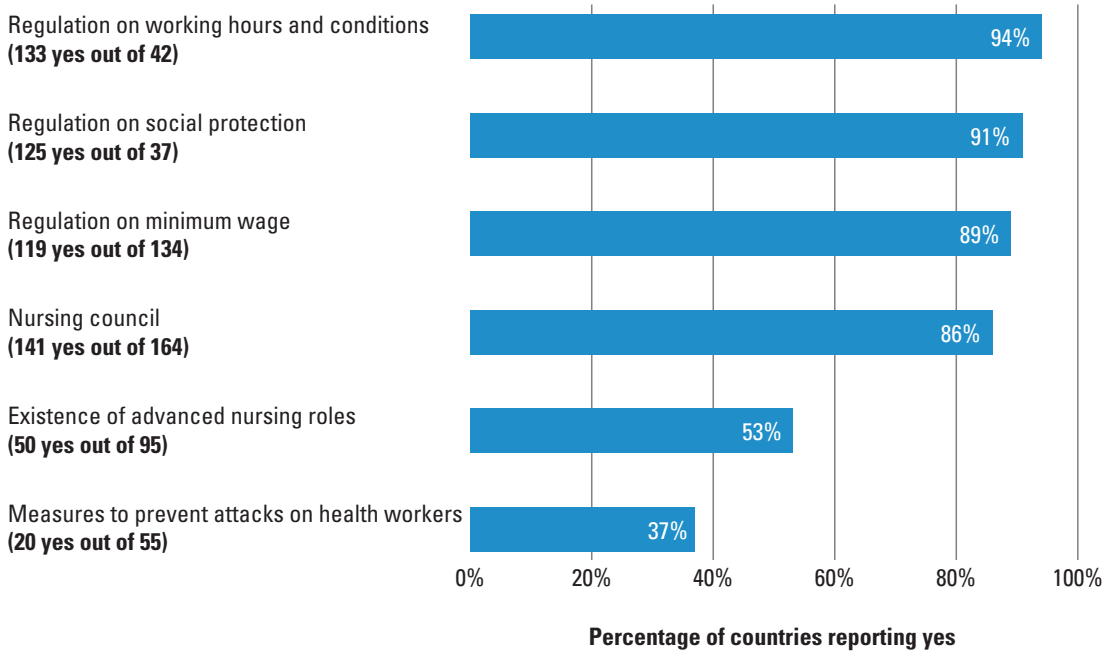
5.6.2 Analysis of results

107. Employment characteristics and working conditions are major drivers of attractiveness of employment, performance and productivity, and retention of the health workforce. The Global Strategy on Human Resources for Health: Workforce 2030 calls for upholding "the personal, employment and professional rights of all health workers, including safe and decent working environments and freedom from all kinds of discrimination, coercion and violence". To assess this dimension, six indicators related to regulation of employment characteristics and working conditions were examined (Figure 5.11). It should be noted that three indicators (regulation on working hours and conditions, nursing council, existence of advanced nursing roles) are specific to nursing: the rest apply to the health workforce as a whole, including nurses.

108. Of the responding countries, more than 80% reported having regulation on working hours and conditions, social protection and minimum wage, and having a nursing council or equivalent, but fewer responding countries (53%) had advanced nursing roles. A total of 55 countries responded to the indicator on the existence of measures to prevent attacks on health workers, of which just over a third (37%) said that such measures were in place.

109. Table 5.9 indicates that countries in the Eastern Mediterranean Region reported higher levels of employment regulations for nurses examined for this report: over 70% of countries responded positively to all six indicators. The South-East Asia and Eastern Mediterranean regions were the only two regions in which the majority of countries reported having measures in place to prevent attacks

Figure 5.11 **Percentage of countries with regulatory provisions on working conditions**



Source: NHWA 2019.

Table 5.9 **Percentage of countries responding on existence of nursing regulations on working conditions, by WHO region**

WHO REGION	Regulation on working hours and conditions	Regulation on minimum wage	Regulation on social protection	Measures to prevent attacks on health workers	Existence of advanced nursing roles	Nursing council
Africa	90%	90%	85%	41%	74%	78%
Americas	97%	85%	94%	37%	55%	91%
South-East Asia	75%	50%	50%	67%	50%	80%
Europe	98%	92%	100%	26%	30%	96%
Eastern Mediterranean	85%	100%	92%	73%	75%	85%
Western Pacific	100%	86%	57%	30%	52%	78%
Global	**94%**	**89%**	**91%**	**37%**	**53%**	**86%**

Source: NHWA 2019, and *State of the world's nursing 2020* specific indicators for the last factor. Latest available data reported by countries between 2013 and 2018.

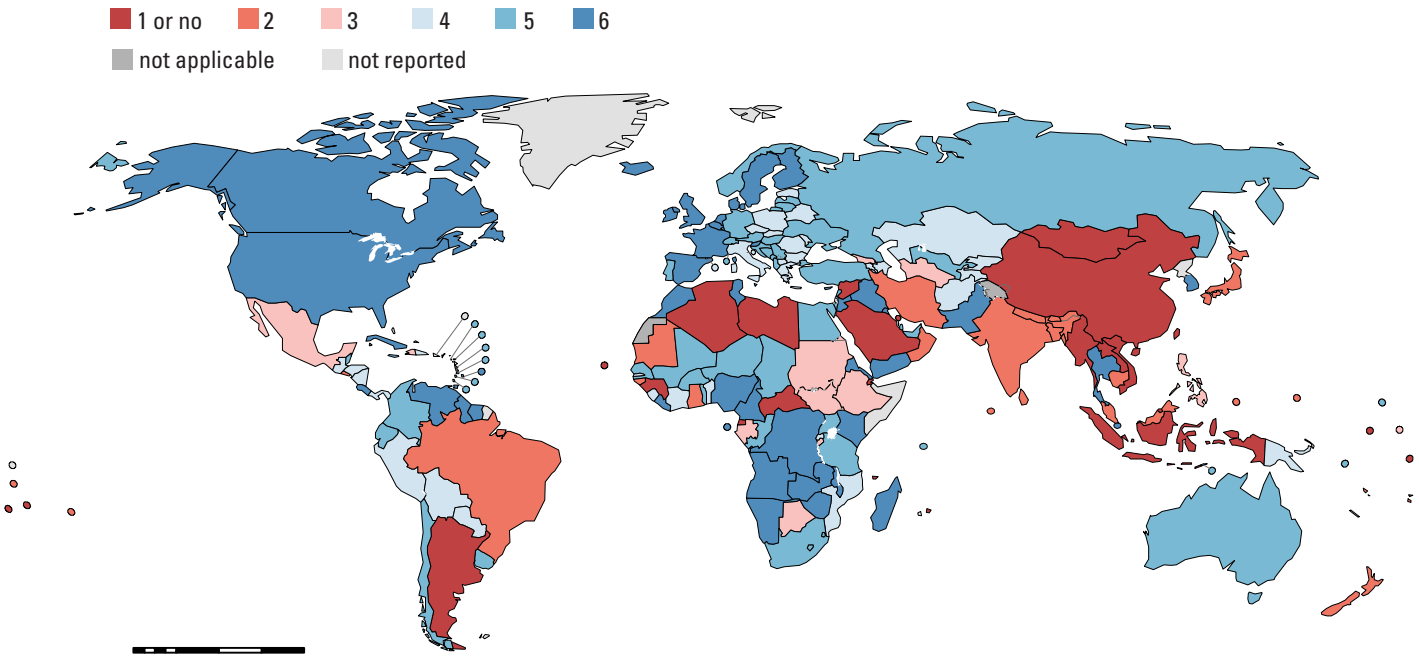
on health workers, probably reflecting the relatively high incidence of such attacks in these regions.[10] The African, American and European regions also reported positively on most indicators tracked; only 30% of responding European countries, however, reported having advanced nursing roles and 26% reported having measures in place to prevent attacks on health workers.

110. High proportions of countries in the Western Pacific Region reported having regulation on working hours and conditions and a minimum wage, and a nursing council or equivalent. However, they reported lower levels of existence of the other three regulation mechanisms. The South-East Asia Region reported the lowest rate of positive responses to indicators assessing the regulatory environment, although half of the countries in this region responded positively to each of the six indicators. As noted in section 5.4, these regional variations may to some extent reflect different perceptions of the meaning of these indicators, as well as the different reporting rates across regions. The data collected do not provide information on the adequacy of regulations or the level of implementation of the relevant provisions.

111. Data for the six indicators were used to derive a composite "regulation of working conditions" score for each country using a similar methodology to that used in section 5.4, and with methods described in Annex 2. Figure 5.12 reinforces the finding that, as for the education system analysed in section 5.4, the regulatory environment was reported to be relatively stronger in

10 Surveillance System for Attacks on Health Care: https://publicspace.who.int/sites/ssa/SitePages/PublicDashboard.aspx.

Figure 5.12 **Map of regulation of working conditions score**

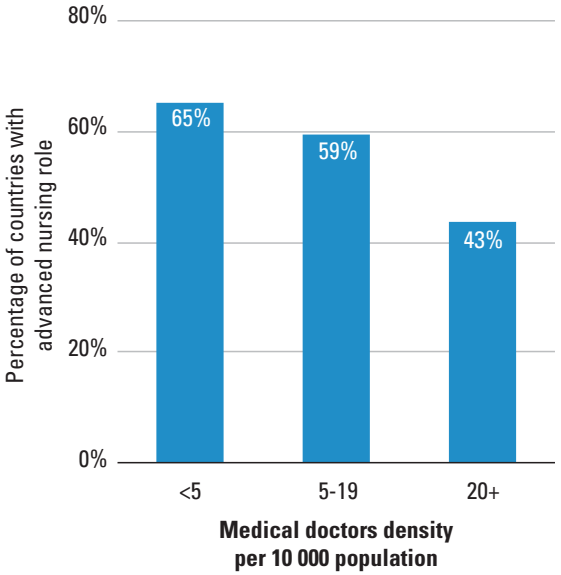


Note: Combining working condition capacity questions, raw score from 0 to 6.
Source: NHWA 2019.

North America, sub-Saharan Africa, and the European Region.

112. Advanced nursing roles were found to be more frequent in countries with lower density of medical doctors, as shown in Figure 5.13.

Figure 5.13 **Percentage of countries with advanced nursing role by level of density of medical doctors per 10 000 population**



Source: NHWA 2019.

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5.7 Governance and leadership

5.7.1 Key findings

- Of the 115 and 76 responding countries, respectively, 71% reported having a government chief nursing or midwifery officer position and 53% a nursing leadership development programme.

- Both the presence of a government chief nursing officer (GCNO) position and the existence of a nursing leadership programme are associated with a stronger regulatory environment for nursing.

- Neither GCNO positions nor leadership programmes are however associated with increased rates of production of nurses.

5.7.2 Analysis of results

113. The future development of the nursing profession requires strong nursing leadership and governance *(264, 265).* Two *State of the world's nursing 2020* indicators were used to assess the state of nursing leadership and governance: the existence of a GCNO position within the national government, and the existence of nationally supported programmes to develop nursing leadership, research or policy literacy skills (115 and 76 countries responded, respectively).

114. Of the 115 responding countries, 71% reported having a GCNO position, ranging from 54% in the Eastern Mediterranean Region to 86% in the European Region (Table 5.10). Fewer countries (53% of the 76 responding countries) reported having a nursing leadership development programme, ranging from 40% in the South-East Asia Region to 64% in the African Region.

115. There are significant correlations between a strong reported regulatory environment and the reported nursing leadership and governance environment. Figure 5.14 shows that, on average, countries with a GCNO and a nursing leadership programme achieved higher scores for regulation of working conditions for nurses and regulation of nursing education.

116. Although existence of a GCNO position and a nursing leadership development programme are both associated with a strong regulatory environment, the association is slightly stronger for leadership programmes than for GCNOs. In other words, the existence of a high-level nursing position within the national government does not necessarily lead to actions such as the introduction of leadership programmes: indeed, 37% of the countries with a GCNO did not have a leadership development programme.

117. To test the hypothesis as to whether leadership and governance in nursing also translate into increased investments, as evidenced by acceleration of nursing graduation and subsequent recruitment

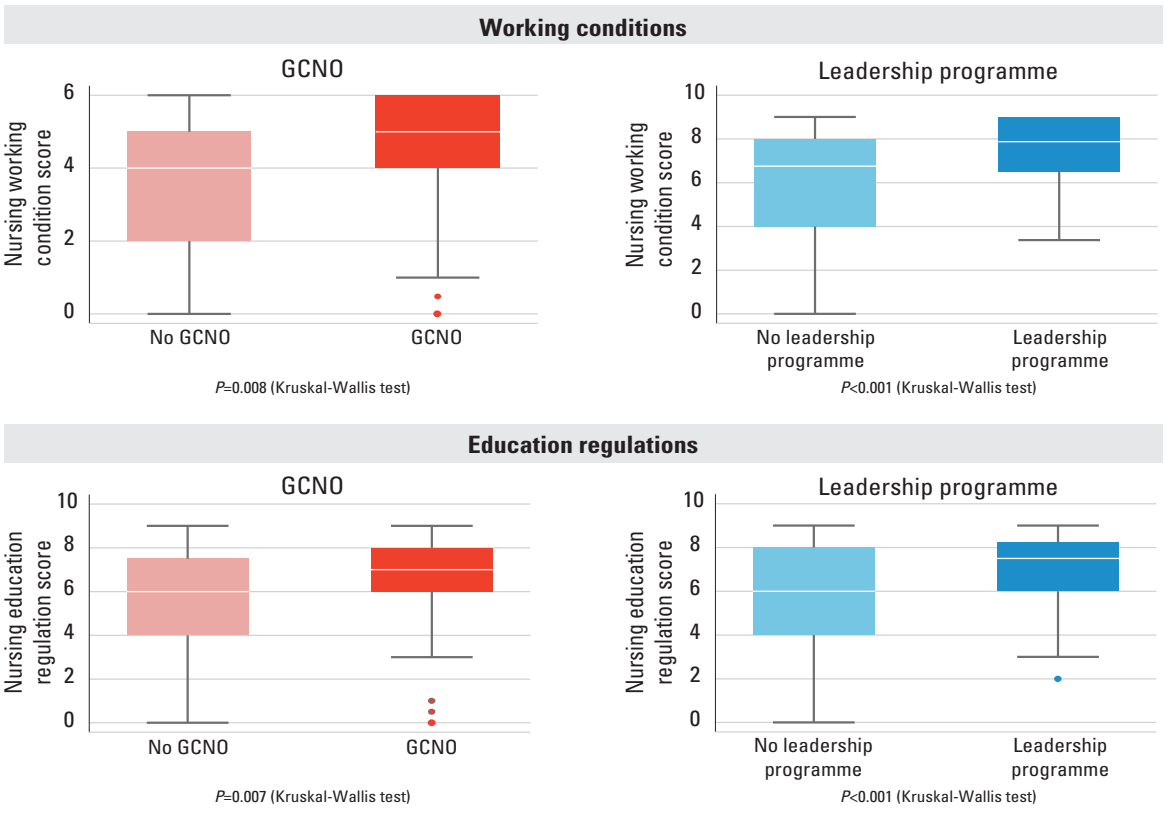
to tackle shortages, the ratio of graduates in countries with leadership and governance measures was compared with that in countries without. No statistically significant association was identified, suggesting that strong nursing leadership and governance does not necessarily translate into accelerated production of nursing graduates.

