State of the

world's nursing 2025

Investing in education, jobs, leadership and service delivery

World Health Organization

ICN International Council of Nurses
The global voice of nursing

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Left: Nurse Lillian leads a daily health discussion at the NCD clinic at Koidu Government Hospital, Sierra Leone. © WHO/Michael Duff
Left centre: Nurse giving babies the polio vaccine in the occupied Palestinian territory. © WHO
Right centre: a midwife/nurse applies an adhesive bandage to 10-year-old Fitriani after she receives her vaccination. © WHO/Harrison Thane
Right: Nurse who attended an immunization training in Bokhtar, Tajikistan. © WHO

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Preface

Central to the achievement of the Agenda for Sustainable Development is an adequate, equitably distributed and fully supported health workforce. Nurses are the largest occupational group and represent an indispensable force with which to combat inequities in access to health services and progress towards health-related Sustainable Development Goals (SDGs), while advancing gender equality through the strengthening and empowerment of a highly feminized profession.

The 2025 edition of the *State of the world's nursing* provides the most comprehensive and up-to-date analysis of the nursing workforce. The report features new indicators on critical areas for nursing, such as education capacity, advanced practice nursing and remuneration. In addition to the 12 policy priorities from the *Global strategic directions for nursing and midwifery 2021–2025*, there are five additional policy priorities and a compilation of data from each WHO region. Country profiles reflect each country's national data and are available for download from the WHO website.

With 5 years left of the SDG era and rising geopolitical tensions, economic retrenchment and concurrent protracted crises, we are at a strategic juncture. We can continue down the path of stagnated progress on universal health coverage and slower progress in reducing the health worker shortage. Or we can seize the opportunity this report presents to drive country-level investments and actions in support of nurses providing essential life-saving services in stronger health systems.

We call on policy-makers in countries, nursing associations, regulators, development partners, partner organizations and other stakeholders to utilize this report for policy dialogue and decision-making on how and where to strengthen nursing to achieve universal health coverage and the other health-related SDGs. These next 5 years are our final opportunity to do so.

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Executive summary



Left: A nurse provides bedside care to a patient in a hospital in the Cook Islands. © WHO/Yoshi Shimizu
Centre: Hasan Mohammad Al-Hroub, a registered nurse, in occupied Palestinian territory. © WHO
Right: A young child receiving an ear examination from a caring nurse in Latvia. © WHO/Gatis Orlickis

Introduction

A rapidly changing global context brings challenges for health systems and affects health and well-being. Geopolitical instability, conflicts, climate change and environmental disruptions are impacting an increasing number of countries. Economic uncertainty persists alongside rising debt burdens, inflation and shrinking fiscal space, all of which impact social sector spending. Ramifications on human health are reflected in slowed progress in reducing maternal, neonatal and child mortality, and increases in noncommunicable diseases (NCDs), mental health conditions, communicable diseases, antimicrobial resistance and high-threat infectious hazards.

There are 5 years remaining in the Agenda for Sustainable Development 2030. Progress on universal health coverage (UHC), health security and the health-related Sustainable Development Goals (SDGs) cannot be achieved without adequate numbers of health and care workers with the requisite competencies to meet population health needs. While the global "stock" of health workers has steadily increased in the last decade, progress in closing the shortage of health workers has slowed, prompting an upward revision of the projected global shortage in 2030 from 10 million to 11 million, 69% of which will be borne by the WHO African and the Eastern Mediterranean regions. These gaps in access to health workers represent a prominent inequity which needs to be addressed.

State of the world's nursing 2025 provides updated and validated data and evidence on the global nursing workforce as reported through a standardized approach for national health workforce data. The data in this report reflect a 33% increase in the number of countries reporting on a core set of indicators as compared with *State of the world's nursing 2020*. The improved data availability allows greater precision in describing the challenges to nursing education, employment, service delivery and leadership, and and proper planning policy responses to address them. Country profiles with national level data are available online for download.

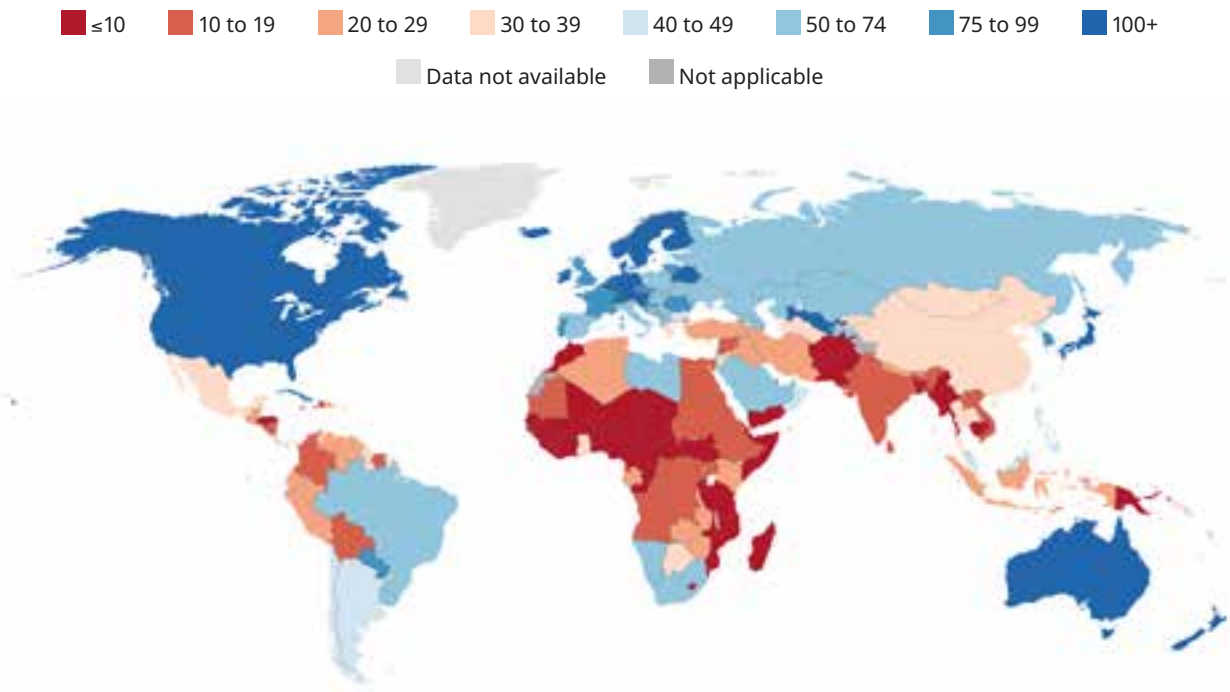
A nurse in Marsabit County, Kenya, advises a mother on the importance of routine vaccination. © WHO/Billy Miaron

Jobs/employment

The global stock of nurses is 29.8 million in 2023 and reflects growth from the previous report (27.9 million in 2018); however, the global distribution and density of nurses in 2023 is highly inequitable and it masks a shortage of 5.8 million nurses. Around 78% of the world's nurses are found in countries representing only 49% of the world's population; high-income countries (HICs), which represent only 17% of the population, host 46% of the world's nursing population. The global density of nurses (37.1 nurses per 10 000 persons) is similarly skewed across WHO regions and income classification. Nurse density in the WHO European Region is five times higher than that in the African and Eastern Mediterranean regions; there is a tenfold difference between the density of nurses in HICs versus low-income countries (LICs). These statistics indicate that much of the world's population has substantially less access to nurses for services such as maternal and childcare, chronic disease management, and response to public health threats and emergencies.

The global nursing workforce is increasingly professional and predominantly works in the public sector. In 2023, 80% of nursing personnel were identified as "professional nurses", providing a multitude of health services with a considerable level of autonomy. Approximately 17% of nursing personnel were classified as "associate professional nurse" with less autonomy in the workplace; it was not possible to classify 3% as either type of nurse. Around 70% of nurses were found in public sector facilities, as opposed to private not-for-profit or private for-profit facilities. While professionalization can improve care quality, it should be accompanied by differentiated roles, scopes of practice, and corresponding compensation in work settings, to not fuel nurse migration to countries that offer better professional opportunities.

Figure 1 **Density of nursing personnel per 10 000 population in 2023**



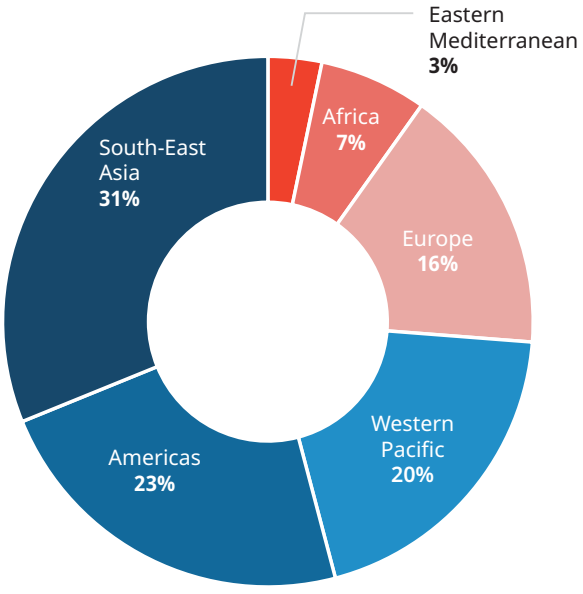
Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

The global nursing workforce is 85% female and relatively young, but age patterns vary by region and by income group. Globally, 33% of nurses are aged under 35 years, compared with 19% who are aged 55 years or above (i.e. for every 100 nurses nearing retirement globally, there are 174 young workers). However, in 20 countries (mostly high-income and from the European Region) the nurses expected to retire in 10 years outnumber early career nurses. Stark regional differences may signal a scenario where regions most in need of experienced nurses will have predominantly novice workforces, while regions with better resources face large numbers of nurses retiring. These trends could also fuel unmanaged international migration, and impact care quality and mentorship capacity.

The distribution of foreign-born nurses indicates continued international mobility and migration. Approximately one in seven practising nurses in 2023 was born in another country. High-income countries have a far higher reliance on foreign-born nurses (23%) than countries in other income classification groups (8% in upper middle-income countries; 1% in lower middle-income countries; 3% in LICs). The increasing reliance on foreign-born nurses in HICs represents a transfer of educational investment from low- to high-income countries. This compromises health system development in source countries while inadvertently compensating for insufficient workforce planning and inadequate investments in education capacity in destination countries.

While the global stock of nurses is projected to increase to 36 million by 2030, the inequity of that growth and the distribution of the global shortage will become even more pronounced. While the global density is projected to rise from 37.1 per 10 000 population in 2023 to 42.5 per 10 000 population in 2030, due to high population growth, the African and Eastern Mediterranean regions will see little to no growth in their nurse to population ratio between 2023 and 2030. The aggregate global shortage of nurses will continue to decrease, from 5.8 million in 2023 to 4.1 million in 2030. However, the concentration of the nursing shortages in the African and Eastern Mediterranean regions (nearly 70% of the global total by 2030) will undermine service delivery capacity and slow progress towards UHC.

Figure 2 **Distribution of the projected increase of nursing stock from 2023 to 2030 by WHO region**



Source: NHWA; 2024.

Education

Improved data on nurse graduates provide a mixed picture of progress in increasing the domestic production of nurses. The ratio of new nurse graduates to the "stock" of nurses in 2023 reflects the pace and volume of the domestic production of nurses. Low-income countries had a graduate to stock ratio that falls within WHO's recommended range (8–12%) and is higher than that of HICs (8.3 vs 5.3 graduates to 100 active nurses, respectively). However, this pattern is reversed in the ratio of nurse graduates to population: it is highest in HICs and progressively decreases in other income groups. The nurse graduates to population ratios are substantially lower in the African and the Eastern Mediterranean regions compared with other regions, perpetuating patterns of inequitable and inadequate access to care.

Globally, the most common duration of nursing education programmes was 3 years (53%), followed by 4-year programmes (31%) and 2-year programmes (9%). While countries are introducing various education pathways to bachelor's degrees, resource-limited settings may struggle to implement the more demanding programmes effectively. In some cases, graduates of bachelor's programmes may not find sufficiently differentiated roles, responsibilities and compensation in health settings that commensurately reward the longer investment in education. The trend toward bachelor's degrees without corresponding role differentiation creates a mismatch between educational investment and job opportunities, potentially fuelling dissatisfaction and migration.

Bottlenecks to scaling up nursing education include limitations in clinical skills sites, availability of faculty and demands of digital learning environments. The development, recruitment and retention of nursing faculty have not kept pace with demand in proliferating education settings and higher expectations of workload. Faculty shortages and inadequate clinical sites create a compound problem, not only limiting existing graduation capacity but potentially compromising quality of education which can affect future care quality and graduates' ability to practise independently. The use of digital technologies and artificial intelligence (AI) in nursing education has expanded, but there are challenges with respect to equity, competency, readiness of faculty and clinical learning opportunities.