Table 5.10 **Leadership and governance indicators: percentage of countries with chief nursing officer position and nursing leadership development programme, by WHO region**

WHO REGION	Chief nursing officer position		Nursing leadership development programme	
	Number of countries responding/total	% yes	Number of countries responding/total	% yes
Africa	26/47	60%	28/47	64%
Americas	26/35	79%	16/35	46%
South-East Asia	6/11	60%	4/11	40%
Europe	30/53	86%	10/53	56%
Eastern Mediterranean	7/21	54%	8/21	62%
Western Pacific	20/27	74%	10/27	43%
Global	**115/194**	**71%**	**76/194**	**53%**

Source: *State of the world's nursing 2020* specific indicators, 2019. Latest available data reported by countries between 2013 and 2018.

Figure 5.14 **Association between GCNO and nursing leadership programme and the regulatory environment**



Source: *State of the world's nursing 2020* specific indicators, 2019.

5.8 Assessing the current trajectory towards 2030 SDG outcomes

5.8.1 Key findings

- We estimate a shortage of 5.9 million nurses comparing 2018 data with benchmark values defined in the Global Strategy on Human Resources for Health; the gaps are mostly (89%) concentrated in low- and lower middle-income countries.
- If all countries maintain their current level of production of graduate nurses, the nurse headcount is projected to increase from nearly 28 million in 2018 to approximately 36 million in 2030; 70% of this projected increase, however, is expected to occur in upper middle- and high-income countries and not where gaps are greatest.
- Taking into account projected population growth and the ageing of the nursing workforce, the African, South-East Asia and Eastern Mediterranean regions are projected to remain in 2030 with a density below 25 nurses per 10 000 population. Density in the African Region is projected to improve only marginally.
- Addressing the shortage of nursing personnel in low-density countries would require an average increase in the number of yearly graduates of 8.8% from 2018 to 2030 (range: 0.2–13.4%), and improving absorption capacity to at least 70%.
- Scaling up education of nurses to address gaps may cost approximately US$ 10 per capita for the period 2018–2030 in affected low- and lower middle-income countries.

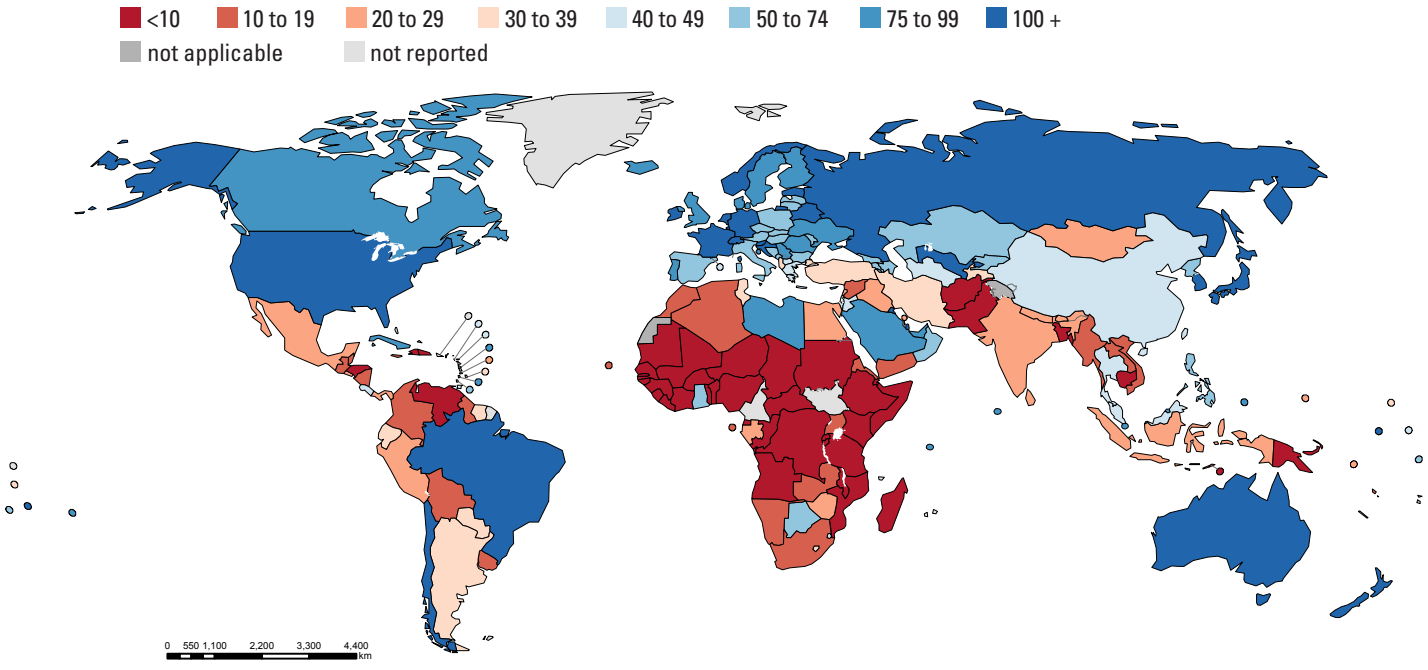
118. To achieve the health-related SDGs, WHO Member States will need to educate enough nurses to (a) compensate for losses to the profession (for example, due to death, migration or retirement); (b) meet the increased demands in many parts of the world due to population growth and ageing and changing health care needs; and (c) eliminate the existing global shortage.

5.8.2 Projection of nursing stock and density to 2030

119. A basic "stock and flow" model for each country was developed, taking into account the current nursing headcount, the estimated retirement rate (based on the age distribution of the nursing workforce), the population growth, and assumptions on the entry in the labour market (see Annex 2 for description of scenarios). On current trends, the stock of nursing personnel is projected to increase from 27.9 million in 2018 to 35.9 million nurses in 2030.

120. The increase of the nursing stock by 2030 will be concentrated in high-income countries, with very limited growth in low-income countries (Figure 5.15). The disparities documented in

Figure 5.15 **Projection of nursing personnel density per 10 000 population in 2030 (global distribution)**



Note: "Nursing personnel" includes nursing professionals and nursing associate professionals.

2018 (see section 5.2) are projected to continue largely unabated to 2030.

121. The growth trajectory of the projected stock is not sufficient to fully address the needs, particularly in the African Region, where a population growth of 34% is expected. Also, the Eastern Mediterranean Region is projected to see only marginal increases in nursing personnel stock (Table 5.11).

122. Projections were conducted with different assumptions and scenarios, relying on data availability and data quality for factors used in the analysis. Potential limitations are discussed in Annex 2.

123. In contrast, the nursing stock is projected to significantly increase in the American, South-East Asia and Western Pacific regions. When grouping by level of income is considered, 88% of the increase in stock is projected in middle-income countries (Figure 5.16).

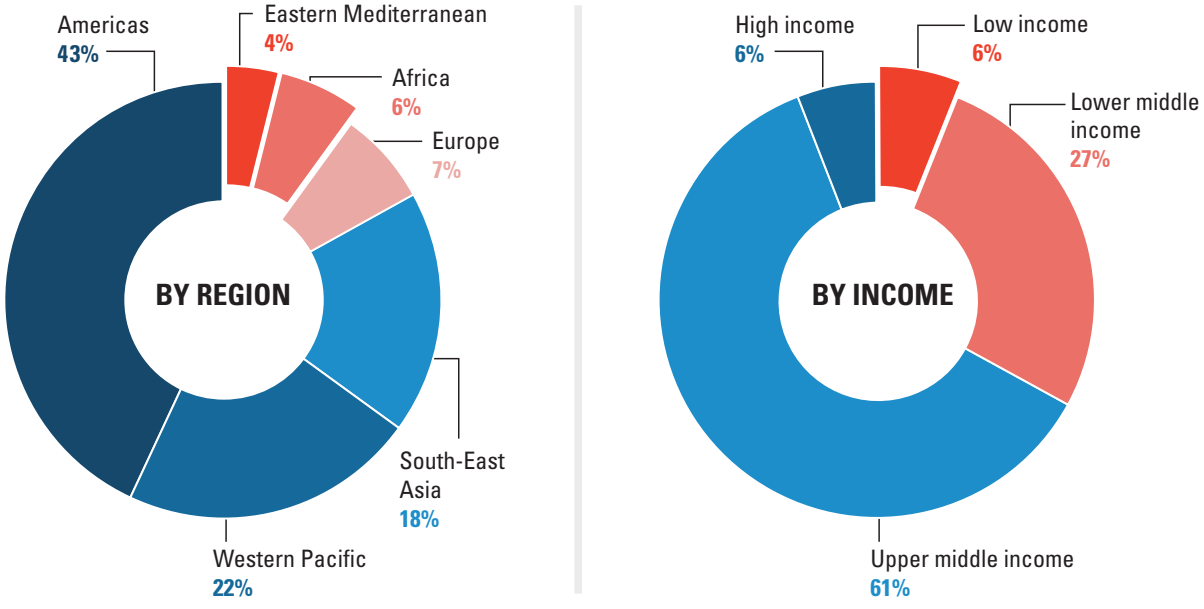
5.8.3 Nursing workforce shortage

124. The WHO Global Strategy on Human Resources for Health estimated in 2016 that by 2030 there would be a global shortage of 7.6 million nurses and midwives in countries with a density below a benchmark of 4.45 physicians, nurses and midwives per 1000 population; this threshold value excluded most high-income countries. Adopting the same methodology and benchmark values, but using more recent data, a shortage of 5.9 million nurses was estimated for 2018, and of 5.7 million

Table 5.11 **Simulation of projected stock of nursing personnel from 2018 to 2030 under three scenarios, by WHO region**

WHO REGION	Stock observed in 2018 (million)	Stock projected to 2030 (million)		
		SCENARIO 1: ageing and stable young age group	**SCENARIO 2:** ageing and graduation as of recent years	**SCENARIO 3:** ageing and graduation increasing by 50% by 2030
Africa	0.9	1.2	1.5	2.0
Americas	8.4	9.2	12.4	17.7
South-East Asia	3.3	4.7	5.0	6.1
Europe	7.3	8.6	8.0	10.4
Eastern Mediterranean	1.1	1.9	1.5	1.7
Western Pacific	6.9	10.3	9.0	11.2
Global	**27.9**	**35.9**	**37.4**	**49.3**

Figure 5.16 **Projected increase (to 2030) of nursing stock, by WHO region and by country income group**



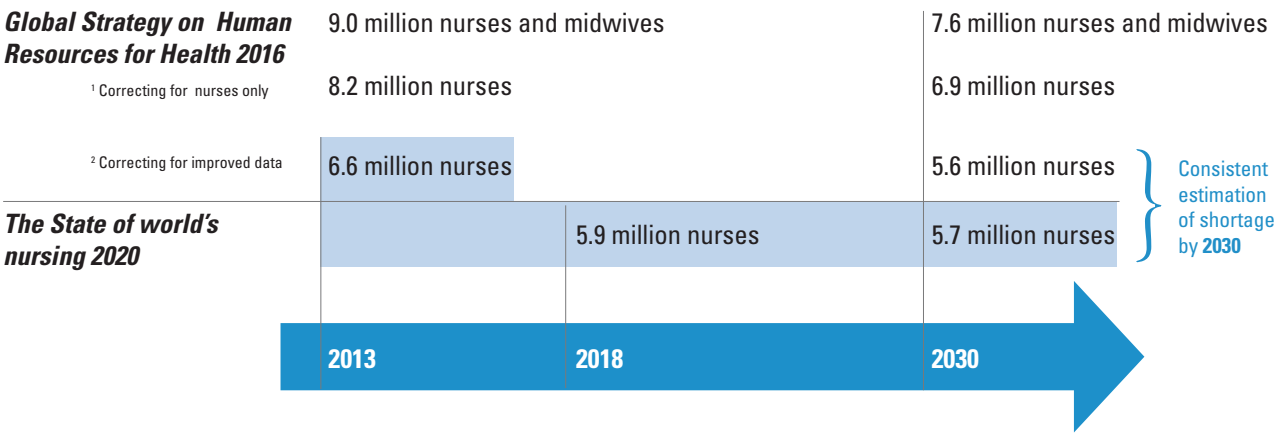
Note: Income grouping is from the World Bank classification as of 2018.

by 2030. The countries accounting for the largest shortages (in numerical terms) in 2018 included Bangladesh, India, Indonesia, Nigeria and Pakistan. Income level is strongly associated with shortages in the nursing workforce (Annex 2, Table A2.2), with 89% of the gaps in 2018 concentrated in low- and lower middle-income countries.