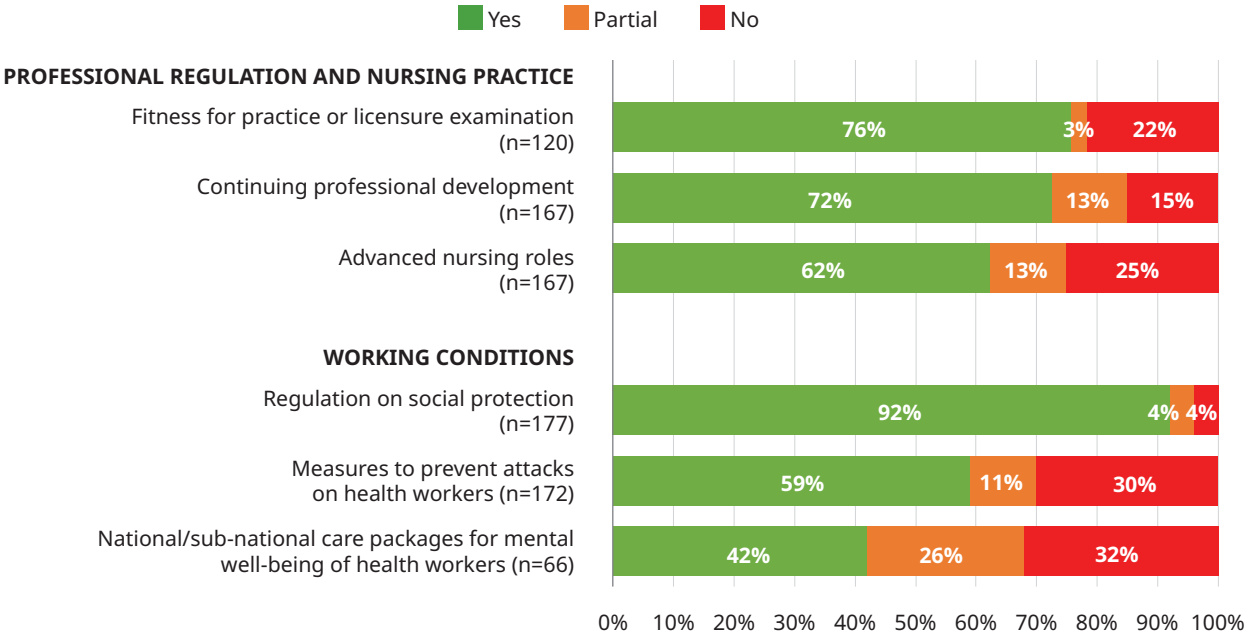
Quality assurance mechanisms for nursing education are largely in place, but relatively little is known about the extent of their implementation. Most responding countries reported standards for faculty qualifications (90%); national accreditation mechanisms (88%); and cooperation between the education, regulation and employment settings on accreditation standards (77%). However, these provisions can only impact the quality of nursing education when they are adequately supported, resourced and implemented. Fewer responding countries reported accreditation standards that include interprofessional education (62%) or social determinants of health (45%), despite the relevance of these aspects to effective nursing practice in interdisciplinary and primary healthcare-oriented teams.

Service delivery

Most responding countries (92%) have a regulatory body for nursing, an assessment of initial competency (76%), continuing professional development (CPD) (72%), and advanced practice nurse (APN) roles (62%). Many of the indicators for initial and continued competency varied by WHO region and published evidence describes substantial global heterogeneity in APN education and regulation. Inconsistent standards between countries can complicate mutual recognition of nursing qualifications and limit opportunities for international mobility, while potentially compromising patient safety. Despite growing evidence on the benefits of APN and nurse-led care, restriction of nurses' scope of practice represents a missed opportunity for improving health services access, quality and effectiveness.

Most countries have laws to support and safeguard nurses in the work environment, but too few have provisions for mental well-being. Most responding countries reported laws on minimum wages (94%), social protection measures (92%) and health worker safety (78%). Fewer of the responding countries indicated regulation on working hours and conditions (55%) and provisions for mental well-being (42%). The extent of application of these support and safeguards provisions remains largely unknown; adequate investments and implementation are needed to operationalize them to advance nurses' safety, motivation and retention. The gap in mental health support threatens workforce sustainability, particularly after COVID-19's multidimensional impact on health and care workers.

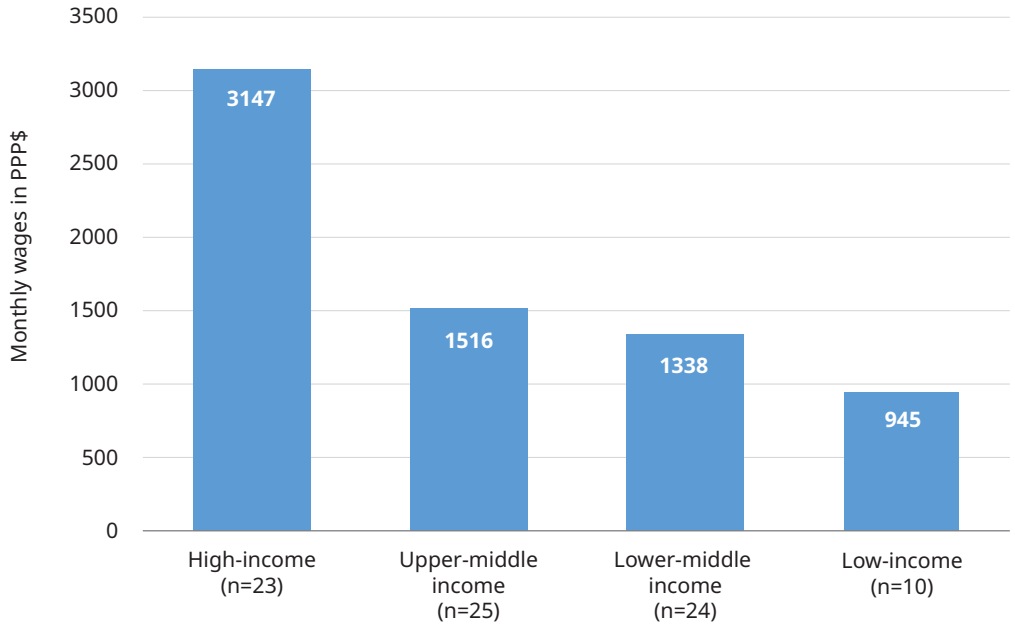
Figure 3 **Percentage of responding countries that reported existence of aspects related to service delivery (professional regulation, nursing practice and working conditions)**



Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

The global median entry-level wage of nurses in 2023 was US$ 774 per month in 82 countries, with significant differences by WHO region and by income group. Median wages in HICs were twice as high as in upper middle-income countries, and three times as high as in LICs. Wages adjusted for purchasing power parity (PPP) indicated that the European and Eastern Mediterranean regions have the highest median entry wages; and the WHO African and South-East Asia regions have the lowest. An analysis of disaggregated data from 31 countries identified a gender pay gap of 7%. The differences in wages and PPP, coupled with a 7% gender pay gap, creates powerful economic incentives for migration while perpetuating gender inequity in the profession.

Figure 4 **Monthly median entry level wage and salaries in PPP$, by World Bank income group**



Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 82 countries on the average monthly entry-level wages and salaries of nurses. PPP is the purchasing power parity in constant 2021 $ international, calculated from country-level estimation on US$ and PPP$ from the International Comparison Program, World Development Indicators Database, World Bank.

Leadership

Most responding countries (82%) reported having a government chief nursing officer (GCNO) (or equivalent position), but their roles in nursing workforce management and health policy and planning are unclear. Without clear authority and resources, GCNOs cannot effectively influence workforce planning or policy, leaving nursing perspectives out of critical health system decisions. This governance gap affects everything from education planning to working conditions and, ultimately, patient care quality. There is also a gap in terms of access to leadership development opportunities for nurses: while 66% of responding countries reported the existence of leadership development programmes for nurses, these were reported in only 25% of LICs.

Policy priorities

All 12 policy priorities of the WHO *Global strategic directions for nursing and midwifery 2021–2025* remain highly relevant for the period 2026–2030; however, each has "areas of emphasis" on which to focus on what remains of the SDG era. In addition, five emerging policy priorities were identified in the areas of advanced practice nursing, gender equality, digital health and technology, the climate agenda, and nurses in situations of war and conflict.

→ Jobs/employment

Conduct nursing workforce planning and forecasting using a health labour market lens. Planning in many low- and middle-income countries (LMICs) should focus on increasing the pool of graduate nurses, ensure absorption into the health system, and improve working conditions to reduce excessive out-migration and account for growth in populations and labour markets. High-income and European countries should focus on expanding enrolment in pre-service education and on retention to offset losses from retirement and to decrease reliance on international recruitment.

Ensure adequate demand (jobs) with respect to health service delivery for primary healthcare and other population health priorities. The priority is to accelerate growth in demand for nursing jobs, particularly in the African and Eastern Mediterranean regions. This will require securing sustainable domestic and, where domestic resources are insufficient to adequately expand fiscal and economic space, external health workforce investments, aligned with national priorities and mechanisms.

Attract, recruit and retain nurses where they are most needed. Countries should develop evidence-based recruitment and retention policies that are bundled, tailored to the local context and tackle the various root causes for the inequalities. Implementing a "rural pipeline" has been successful in increasing the return of graduate nurses to their rural communities.

Advance the WHO Global Code of Practice on the International Recruitment of Health Personnel (the Code). Urgent priorities are to strengthen adherence to the Code, including provisions outlined in the *WHO health workforce support and safeguards list 2023*, increasing investment in the health workforce of these countries, and bilateral agreements that translate into mutual and proportional benefits for source countries.

→ Education

Align the levels of nursing education with optimized roles within health and education systems. As more countries move towards bachelor's degrees, planning and coordination between academia, regulators and health facilities are essential to establish the roles and responsibilities of bachelor's prepared nurses relative to other types of nurses and health workers. Research on the impact of this development should be expanded to include primary care settings and low- and lower middle-income countries.

Optimize domestic production of nurses to meet or surpass health system demand. Many countries, particularly African and Eastern Mediterranean, need to increase the number of nurse graduates to keep up with growing populations and expanding labour market demand. Many countries will need to address bottlenecks to admitting or enrolling students (e.g. availability of nursing faculty and clinical training sites; limitations in infrastructure and training equipment).

Design education programmes to be competency-based, apply effective learning design, meet quality standards and align with population health needs. Greater coordination between accreditation bodies, education institutions and employers to align learning outcomes with competencies needed in health services settings. The expansion of "blended learning" requires more investment in infrastructure and resources to support equitable and relevant digital education; education standards should include digital competencies for contemporary practice.

Ensure faculty acquire competencies in the best pedagogical methods and technologies, with demonstrated clinical expertise in content areas. Priorities to strengthen faculty capacities include structured orientation and mentorship, conducive working conditions, appropriate remuneration and career advancement, and opportunities to develop digital competencies that facilitate students learning, professional development and patient care.

→ Service delivery

Review and strengthen professional regulatory systems and support capacity building of regulators, where needed. Priorities are to ensure updated scopes of practice that are differentiated for various types and levels of nurses, and that CPD content contributes to necessary competencies for nurses caring for increasingly complex population health needs. Regulations should be optimized to support more equitable distribution and retention of nurses and allow for flexibilities and adaptions during emergencies.

Adapt workplace policies to protect and safeguard nurses. Working conditions should be improved to ensure a decent work environment that attracts, supports and retains nurses. This includes enhancing salary scales for nurses, ensuring equal pay for equal work, safe staffing, and protections for collective organizing and legal rights. There is an urgent need to protect and safeguard the mental health and well-being of nurses.

→ Leadership

Establish and strengthen senior leadership positions for nursing workforce governance and management and input into health policy. Countries are encouraged to ensure GCNO roles and responsibilities reflect a suitable level of seniority and linkages with broader health workforce policies and management. GCNOs should be engaged in nursing workforce data reporting and use, national policy processes and mechanisms, as well as regional and global forums.

Invest in leadership skills development for nurses. Nursing leadership development programmes should be expanded, particularly in LICs, to provide contextualized programmes for needed competencies in a variety of settings. Mobilization of resources will be required to overcome barriers such as funding, lack of senior policy-level nurses, or lack of exposure to leadership in education and training curricula.

→ Emerging policy priorities

Further develop advanced practice nursing roles to increase access to high-quality health services. Introduction and integration of APN roles should meet an identified need for the role, have acceptance by ministries of health, and reflect collaboration among ministry of health, education institutions, regulators, associations and employers. Standardized definitions for the APN occupational group are necessary for accurate counting, global monitoring and policy development.

Address gender-related bias, including equitable and competitive wages. Countries should address drivers of feminization of nursing, such as cultural, societal gender norms and access to education, and support gender-equitable labour force participation in all settings. Countries should collect gender-disaggregated data and conduct intersectional gender analyses of the health labour market. The wages for nurses must be fair and equitable, reflect the hardship nature of many of nurses' roles and tasks, and reward equal pay for equal work.

Harness the potential of digital tools and technologies to meet population and health system needs. Nurses must be prepared and fully supported to competently utilize digital technologies across areas of professional practice from education to practice, research and management. Adoption of AI and its use and acceleration in health workforce learning and practice will require significant investments to build health workforce capacity, raising concerns on equity and inclusivity.