125. This estimation can be compared with the findings of the Global Strategy in 2016 by correcting the previous estimate to only display shortage of nurses (that is, excluding the midwife component) and to account for improvement of data (Figure 5.17).

126. The shortage was estimated considering the benchmark value used in the Global Strategy. As such, all countries above the benchmark are excluded from this estimation. This is not to suggest that countries above the benchmark are not experiencing shortages of nurses. Most actually do experience a significant level of shortage defined against nationally identified service delivery targets and health system configurations. For these countries, specific estimations of shortages should be conducted. These should apply methodologies that account for population and workforce ageing, changing epidemiological patterns, implementation of retention strategies, and other labour market dynamics. For instance, an analysis based on nationally defined population needs and health system requirements identified a potential shortfall of up to 3.2 million nurses in 31 high-income OECD countries to 2030 *(266).* Similar estimates of future shortages of nurses have been reported in Japan (270 000 nursing staff by 2025) *(267),* Germany (approximately 500 000 health workers

Figure 5.17 **Estimation of shortages of nursing workforce in 2013, 2018 and 2030**



Correction factors applied:

[1] Removing the share of midwives from the stock of nurses and midwives combined in the Global Strategy using more recent share data (90% nurses out of nurses + midwives).

[2] Correcting for improved data, which results in higher stock estimates and lower shortages: 4.4 million nurses out of 27.8 million in 2018, being an effect of improved data as compared to the Global Strategy.

Note: Shortage estimated by comparing nursing stock in each country in each year to a benchmark density.

Source: Global Strategy on Human Resources for Health 2016 and *State of the world's nursing 2020* report at global level.

The *State of the world's nursing 2020* estimate of nursing shortage by 2030, if the current trends are maintained, is consistent with (5.7 million nurses versus 5.6 million) the Global Strategy estimate.

by 2030, especially elder care personnel and nurses) *(268),* and the United Kingdom (shortage of over 108 000 nurses by 2030) *(269),* among others.

5.8.4 Production and cost required to tackle nursing shortage by 2030

127. The required increase in graduation and jobs to fully address the shortage by 2030 was estimated under different hypotheses.

- On current trends, an average of around a 10% increase per year in number of graduates (ranging from 1.5% to 14.9%) would be required.
- If the labour market absorption capacity of nursing graduates were improved, using an absorption rate of 70% of graduates into the labour market, the average increase per year in graduates would be 8.8% (ranging from 0.2% to 13.4%) to address the gap.
- In a scenario with a further improved labour market absorption capacity (80% of graduates), the required average increase in the graduation rate would be 8.1% per year (from 0.03% to 12.2%) to address the nursing shortage by 2030.

128. To estimate the investment required to eliminate the shortage by 2030, the additional number of nurses (projected under the scenario of employment of 80% of graduates) from 2018 to 2030 was multiplied for each country by an average cost to train a nurse *(270).* Based on published and grey literature on education costs in low- and lower middle-income countries, three different assumptions for average cost of training per nurse were used: US$ 5000, US$ 10 000 and US$ 20 000 *(271).* The required investments to train additional nurses to eliminate the shortage were respectively US$ 5.2, US$ 10.5 and US$ 21 per capita on average.[11] Considering the sensitivity of the analysis to the assumptions made and the paucity of the evidence, it can be reasonable to adopt a central estimate of approximately US$ 10 per capita to develop illustrative simulations.

11 Figures quoted constitute a one-off investment in countries with shortages to cover the training of all graduates.

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CHAPTER 6

Future directions for nursing workforce policy

129. The evidence presented in this report, building on both existing frameworks and published literature (Chapters 2, 3 and 4) and the analysis of the current status of the nursing workforce (Chapter 5), provides a compelling case for a radical change in the way the nursing workforce is educated, deployed, managed and supported, as part of broader health workforce and health system policies.

130. The investments required will be substantial, but even bigger will be the returns for societies and economies in terms of improved health outcomes for hundreds of millions of people, creation of millions of qualified employment opportunities, particularly for women and young people, and enhanced global health security.

131. Harnessing this potential requires concerted efforts spanning different sectors at the local, national and global levels. In this chapter, we discuss in turn the main findings emerging from the global discourse and the specific evidence collated for this report; on that basis, we outline the actions required to stimulate sustainable investments, build institutional capacity, and catalyse policy action in support of a fit-for-purpose and fit-to-practise nursing workforce.

132. These policy options are addressed to both Member States and, where relevant, other stakeholders. Their applicability and relevance should be considered by countries on a case-by-case basis, depending on their health system's objectives, underlying conditions and implementation capacity.

6.1 Strengthening the evidence base for planning, monitoring and accountability

Synthesis of results

133. The *State of the world's nursing 2020* report represents the most comprehensive global data and evidence specific to nursing. While 80% of countries reported on at least 15 indicators, the data gaps identified reflect the varying capacity of countries' health workforce information systems and represent valuable opportunities for focused attention moving forward.

134. Data availability was highest for indicators such as active nursing workforce stock and age composition (191 and 132 countries, respectively), but reporting of indicators relating to education, financing and health labour market flows was substantially lower, hindering the capacity to conduct comprehensive health labour market analyses. For instance, only knowing stock data without understanding in quantitative terms production capacity, vacancy rates, unemployment and attrition may leave policy-makers uncertain about whether production should be scaled up or is already adequate. Policy-makers and planners should know whether production by the education sector and absorption in the health labour market are evenly matched or leading to any form of disequilibrium (shortage versus unemployment) (see Box 6.1 on the health labour market in Scotland).

Box 6.1 Scotland health labour market analysis

In December 2019, the Government of Scotland released an integrated health and social care workforce plan for Scotland *(272)*. The plan includes a vision to enable people to stay at home rather than being hospitalized. However, implementation requires an increase in the number of district nurses.

The Scottish Government used data from NHS National Services Scotland, Information Services Division, to create modelled scenarios of how many additional nursing students would be required. The government also considered the supply and shortages in other health occupations, how the shortages impact what care needs to be delivered, and how this may be addressed.

The data and findings were shared with the Nursing and Midwifery Student Intake Reference Group and other stakeholders. This dialogue led to decisions to take a proactive approach to training district nurses, increase investment in education and training of district nurses, and consider staffing arrangements that will allow for nurses already in service to receive such education and training.

This represents the government's first attempt at addressing health and social workforce issues in an integrated manner at the national level and shifting from planning for a single profession towards planning for multidisciplinary team-based care.

135. Factors influencing the availability of data and ability of countries to report across these indicators include the level of coordination across the ministries of health, labour, education, and finance, as well as engagement with other stakeholders, such as professional associations, councils and educational institutions.

Policy options

136. Countries should accelerate the implementation of their National Health Workforce Accounts (NHWA), including disaggregated reporting for the nursing workforce. Of particular urgency is addressing gaps in essential data elements to conduct national health labour market analyses. This should be accomplished through a comprehensive effort at strengthening and building the capacity of the human resources for health information system *(273).* The description of the global nursing workforce was feasible due to global efforts to implement NHWA and a commitment to diversify data sources. Institutional capacity-building for human resources for health information systems may entail establishing permanent mechanisms to convene stakeholders, including nursing leaders, to establish clear mechanisms for collation and exchange of data, to discuss data availability, quality, and challenges, and to implement interoperable data systems. Coordination among different sectors and stakeholders may also present opportunities to formalize the political mandate for data collection and sharing, and for intersectoral policy dialogue to translate the data into meaningful policy changes. Countries should leverage strengthened nursing and health workforce data to be included in health labour market analyses to guide policy and investment decisions at the national level (see Box 6.2 on nursing leadership teams using NHWA indicators for a nursing labour market analysis).

6.2 Mobility and migration

Synthesis of results

137. Approximately 3.7 million nurses (or one in eight) are practising in a country other than the one in which they were born or trained as a nurse. The findings indicate a high international mobility of nurses, fuelled by a strong dependence on migrant nurses in countries with low domestic production. The demand from high-income countries (where over 15% of nurses are reportedly foreign born or foreign trained) can attract the most qualified nurses from lower-income countries and deepen quality and distribution divides that are detrimental to population health (see Box 6.3 on Germany's approach to managing migration).

138. Very high levels of out-migration (when they are not the result of a deliberate policy to export the nursing workforce overseas) can be interpreted as a symptom of unattractive labour conditions at home. The policy prescription should therefore focus on treating the underlying causes (in terms of improving the work environment, support systems and remuneration), rather than attempting to address in isolation the migratory phenomenon. Similarly, in the preparation of nurses an appropriate balance must be struck between the skills and competencies required to prepare a nurse to work in their local context and in primary care, versus the interests of students to learn skills that will allow them to maximize income

Box 6.2 East, Central and Southern African Health Community: national collaboration on nursing data reporting using NHWA indicators

The East, Central and Southern African Health Community (ECSA-HC) is an inter-governmental health organization that fosters and promotes regional cooperation in health *(274)*. Nursing shortages are common in the subregion. Poor working conditions and high caseloads contribute to lack of incentives for nurses to enter the workforce and high levels of out-migration. Often-fragmented education systems struggle with inadequate faculty and regulatory capacity, resulting in a limited ability to train enough skilled nurses.

The World Bank Group collaborated with Jhpiego, the International Council of Nurses, and the ECSA College of Nursing on a study to assess nursing labour and education markets. The objective was to estimate the magnitude of the challenges in these systems and to identify policies to scale up nursing education in the region through targeted public and private investments. The study examined how the interaction between the education system and the health system was mediated by the labour market for nurses, considering governance and regulatory challenges. The data collected were indicators from the WHO-developed NHWA *(273)* as well as additional qualitative data collected during regional consultations. The country teams coordinating data reporting for the study were national nursing leadership "quads" with additional support from WHO in the review process (see also subsection 6.3.3).

Results revealed an imbalanced market, and a critical misalignment of demand for and supply of nurses in the subregion. While nursing supply has grown faster than population growth over the past 10 years, it coexists with low absorption rates of nurses into public sector positions (often due to recruitment inefficiencies or undesirable working conditions) in many countries, and large needs-based shortages. The projections analysis estimated that effective demand would grow by 33% between 2019 and 2039, but still leaving a surplus of over 220 000 nurses that the public and private sector were not able or willing to employ. In contrast, needs-based shortages are estimated to reach 841 000 nurses by 2030, expanding the current imbalances in the nursing labour market.

The study concluded that increasing the supply of nurses to respond to the SDGs in ECSA countries would require scaling up nursing education, improving the quality of nursing schools (including enforcement of quality assurance mechanisms), and increasing resources needed to absorb nurses into the local and regional labour markets. This can be facilitated by adequate investments in physical and human resources, nursing governance, regulation, and the production of data and analytical capacities to empower countries to monitor the impact of investments.

Box 6.3 Germany's approach to managing migration

On 9 November 2018, the German Parliament passed the Care Strengthening Act, which aims to improve the attractiveness of health care and long-term care for employees and care staff in hospitals and residential homes *(275)*. Improving staffing in these facilities was at the heart of the new government's health policy. For many years health care and long-term care had suffered from a severe shortage of nurses, with widespread understaffing in hospitals and residential homes. Numbers of professionals leaving the health service due to retirement and dissatisfaction were greater than the numbers entering the workforce upon graduation from vocational training. Furthermore, understaffing was perceived to lead to deteriorating working conditions for staff and poor quality of care. In 2012 it was projected that Germany would have a nursing care shortage of between 263 000 and 500 000 by 2030 *(276)*. In its attempt to reduce staff shortages, Germany adopted a multipronged strategy comprising a scale-up in education, the creation of new nursing jobs and the optimization of international recruitment of migrant health workers, such as nurses from central and south-eastern Europe *(277)*. For this last element, Germany has taken steps to harness opportunities for mutual benefits with source countries from international health worker mobility, including through technical cooperation and bilateral agreements that create training and investment opportunities in the source country *(168)*.

opportunities and migrate to work in a more specialized or global professional setting.

139. With the vastly increasing numbers of nurses migrating, the typical approach of single-jurisdictional solutions to public protection are inadequate, and reformed systems need to provide and enhance regional and global solutions *(245, 278, 279)*. Furthermore, because many countries are simultaneously countries of both origin and destination, it is essential to better understand the patterns of movement in order to effectively manage mobility and plan for future health workforce requirements. However, only 86 Member States reported on the percentage of foreign-born or foreign-trained nurses in their workforce, one of the basic reporting requirements envisaged in the WHO Global Code of Practice on the International Recruitment of Health Personnel.

Policy options

140. **Countries and regulators should strengthen the implementation of regulations governing international mobility of health personnel, including the nursing workforce.** The regulators in the destination jurisdictions need to establish that the nurse's preparation, qualification and disciplinary history meets the required licensure, educational and ethical standards and codes of conduct, in the interest of public protection. Enhanced models of regulation can facilitate mobility through harmonization of requirements to enter a nursing programme and of the educational content required to earn and maintain nursing credentials. Regional experiences of agreements on mutual recognition of nursing professional qualifications provide a potential basis for broader agreements in the future.

141. **Countries and international stakeholders should reinforce the implementation of the WHO Global Code of Practice.** The ability to effectively monitor, govern and regulate international mobility of the nursing workforce may require capacity-building, leveraging partnerships, and collaboration between regulatory bodies, health workforce information systems, employers, government ministries, and other stakeholders such as professional associations. Countries experiencing an excessive loss of their nursing workforce through out-migration should consider putting in place mitigating measures, such as improving the salaries (and pay equity) and working conditions, ensuring decent work, and implementing tailored retention packages where warranted.

6.3 Developing and supporting the nursing workforce

6.3.1 EDUCATION

Synthesis of results

142. The findings of this report illustrate a complex situation with respect to the production of nursing programme graduates. The lowest proportion of graduates in relation to existing stock was in the European and Eastern Mediterranean regions and high-income countries. Unless middle- and high-income countries can increase production, the data suggest a potential continued reliance by high-income countries on international recruitment, potentially exacerbating existing shortages and raising related access and equity issues.

143. There is considerable variety in the duration of nursing education and training programmes in different regions of the world. However, countries overwhelmingly (154 out of 169 responding countries) reported standards for the content and duration of education and training. Critical considerations when developing such standards include whether they help educators provide students with competencies required to meet population health needs, including preparation for primary and preventive care services, disaster, emergency, and conflict competencies where indicated, leadership skills, and appropriate use of technology (see Box 6.4 on technology in nursing education and practice).

144. Most countries (89%) also reported accreditation mechanisms in place for education institutions and maintaining a master list of accredited institutions. This indicates, for most countries, an opportunity to focus on strengthening key areas of accreditation, including efficient and affordable models, and ensuring the social accountability and relevance of programmes to population health priorities. Robust accreditation mechanisms can cover content, curriculum, student clinical experiences, faculty qualifications and interprofessional learning. Our findings indicated that 67% of responding countries have standards for interprofessional learning, but in some regions this was less than half or as low as 20%.

145. Ensuring a representative health workforce, with a composition mirroring that of the population to be served, requires diversity of those entering and completing nursing programmes. Findings from this report indicate that that the nursing workforce is still largely female, particularly in the American and Western Pacific regions. Fostering an appropriate composition of the nursing

workforce will require not just increased enrolment of diverse student groups; it will also require addressing the structural and organizational challenges that either exclude some students from nursing (for example, completion of secondary education) or prevent the completion of their studies (for example, excessive costs) *(126)*. Demand for nursing programmes may also be affected by the gendered occupational segregation and the low status of nursing in some countries. Addressing these challenges is required to make nursing an attractive career choice, especially in regions such as the Americas, where graduates are fewest relative to population.

Policy options

146. **Countries should ensure nursing education and training programmes equip nurses with competencies to deliver high-quality, integrated, people-centred services.** A priority

Box 6.4 Technology in nursing education and practice

Technology is playing an increasing role in both education and practice of the nursing workforce. Technology can be harnessed to access clinical decision support, conduct provider-to-client telemedicine, and receive provider-to-provider training and consultation *(280)* in ways that can enhance access, enable remote care, improve primary health care service delivery and empower patients. Nurses should be equipped and conversant with the digital determinants of health: these include their level of digital literacy, access to technological equipment, and Internet infrastructure, including broadband where available *(281)*.

Digital health technologies, be it artificial intelligence or other forms such as augmented reality and the use of robotics, are already transforming nursing and patient care *(282)*. Personalized medicine and genomics have the potential to better tailor patient care *(283)*. One of the greatest potentials for digital health lies in lifelong learning opportunities. Technologies such as artificial intelligence can allow learning to be personalized, relevant and up to date.

Findings from a Cochrane systematic review of health worker experiences of mHealth in primary health care suggest that health workers, including nurses, have appreciated the benefits of using mobile technology in their delivery of care, but have also encountered challenges *(284)*. The benefits described included being more connected to each other, taking on new tasks, improving coordination and quality of care, improved communication with clients, and accessing clients in hard-to-reach areas *(284)*. Simultaneously, health worker accounts described multiple and complex challenges, which could be personal (such as poor digital literacy), relational (preferring face-to-face contact with clients and colleagues), professional (feeling that their clinical skills were threatened by digital clinical support tools), contextual (clients not being able to afford mobile phones), or infrastructural (lack of electricity) *(284)*. While technological advances offer many benefits, health worker accounts included in this systematic review suggest that health system decision-makers need to think carefully about how it is implemented in their context so as to minimize the challenges experienced by health workers, including nurses.

issue is to critically appraise the skills mix within the nursing profession and decide whether the levels of nurses and the types of specializations are relevant to the health system objectives, and ensure availability of adequate numbers of training posts based on health system needs and absorption capacity. Creating or increasing the number of higher levels of nursing education – for example, bachelor's or master's programmes, or Doctor of Philosophy – has structural implications, such as developing new educational programmes, staffing them with appropriate faculty, and ensuring nurses with this type of educational pathway will have a defined role in the health system.

147. **Countries should consider mechanisms to increase the demographic and geographical diversity of students in nursing school.** This may mean addressing biases that negatively impact nursing as a career choice for men, young people, or specific ethnic groups, and accommodating those wanting to enter nursing as a second or subsequent career choice. Developing a "rural pipeline" to foster a gender-balanced intake and appropriate number of students from rural, remote and otherwise underserved areas and communities may be required in some contexts. Targeted financial support and incentive mechanisms can also be used to increase opportunities for formal education for minority and vulnerable groups and disadvantaged populations, and to attract faculty that reflects student and community populations. Accreditation criteria that reinforce social accountability measures are one such mechanism.

148. **Health education institutions and regulators should adopt competency-based curricula and leverage appropriate technology.** Quality in nursing practice should be reflected throughout the curricula. In addition to the technical knowledge and procedural skills for individual clinical interventions, nurses should be equipped to work in interprofessional teams; to demonstrate empathy and compassion to patients; to make decisions under pressure; and to acquire the tools to keep learning over a career spanning decades. Curricula should be matched to both the scope of practice of graduating students and the population health needs. The digital provision of educational and training content can usefully complement traditional methods. The success of such efforts at "distributed learning" will require ensuring that students acquire a minimum level of digital health literacy as part of their education, that the curriculum design makes use of relevant digital and telehealth learning for the requisite competencies with support and supervision for clinical training *(285)*, and that the institutional and infrastructural resources needed to enable a bridging of the digital divide are in place *(286)*.

149. **Governments and stakeholders should develop and leverage intersectoral partnerships and cooperation to advance the nursing education agenda.** Cooperation with regulatory bodies can facilitate review of entry requirements to nursing programmes and the minimum education standards for nurses (given the current and future professional roles in the health system) and can promote harmonization of standards at regional level. Intersectoral dialogue

with accrediting bodies can help identify mechanisms to further the social accountability aspects of accreditation, for example by ensuring that nursing education institutions prioritize the production of graduates able to deliver quality health services, rather than their institutional income and status, through tuition fees and government grants. Relevant line ministries (education, health) can strengthen formal coordination to promote science and technology as fundamentals of the nursing profession, to market nursing as a STEM (science, technology, engineering, mathematics) field, and to put in place mechanisms to attract a diverse range of secondary school students to nursing. Public–private partnerships can help source sites for clinical training in primary health care settings; engagement with other health occupation education programmes can help make these clinical practicums interprofessional.

150. **Nursing education institutions should strengthen their capacity by addressing inadequacies in faculty numbers or competencies, infrastructure limitations, and the availability of appropriate clinical practice sites** (see Box 6.5 on commitments from Pakistan on producing more nurses). In order to increase training posts while preserving quality, investment in faculty development programmes may be needed. High-income countries or countries relying on international recruitment should increase the domestic production and deployment of nurses.

151. **Countries should consider applying relevant financing levers to expand (where needed) or strengthen the quality of nurse education to address health labour market failures.** Financial mechanisms have great potential for increasing the diversity of the student pool, the faculty pool, or the number of seats in nursing programmes, and addressing some of the current limitations in clinical training. Financial subsidies for post-basic education programmes are sometimes used to promote pathways

Box 6.5 Pakistan efforts to increase nurse education capacity

Pakistan is attempting to address its shortfall of 1 million health workers. In 2018 it launched its national Human Resources for Health Vision for 2030, aimed at addressing the health workforce skills mix and the nursing workforce. Nursing, which is regarded as the backbone of the health sector, is key to this vision, with 2019 having been made the Year of Nursing in Pakistan, highlighting the contributions of nursing to population health *(287)*. In launching the Year of Nursing, President Alvi announced that a nursing university would be established in Islamabad, which aims to provide training to 25 000 students each year *(287)*. The country plans to double the size of the nursing sector within two years, to overcome the national shortage of nurses. The shortage of nurses was described by Dr Nausheen Hamid, Parliamentary Secretary for National Health Services, as an impediment to attaining universal health coverage, with adequate numbers of well performing nurses needed for an effective health system *(288)*.

to higher levels of nursing practice. Governments, however, must be able to make informed decisions on whether it is a cost-effective investment to subsidize nursing education, under what circumstances, and in what ways, prioritizing scarce resources on investments that can directly contribute to equity and efficiency objectives *(289)*. For example, a health labour market analysis should identify the settings where nurses are underproduced or overproduced as compared to health system needs. Where a systematic underproduction is documented, there is a case for government intervention to relax unnecessary barriers to entry and if needed to subsidize pre-service education, particularly if priority is awarded to the group of disadvantaged students, in order to facilitate education pathways leading to a preferential career in the primary health care setting, and in exchange for a minimum guaranteed period of exclusive service within the public sector *(140)*.

6.3.2 NURSING PRACTICE

Synthesis of results

152. The report findings indicate a nursing workforce larger than previously estimated — nearly 28 million in 2018, comprising a minimum of 69% professional and at least 22% associate professional nurses. The growth, compared to previous 2016 estimates in the Global Strategy on Human Resources for Health, is due in roughly equal portions to vastly improved nursing workforce data availability and quality, and to actual growth in stock.

153. Even with the growth in stock, inequitable geographical distribution of health workers, including nurses, is a universal challenge. This report found significant differences in the distribution of nurses across and within countries and regions. The findings of the report further indicate that 53% of responding countries have advanced practice roles in nursing. These roles are more frequently found in countries with low density of medical doctors. This highlights the flexibility and responsiveness of the nursing workforce in relation to the broader health workforce situation of a country. These nurses may be well placed to provide care to populations in rural and remote settings, if the existing skills mix suggests such a move would increase efficiency.

154. Within countries, the data point to a continued need to focus on addressing the maldistribution of nurses located in rural versus urban areas to improve equity of access. The retention of health workers is related to a variety of complex and interrelated factors such as working conditions, occupational safety, remuneration levels and non-monetary incentives. Sustained success in improving nurse retention is likely to be the result of planned, sequenced, multi-policy interventions tailored to the local context. Retention should not be examined or addressed in isolation from the context of other features of the working and living conditions of nurses.

Policy options

155. **Countries should enable nurses to work to the full extent of their education and training** *(180)*. This objective should be part of broader national efforts to adopt care models that optimize the division of tasks in integrated primary health care teams *(179)*. This entails maximizing the contribution of nurses to enhance primary health care in priority areas

(see Box 6.6 on expanding access to community health services in Oman). Possible approaches could include advanced practice roles, expansion of nurse-led clinics, and developed or expanded authority for prescribing, with the commensurate development or strengthening of education and training required. Nurses with advanced practice credentials should be in settings that optimize their productivity in providing patient care or leadership and management to other clinicians. Nurses functioning in advanced practice roles or in nurse-led clinics should be supported with mentorship or collaborative partnerships as needed, be provided with adequate supplies and medications, have clear clinical and facility guidelines for practice, and have access to the required resources, including online reference materials and appropriate technology. Embedding the required reforms in relevant education, health, labour and other policies requires institutional capacity for effective collaboration and coordination; supportive institutional structures and dedicated resources; leadership and political will; effective managerial oversight; and effective organizational culture. It is also important that the roles and functions of nurses based on scope of practice and competencies are accurately communicated to other health care providers and the public.

156. **Countries should optimize their modalities and mechanisms for effective deployment and management of their nursing workforce.** The efficiency, equity and transparency of hiring and deployment are key elements of the decent work agenda *(16)*.

Box 6.6 Expanding access to community health services in Oman

The country of Oman provides an example of reorienting nursing and midwifery education and emphasizing primary care competencies, which was a component of the call for action to strengthen the nursing workforce adopted by the 66th session of the Regional Committee for the Eastern Mediterranean (October 2019) *(290)*.

Oman has experienced a rapid growth in population and life expectancy. The improvements in socioeconomic status, however, have come with an increase in the burden of chronic illness. To address this population health issue, the government decided to invest in community health nurses *(291)*. The Department of Nursing and Midwifery at the Ministry of Health initiated a 16-week on-the-job training programme, first piloted in the capital, Muscat, and then extended to other governorates. Community health nursing services were integrated into primary health care structures in line with the services provided in the primary health centres *(292)*.

Eventually, the 16-week training transformed into a bachelor's degree in nursing with a focus on community health nursing, and then to a post-basic diploma in community health nursing specialty *(291)*. This specialty programme has contributed to maintaining the supply of qualified community health nurses to meet primary care service needs in the country.

Policy-makers and managers should have access to reliable metrics that assess the efficiency and timeliness of the employment process, such as the percentage of new graduates that are employed three months, six months or one year after licensure, the average time between graduation and licensure, and the average time between licensure and employment. A low rate of employment of graduates may be symptomatic of saturation of the labour market, but if concomitant with excessively long lag times between graduation, licensure and employment, it can instead suggest rigidities and bureaucratic hurdles in the administrative system. The modalities of deployment also matter: unless the public sector can guarantee the absorption of all qualified candidates, competitive recruitment following the publication of vacancies and a meritocratic assessment of candidates' competencies remains the modality of choice *(289).*
Career advancement and promotion opportunities should also be linked to merit and capacity, rather than primarily based on seniority (years of service). As for other occupational groups, the limits of compulsory deployment and rotation schemes should be taken into account when considering such schemes. Wherever possible, deployment of nurses should be based on voluntary career choices and preferences in relation to duty station. Reconciling nurses' preferences with health system needs, in particular in relation to geographical equity, can be challenging. When tensions emerge between the two, a range of related and mutually reinforcing strategies for rural deployment and retention is desirable from the perspective of both effectiveness and workers' rights *(289).*

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157. **Countries should explicitly and proactively anticipate challenges in the retention of nurses and put in place relevant policies.** Evidence-based approaches to enhance retention include opportunities for leadership development, mentorship *(293, 294),* flexible scheduling, non-monetary incentives and lifelong learning. A formalized preceptorship for new graduates entering the workforce can improve their transition to practice, clinical competence, job satisfaction and professional socialization, all of which may affect retention of new nurses in the workforce *(295).* The effect of preceptorship on role competence and retention is similar for new nurses in rural or urban settings *(296).* Specific policies should be in place for increasing the roles of women in leadership, addressing gender discrimination, and preventing sexual harassment, which, in addition to being a violation of workers' dignity and rights, is linked to increased attrition *(122, 297, 298).*

6.3.3 REGULATION

Synthesis of results

158. Nursing regulation plays an essential role in protecting the public and empowering health systems to respond to changing patient and population needs. It can also provide a framework for advancing the profession *(243, 299).* The findings of this report indicate that 164 Member States (86%) have an authority responsible for the regulation of nursing education and practice. The strength and effectiveness of the regulations issued, however, must be examined on an individual country level. For example, 73% of countries indicated they had a regulatory requirement for lifelong learning, but fewer (64%) indicated presence of regulations that required a licensure or fitness to practise examination.