Empower nurses to contribute to the climate agenda through education, advocacy, climate conscious practice in health settings and leadership. Integrate learning outcomes on the health impacts of climate change into competency-based curricula and interdisciplinary study. Community education and policy advocacy roles should be expanded, particularly in vulnerable or at-risk populations. Nursing roles in health facilities can advance climate conscious and sustainability measures in their workplaces. The GCNOs have a strategic role in facilitating the avenues for nurses' contributions to the climate agenda.

Provide tailored support for nursing education and employment and working conditions in fragile, conflict-affected and vulnerable settings. Physical safety must be prioritized, along with psychosocial support. Interventions are needed to support remote, flexible and innovative education to continue nursing studies in active and post-conflict settings. On-the-job training for nurses may be needed to refocus skills in emergency and trauma care; learning recognition and remuneration should be maintained. Post-conflict programmes can provide rehabilitation, reskilling as needed and support in transitioning to nurses' pre-conflict roles.

Left: Nurse Maisara providing care in neonatal intensive care unit Al-Makassed Hospital, Jerusalem. © WHO
Left centre: A nurse smiles while holding a tablet and reflex hammer in a hospital corridor. © WHO
Right centre: Nursing students in uniform attend a classroom training session. © Yeshey-Wangmo, Nursing in Focus
Right: Nurse in Faiz Mohammad Kateb Hospital, Afghanistan. © WHO/Zakarya Safari

CONCLUSION

Across the domains of analysis explored in this report, a recurrent theme is that of persistent and worsening inequities. A pattern of inequity is evident in nurse distribution, density, education capacity, wages and working conditions, and in existing and projected future shortages of nurses. This inequity trend recurs among and within regions, across countries and within countries, and by country income classification. The impacts of the inequities affect patient care and health outcomes, health system functioning, health equity and access, UHC, and economic and social development. To achieve SDG targets, these inequities must be addressed and urgently.

The findings in *State of the world's nursing 2025* provide policy-makers, planners, employers, educators, regulators and health services managers with data, analyses and policy options to take forward in their countries and contexts. Mobilizing the advised sustainable long-term domestic and external investments in nursing can support the needed scale up of nursing education and employment to offset shortages, stem nurse under- and unemployment, improve working conditions and help manage migration.

Investing in the education, employment, service delivery and leadership of nurses will stimulate economic growth by creating decent jobs for nurses and greater economic participation by women in the workforce. Such advancements can accelerate progress towards health equity, gender equality and UHC through a primary healthcare approach and move towards achieving the broader Sustainable Development Agenda.

> **Around 78% of the world's nurses are found in countries representing only 49% of the world's population;**
> high-income countries (HICs), which represent only 17% of the population, host 46% of the world's nursing population.

Left: Abdel Ghan is a nurse at Azzaz's Shamarekh primary health centre, Syrian Arab Republic. © WHO/Giles Clarke
Centre: Nurse Naomiridou Dine stands outside a health facility in Niger. © WHO/Myraim Volonarivo
Right: A nurse in Hay River, Canada, speaks with a patient in a community health setting. © WHO/Christine McNab

Conducting a patient assessment in Faiz Mohammad Kateb Hosital, Afghanistan. © WHO/Zakarya Safari

CHAPTER 1

Introduction

1. **Nurses and nursing have maintained a distinguished status within WHO since its founding in 1948.** The delegations of Ireland and the United States were the first to propose that: "the fundamental importance of nursing in the improvement of health services" be recognized and that the Director-General "give full consideration to the importance of the nursing function when organizing the Secretariat and committees" (*1*). WHO's governing bodies immediately gave top priority to the occupation, requesting the establishment of posts and allocation of resources to advance work with countries, addressing the shortage of personnel, the existence of many different models for ensuring their adequate supply, and the need for education, recruitment and employment standards (*2*).

2. **This second edition of the *State of the world's nursing* continues WHO's extensive commitment to the global nursing workforce.** The global development, economic and health landscape has changed dramatically since WHO's founding, but the need for multinational stewardship and investment in health systems, the health and care workforce, and the evidenced-based value of nurses and nursing is a constant: an investment which is proven to generate multiple dividends across the SDGs.

3. **The global environment is increasingly defined by concurrent crises and conflicts, economic uncertainty, accelerating climate change and widening social inequities.** Protracted conflicts and emergencies are taking place amidst rising geopolitical tensions. Global economic stagnation and regression are putting pressure on development assistance budgets and restricting social sector spending more broadly *(3, 4)*. The impacts of climate change and environmental degradation are clearer and disproportionately impact vulnerable populations. Demographic changes are increasingly defined by ageing populations and low birth rates in many countries, alongside a steady rise in urbanization across the globe. While advances in technology offer significant potential to improve access to information, decision-making and productivity, the benefits come with the potential to risk of widening access gaps, deepening inequalities, disinformation and unemployment *(5)*.

4. **These global trends undermine health determinants and impact upon human health and well-being.** In 2023, WHO estimated the world is off-track to meet most of the health-related SDG targets. Insufficient action to address determinants of health such as sex/gender inequality, education opportunities, poverty and social protections contributed to the lack of progress, as did communicable diseases and an increasing incidence of NCDs, such as cardiovascular conditions, cancer, chronic respiratory illnesses and diabetes *(5)*. Epidemic-prone diseases, and climate-sensitive epidemics are impacting communities worldwide, with Small Island Developing States (SIDS) suffering disproportionately.

5. **Global health insecurity, restricted health spending and increasing threats to health and well-being are straining health systems.** Progress toward UHC, a reflection of the health system's ability to provide necessary services to all citizens, has stagnated or reversed: in 2021, over half the world's population lacked access to essential health services, and one in four people incurred financial hardships as a result of receiving the care they needed *(6)*.

6. **Access to essential services is directly related to the availability of health workers.** There is a similar slowing of progress in closing the global gap of health and care workers by 2030. Due to slower than anticipated growth in health worker density, especially in countries still experiencing rapid population growth, estimates of the global shortage of health workers projected to 2030 had to be revised upwards, from 10 million in 2022 to 11 million. The burden of the shortage is increasingly concentrated in the WHO African and Eastern Mediterranean regions *(7)*. Thus, UHC will remain out of reach if workforce shortages and inequity of access to health workers persist.

7. **The year 2025 represents a strategic juncture to forge progress in global health and well-being.** There are 5 years left in the era of the Agenda for Sustainable Development. WHO, with responsibility for leadership on health-related SDG targets, has articulated the 14th General Programme of Work 2025–2028 (GPW14) focused on strong, sustainable and resilient health systems for long-term stability and growth *(5)*. The World Health Assembly, Member States and partners have adopted and endorsed the GPW14 as the strategy to guide collective action. At the core is a commitment to reorient health systems to primary healthcare to enhance equity, inclusiveness, cost-effectiveness and efficiency in all communities.

8. **Nurses are the largest component of the health and care workforce and have a wide set of skills applicable in almost every health service delivery setting.** Different kinds of nurses can be found across the continuum of health services – from health promotion to palliative care – and may be the sole provider of health services in some settings, especially in rural, remote and disadvantaged areas. In many ways, nurses can help enhance equity, inclusiveness, cost-effectiveness and efficiency of health systems *(8)*. However, several challenges can prevent the full contributions of nurses in their health settings and impede progress toward our common health priorities.

9. ***State of the world's nursing 2025* consolidates the most comprehensive, contemporary evidence on the global nursing workforce to inform national, regional and global actions.** The latest available data on nursing education, employment, practice, regulation, working conditions and leadership are presented. This 2025 edition includes new indicators, more in-depth data and exemplars, and concrete policy options to leverage the nursing profession as part of an integrated health and care workforce. Consolidated data for each WHO region are presented in Annex 1. Individual country profiles are available online and for download.

Head nurse of the Bangladesh Red Crescent Society/Japanese Red Cross emergency clinic Mayumi Kawaguchi. © WHO/Kate Marshall

A nurse gently holds and comforts an infant in a health facility. © WHO/Faizza Tanggol

CHAPTER 2

Health priorities and workforce requirements in the SDG era

10. This chapter introduces the focused health priorities for the remaining SDG era within the context of global trends and health system demands, highlighting the renewed commitment of the United Nations (UN) to UHC, including in the GPW14 2025–2028

2.1 The focused health priorities for the remaining years of the SDG era

11. In an increasingly complex milieu of global trends, their impacts upon health, and demands on health systems, the UN reinforced its commitment to UHC through a 2023 political declaration *(9)*; and the World Health Assembly adopted the GPW14 to lead the global community's concerted efforts to achieve it. The overarching goal of the GPW14 2025–2028 is to promote, provide and protect health and well-being for all people, everywhere (see Box 2.1).

Box 2.1
Core elements of the WHO General Programme of Work 2025–2028

To promote health:

(a) respond to climate change, an escalating health threat in the 21st century; and

(b) address health determinants and the root causes of ill health in key policies across sectors.

To provide health:

(a) advance the primary healthcare approach and essential health system capacities for universal health coverage; and

(b) improve health service coverage and financial protection to address inequity and gender inequalities.

To protect health:

(a) prevent, mitigate and prepare for risks to health from all hazards; and

(b) rapidly detect and sustain an effective response to all health emergencies.

12. Delivering these focused priorities for health and well-being in a condensed timeframe, in a manner that espouses the principles of the Sustainable Development Agenda, can be most effectively achieved through development of human capital. Human capital consists of the knowledge, skills and health that people accumulate throughout their lives, enabling them to realize their potential as productive members of society *(10)*. Government investment in human capital, particularly in education, employment and health, can accelerate progress across many SDGs (1, 2, 3, 4, 5, 8, 10), generating additional returns in productivity, income and savings, poverty reduction and sustainable economic growth *(11)*. On the contrary, underinvestment in health, education and social protection systems is associated with insufficient capacity and limited institutional capabilities, which often contribute to inequalities in access to quality essential health services and produce poorer health outcomes *(5)*.

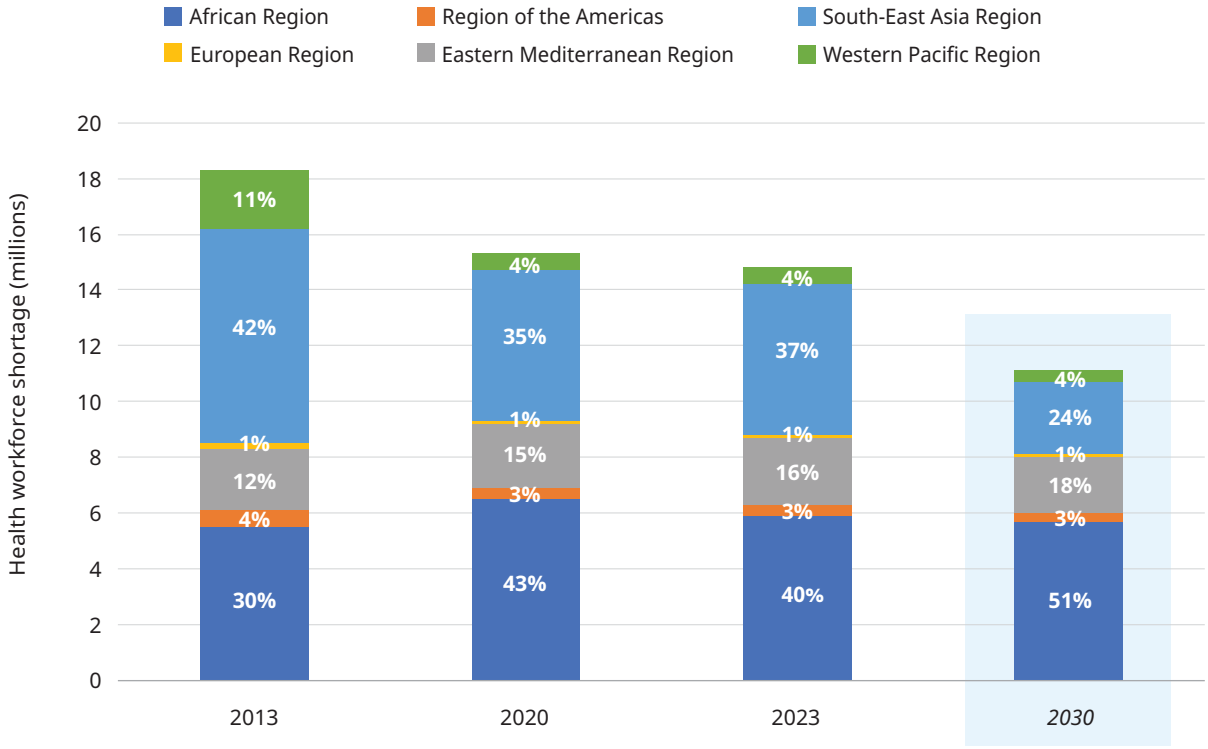
A nurse in Haiti prepares an IV line while coordinating emergency care in a hospital ward . © Jayme Gershen/WHO

2.2 Global context and challenges for the health and care workforce

13. At the outset of the Sustainable Development Agenda, the size and distribution of the global health workforce was detailed to ensure a workforce capable of delivering the health-related SDGs, including SDG 3, focused on UHC. In 2016, the global shortage of health workers by 2030 was projected to be approximately 18 million *(12)*. The shortage was unequally distributed, however, and predominantly in the South-East Asia and African regions, followed by the Eastern Mediterranean and Western Pacific regions. While the size of the global health workforce has steadily grown over time and the projected shortage has decreased steadily, the pace of decrease has slowed since the COVID-19 pandemic.