159. Professional regulations are also important to preserve quality care in a context of growing international professional mobility, ensuring incoming health workers have competencies that match the needs of the population, and the ability to practise without compromising public safety. Real-time, web-based systems that can facilitate expedited recognition of credentials and provide collated information on the current licence status and professional history of the practitioner are emerging as useful tools on a regional basis and could potentially be developed into global solutions *(168, 300–302).*

Policy options

160. **Countries should develop and enhance nursing regulation to support safe, sustainable, and high-quality education and practice.** The authority to regulate nursing may need to be established through new or updated primary legislation that establishes the role and functions of the regulatory authority and key provisions and standards for nursing education and practice. One recurring challenge is the need to strike the right balance — ensuring that regulations are the least restrictive while achieving the desired public protection benefit *(303–306).* Countries should consider establishing requirements for lifelong learning to ensure nurses at various levels are exposed to learning opportunities appropriate to their role. The use of a licensure examination to assess a minimum level of initial knowledge before a nurse is allowed to practise is increasingly common *(255, 307)*. While stronger evidence of the comparative effectiveness of different approaches is still needed, there is a broad consensus on the need for the competency assessment to be valid, fair, independent, and based on the knowledge and skills that nurses will need in a variety of practice settings.

161. **Countries should invest in the capacity of regulatory systems to strengthen and enhance the quality of nursing education and practice.** A key aspect is to ensure regulators have and maintain live registries that are interoperable with other databases in the health system and other regulators. One way of maintaining up-to-date registries is through the requirement for re-registration or re-licensure, which can also be instrumental in incentivizing lifelong learning as well as generating income for the regulatory body. The individual capacity of nurse regulators also requires strengthening. Nurse regulators, as is also typical for other health occupations, may have received

Box 6.7 African Health Profession Regulatory Collaborative

The African Health Profession Regulatory Collaborative (ARC) was created to help countries update nursing and midwifery regulations to facilitate safe and sustainable nurse-led models of care and treatment for patients with HIV. The collaborative involved 17 countries, comprising most members of the East, Central and Southern African College of Nursing (ECSACON) *(308)*.

ARC convened the government chief nurse, the president of the national nursing association, a leader in academia, and the registrar of the national nursing and midwifery council from each country and supported prioritization of and collaboration on nationally identified regulatory challenges. The country leadership teams, who called themselves "quads", worked together on their regulatory priority (for example, scope of practice inclusive of HIV tasks, continuing professional development requirements for HIV content) on annual cycles. Quads met frequently in country as well as with regional colleagues working on similar priorities. Progress was measured regularly and with diverse measures *(309)*.

Over the course of five years (2011–2016) nursing and midwifery regulations were strengthened, and quads reported substantial increases in leadership skills, organizational capacity, and collaboration among national nursing and midwifery organizations *(310)*. While ARC was a donor-funded initiative, the "quad" arrangement has been institutionalized in ECSACON countries and serves as a continuing mechanism to leverage nursing and midwifery leadership to address national health priorities.

little or no formal training in professional regulation prior to assuming that role. Regulators can learn from the experience of other countries and regional-level efforts that have been successful at strengthening regulatory frameworks (see Box 6.7 on the African Health Profession Regulatory Collaborative).

6.3.4 DECENT WORK

Synthesis of results

162. Ensuring decent work conditions is relevant and necessary for all health occupations, but the nursing profession faces particular challenges. As a mostly female workforce and considering the negative legacy in some contexts of a traditionally subordinate role, the nursing workforce is inherently more prone to facing gender bias and discrimination at work. Nurses are also subject to long working hours, risk of attack in some settings, sexual harassment and unfair treatment as migrant workers. The existence of regulations on working hours and conditions was reported by 94% of countries, on social protection by 91%, and on minimum wage by 89%, although less is known about the adequacy and actual level of implementation of such policies. A total of 55 countries (36%), mostly in the South-East Asia and Eastern Mediterranean regions, reported measures to prevent attacks on health workers.

Policy options

163. **Countries should implement the Decent Work Agenda and invest**

in enabling working conditions for nurses. Essential elements include adequate remuneration, social protection, fair working conditions, reasonable working hours, occupational safety, non-monetary incentives, and transparent and merit-based opportunities for career progression. These conditions are closely related to nurse retention and should apply to nurses irrespective of their gender, social background, country or region of origin, ethnic group, or language, and should be enforced through clear accountability mechanisms. Health workers' rights, including appropriate pay and adequate working conditions, are some of the most common reasons for industrial action or strikes by health workers (see Box 6.8 on health worker strikes).

164. **Countries must protect and support nurses who are directly affected by humanitarian crises.** Ministries of health, professional nursing organizations and nongovernmental organizations need to engage with relevant authorities and parties involved to ensure the protection of and support for nurses who may be providing care in severely underresourced or harsh conditions (such as refugee camps or shelters), or who may be part themselves of a population displaced across a border and providing care in jurisdictions where they are not formally recognized to practise. This will help ensure the security of all health workers and health facilities in all settings, particularly for women, who may be at greater risk of attack or harassment during the crises.

Box 6.8 Health worker strikes

In many countries across the globe, workers are legally entitled to strike, and this is widely considered as a civil right *(311)*. However, for health workers, exercising this right is complicated because doing so creates a tension with patients' rights to care, and with citizens' rights to universal health coverage, and may or may not lead to increased mortality *(311–314)*. Notwithstanding, health worker strikes, including by nurses, take place across the world, in high-, middle- and low-income countries *(313, 314)*. An analysis of strikes in low-income countries found that health workers were reported to be on strike for 875 working days, in 23 low-income countries, between 2009 and 2018 *(311)*. The study reported that strikes could last days or months, and could also be recurrent over months or years *(311)*. The primary causal factors leading to these strikes were complaints about remuneration and delayed payments, followed by protest against the unsatisfactory implementation of a previously reached agreement, or against the health sector's governance and policies, as well as complaints about working conditions and security issues. Reducing health worker strikes will require multistakeholder, multifaceted and multisectoral approaches *(311, 314, 315)*. More research is needed to understand the causal factors in individual cases, as well as patterns across regions, and which actors should be engaged to reach a positive resolution *(311)*. However, it is clear that multisectoral action, with the support of political leadership, is needed between health and other sectors to address the upstream factors associated with health worker strikes *(314)*. Investment in decent working conditions for health workers, where they are assured of a safe, enabling and effective working environment, is vital for the achievement and protection of the right to universal health coverage *(314)*.

6.3.5 GENDER AND WOMEN'S RIGHTS

Synthesis of results

165. Approximately 90% of the nursing workforce globally is made up of women. The high level of gender segregation in nursing leads to complex patterns of remuneration: in many countries there is a "gender pay gap", although the evidence is largely from high-income countries *(21)*. The effective implementation and monitoring of gender wage gap policies are required to deliberately promote gender equity within the health workforce, and overcome the historical legacy that has undervalued nurses' work, including through gender bias *(121, 232)*. Analyses by WHO found that health leadership positions continue to be dominated by men, with only 25% of leadership positions in health globally being held by women *(21)*. A study of leadership barriers and facilitators in nursing commissioned by the Nursing Now campaign described not only a "glass ceiling" for women, but also a "glass elevator" for men, who hold a disproportionately high number of senior nursing roles *(122)*. This is just the most visible manifestation of deep-seated gender imbalances that permeate health systems at all levels and affect all facets of the management of the nursing workforce.

Policy options

166. **Countries should address the gender pay gap affecting female nurses.** In some countries the inequitable remuneration between genders may be driven by the high levels of occupational segregation in nursing as compared to other occupations. Addressing this can start with an analysis of national pay scales and a commitment to progressively implement a more equitable and gender-neutral system of remuneration among health workers. It must include sound policies and a reconsideration of fiscal arrangements with respect to health worker remuneration. While recognizing the need for market forces to influence pay levels, policies and laws addressing the gender pay gap should apply as relevant to the private sector as well. Nursing leadership must be included in the assessments of remuneration equity and development of policies to redress the issue.

167. **Countries should prioritize and enforce policies addressing sexual harassment and discrimination within nursing and the overall health workforce.** This should include a zero tolerance policy towards violence and verbal, physical and sexual harassment; policies that create decent working environments for women, including flexible and manageable working hours that accommodate the changing needs of nurses as women; and gender-sensitive leadership development opportunities for women in the nursing workforce.

6.4 Building institutional capacity and leadership skills for effective governance

Synthesis of results

168. Over 80 countries reported a leadership position for nursing at the national level with responsibility for providing input into policy decisions related to health and nursing. Government chief nurses should work as full partners with other health professional leadership in making strategic decisions that impact

health service planning, care delivery and working conditions *(316).* Capacity in labour market and fiscal space analysis, workforce policy, planning and governance is needed to identify priorities and develop evidence-based solutions to strengthen education capacity, create jobs and retain nurses. The findings of this report indicate that of 76 responding countries, 53% had national programmes for leadership development of nurses – though distribution was unequal as a majority of the countries reporting such programmes were in the WHO regions of Africa and the Eastern Mediterranean.

169. Governance capacity for sound design and implementation of nursing and health policies also requires institutions, mechanisms, policies and procedures to ensure that the nursing workforce priorities are considered and embedded in broader government actions in the health sector and beyond. The findings of this report have highlighted that a chief nurse position and the presence of leadership development programmes for nurses were correlated with a stronger regulatory environment for nursing. However, the existence of a chief nursing officer was not necessarily correlated with the existence of leadership programmes. This may be due to the fact that leadership programmes have often been driven by the professional associations as either a service to their members or as an income generation opportunity.

Policy options

170. **Nurse leadership must be developed at country, regional and global levels.** Nurses must have opportunities to develop their leadership potential and participate in decision-making forums. Nurses should be considered, on par with other health professions, for appointment to leadership positions within national and state governments, as well as within local and other organizational structures. This effort will require budgetary allocation specifically for the development of nursing leadership. Country-based award and recognition mechanisms can be created to recognize nursing contributions to the advancement of universal health coverage and serve as role models to younger nurses (see Box 6.9 on a leadership fellowship programme in the Western Pacific Region).

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171. **National policy-making forums should consider the nursing perspective in health system decision-making.** Policies should ensure that nurses are represented at all levels of decision-making and have a voice in influencing key health system decisions and public health policy matters. Nurses should also be included in population-level clinical decision-making, which implies, for instance, including nurses in guideline development teams and guideline review panels to reflect nursing research and insight on the feasibility and acceptability of clinical recommendations.

6.5 Catalysing investment for the creation of nursing jobs

Synthesis of results

172. This report provides additional evidence for the inclusion of a greater focus on nursing as part of the broader investment case for the health workforce for achieving universal health coverage. Despite a positive trend recorded over the last few years, unless the production and absorption of nurses increase substantially, nursing density will improve only marginally in most regions over the next decade, with substantial needs-based shortages persisting in low-income and lower

Box 6.9 Leadership fellowship in the Western Pacific Region

Health systems in the Western Pacific Region are managing a double burden of noncommunicable and communicable diseases, while also facing significant economic, social and environmental challenges. Nurses provide approximately 78% of the care in the Western Pacific Region *(317)*, so it is crucial that they are empowered and educated to a level that gives them the influence they need to improve community health outcomes. However, the Western Pacific Region has traditionally experienced a lack of leadership programmes *(318, 319)*, including few for health professionals *(320–322)*, and existing programmes have not been culturally contextualized *(317, 323, 324)*.

From 2009 to 2017, the University of Technology Sydney ran an Australia Awards Fellowships leadership and mentorship programme in partnership with the South Pacific Chief Nursing and Midwifery Officers Alliance *(318)*. The leadership programme focused on human resources for health, collective cultures, teaching mentorship, policy implementation and links with universal health coverage. Impact assessment involved more than 300 stakeholders and programme participants from 14 countries *(318)*.

Initial findings show that 85% of the participants of the leadership model have had major career developments and assumed senior roles in nursing and midwifery. They have also implemented projects in their home countries in areas such as succession planning, professional development, regulation and refresher training *(319)*. Another major finding is that these professions are now represented at global summits, influencing policy on global, regional and national levels *(325)*. Nine nursing and midwifery officers from the leadership programme attended the Seventy-second World Health Assembly. Six have become government chief nurses in their countries, and two are the health ministers of their countries.

middle-income countries, especially in the African, South-East Asia and Eastern Mediterranean regions.

173. Intersectoral policy dialogue will be needed to identify and commit adequate budgetary resources for investments in education, skills and job creation, recruitment, deployment and retention policies, and capacity-building of relevant national institutions, such as licensure and accreditation bodies. Expanding health labour markets creates opportunities for employment, particularly for women. Expanding jobs in nursing could help bolster the female labour force participation – which is only 48% globally for women, compared to 75% for men – and the female employment rate *(326, 327)*. The benefit of investing in the creation of nursing jobs is supported by overwhelming evidence that speaks to the "triple dividend" – for health, gender equality, and development *(21)*.

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Policy options

174. **Countries should coordinate intersectoral action and sustainable financing to enable an expansion of economic demand for the creation of nursing jobs.** The 5.9 million new nursing jobs needed (only focusing on those required to fill current gaps) can be created in most countries with existing domestic funds by effective management of wage bill growth. National planners should consider the efficiency of nursing investments vis-à-vis that of other occupational groups and optimize the productivity of the current and future nursing workforce through appropriate incentives and management systems. Public funds can meet the recurrent costs of health workers in most high- and middle-income countries (assuming normal fiscal growth and ability to prioritize health) *(328)*. Some high- and middle-income countries can address shortages and unlock demand by lifting restrictions on the supply of health workers, while at the same time reducing overreliance on international labour mobility and immigration.

175. **Development partners should align official development assistance for nursing education and employment with national health workforce and health sector strategies.** Some low- and lower middle-income countries will face challenges to create nursing jobs due to insufficient fiscal space. The harmonization and alignment of donors' and development partners' support can expand sustainable financing for strengthening the health and social workforce while ensuring that the wage bill can be expanded and sustained to accelerate progress towards universal health coverage (see Box 6.10 on investing in human capital). Where domestic resources are estimated to be insufficient in the medium and long term, for example in low-income countries and in fragile, conflict-affected, and vulnerable contexts, and governance conditions allow it, mechanisms such as fund-pooling institutional arrangements can be considered.

176. **Countries should address the question of how much nurses should be remunerated considering prevalent local, national and international labour market conditions.** Policy-makers and regulators, such as the civil service or health service commission, should deliberately avoid some typical pitfalls. These may include keeping remuneration levels too low (which can lead to demotivation, excessive turnover and

Box 6.10 Investing in human capital

To increase access to quality primary health care services, as the cornerstone for achieving universal health coverage, substantial investments are needed in infrastructure (for example, hospitals and health centres) and the associated human capital (the health workforce, including knowledge and skills) *(14, 328)*. A number of human capital initiatives are focused on helping countries invest more — and more effectively — in their people to improve outcomes in health, nutrition, quality education and skills.

- The World Bank committed to invest US$ 15 billion to support human capital reforms in low- and lower middle-income countries, with a particular focus on Africa; 63 countries have signed on as human capital project countries.
- The International Monetary Fund is reinforcing all programmes with a social spending initiative as a core objective. They will provide additional technical assistance in the areas of social spending, social protection, education and health.
- Within the context of universal health coverage, the European Investment Bank and WHO are partnering on the human capital agenda through development of a financial instrument that links European Investment Bank investments with targeted support for education, skills and jobs in the health sector.
- The OECD, WHO and the ILO established a United Nations Multi-Partner Trust Fund to pool resources for implementation of recommendations stemming from the United Nations High-Level Commission on Health Employment and Economic Growth related to transformative education, skills and job creation.

illicit coping strategies), too high (which can lead to wage inflation and problems of sustainability of the wage bill), or perpetuating gender pay disparities. The modality of remuneration also matters: nurses are typically paid a fixed income through a salary in most settings, and the income through dual practice is less substantial than for other occupational groups. Attention should be paid to avoiding the known drawbacks of disease-specific or programme-specific top-up incentives that distort national priorities and tend not to be sustainable. Policy-makers should also consider the coherence of the remuneration across health professions in order to avoid, for instance, creating disincentives for choosing a nursing career. Ultimately, nurses should be remunerated at a level that attracts, retains and motivates them sufficiently to meet the country's needs.

6.6 Research and evidence agenda

177. This report has provided an unprecedented wealth of data and an overview of the research evidence on the nursing workforce, allowing the development of policy options for consideration by Member States and other stakeholders. At the same time, its development was affected by several limitations in both data and evidence of effectiveness. The main gaps we identified are reported below and can be considered as part of a forward-looking research agenda.

178. **Nursing-specific quantitative and semi-quantitative evidence.** One of the most important findings in the *State of the world's nursing 2020* report is not from the data, but about the data. There are large and important gaps in information needed to comprehensively understand the nursing workforce and conduct a health labour market analysis, particularly in relation to production capacity, attrition, wage levels and absorption in the health labour market. The support systems that underpin collation, analysis and use of this type of evidence need to be strengthened. The use of NHWA, which hinges on strong intersectoral engagement, can support the policy dialogue and decision-making on planned, sustainable investments to catalyse progress in key areas for nursing.

179. **Evidence on nursing workforce effectiveness in primary health care and universal health coverage.** This report has summarized evidence on the contribution of nurses across different clinical interventions and public health areas. The strongest evidence comes from a systematic review that included 18 randomized controlled trials that showed the effectiveness of nurse-led interventions across a range of primary care functions *(30).* However, 17 of the 18 included studies were conducted in high-income countries, with only one from a middle-income country and none from low-income countries. Further Cochrane and Campbell reviews have also been conducted for specific clinical or programme areas, including antiretroviral therapy, tobacco cessation, mental health and sexual assault examination. Among these, one included only randomized controlled trials, while the others included both experimental and quasi-experimental studies, including controlled trials (randomized or non-randomized), controlled before and after studies, cohort studies (prospective or retrospective), and interrupted time series studies, thus enabling comparison between intervention and control *(31, 33,*

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34). The Campbell review was focused on practices in the United States and the United Kingdom and was thus limited to studies from those countries. The review on antiretroviral therapy only included studies from Africa. All studies in the review on tobacco cessation were from high-income countries, mostly the United States. The mental health review only focused on low- and middle-income countries, including seven studies from low-income countries and 15 from low- and middle-income countries *(31, 33, 34)*. The overview also highlights specific gaps in the evidence on effectiveness, such as nursing interventions with respect to the social determinants of health, including climate change, and nursing interventions in complex emergency settings.

180. **Leveraging different research settings and methodologies.** While the aforementioned evidence reviews are essential to establishing the effectiveness of nursing interventions, the setting of the included studies limits their generalizability and global applicability. Furthermore, experimental and quasi-experimental investigations most typically compared nurses to other health professionals. While this may offer useful insights, the method is ill suited to illustrate and fully understand the team-based nature of efforts and interconnected processes required for the successful delivery of quality health care. A broader range of studies, comprising quantitative (experimental and non-experimental) and qualitative primary studies, mixed methods

reviews, and field descriptions, provide a more comprehensive overview of nursing policy issues across the globe (see web annex). However, most of this evidence was generated in high-income country settings *(30, 329),* including the generation of research priorities *(330).*

181. More needs to be done to support the documentation of nursing interventions in low- and middle-income countries and to support nursing science within low- and middle-income countries, so that nurses themselves drive their research agenda based on their own experience of working in health service delivery. Nurses already make a very substantial contribution to health care science, including developing innovative research methods and using these methods to investigate issues of importance to improving global health *(331)*. Research has shown that the quality of evidence for effective strategies to improve health worker practices in low- and middle-income countries is low *(332)*. Investment in nursing research must therefore focus not only on increasing quantity of output, but also on increasing the quality of the science, as this will contribute to our overall health workforce knowledge.

182. **Evidence on effective policy and system support to optimize the role of nursing.** This report has highlighted the evidence on the effectiveness of policy options to optimize the contribution and impact of nursing, including diverse areas such as education, regulation, deployment, practice and retention. At the same time, the evidence on other areas was less strong. For instance, the return on investments in nursing and the broader health workforce could be better understood and should be studied in a variety of settings and policy contexts, including through studies of cost-effectiveness of nursing care, particularly in primary care settings in low- and middle-income countries. There is also room to strengthen the evidence on effectiveness of policy interventions to retain nurses in practice settings, regulatory and governance approaches to enable nurses to practise to their full scope in primary health care service delivery, and effective mechanisms to regulate private sector education and practice. A more robust evaluation of policies intended to address the negative effects of migration would enable a better design and a more realistic targeting of policy responses. Across all these areas, an explicit gender lens should be applied to the analysis. As most of the reviewed studies have typically a short time horizon, longer-term longitudinal studies might help develop a greater level of confidence in the relevance of the findings to real-life policy settings.

CHAPTER 7

CONCLUSION

183. **This *State of the world's nursing 2020* report has underscored the centrality of nurses as part of integrated teams in making critical contributions towards universal health coverage and other national and global health objectives.** Nurses represent the largest occupational group, with a headcount estimated for 2018 of approximately 28 million, representing a central element of primary health care and health systems in countries of all levels of socioeconomic development.

184. **The data and evidence collated for this report are stronger than ever before.** A total of 191 countries reported on workforce stock — an all-time high and a 53% increase on the health workforce data released in 2018. For the first time, 80% of countries provided WHO with data on at least 15 nursing indicators spanning different workforce policy dimensions. An analysis of stock data trends indicates a shortage of 5.9 million nurses in 2018, concentrated primarily in the African, South-East Asia and Eastern Mediterranean regions. This represents an improvement in the nursing workforce stock in the countries affected by shortages, as compared with the baseline situation identified by the Global Strategy.

185. **Despite signs of progress, the report has also highlighted key areas of concern.** In line with the projections made by the Global Strategy in 2016, an acceleration of progress will be required in low- and lower middle-income countries and the African and Eastern Mediterranean regions in order to address key gaps. The largest shortfall in absolute numbers remains in the South-East Asia Region. The American and European regions face an additional threat in light of their ageing nursing workforce. Several high-income countries in the American, European and Eastern Mediterranean regions appear excessively reliant on international nursing mobility.

186. **National governments, with support where relevant from their domestic and international partners, should catalyse and lead an acceleration of efforts to:**

- build leadership, stewardship and management capacity for the nursing workforce to advance the relevant education, health, employment and gender agendas;
- optimize return of current investments in nursing through adoption of required policy options in education, decent work, deployment, practice, productivity, regulation, and retention of the nursing workforce;
- generate massive investment in the health workforce, and in nurses as part of this, and leverage them for multiple development outcomes, including job creation, gender and youth empowerment.

187. **Translating the evidence of this report, the policy options recommended, and the strategic directions above into concrete policy and investment decisions will require coordination among government sectors and collaboration with the most critical stakeholders.** The findings and data presented should be used to trigger policy dialogue opportunities in countries involving the most important stakeholders. These policy dialogue mechanisms should be leveraged to elicit the requisite decisions in terms of both the adoption of sound and evidence-informed policies and appropriate investment levels.

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Annex 1. Who is a nurse?

Nurses provide a wide variety of services for people in all health care settings, from specialist hospitals to health posts and communities. Nurses hold a diverse set of job titles, roles and educational pathways. The six most common nursing job titles are registered nurse, nurse, licensed practice nurse, advanced practice registered nurse, nurse practitioner, and nursing assistant. However, the role of a nurse in one country may be different from the role of a nurse in another country, even if their job title is the same. This makes it inappropriate to use job title as a method of classification and analysis at international level.

This report aims to present the best available, internationally comparable data on the nursing workforce, as defined by the ILO 2008 International Standard Classification of Occupations (ISCO-08) and reported and validated by WHO Member States. To help achieve this aim, National Health Workforce Accounts (NHWA) use the ISCO-08 system to categorize the health workforce. Countries were asked to classify their nursing workforce into one of two main ISCO-08 codes: professional nurse (ISCO code 2221) and nursing associate professional (ISCO code 3221). Of note, the present section reports on nursing personnel as an occupational group defined above, but it should be noted that "nursing care", putting the nursing personnel within a multidisciplinary health system, involves several other occupations not described in the present section. For example, the ISCO classification and a country's system following ISCO would classify "nurse aids" as health care assistants, a broader support occupational group.[12]

ISCO guidance provides detailed descriptions of which health workers should be counted under each category (Box A1.1). In summary, professional nurses assume responsibility for the planning and management of the nursing care of patients, working autonomously or in teams with medical doctors and others. Nursing associate professionals provide basic nursing and personal care and generally work under the supervision or in support of medical, nursing or other health professionals.

However, in some countries, the distinction between professional nurses and associate professional nurses is blurred. Similarly, the distinction between associate professional nurses and nurse aides is not always clear. In these cases, therefore, an element of judgement was required from national stakeholders. Countries were advised to consider both the roles and responsibilities and the duration of pre-service education when deciding whether to classify an occupation group as professionals or associate professionals, or not nurses at all. For example, as a general rule, a professional nurse will have completed a pre-service education course lasting at least three years. In case a country was not able to decide which category to use, NHWA includes a "nurses: not further defined" option, and some countries opted to place some or all of their nursing workforce into this category. This category corresponds to either nursing professionals or nursing associate professionals, but it excludes nursing aides, who belong to the health care assistant occupational group, not analysed in the present report.

12 ILO International Standard Classification of Occupations: https://www.ilo.org/public/english/bureau/stat/isco/.

Box A1.1 **ISCO definitions of nursing personnel**

NURSING PROFESSIONAL TASKS INCLUDE:	NURSING ASSOCIATE PROFESSIONAL TASKS INCLUDE:
• Planning, providing and evaluating nursing care for patients • Coordinating the care of patients in consultation with other health professionals • Developing and implementing care plans for the treatment of patients in collaboration with other health professionals • Planning and providing personal care, treatments and therapies, including administering medications and monitoring responses to treatment or care • Cleaning wounds and applying dressings • Monitoring pain and discomfort in patients and alleviating pain using therapies, including painkilling drugs • Planning and participating in health education programmes, health promotions and nurse education activities • Answering questions from patients and families and providing information about prevention of ill-health, treatment and care • Supervising and coordinating the work of other health workers • Conducting research on nursing practices and procedures	• Providing nursing and personal care and treatment and health advice to patients according to care plans established by health professionals • Administering medications and other treatments to patients, monitoring patients' condition and responses to treatment, and referring patients and their families to a health professional for specialized care as needed • Cleaning wounds and applying dressings • Updating information on patients' conditions and treatments received in record-keeping systems • Assisting in planning and managing the care of individual patients • Assisting in giving first-aid treatment in emergencies

Note: The distinction between professional and associate professional nurses should be made on the basis of the nature of the work performed in relation to the tasks specified above. The qualifications held by individuals or that predominate in the country are not the main factor in making this distinction, as training arrangements for nurses vary widely between countries and have varied over time within countries.