14. WHO's earlier (2022) estimate of a projected shortage of 10 million by 2030 has been revised upwards to 11 million *(7)*. The inequitable distribution of the shortage continues to increase. While proportions of the shortage have consistently decreased (such as in the South-East Asia Region) or remained small (between 1% and 4%) in other regions, the proportions are increasing in the African and Eastern Mediterranean regions such that by 2030, they may bear 69% of global shortage of health workers (see Fig. 2.1). The inequities persist across countries in each region, as well as within individual countries.

Figure 2.1 **Distribution of the global health workforce shortage by WHO region 2013–2023 and projected to 2030**

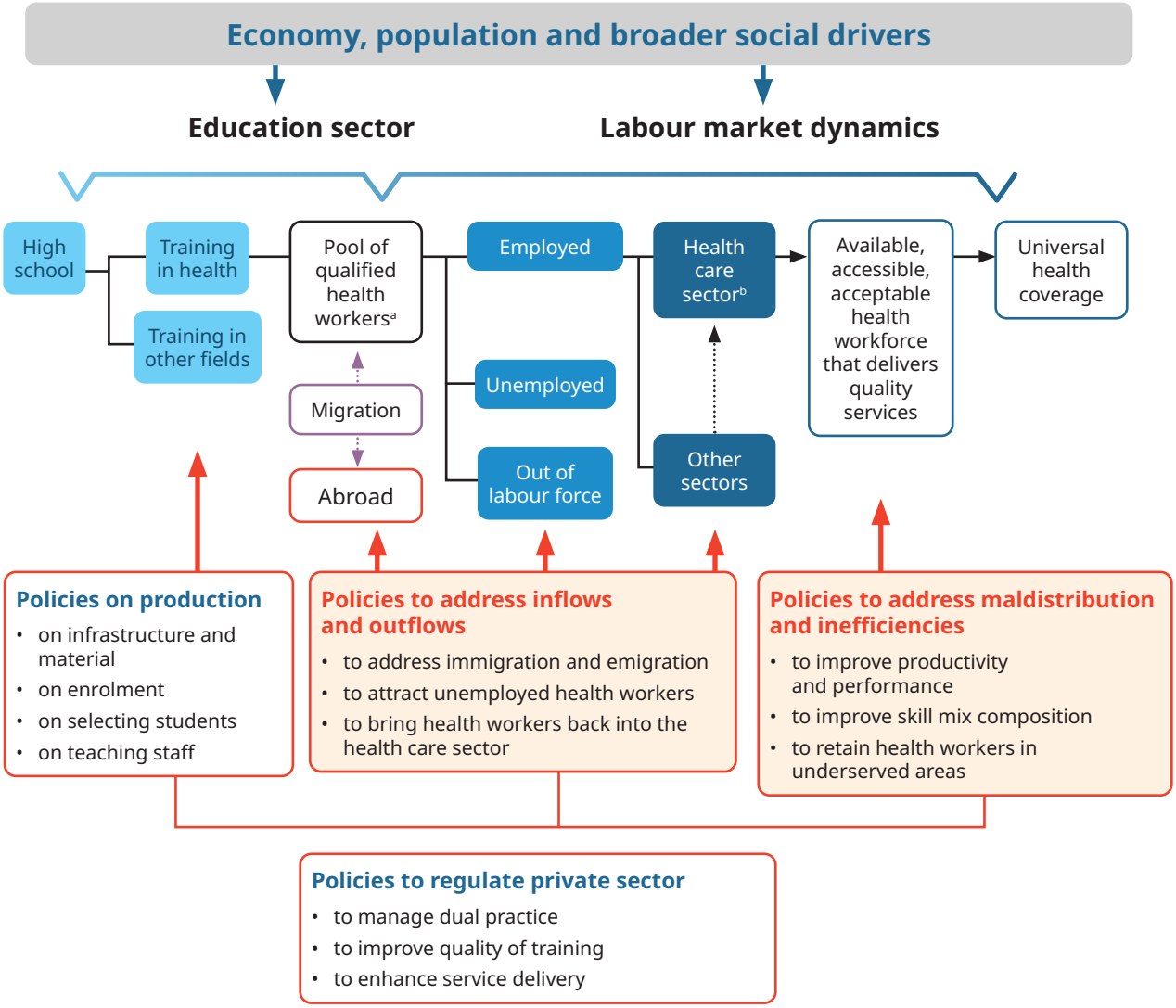


Note: Percentages represent the relative share of the global health workforce shortage.

15. Many factors contribute to shortages and inequality of access. Shortages may be due to inadequate production from health education institutions, resulting in a pool of available workers that is too small, or because the education and training do not match the skills and capabilities needed in the health sector. The predominant challenge in most low- and lower middle-income countries, however, is insufficient economic capacity and fiscal space to absorb health workers in the labour market: quite simply, there are too few paid jobs in the health system for qualified graduates. Unattractive working conditions, i.e. the jobs don't pay as well, or the working conditions or locations are not as favourable as in other sectors, may determine both low interest in considering a career in the health sector and challenges in attraction, employment and retention of the pool of qualified graduates *(13)*. In contrast, HICs tend to offer higher levels of remuneration, social protection and better working conditions. These conditions, along with aspects such as infrastructure, and education and career prospects, influence the supply of health workers; in addition, they can be considered "push" and "pull" factors that impact retention and the international mobility and migration of health workers, with many new graduates drawn to work in other countries or other sectors. All these factors can decrease the "pool" of available and qualified workers in a given health system and serving in their communities.

16. Many of the root causes of inequities in availability of competent health workers are best understood using the concept of a health labour market. A health labour market is a dynamic and complex system that comprises the production of health workers through the education system through to the active pool of skilled health workforce equipped to deliver quality health services where they are needed (see Fig. 2.2). Analysing the whole of a health labour market permits a comprehensive understanding of the key factors influencing the supply and

Figure 2.2 **Health labour market framework**



[a] Supply of qualified health and social workforce willing to work.
[b] Demand for health and social workforce in the health and health-related social care sectors.
Source: Adapted from Sousa A, Scheffler RM, Nyoni J, Boerma T. *A comprehensive health labour market framework for universal health coverage.* Bull World Health Organ. 2013;91:892-4.

demand of health workers and allows identification of health labour market "failures" and other factors that result in workforce shortages, including issues of maldistribution, unemployment, absenteeism, gender inequalities, and the impacts of conflict and social disruption, allowing more tailored policy responses and investment strategies.

2.3 Globally agreed approaches to address health workforce challenges

17. In 2010, the World Health Assembly adopted the WHO *Global code of practice on the international recruitment of health personnel* ("the Code") *(14)*. Acknowledging the vital role of health workers in achieving global health goals and noting that international migration of health workers can deplete health workers in low-resource countries with pre-existing health workforce shortages, the Code guides international cooperation in the ethical management of health worker migration and highlights actions and investment areas in the health systems of LICs with health workforce shortages *(15)*.

18. In 2016, WHO's *Global strategy for human resources for health: workforce 2030* (the "Global Strategy") was adopted through resolution 69.16 *(16)*. The Global Strategy makes explicit the areas for investment to develop a health and care workforce to achieve health-related SDGs: health worker education, employment, institutional capacity and human resources for health information systems *(13)*.

Nurses supporting community health at a diabetes clinice in Suva, Fiji.
© WHO/Toma Vierus

19. Adoption of the Global Strategy included the progressive implementation of a globally standardized system for countries to monitor their workforce and report data on their health and care workers through the National Health Workforce Accounts (NHWA). This system became the mechanism for Member States to share their national health workforce data, allowing for evidence-based health and care workforce planning and policy-making at national level, and contributing to the global monitoring on progress and towards UHC. It also defined standards for monitoring and reporting health and care workforce indicators, which enable international comparisons. As of February 2025, 189 Member States are utilizing the NHWA platform to share workforce data with WHO as a global public health good.

20. The UN High-Level Commission on Health Employment and Economic Growth was convened in 2016 to advance implementation of the Global Strategy with the education, employment and economic sectors of governments. Its report and recommendations *(17)* demonstrated the multiple dividends accrued from health workforce investments, and recommended accelerating investments in health workforce education and jobs for increased economic prosperity, youth employment and women's labour participation. Because nurses are predominantly female, investments in nursing education, employment and working conditions can drive progress not only in SDG 3 (better health and well-being), but also SDG 4 (education), 5 (gender) and 8 (decent work and economic growth).

21. The World Health Assembly adopted the Working for Health Action Plan and its Multi-Partner Trust Fund mechanism in 2017 *(18)* and renewed this in 2021 *(19)*. Working for Health is a partnership between the International Labour Organization (ILO), Organisation for Economic Co-operation and Development (OECD) and WHO, convened as an inter-agency collaboration on the global health

A nurse attends to a patient at a primary health centre in Mutanpal village in Bastar district, Chhattisgarh, India. © WHO/Atul Loke/Panos Pictures

workforce investment and action agenda *(20)*. It leverages intersectoral cooperation and coordination between the finance, labour, education, health, social and foreign affairs sectors, and with health employers' and workers' organizations, professional associations and other key stakeholders, including civil society, on priority policy issues *(21)*.

22. In 2022, the World Health Assembly adopted a resolution referencing the *Global health and care workers compact (19)* outlining how to protect health and care workers and safeguard their rights, to promote and ensure decent work, and to provide a safe and enabling work environment *(22)*. Following the COVID-19 pandemic, WHO and partner organizations agreed on a "roadmap" for national workforce capacity to deliver the essential public health functions (EPHFs), including emergency preparedness and response *(23)*, supporting all countries to align and integrate public health in workforce policy, planning and investments.

23. The year 2023 marked the mid-point in the implementation of the *Global strategy for human resources for health: workforce 2030* and an opportunity to understand the lessons from the COVID-19 pandemic. The Fifth Global Forum on Human Resources for Health hosted ministers of health and other delegates from over 160 countries to discuss how to overcome market failures between education and employment in the health and care sector and generate investments in the health and care workforce *(24)*. Among the areas for action was a goal to increase the domestic production capacity of countries experiencing severe health workforce shortages by 8–12% per year, in order to double their health workforce in the next 10 years *(25)*. These efforts should complement co-investments in health systems to ensure absorption of health workers in LMICs, particularly in the African and Eastern Mediterranean regions and SIDS *(26)*.

A nurse with the Chihuahua Health Secretariat explains the importance of vaccinations to indigenous Raramuri girls, Chihuahua, Mexico. © WHO/Felix Marquez

CHAPTER 3

Global nursing workforce policy context

24. This chapter explores how the first decade of the SDGs has brought recognition in global policy discussions for the vital contributions of nurses, emphasizing the need to maximize their impact on achieving shared health goals.

25. In the first decade of the Sustainable Development Agenda there has been explicit recognition in the global policy discourse about the contributions of nurses and midwives to the common agenda. In 2019, the World Health Assembly decided to name 2020 as the International Year of the Nurse and the Midwife *(27)*. Capitalizing on the global attention and momentum *(28)*, WHO developed the first report, *State of the world's nursing 2020: investing in education, jobs and leadership (29)*, which described the education, employment, migration, regulations, leadership and working conditions of the global nursing workforce and provided evidence-based policy options to address barriers impeding nurses' contributions to the SDGs and UHC. The following year, the *State of the world's midwifery 2021* was released *(30)*, describing in detail the status, challenges and policy considerations concentrated in the midwifery community.

26. In the wake of evidence in the nursing and midwifery reports, the Seventy-third World Health Assembly requested WHO to develop the next iteration of the *Global strategic directions for nursing and midwifery (31)*. The resulting document, the draft *Global strategic directions for nursing and midwifery 2021–2025*, provided 12 evidence-based policy priorities, relevant in all country contexts and equally applicable to nursing and midwifery, covering the areas of education, jobs, leadership and service delivery (see Fig. 3.1). The proposed draft was adopted by the Seventy-fourth World Health Assembly – the first time a global strategic directions for nursing and midwifery had been adopted by a World Health Assembly – with a resolution that urged Member States and partners to implement the 12 policy priorities and the monitoring and accountability plan *(32, 33)*.

Figure 3.1 **Policy priorities of the Global strategic directions for nursing and midwifery 2021–2025**

JOBS/EMPLOYMENT

Strategic direction: Increase the availability of health workers by sustainably creating nursing and midwifery jobs, effectively recruiting and retaining midwives and nurses, and ethically managing international mobility and migration.

Policy priority: Conduct nursing and midwifery workforces planning and forecasting through a health labour market lens.

Policy priority: Ensure adequate demand (jobs) with respect to health service delivery for primary health care and other population health priorities.

Policy priority: Reinforce implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel.

Policy priority: Attract, recruit and retain midwives and nurses where they are most needed.

EDUCATION

Strategic direction: Midwife and nurse graduates match or surpass health system demand and have the requisite knowledge, competencies and attitudes to meet national health priorities.

Policy priority: Align the levels of nursing and midwifery education with optimized roles within the health and academic systems.

Policy priority: Optimize the domestic production of midwives and nurses to meet or surpass health system demand.

Policy priority: Design education programmes to be competency-based, apply effective learning design, meet quality standards, and align with population health needs.

Policy priority: Ensure that faculty are properly trained in the best pedagogical methods and technologies, with demonstrated clinical expertise in content areas.

SERVICE DELIVERY

Strategic direction: Midwives and nurses work to the full extent of their education and training in safe and supportive service delivery environments.

Policy priority: Review and strengthen professional regulatory systems and support capacity building of regulators, where needed.

Policy priority: Adapt workplaces to enable midwives and nurses to maximally contribute to service delivery in interdisciplinary health care teams.

LEADERSHIP

Strategic direction: Increase the proportion and authority of midwives and nurses in senior health and academic positions and continually develop the next generation of nursing and midwifery leaders.

Policy priority: Establish and strengthen senior leadership positions for nursing and midwifery workforce governance and management and input into health policy.

Policy priority: Invest in leadership skills development for midwives and nurses.

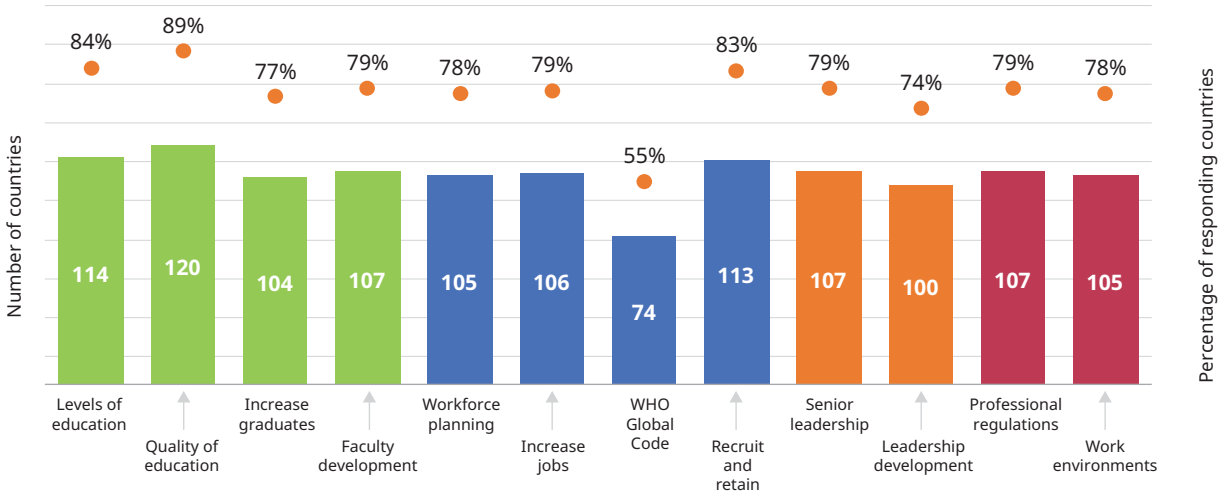
Source: *Global strategic directions for nursing and midwifery 2021–2025*. WHO; 2021.

27. Implementation of the *Global strategic directions for nursing and midwifery 2021–2025* has been high across all 12 policy priorities (see Fig. 3.2). Examples reported to WHO in the monitoring exercises and reported to the 156th Executive Board include nursing education policy changes undertaken in Kazakhstan to increase the number of graduates available at multiple levels within the health system; India committed to opening 157 new nursing colleges by mid-2025 to increase nursing seats by 15 700 per year *(34)*; six countries in the African Region are using health labour market analyses (HLMAs) to inform hiring decisions on nurses and midwives; Thailand created more senior positions and better pay for nurse-midwives in prioritized areas, such as critical care *(35)*; nursing leaders from SIDS (from both the Western Pacific and the Caribbean) meeting for a virtual summit on international nurse migration *(36)*; and the nursing regulatory body in Jordan increased the number of accredited activities for CPD (from 11 in 2021 to 750 in 2024) and instituted a national CPD database to monitor and evaluate progress *(37)*.

3.1 Objectives and methods

28. While evidence on implementation of the *Global strategic directions for nursing and midwifery 2021–2025*, provides useful insights on the policy and governance actions taken by countries in relation to their nursing and midwifery workforces, a more comprehensive picture is needed of the world's nursing situation to inform country-level planning for the present and future nursing needs, as well as inform the dialogue and decision-making in all forums.

Figure 3.2 **Member States reporting activity under each policy priority of the Global strategic directions for nursing and midwifery 2021–2025, by number of countries (N=135) and percentage of responding countries**



29. Accordingly, the objectives of *State of the world's nursing 2025* include:

    - To understand the status of the nursing workforce in the wake of the COVID-19 emergency with validated data and evidence.
    - To look forward and plan for the nursing workforce to achieve the 2030 targets and beyond, and contribute to the global agenda on emergencies, primary healthcare and health systems resilience to future emergencies.
    - To facilitate global health governance and decision-making to support Member States' policy actions related to the nursing workforce.

30. The primary method to develop the *State of the world's nursing 2025* was country-level official statistics reporting using the NHWA process and platform. The NHWA reporting process utilizes globally standardized classifications and definitions for occupational groups as defined by the International Standard Classification of Occupations 2008 (ISCO-08)[1] and an annual reporting and validation process using nationally identified focal points *(38)*. These NHWA focal points are, in most cases, senior authoritative officials in the ministry of health – usually directors of the health workforce department or unit – or at specialized government agencies designated to collect health-related information and statistics. They share the data for the health and care workforce on behalf of their country following the NHWA norms and standards annually. For the *State of the world's nursing 2025*, the reporting period was from February 2024 to November 2024; countries were asked to report data for 2023 or the latest year available and were able to update and complete data from prior years as well. Please see a detailed description of the NHWA process in Annex 3.

31. For nurses, there are two globally standardized occupational classifications: nursing professional (ISCO code 2221) and nursing associate professional (ISCO code 3221). The distinction between nursing professionals and nursing associate professionals reflects the type of care and services they provide. Those classified as nursing professionals "provide treatment, support and care services for people who are in need of nursing care due to the effects of ageing, injury, illness or other physical or mental impairment, or potential risks to health. They assume responsibility for the planning and management of the care of patients, including the supervision of other health care workers, working autonomously or in teams with medical doctors and others in the practical application of preventive and curative measures" *(39)*. Those classified as nursing associate professionals "provide basic nursing and personal care for people in need of such care due to effects of ageing, illness, injury or other physical or mental impairment. They generally work under the supervision of, and in support of, implementation of health care, treatment and referral plans usually established by medical, nursing and other health professionals" *(39)*. Countries were asked to classify their nursing workforce according to those two definitions; if they did not, the nursing personnel were classified as "nurses not further defined".

[1] The current version of ISCO used is the ISCO-08, which was published in 2008.

The occupational groups of midwives, nursing aides or other auxiliary health workers have separate classifications in ISCO-08 and were not included in the reporting for the *State of the world's nursing 2025*.

32. *State of the world's nursing 2025* includes data reported from more countries on more indicators than ever before. Compared with *State of the world's nursing 2020,* this report is based on updated indicators revised through a global consensus process *(40)*. New topics include public versus private sector employment, nurse wages and more robust data on nursing graduates and APNs. Statistics on the "stock" of nursing personnel were reported for all countries, 83% of which reflect the period 2021–2023, hence providing a systematic post COVID-19 pandemic assessment. A total of 34 NHWA indicators were reported by more than 100 countries and 36 by more than 70 countries, as compared with 18 and 22 respectively in the 2020 report. After data quality checks, 34 indicators (28 NHWA along with six indicators specifically designed for the *State of the world's nursing reports*) were sufficiently reported to be included in the report. Despite consistent annual improvements in data availability, certain indicators remain challenging for countries to report at a level sufficient to be included in the present analyses. These include exits from the workforce, vacancy rates, nurse employment settings and subnational density (please see Annex 4 for details on the reporting levels). However, as countries progressively implement the NHWA process in alignment with national priorities and broader health information system strengthening efforts, the availability of and reporting on these indicators will continue to improve.

Nurse delivering patient care in a hospital ward, Lao People's Democratic Republic. © WHO/Yoshi Shimizu

Nurse, Shueb Hassan, attends to an internally displaced Somali child inside a ward dedicated for diarrhoea patients in Banadir hospital, Mogadishu. © WHO

CHAPTER 4

Nursing roles and contributions to the health-related SDGs, including UHC

33. This chapter explores the pivotal role of nurses in achieving the health-related targets of the SDGs, working at the forefront of health systems to improve health outcomes in communities. Their multifaceted roles – direct service provision, community outreach, policy advocacy and cross-sector collaboration – advance progress by promoting health, preventing disease, providing care and responding to public health crises *(41, 42)*.

4.1 Health promotion

34. In vulnerable and marginalized communities, including remote, rural areas and SIDS, nurses often serve as key health services providers by promoting climate-resilience through telemedicine and preventive care through nurse-led clinics *(43, 44)*. They also tackle systemic barriers, such as gender inequality through advocacy, education and community-driven initiatives *(45)*.

35. Social determinants of health are "the conditions in which people are born, grow, work, live, and age" *(46, 47)*. Nurses address these determinants by delivering care and contributing to policy that considers social and environmental contexts to ensure timely improvements in population health *(26, 33, 46)*. These efforts require collaboration across sectors, sharing of best practices and ongoing engagement of stakeholders, patients, families and professionals *(47)*. For example, nurses often educate patients, families and communities about climate-related risks, such as heatwaves, monsoons and vector-borne diseases, by promoting resilience measures like hydration, shelter cooling and infection prevention *(48–50)* (see Box 4.1).

36. Through community engagement, nurses bridge gaps among health providers, social workers, patients, caregivers and communities by building trust and amplifying community voices in health planning and delivery. Nurses often collaborate between health systems and community members to

co-create solutions that address local needs and the evolving social networks that shape identity, values and beliefs – beyond geographic boundaries *(51, 52)*.

4.2 Providing care through the life course

37. As the largest occupational group, nurses play a central role in health service delivery at all levels across every health domain and from facility- and disease-oriented systems to integrated, people-centred services that uphold the principles of health equity, gender equality and the right to health for all *(29)*. They are essential to the reorientation of health systems toward a primary healthcare approach for persons, families and communities including those living in poverty, migrants, displaced populations and persons with disabilities, ensuring inclusive, equitable and accessible care. Through their roles in promotion, prevention, treatment,

Box 4.1 Climate change and nursing

Nurses play a crucial role in addressing the health impacts of climate change through education, advocacy and sustainable health practices *(53)*. As health workers working at the forefront of service provision, they educate patients and communities on climate-related health risks, including air pollution, extreme heat and vector-borne diseases, while promoting protective measures such as emergency preparedness and response, hydration strategies and infection prevention *(48–50, 54)*. Their close ties to communities make them powerful advocates for social justice, addressing the disproportionate burden of climate change *(55, 56)*, such as the increased prevalence of respiratory and cardiovascular diseases due to air pollution, or vector-borne diseases due to changing weather patterns *(57)*.

Beyond patient education, nurses lead initiatives to reduce the carbon footprint of health and care facilities by promoting recycling, reducing energy consumption, implementing sustainable procurement practices and advocating for telemedicine *(43, 55)*. These efforts help mitigate health and care's environmental impact while ensuring resilience against climate disruptions such as extreme weather events, wildfires and floods. However, nurses themselves face health risks from climate change, including exposure to extreme temperatures, poor air quality, and the psychological toll of responding to climate-driven emergencies *(58)*. Mental health support for nurses dealing with stress, burnout and trauma is essential to maintaining workforce well-being and effectiveness *(59, 60)*.

Despite their pivotal role, many nurses report inadequate training in climate-related health issues *(61)*. A global study found that among surveyed health workers, 41% reported a lack of knowledge as a barrier to climate change initiatives, 22% cited limited peer support, and 31% believed that health workers would have little impact, emphasizing the urgent need for improved education and competency development *(62)*. As such, strengthening nursing curricula and expanding CPD programmes will better prepare nurses to address climate challenges in their practice *(63–66)*.

By integrating climate-conscious care into their practice, nurses contribute to global health resilience and the achievement of the SDGs *(53)*. Their expertise in both direct patient care and broader health system sustainability makes them central to advancing a health-centred response to climate change that prioritizes prevention, adaptation and equity *(48, 50, 61, 67–69)*.

rehabilitation and palliative care, nurses ensure the consistent delivery of quality health services and must be prepared to work in diverse cultural settings, respecting local traditions and beliefs, while still promoting global health goals *(70)*.