Source: Adapted from ISCO-08.

Annex 2. Methods

Indicators used in the *State of the world's nursing 2020* report

WHO member states were invited to submit from July 2019 to November 2019 the most recent available data on the nursing workforce through 36 indicators, 30 from the NHWA and six additional specific indicators (see list in Table A2.1). The 30 indicators are defined in the *NHWA handbook*,[13] which also provides detailed definitions and metadata for each indicator.

Data collection process

NHWA is a continuous process with progressive improvement of availability, quality and use of health workforce data. As part of this process, countries were encouraged to set up multistakeholder working groups on all health workforce data-related aspects to conduct internal validation before submitting data; this was done in a substantial number of countries. The preparation of the *State of the world's nursing 2020* report accelerated this global effort of improved monitoring and reporting of standardized data. Countries were asked to nominate focal points, which were provided with access to the NHWA online platform to enter or validate the data. In addition, data for OECD countries resulting from the joint OECD, Eurostat and WHO Regional Office for Europe data collection questionnaire were prepopulated to avoid double reporting to international organizations, and focal points were advised to review and validate the data. The population size for each country and year were extracted from the 2019 revision of the *World population prospects* of the United Nations Department of Economic and Social Affairs.[14] Additional data on indicators assessing the governance and policy environment through binary questions (yes/no) on the existence of related mechanisms and processes, as well as on the duration of education and training, were also gathered from the Sigma and the NCBSN databases[15] to complete information for a small number of countries.

To support the data collection, WHO conducted regional NHWA workshops in all six regions and provided tools and information in several languages. In total, more than 250 representatives from around 80 countries attended these capacity-building events. Data were submitted between July and November 2019, and data cleaning and analysis were conducted between October and December 2019. The present report is based on the data set from the NHWA online platform as of 17 December 2019.

NHWA focal points were advised to involve nursing leaders and other national stakeholders. The WHO country and regional offices supported the NHWA implementation and reporting process, including the collection, reporting and validation of the relevant data.

Data reported

Of the 194 WHO Member States, 193 reported data (191 reported on stock) either directly via the NHWA platform or through regional offices and other international processes such as OECD, Eurostat and WHO Regional Office for Europe joint data collection on non-monetary health care statistics. Figure A2.1 illustrates that 80% of countries provided data for at least 15 of the 36 selected indicators, and 23% of countries did so for at least 25 indicators.

The main data gaps were for the indicators relating to wages, expenditure on nursing education and other education-related issues. For selected indicators, alternative sources were identified to supplement the NHWA data, such as duration of education and training, wages and capacity indicators. For example, the international nursing honours society, Sigma, manages a database on the status of nursing education globally, including indicators on entry-level wages and educational programme duration for around 50 additional countries. For the set of binary indicators relevant to policies and regulations of nursing practice and education, the Global Regulatory Atlas was used to identify where licensure examinations are required and where regulatory bodies exist.

13 National Health Workforce Accounts: implementation guide. Geneva: World Health Organization; 2018.

14 Department of Economic and Social Affairs and Population Division. World population prospects 2019, online edition, revision 1. New York, United States of America: United Nations; 2019.

15 Sigma data extracted from: https://www.sigmanursing.org/advance-elevate/research/research-resources. NCSBN data extracted from: https://www.ncsbn.org/national-nursing-database.htm.

Table A2.1 List of 36 indicators used for the *State of the world's nursing 2020* report

Thirty indicators were derived from the *NHWA handbook* and six were specifically designed for the present report.

	Indicator name (NHWA abbreviated)	NHWA number	Response rate as of 17 December 2019
NURSE WORKFORCE STOCK AND DISTRIBUTION	Nurse density by type/level of nurse	1-01	98%
	Nurse density at subnational level	1-02	31%
	Nurse distribution by age group	1-03	55%
	Female nurse workforce	1-04	68%
	Nurse distribution by facility ownership	1-05	47%
	Nurse distribution by facility type	1-06	34%
	Share of foreign-born nurses	1-07	35%
	Share of foreign-trained nurses	1-08	46%
EDUCATION AND TRAINING	Master list of accredited education institutions	2-01	88%
	Duration of education and training	2-02	56%
	Number of applications for education and training	2-03	12%
	Ratio of nursing students to qualified educators	2-05	10%
EDUCATION AND TRAINING REGULATION AND ACCREDITATION	Standards for duration and content of education	3-01	87%
	Accreditation mechanisms for education institutions	3-02	84%
	Standards for interprofessional education	3-06	80%
	Continuing professional development	3-08	82%
EDUCATION FINANCES	Expenditure per graduate on nursing education	4-05	7%
HEALTH LABOUR MARKET FLOWS	Graduates starting practice within one year	5-01	14%
	Replenishment rate from domestic efforts	5-02	45%
	Entry rate of foreign nurses	5-03	11%
	Voluntary exit rate from health labour market	5-04	9%
	Unemployment rate	5-06	8%
EMPLOYMENT CHARACTERISTICS, WORKING CONDITIONS	Health workers with a part-time contract	6-02	6%
	Regulation on working hours and conditions	6-03	86%
	Regulation on minimum wage	6-04	86%
	Regulation on social protection	6-05	86%
	Measures to prevent attacks on health workers	6-09	80%
NURSING WORKFORCE SPENDING AND REMUNERATION	Entry-level wages and salaries	7-05	42%
	Gender wage gap	7-07	3%
SKILL MIX COMPOSITION FOR MODELS OF CARE	Existence of advanced nursing roles	8-06	79%
ADDITIONAL *STATE OF THE WORLD'S NURSING 2020* SPECIFIC INDICATORS	National chief nurse (or equivalent) role	–	84%
	National leadership development opportunities	–	76%
	National association for pre-licensure students	–	76%
	Authority that regulates nursing	–	98%
	Standards for faculty qualifications	–	68%
	Fitness for practice or licensure examination	–	92%

Note: For further information on NHWA indicators, detailed information with metadata is available in the *NHWA handbook*: https://www.who.int/hrh/documents/brief_nhwa_handbook/en/.

Metadata for the additional six non-NHWA indicators are available on request to SOWN2020@who.int.

Of the 191 countries, 83% provided nursing headcount data from 2017 or 2018. Others were able to provide data only from earlier years (from 2013 to 2016). In such cases, the 2018 headcount was estimated by applying the latest available year's density to the 2018 population. For four countries for which headcount was not reported, the corresponding regional densities were applied to their 2018 populations.

The fact that many countries — most notably in west and central Africa and in central Asia — were unable to provide data for several indicators indicates a critical need to continue to strengthen human resources for health information systems in these regions.

Not all data collected are presented in this report: only indicators for which a significant number of countries reported statistics were analysed and presented. Additional data will be made available progressively through a public portal for accessing NHWA data.

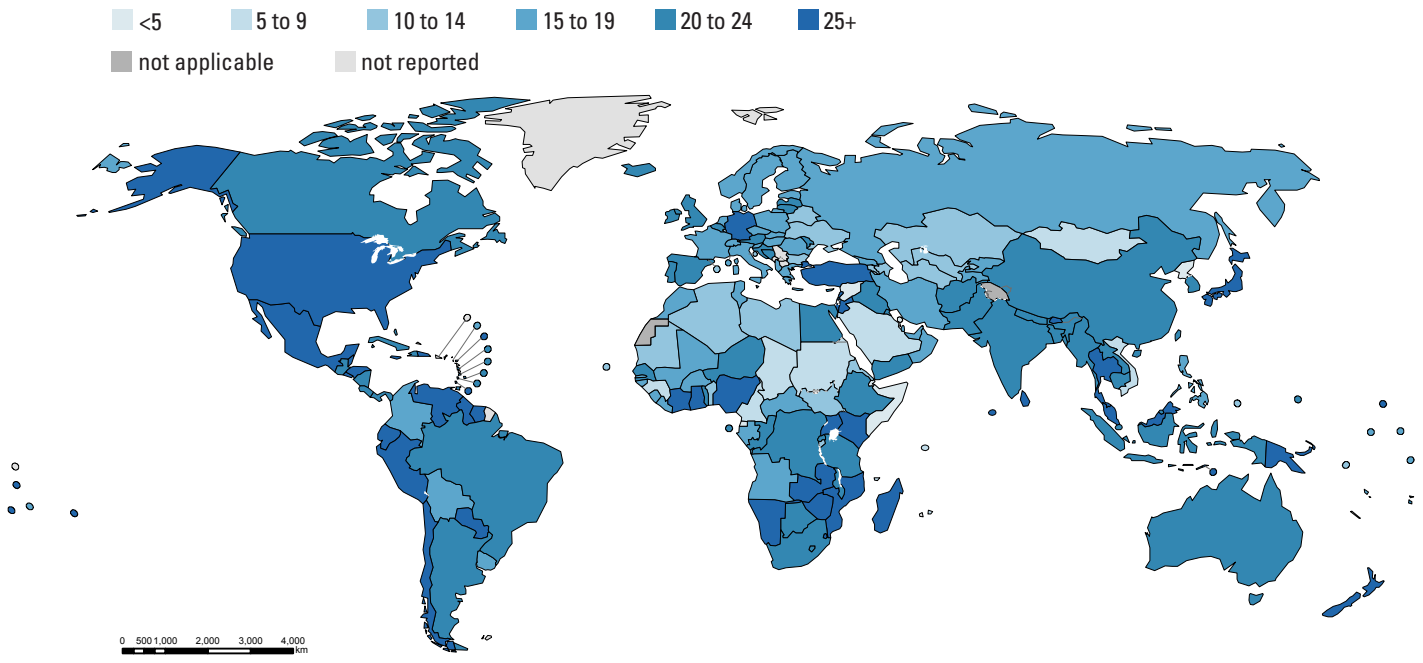
Composite score on education regulation and working conditions in sections 5.4 and 5.6

Whilst most analyses were purely descriptive in nature, focusing mainly on percentages, composite scores were used to summarize regulation of education and working condition indicators. For both scores, a country was awarded 1 point for every indicator for which the answer was "yes", 0.5 points if the answer was "partially", and 0 points if the answer was "no", then the scores were added to determine a composite one. Thus, the maximum possible score was 9, and the minimum was 0. For indicators with missing information, the indicator was considered as "no", hence 0 points.

Multiple correspondence analysis of education regulation and working conditions in sections 5.4 and 5.6

Indicators on regulation of education and practice display a high level of correlation: if one is answered "yes", it is likely that some others will also be answered "yes". To better understand such patterns, a multiple correspondence analysis was conducted, which simplifies the correlation between many variables in a single two-dimensional graph (Figure A2.2). The analysis enabled extraction of two dimensions (x and y axis). The first "dimension" (the x axis) can be interpreted as factors associated with the absence of regulation on the right as opposed to presence of regulation on the left. The first

Figure A2.1 **Number of indicators reported globally for the *State of the world's nursing 2020* report**



Note: includes 30 NHWA indicators and six capacity questions.
Source: NHWA 2019.

dimension explains 79.7% of the variation between variables. The second dimension (the y axis) can be interpreted as an absence of accreditation mechanisms towards the top of the axis as opposed to an absence of education regulation towards the bottom of the axis. This dimension explains 2.1% of the variation between indicators. The graph also includes regions to highlight to which indicators they are more closely correlated. The analysis confirmed that, with the South-East Asia Region, Eastern Mediterranean Region and Western Pacific Region on the right side of the graph, these regions are more likely to be associated with a lower level of regulation of nursing education.

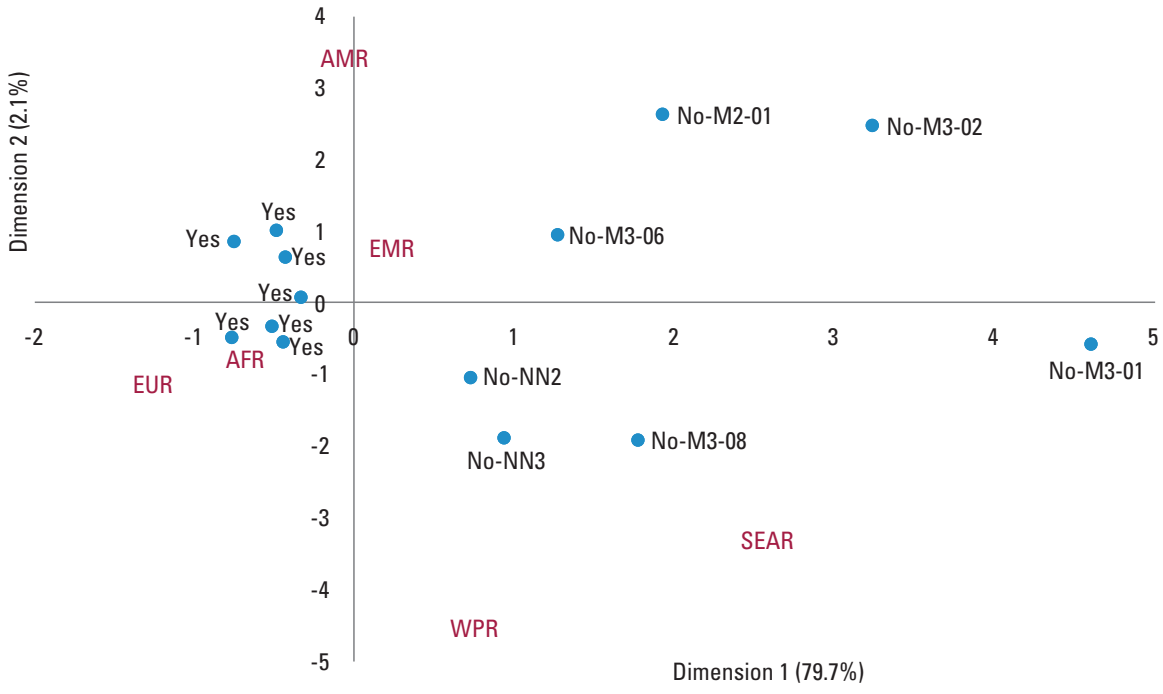
The indicators on working conditions were strongly correlated, as evidenced by multiple correspondence analysis (Figure A2.3). Two indicators showing a strong correlation were measures to prevent attacks and existence of advanced nursing role: this might suggest that in more risky environments nurses may be awarded a greater level of professional autonomy to continue ensuring patient care under challenging circumstances. The European Region displayed a different pattern than other regions, indicating both fewer measures to prevent attacks on workers and fewer advanced nursing roles.