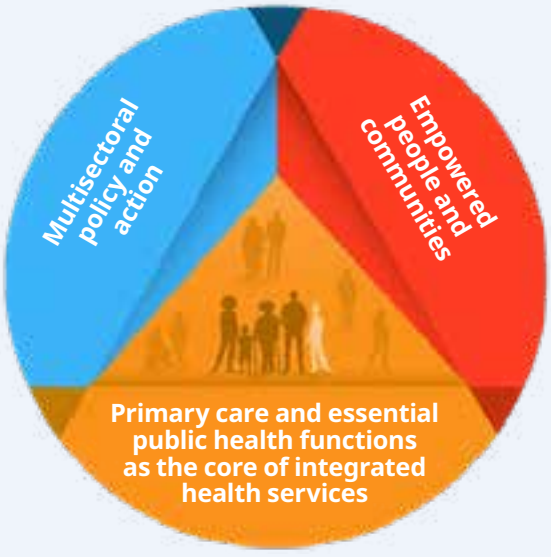
38. Delivering quality care at all levels of the health system to build equitable, people-centred and resilient health systems oriented towards primary healthcare relies significantly on the contributions of nurses *(71–73)* (see Box 4.2). At the point of care, nurses ensure that services are safe, effective and responsive to the diverse needs of populations, while also often leading multidisciplinary teams to provide comprehensive, integrated, and coordinated care that improves health outcomes and system resilience *(74)*. As health systems increasingly rely on a mix of professionals and non-professionals, nurses are central to coordinating, tailoring, supervising and communicating care across specialists, assistants and informal carers *(33, 72, 73, 75)*.

39. As caregivers, advocates, supervisors, educators and leaders, nurses are essential to patient safety. Their expertise in risk management and evidence-based care ensures safety in service delivery *(81, 82)*. Notably, 67% of countries report integrating patient safety principles into nursing education, supporting critical functions like medication administration and infection prevention and control (IPC). Despite challenges like staffing shortages, nurses uphold IPC measures such as hand hygiene and aseptic techniques while fostering trust through patient education. Investing in nursing capacity and leadership is vital for sustaining

Box 4.2
Nurses in primary healthcare

Nurses are central to primary healthcare, delivering equitable, cost-effective and people-centred services while strengthening health system capacities *(33, 76)*. Rooted in evidence and supported by global policies, the primary healthcare approach remains key to achieving UHC and the SDGs *(77, 78)*. The Declaration of Astana outlines three interrelated pillars of primary healthcare:

- integrated health services across the life course;
- multisectoral action on health determinants; and
- empowering individuals and communities to manage their health.



Nurses are pivotal in advancing these pillars and driving the primary healthcare agenda *(33, 78, 79)*. Nurses, with their rich history of providing care within communities and homes, stand at the front of this vision. With their high level of education and expanded scope of practice, APNs emerge as a promising workforce solution to the growing challenge of general practitioner shortfalls *(80)*.

global patient safety and ensuring respectful, protective care.

40. Nurses play a key role in managing communicable diseases like tuberculosis, malaria, HIV, hepatitis and sexually transmitted infections, and respiratory and gastro-intestinal infections, among others *(83, 84)*. Their contributions to driving community-based prevention efforts, patient care management and treatment administration like differentiated HIV care and follow-up, care and improve the access to health services populations need *(29, 83, 85)*.

41. In the fight against antimicrobial resistance, nurses fulfil a pivotal role by ensuring careful antibiotic use, monitoring patient progress and educating communities on best practices. They also can oversee antimicrobial consumption and lead on antimicrobial stewardship, fostering awareness of optimal antimicrobial use *(86, 87)*.

42. Preventing and managing NCDs relies on the essential role nurses *(88)* play in health. For example, nurse-led clinics increase screening rates, address major risk factors, improve medication adherence and can expand patient access to care *(74, 89, 90)* (see Box 4.3).

Box 4.3 Nurse-led clinics

Nurse-led clinics have been shown to be effective in delivering patient-centred primary care, reducing hospital admission and emergency room visits, length of hospital stay, symptom burden and improving patient satisfaction, diet and activity, while lowering patient anxiety and depression and improving self-management of chronic conditions *(91–100)*. Further, nurse-coordinated interventions for frail older adults discharged from hospitals have been associated with reduced re-admissions at 1 month and 3 months *(101)*.

Advancing the integration of nurse-led clinics in primary care requires a comprehensive, multilevel approach with targeted workforce policies at national, subnational and community levels *(102)*. Challenges such as policy constraints, leadership support, service inconsistencies and community buy-in can hinder widespread adoption *(92)*. Strengthening cost analyses and outcome measures can provide stronger evidence, while interprofessional collaboration can embed nurse-led models into existing frameworks that support their sustainability and scalability *(91, 92, 102, 103)*.

In the Philippines, public health nurses play a vital role in the implementation of the Universal Health Care Act, which aims to provide all Filipinos equitable access to high-quality health services with financial risk protection *(104)*. The Department of Health sponsored the Leadership Development Course for Public Health Nursing to enhance public health nursing competencies in areas essential to strengthening the health systems *(105)*. In the course, nurses are trained in public health and take on the role of leader, manager, advocate and care provider to meet the health care needs of individuals and population groups in the community. This course demonstrates the contribution of public health nurses with advanced skills who can effectively navigate and participate in all components of the health system, thus ensuring their increased role in the implementation of UHC through primary healthcare *(106)*.

Strengthening regulatory support for nurse-led interventions are also critical for effective, cost-efficient and sustainable NCD management *(90)*.

43. As the principal providers of contraception and reproductive health services worldwide, nurses face restrictions in some countries on tasks within their usual scope. A 2023 sexual, reproductive, maternal, newborn, child and adolescent health survey of 115 Member States found that 79% allow nurses to independently administer injectable contraceptives, 52% permit implant insertion and removal, and 47% authorize intrauterine device insertion and removal *(107)*. These figures highlight nurses' significant yet underrecognized role in comprehensive contraceptive care.

44. Across every stage of life – from neonatal care to child health and from adolescence through older age – nurses provide essential services in both facilities and communities. They play a pivotal role at every level of the health system in caring for small and sick newborns, ensuring survival and well-being. Nurses are often the first to identify and respond to signs of physical, emotional and psychological abuse of children in hospitals, schools, community health centres and home care. They often identify these cases through routine examinations of children presenting for unrelated concerns *(108–110)* (see Box 4.4).

Box 4.4 School Health and Nursing Service Programme in Nepal

The Ministry of Health and Population endorsed the School Health and Nursing Service Programme in 2019 to ensure the presence of health personnel in schools and deliver essential health services. The programme aims to promote a healthy lifestyle among adolescents by certifying schools as "Health Promoting Schools" and implement national health initiatives such as nutrition, vaccination and sexual and reproductive health education. It fosters a safe, supportive school environment, emphasizing health education for behavioural change, mental health promotion, first aid, and protection from accidents, injuries and substance abuse. Regular health screenings and timely referrals to health facilities help address health issues, while the programme works to reduce absenteeism and dropout rates. Achievements include successful implementation of deworming programmes, iron and folic acid supplementation for adolescent girls, and vaccination coverage (COVID-19; measles, mumps and rubella – MMR; typhoid). Health education has raised awareness on disease prevention and healthy lifestyles, contributing to safer communities. School absenteeism has decreased, and mental health initiatives through counselling and socioemotional learning have been promoted. Additionally, schools have developed disaster preparedness plans with regular drills. The programme plays a vital role in improving adolescent health and advancing Nepal's UHC goals *(111–115)*.

Box 4.5 Nurses play a vital role in the delivery of the essential public health functions

Essential public health functions encompass a comprehensive range of activities necessary to achieve and sustain global health goals such as UHC and global health security. These functions also include emergency preparedness and response, health promotion, disease prevention, surveillance and monitoring, and policy development *(116, 117)*. These functions are delivered through integrated services and systems across various health and allied sectors, including animal and environmental health, water and sanitation, food supply chains, road safety and urban planning.

The public health workforce includes all individuals who contribute to the delivery of at least one of the EPHFs as part of integrated services and systems within health and allied sectors. It comprises a heterogenous grouping of diverse occupations and can be conceptually framed as three overlapping groups: core public health personnel; health and care workers; and personnel from other occupations allied to health *(23, 118)*.

Working within their communities, nurses play an active role in contributing to the delivery of the EPHFs. Nurses are pivotal in emergency preparedness and response, leading response teams, providing critical care during emergencies and educating communities on disaster preparedness *(23)*. Nurses also actively engage in health promotion and disease prevention by conducting community education, vaccination campaigns, advocating for healthy lifestyles and performing screenings to prevent disease outbreaks. Nurses are well-positioned to identify and address health risks within their communities, including public health surveillance and monitoring, by collecting and analysing health data – essential for the early detection of potential health threats to communities *(29, 116, 119)*.

Moreover, nurses can influence public health policy development and implementation through their understanding of community health needs. They can advocate for policies that enhance health equity and improve access to care, ensuring that public health initiatives are both effective and inclusive *(23, 120)*. Additionally, nurses can lead capacity-building efforts by mentoring other members of the public health team and conducting training programmes to ensure that the workforce remains competent and prepared to handle evolving health challenges *(120)*. Nurses can also play a vital role in identifying and supporting vulnerable population groups, such as older adults, individuals with multiple health conditions and marginalized communities.

National planners and policy-makers should enable nurses' roles in the delivery of public health functions by ensuring that they are equipped with the requisite competencies to perform their tasks in multidisciplinary teams through competency-based education programmes across the lifelong learning continuum (pre-service, in-service and specialization education) *(119)*. Furthermore, fostering collaborative partnerships between nurses and other occupations that comprise the public health workforce enhances the implementation of EPHFs, ensuring an integrated and comprehensive approach to public health that leads to healthier communities.

4.3 Essential public health functions, including emergency preparedness, response

45. Nurses play a crucial role in strengthening health systems, building community capacities and ensuring the sustainability of essential health services during emergencies. Their engagement in interdisciplinary and intersectoral collaborations enhances the effectiveness of emergency preparedness and response, ensuring that communities are better equipped to handle health risks during crises (see Box 4.5).

46. Nurses have been indispensable in managing essential health services during global health emergencies such as the COVID-19 pandemic and the Zika and Ebola virus outbreaks *(33, 116, 117)*. The WHO Pulse Survey 2023 reported that nearly one quarter of essential health services experienced disruptions from the COVID-19 pandemic in various service settings, including primary care, emergency and critical care, rehabilitation, palliative care and community care *(121)*. Nurses contribute to maintaining these essential services and their leadership in disaster management and response planning ensures that services can quickly adapt to avoid ongoing disruptions, minimizing the impact on patient outcomes and quality essential health services *(121–126)*.

47. Acute health emergencies impact millions globally each year, with risks continuing to rise due to climate change *(127)*. Timely detection and the dissemination of information regarding these threats are critical in a multisectoral response to mitigate the public health, social, political and economic consequences of such emergencies *(122, 124, 128)*. Emergency risk mitigation is crucial for reducing the impact of disasters, and nurses are pivotal in protecting at-risk populations through patient care, community education, early warning systems, disaster planning and promoting health system resilience *(122–124, 127, 129)*. To support these efforts, core competencies in disaster nursing have been defined, establishing the minimum standards required for nurses deployed as part of an established team to effectively respond to disasters *(130)*.

A nurse disinfects a cholera treatment centre in cholera-prone Gofa Zone, southwest Ethiopia. © WHO/Mulugeta Ayene

A nurse prepares a syringe while working in a hospital in the Pacific Islands. © WHO/Mesake 'Isileli Taukolo

CHAPTER 5

Jobs/employment

STRATEGIC DIRECTION

Increase the availability of nurses by sustainably creating nursing jobs, effectively recruiting and retaining nurses, and ethically managing international mobility and migration.

KEY FINDINGS

- The global stock of nurses is 2023 is 29.8 million. Among these, 80% were classified as nursing professionals, 17% as nursing associate professionals and 3% were not categorized in either group.
- Nurses represent approximately 57% of the five health occupations (medical doctors, nursing and midwifery personnel, dentists and pharmacists).
- The global distribution of nurses is highly skewed. High-income countries, which account for 17% of the world's population, host nearly half (46%) of the world's nurses.
- The density of nurses varies greatly across regions and income groups. Low-income countries have 9.3 nurses per 10 000 population, HICs have 100.4 nurses per 10 000 population – a tenfold difference.
- The 35 SIDS have a lower average nurse density (29.6 per 10 000 people) compared with non-SIDS countries (37.1 per 10 000 people).
- Data from 130 countries between 2018 and 2023 reveal a relatively young nursing workforce, with 33% under 35 years old and 19% aged 55 or older and nearing retirement.
- Data from 150 countries show that 85% of nurses globally are female, ranging from 91% in the Western Pacific to 66% in Africa, with 15 countries reporting more male than female nurses.
- In the 80 countries reporting data, approximately 15% of nurses, or one in seven, are foreign-born.
- High-income countries that reported data have the largest share of foreign-born nurses (23%), while lower middle-income (1%), upper middle-income (8%) and LICs (3%) had significantly smaller shares, a pattern consistent with the 2020 data.
- Globally, an average of 70% of nurses work in the public sector, 18% in private for-profit facilities and 11% in private not-for-profit facilities.
- The global stock of nurses is projected to reach 36 million by 2030, representing an average annual growth rate of 2.7%.
- The global nursing shortage in 2023 was 5.8 million and projected to decline to 4.1 million by 2030. However, 69% of the shortages in 2030 will be in the African and the Eastern Mediterranean regions.

48. This section on nurse employment describes the types of nurses, their geographic distribution, age and sex profiles. It also assesses how nurses are distributed across various facility ownership types, projects nursing stock and density through 2030, identifies shortages in 2023, and evaluates the production needed to address these gaps by 2030. It examines the complex dynamics of international mobility and migration of nurses, presenting data on foreign-born and foreign-trained nurses and assessing how the international movement of nurses affects the sustainability of the global health workforce.