Projected stock by 2030

For the assessment of the stock of nurses by 2030, three scenarios were developed, as follows.

- **Scenario 1: ageing** (single effect of ageing of the nursing workforce). A projection used the age distribution per country and a stable age group of less than 35 years, considering a replenishment of one tenth the size of this lowest age category. It considered an ageing workforce with retirement of one tenth of the size of the group of nurses aged 55 years and over. This scenario does not take into account the graduation statistics and considers the proportion of the younger age group as constant for upcoming years.

Figure A2.2 **Correlation of education indicators with a multiple correspondence analysis**



Type of analysis: multiple correspondence analysis of variables on regulation of nursing education system; regions are displayed as independent variables.

Variables summarized in the present graph: M2-01: master list of accredited education institutions; M3-01: standards for duration and content of education; M3-02: accreditation mechanisms for education institutions; M3-06: standards for interprofessional education; M3-08: continuing professional development; NN2: fitness for practice examination; NN3: standards for faculty qualifications.

AFR = African Region; AMR = Region of the Americas; SEAR = South-East Asia Region; EUR = European Region; EMR = Eastern Mediterranean Region; WPR = Western Pacific Region.

Source: NHWA 2019. Latest available data reported by countries between 2013 and 2018.

- **Scenario 2: replenishment.** A scenario with similar ageing as scenario 1 but using the most recent graduation rate by region computed in section 5.5 to which a correction factor of 0.6 was applied, assuming that 60% of the new graduates will find a job in the health sector, to mimic the difference between graduation and entry into the active workforce as observed in OECD countries.

- **Scenario 3: accelerated replenishment.** A similar scenario as scenario 2 but considering an acceleration of graduation and absorption rate, with more graduates per year by 2030, assuming a growth of 50% from 2018 to 2030 of the graduation capacity of countries (equivalent to an annual increase of 3.44%). This scenario also assumes a 60% absorption into the health labour market.

From these scenarios, estimated projected densities for 2030 were calculated using population estimates from the United Nations population prospect estimates for 2030.

To assess the impact of scenario 3, various simulations with variations in the increase in graduates were used: 25% increase, 50% increase and 100% increase (a doubling of production) (Figure A2.4). This shows that the choice of the growth rate of the number of nursing graduates does not drastically impact the estimated stock by 2030, with projected stocks of 38.0 million, 39.7 million and 42.8 million nurses with total growth rates of 25%, 50% and 100%, respectively.

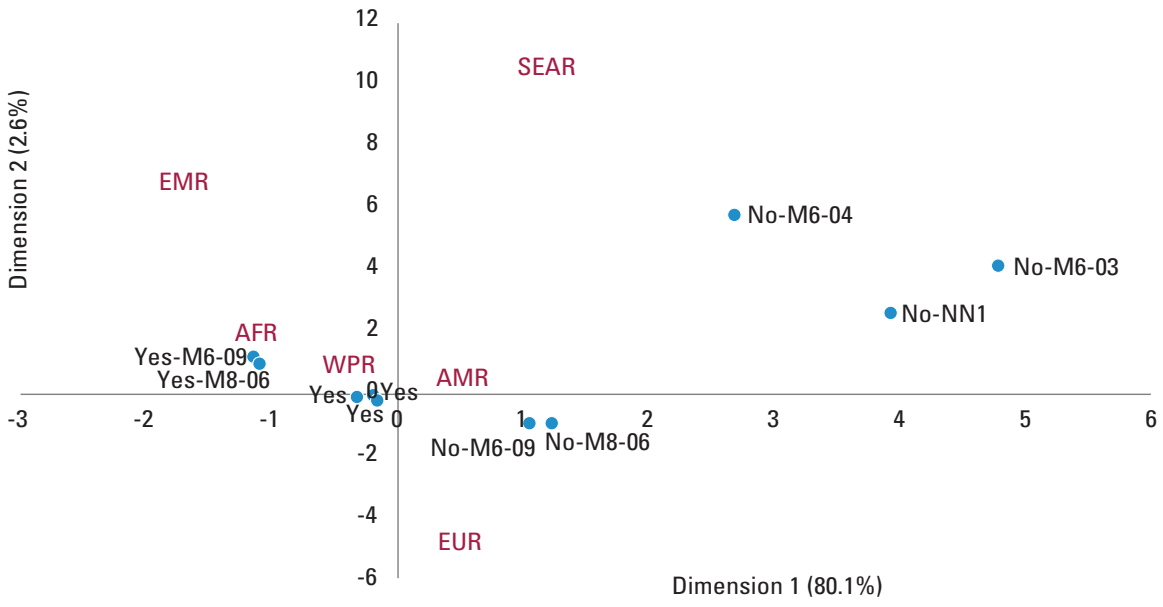
Words of caution in interpreting projections

Several limitations need to be taken into account when interpreting projections.

1. Regarding the availability of data, not all countries were able to report on age, used in scenario 1, and on graduation rate, used in scenario 2. The analysis showed consistent results for scenarios 1 and 2, therefore providing reassurance on the entry rate into the labour market of new graduates.

2. Several assumptions were used on the attrition rate for personnel aged 55 years and above. This could potentially vary across regions and might be optimistic, considering that the retirement age will be up to 65 years. Similarly, the analysis applied a ratio of 0.6

Figure A2.3 **Correlation of working condition indicators with a multiple correspondence analysis**



Type of analysis: multiple correspondence analysis of variables on regulation of working conditions; regions are displayed as independent variables.

Variable summarized in the present graph: M6-03: existence of regulation on working hours and conditions; M6-04: regulation on minimum wage; M6-09: existence of measures to prevent attacks; M8-06: existence of advanced nursing role; NN1: existence of nursing council.

AFR = African Region; AMR = Region of the Americas; SEAR = South-East Asia Region; EUR = European Region; EMR = Eastern Mediterranean Region; WPR = Western Pacific Region.

Source: NHWA 2019. Latest available data reported by countries between 2013 and 2018.

for adding graduates who were starting to practise, based on the OECD ratio of practising to licensed nursing workforce. However, this could potentially vary by region. To test the impact of all underlying assumptions for scenarios 1–3 a series of sensitivity analyses were conducted. Results only varied marginally, and the conclusions remained largely unchanged.

3. Projections only reflect recent trends and provide a broad understanding of the trajectory of the stock of the nursing workforce. This would need to be revised in the future as more data become available. Also, these projections do not replace the conclusions derived from national-level modelling, which would take account of a wider range of health workforce and other indicators throughout the health labour market and more detailed economic statistics, including fiscal space.

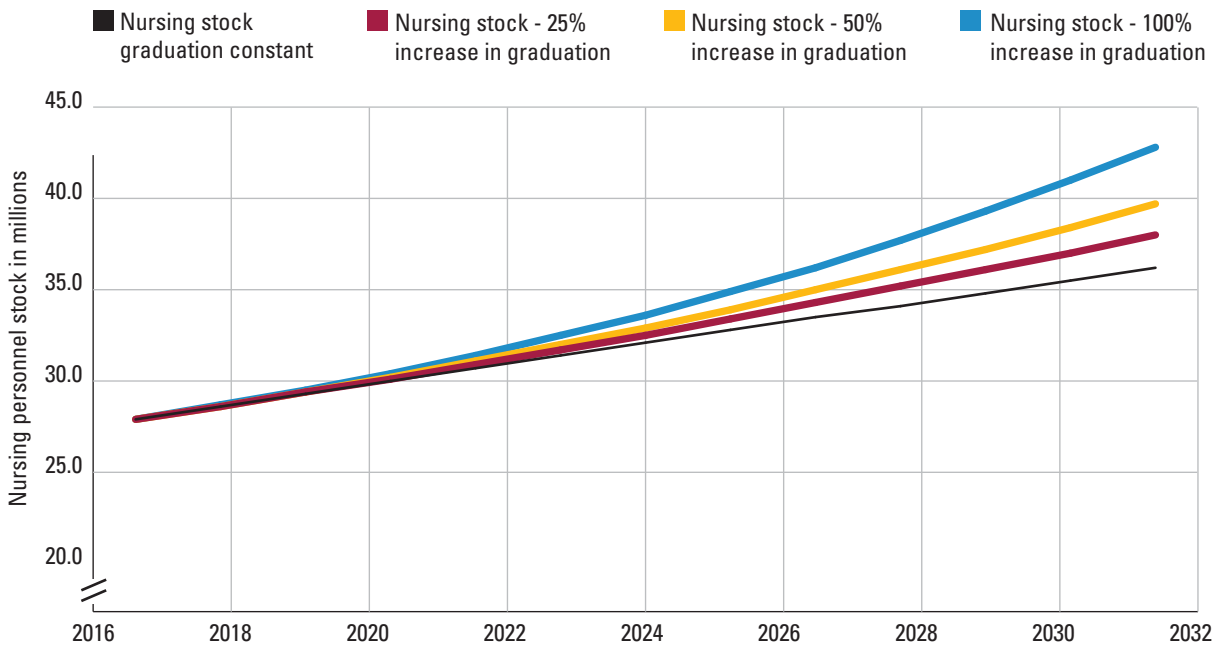
Estimating shortage

The estimation of the shortage in nursing personnel followed a method similar to the one described in the Global Strategy on Human Resources for Health. However, because of the updated data, the shortage values cannot be directly compared to those estimated in the Global Strategy.

The analysis shows that the estimation in the Global Strategy was based on 102 countries with stock available for the period 2009–2013; older or imputed data were used for the remaining countries. Based on the recent data available for the *State of the world's nursing 2020* report, 174 countries had stock data for 2013 or the previous five years (including 130 countries with 2013 data), and the revised stock for 2013 was estimated at 23.2 million nurses. The stock for 2018 is based on data for 191 countries for the period 2013–2018, including 89% with data for 2017 and 2018. Therefore, the stock reported in the *State of the world's nursing 2020* report for 2018 can also be considered as a very robust estimate.

For estimating the shortage, the 2018 and 2030 densities were compared to a benchmark value used in the Global Strategy on Human Resources for Health. That benchmark of 4.45 medical doctors,

Figure A2.4 **Evolution of global nursing stock (millions) under a "business as usual" scenario and three "increased production of graduate nurses" scenarios, 2018 to 2030**



Note: "Nursing stock" includes nursing professionals and nursing associate professionals.

Correction factors used, region specific: ageing factor (one tenth of age group aged 55 years and above in 2018 retiring per year), the graduation rate from section 5.5 analysis corrected by 0.6 (OECD practising to licensed ratio) to account for activities outside nursing practice.

nurses and midwives per 1000 population was then converted into a benchmark value for nursing.

- First, the share of nurses and midwives in the Global Strategy was applied to this benchmark: with 20.7 nurses and midwives per 10 000 population and 9.8 medical doctors per 10 000 population in 2013, the benchmark is corrected to 3.02 nurses and midwives per 1000 population (4.45 x (20.7/(9.8+20.7))).

- Then, to calculate a benchmark value for nurses only, the share of nurses among nurses and midwives combined (90.7% from most recent year) was applied to this benchmark, giving a benchmark value of 2.74 nurses per 1000 population.

- Because densities on the health workforce are expressed per 10 000 population, the value of 27.4 nurses per 10 000 population was used as benchmark.

- This benchmark value was then compared to the density observed in 2018 and projected for 2030 under the three scenarios.

The estimated shortage by 2030 was estimated for the three projection scenarios described above and showing that the shortages remain high in low- and lower middle-income countries under each scenario (Table A2.2).

Cost per graduate

Multiple divergent sources of costs per graduate were identified for low- and lower middle-income countries, where the shortages are mostly located. These range from US$ 5180 in Madagascar, US$ 5589 in the World Bank ECSA analysis,[16] and US $5656 in Mozambique, to US$ 19 794 in Ghana.[17] Therefore, computations of costs were conducted with a lower-cost scenario of US$ 5000 per graduate, an intermediate scenario of US$ 10 000 per graduate, and a higher scenario of US$ 20 000 per graduate. Note that available data on these costs were from African countries and could not be transposed to high-income countries, for which published data show much higher costs per graduate.

Table A2.2 Estimates of shortage of nursing personnel (millions) in countries below the Global Strategy threshold by income level: 2018 and 2030 (three scenarios)

INCOME GROUP	2018	2030		
		Ageing and stable young age group	Ageing and graduation as of recent years	Ageing and graduation increasing by 50% by 2030
Low-income	1.34	1.80	1.54	1.26
Lower middle-income	3.91	3.44	2.81	1.54
Upper middle-income	0.67	0.45	0.25	0.12
High-income (used as reference, all with density above threshold)	–	–	–	–
Global	**5.91**	**5.69**	**4.60**	**2.92**

Note: "Nursing personnel" includes nursing professionals and nursing associate professionals. Income grouping is from the World Bank classification as of 2018.

16 Araujo EC, Garcia-Meza AM. Nurse labour market analysis in 16 countries in east, central, and southern Africa (preliminary findings, unpublished). Washington (DC): World Bank; 2020.

17 Beciu HA, Preker AS, Ayettey S, Antwi J, Lawson A, Adjey A. Scaling up education of health workers in Ghana. Washington (DC): World Bank; 2009.

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