49. All 194 WHO Member States have reported data on stock of nursing personnel, out of which 88% of Member States reported data for the years 2020 to 2023 (see Annex 4). Factoring in the projected growth in countries that reported data for previous years, it is estimated that there were 29.8 million nurses globally in 2023 (Table 5.1). However, this global figure masks deep variations within and across regions (see section 5.1.3).

50. The 2023 estimate of 29.8 million nurses shows an increase from WHO's 27.9 million figure of 2018, reported in the first edition of the *State of the world's nursing*, published in 2020. The increase stems from both improvement of data quality and reporting, including countries and regions which have updated or adjusted time-series data to account for the private sector *(131)* and a real increase in stock.

Table 5.1 **Distribution of global stock of nursing personnel (in millions) in 2013, 2018 and 2023 from various data releases**

DATA RELEASE	***Global strategy on human resources for health: workforce 2030***	***State of the world nursing 2020***	***State of the world nursing 2025***
YEAR OF REPORTING	2013 (nurses/midwives)	2018 (nurses)	2023 (nurses)
African Region	1.0	0.9	1.7
Region of the Americas	4.7	8.4	7.5
South-East Asia Region	2.9	3.3	3.6
European Region	6.2	7.3	7.2
Eastern Mediterranean Region	1.3	1.1	1.3
Western Pacific Region	4.6	6.9	8.5
Global	**20.7**	**27.9**	**29.8**

Note: This table presents stock of nurses from various data releases since the *Global strategy on human resources for health: workforce 2030* in 2016. The data presented for years 2013 and 2018 have not been retrospectively adjusted, they are reported as in the original published sources in the *Global strategy on human resources for health: workforce 2030, State of the world's nursing 2020* and *State of the world's nursing 2025.*
Sources: *Global strategy on human resources for health: workforce 2030; State of the world's nursing 2020*; NHWA data portal for *State of the world's nursing 2025*.

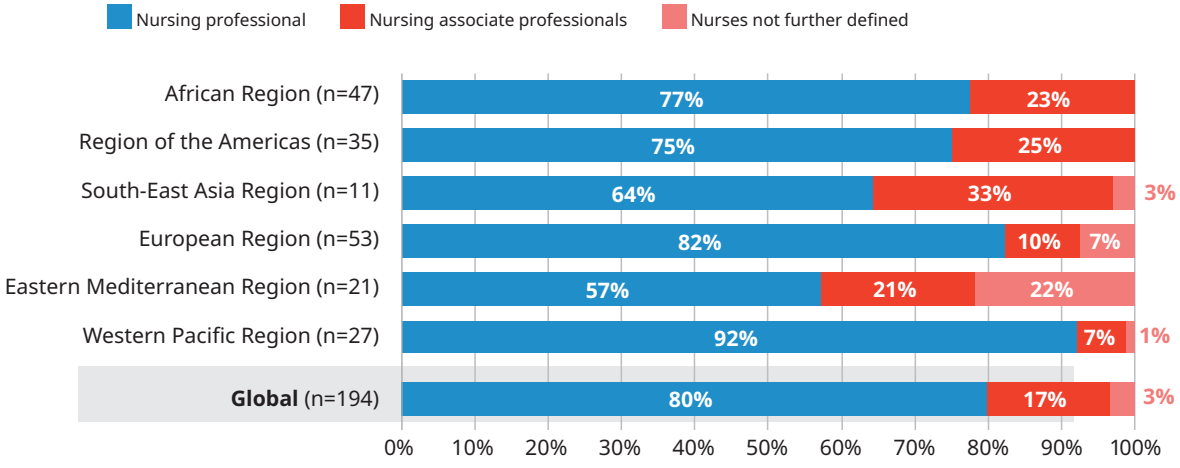
5.1 Nursing personnel stock and density

5.1.1 Distribution by type of nursing personnel – professionals and associate professionals

51. Out of the 29.8 million nurses reported through the most recent data and estimates, 16.8 million (56%) were categorized as nursing professionals (ISCO code 2221) and 4.7 million (16%) as nursing associate professionals (ISCO code 3221), while 8.3 million (28%) were not classified as either and thus categorized for this analysis as "nurses not further defined". This reporting of nurses not further defined (28%) is higher than reported in *State of the world's nursing 2020* (9%), probably reflecting potential challenges to harmonize national data to ISCO-08 classification or less engagement with nursing stakeholders to conduct occupation mapping to ISCO-08. This share of nurses not further defined was particularly high in the Western Pacific Region (63%).

52. Additional information collected and previous reporting enable reclassifying nursing personnel reported as nurses not further defined, by using previous reported distribution of nursing personnel, or using information on training duration where training duration of 3 years or more usually reflects nursing professionals. Using this additional information, out of the 46 countries reporting nurses not further defined, it was possible to reclassify the nursing category for 35 countries. The majority of nurses were nursing professionals (80%), with 182 countries reporting, and a lower proportion (17%) were nursing associate professionals, with 98 countries reporting. Only 3% of nurses could not be clearly reclassified (from 11 countries), especially in the Eastern Mediterranean Region (22%). *State of the world's nursing 2020* reported 69% as nursing professionals and 22% nursing associate professionals. The distribution in the relative proportions of the reclassified nursing categories varies by WHO region (see Fig. 5.1).

Figure 5.1 **Proportion of nursing headcount within each occupation group, by WHO region**



Notes: Analysis is based on the latest available data over the period 2018–2023 for nursing personnel stock, or headcount of nurses. They are categorized according to nursing professionals, nursing associate professionals, and nurses not further defined. Nurses not further defined were reclassified, whenever feasible, based on previously known distribution or information on training duration.
Source: NHWA; 2024.

5.1.2 Distribution of nurses vs other health occupational groups

53. Analysis of the share of nursing personnel (meaning nursing professionals, nursing associate professionals and nurses not further defined combined) out of the five health occupations (medical doctors, nursing and midwifery personnel, dentists and pharmacists) used as tracer indicator for the SDG 3.c.1 target indicates that nurses represent approximately 57% of these health occupations, ranging from 44% in the Eastern Mediterranean Region to 68% in the African Region (see Table 5.2). This is slightly lower than in *State of the world's nursing 2020,* which revealed that the share of nursing personnel out of these five occupations was 59%.

5.1.3 Global geographic distribution of nursing personnel

54. The global distribution of nursing personnel and their corresponding density per 10 000 population varies substantially by WHO region and by World Bank income group (see Table 5.3).

Number of nurses

55. The region with the highest estimated nursing stock is the Western Pacific Region (8.5 million nurses); in contrast, the regions with the lowest estimated nursing stock are the Eastern Mediterranean (1.3 million nurses) and African regions (1.7 million nurses). A majority (78%) of the world's nurses work in three WHO regions (Americas, European and Western Pacific), which collectively account for 49% of the world's

Table 5.2 **Nurses as a percentage of the SDG 3.c.1 health occupations (medical doctors, nursing and midwifery personnel, dentists and pharmacists) by WHO region and by World Bank income group**

BY WHO REGION	Number of countries reporting/total	Average share of nurses
African Region	47/47	68%
Region of the Americas	35/35	63%
South-East Asia Region	11/11	50%
European Region	53/53	58%
Eastern Mediterranean Region	21/21	44%
Western Pacific Region	27/27	55%
BY WORLD BANK INCOME GROUP		
High-income	64/64	64%
Upper middle-income	54/54	52%
Lower middle-income	50/50	52%
Low-income	26/26	58%
Global	**194/194**	**57%**

Note: SDG 3.c.1 is the indicator used to assess progress on SDG target 3.c. Analysis is based on the latest available data over the period 2018–2023.
Source: NHWA; 2024.

Table 5.3 **Number of nurses globally and density per 10 000 population in 2023, by WHO region and by World Bank income group**

BY WHO REGION	Number of countries reporting/total	Number of nursing personnel [million (%)]	Density per 10 000 population [overall (min-max)]
African Region	47/47	1.7 (5.8%)	14.1 (1.2–63.7)
Region of the Americas	35/35	7.5 (25.1%)	72.2 (7.1–133.8)
South-East Asia Region	11/11	3.6 (12.2%)	17.4 (2.0–50.2)
European Region	53/53	7.2 (24.2%)	76.9 (28.0–202.6)
Eastern Mediterranean Region	21/21	1.3 (4.2%)	15.5 (1.2–83.7)
Western Pacific Region	27/27	8.5 (28.5%)	44.0 (5.1–127.1)
BY WORLD BANK INCOME GROUP			
High-income	64/64	13.8 (46.3%)	100.4 (26.5–202.6)
Upper middle-income	54/54	10.3 (34.6%)	36.0 (13.6–103.2)
Lower middle-income	50/50	5.0 (16.9%)	16.3 (1.2–106.8)
Low-income	26/26	0.7 (2.3%)	9.3 (1.2–40.7)
Global	**194/194**	**29.8 (100%)**	**37.1 (1.2–202.6)**

Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

population. High-income countries, which account for 17% of the world's population, host nearly half of the world's nurses (46%). This inequity in global distribution is almost unchanged from that reported in *State of the world's nursing 2020,* at which time the Americas, European and Western Pacific regions accounted for 51% of the population and hosted 81% of the world's nurses.

5.1.4 Density of nurses

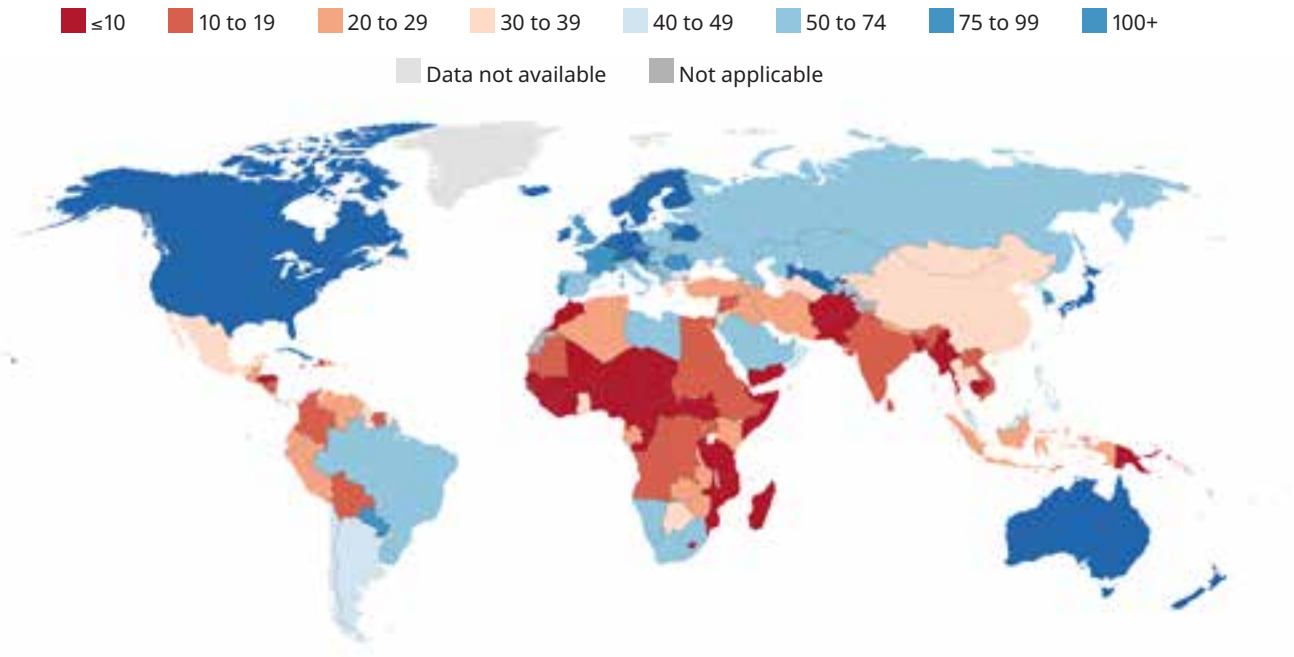
56. The WHO European Region has the highest density (76.9 nurses per 10 000 population); in contrast, the African, South-East Asia and Eastern Mediterranean regions are characterized by low densities of nurses (more than 35% lower than the median global density observed 10 years ago in 2013). While LICs have 9.3 nurses per 10 000 population, HICs have 100.4 nurses per 10 000 population – a tenfold difference. This scale of inequity was also observed in *State of the world's nursing 2020,* with an almost tenfold difference in the density between the Americas (83.4 per 10 000 population) and African (8.7 per 10 000 population) regions and more than tenfold difference between HICs (107.7 per 10 000 population) and LICs (9.1 nurses per 10 000 population) at the time.

57. The density of nurses per 10 000 population varies widely across and within regions (see Fig. 5.2): the countries with the lowest densities are concentrated in the African, South-East Asia and Eastern Mediterranean regions, along with some countries in Central and South America.

58. The density of nursing personnel in the 45 Member States classified by the UN Committee for Development Policy as least developed countries (LDCs) in December 2023, is 8.1 nurses per 10 000 population (see Table 5.4). The data from 2018 included in *State of the world's nursing 2020* indicated a ratio of 6.4 nurses per 10 000 population which, at the time, was still five times less than the average reported for countries not classified as least developed (42 nurses per 10 000 population). In addition, most of the LDCs are characterized as vulnerable according to the Fragile States Index.[1]

59. Meanwhile, the average density of nursing personnel in the 35 SIDS is 29.6 nurses per 10 000 population, which is lower than the density of the remaining countries (37.1 nurses per 10 000 population) (see Box 5.1). Lastly, for the 55 countries included in the *WHO health workforce support and safeguards list 2023*, the average nursing density is 8.8 per 10 000 population, five times lower than other countries (44.6 per 10 000 population) (see Box 5.2).

Figure 5.2 **Density of nursing personnel per 10 000 population in 2023**



Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

[2] Countries with a Fragile States Index score of 80+.

Table 5.4 **Number and density of nursing personnel in 2023 by categories of countries (level of development, Small Island Developing States, WHO health workforce support and safeguards list 2023)**

LEVEL OF DEVELOPMENT	Countries reporting	Number (million)	Density per 10 000 population [average (min-max)]
Least developed countries	45/45	0.9	8.1 (1.2–39.4)
Other countries	149/149	28.9	42.0 (5.1–202.6)
SMALL ISLANDS DEVELOPING STATES			
Small Island Developing States	35/35	0.2	29.6 (5.1–76.0)
Other countries	159/159	29.6	37.1 (1.2–202.6)
WHO HEALTH WORKFORCE SUPPORT AND SAFEGUARDS LIST 2023			
Countries on list	55/55	1.5	8.8 (1.2–39.4)
Other countries	139/139	28.3	44.6 (2.0–202.6)

Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

Box 5.1 Small Island Developing States

The 2023 Sustainable Development Goals report shows that SIDS face greater gaps to SDG achievement than the rest of the world *(132)*. There are 39 SIDS, representing one fifth of WHO's membership and 70 million people worldwide *(133)*. Populations living in SIDS are disproportionately affected by the climate crisis, external economic shocks, natural disasters and other development challenges. Most SIDS are middle-income countries and have made progress towards the social, economic and environmental objectives of sustainable development; however, progress has been uneven and slowed by successive global crises, including the global COVID-19 pandemic *(11)*.

Due to population size, there are not economies of scale to leverage for health workforce education, licensing and other regulatory functions. It can be challenging to attract and retain health personnel in remote areas. Nurses are often the only health practitioner in remote areas, such as "outer islands", which can mean long shifts and limited cover for personal time or professional development *(134, 135)*. They may also face deskilling due to professional isolation. Further, aggregate health worker to population density figures may not be applicable in areas with highly dispersed populations.

Policy priorities for SIDS include securing sustained levels of domestic investment for nurse education, employment, advanced practice and skills development and leadership. A clear imperative is to optimize the full scope of practice of nurses to deliver essential services, based on a primary healthcare approach. Additional aspects of service delivery may include telemedicine and use of APNs and referral systems. Recruitment and retention of nurses can be enhanced through ensuring decent work environments, secure income and employment, career advancement opportunities and incentive measures. Of particular relevance in SIDS, countries may also consider approaches to strengthen the capacity, capability and self-sustainability of nurses in partnership with other countries: mechanisms such as pooling or coordinating education and regulatory functions with other SIDS or larger neighbour countries have also been effective.

Box 5.2 WHO health workforce support and safeguards list (2023)

Consistent with the guiding principles of the WHO Global Code of Practice on the International Recruitment of Health Personnel, the *WHO health workforce support and safeguards list* identifies countries with a relative shortage of doctors, nurses and midwives and low coverage of essential health services *(136)*. These countries need investment for health workforce development and health system strengthening and safeguards that discourage active international recruitment of health personnel.

High-income countries are encouraged to collaborate with governments of countries on the list to ensure the health workforce is adequate to progress towards UHC and that the destination countries' governments provide the required co-investment and support *(137)*. Government-to-government agreements related to health worker mobility, under certain circumstances, are not proscribed for the listed countries, but should:

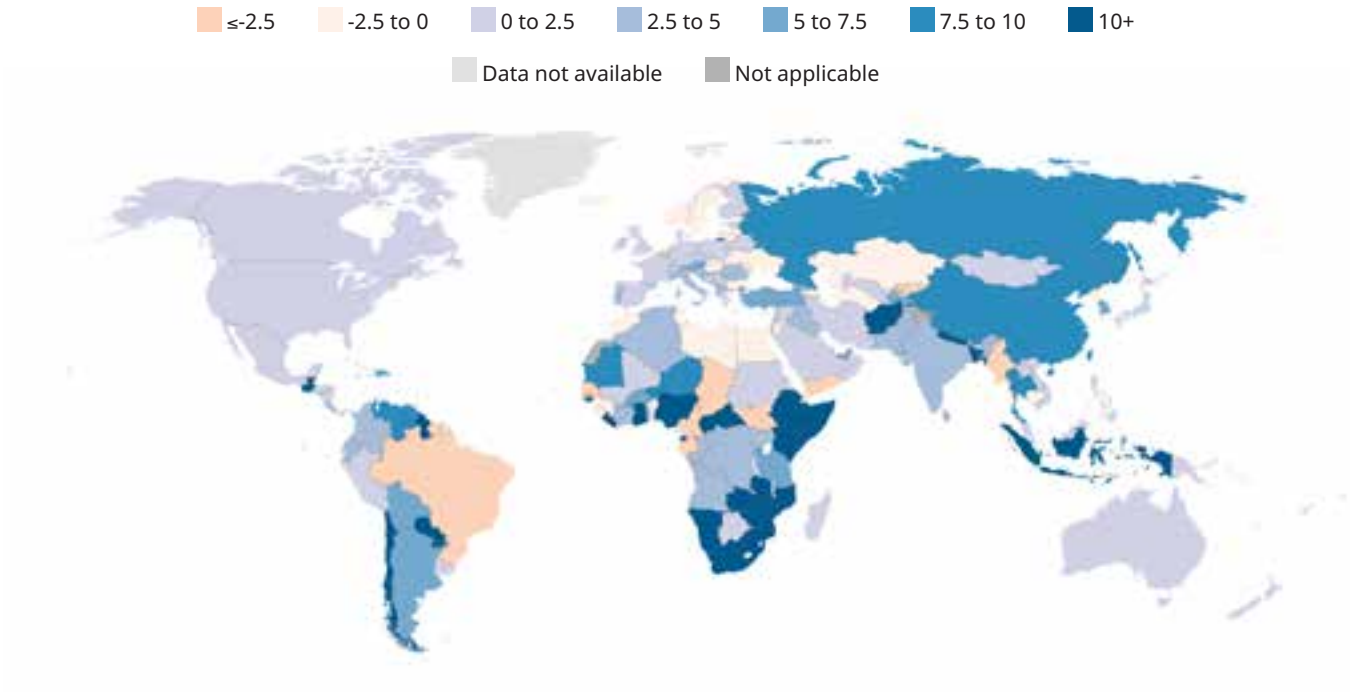
- be informed by an HLMA and the adoption of provisions to ensure adequate domestic supply in countries.
- explicitly engage health sector stakeholders, including ministries of health, in dialogue and the negotiation of relevant agreements;
- specify benefits to the health system of source countries that are commensurate and proportional to the benefits accruing to destination countries; and
- be notified to the WHO Secretariat through the respective NHWA and Code reporting processes.

The *WHO health workforce support and safeguards list 2023* has 55 countries, 37 of which are in the African Region. These recommendations can be extended to other countries as appropriate.

60. The nursing density observed in 2023 has increased when compared with earlier years of reporting such as 2013 (year used for health workforce stock and shortage estimates in the *Global strategy for human resources for health: workforce 2030*) (see Fig. 5.3).

61. In many countries the density of nursing personnel changed substantially between 2013 and 2023. The data suggest that some countries (in dark blue) may have experienced a 10% annual increase or more, while other countries did not change at all or experienced a decrease (countries in pink tones). The decreases in stock are often seen in countries with chronic conflict or civil strife (see Box 5.3). Conversely, many countries, particularly in the WHO African Region, had increases through effective health workforce strengthening efforts *(138)*. Finally, large increases or decreases could be due to data changes registered as countries continue to improve their data quality and completeness by including data for previous year and/or modifying approaches to classifying and counting nurses *(138)*.

Figure 5.3 **Annual percentage change in nursing personnel density between 2013 and 2023**



Box 5.3 Nurses working in conflict affected areas

Ongoing conflict has had a devastating impact on affected regions, posing significant challenges for nursing education, employment and service delivery to highly vulnerable populations. Many education settings have been forced to close due to violence and instability, halting programmes and delaying graduation *(139)*. The displacement of faculty members and experienced nurses has further limited the availability of skilled instructors for nursing programmes *(140)*. Damage to buildings, infrastructure and equipment has also restricted both theoretical and practical training, hindering the acquisition of nursing competencies *(141)*.

Widespread displacement has left many nurses unemployed, while damage to health facilities has reduced the number of available positions for nurses *(142)*. Nurses may migrate to neighbouring countries or further afield, seeking safety and better employment opportunities due to the deteriorating conditions in their local setting *(140)*. Nursing service delivery may shift from preventive, community-based, routine care to emergency and trauma care *(136)*. In conflict zones, nurses are often required to triage and provide care for victims of violence, including mass casualties, without prior training in trauma care *(139, 144)*.

Nurses working in conflict zones face immense risks, including from bombings, attacks on health facilities and direct threats to their safety *(145)*. Female nurses are at greater risk of sexual violence and kidnapping *(146)*; travelling to and from health facilities increases their exposure to danger *(147)*. Most facilities experience shortages of medical supplies, medications and personal protective equipment *(148)*. The stress of demanding work in these environments takes a significant psychological toll, leading to burnout and mental health challenges *(149)*.

While nursing leaders and partners can help identify and address public health challenges *(150, 151)* the safety of nurses and the broader population ultimately depends on an end to violence and conflict *(152, 153)*. Ensuring the physical safety and mental well-being of health and care workers, including nurses, remains crucial as they continue to provide essential and lifesaving services under extremely difficult circumstances *(141, 147, 149)*.

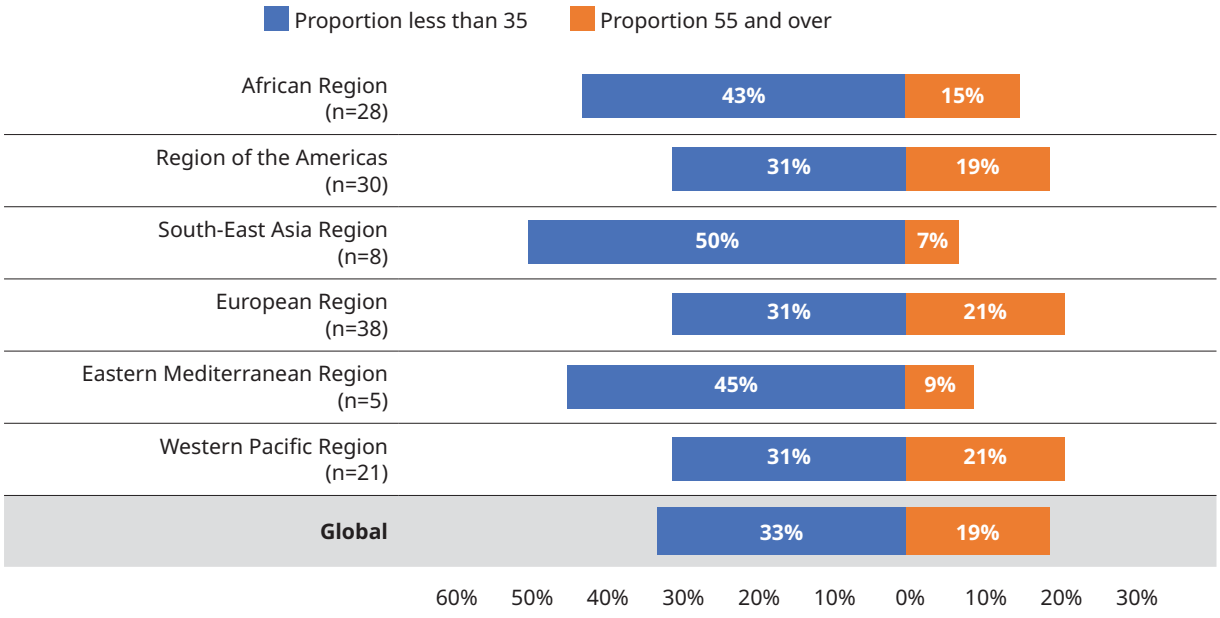
5.2 Nursing personnel demographics

5.2.1 Age profile of the nursing workforce

62. Available data on the distribution of nurses by age group from 130 WHO Member States for the period 2018 to 2023 revealed, in the aggregate, a relatively young nursing workforce: 33% of nurses are aged under 35 years, compared with 19% who are aged 55 years or above (the latter group expected to retire over the subsequent decade). This is only slightly different from what was reported in *State of the world's nursing 2020,* which identified 37% of nurses were aged 35 and below and 17% of nurses were aged 55 and above. However, wide regional disparities are observed in workforce ageing (see Fig 5.4).

63. Given that 19% of nurses are aged 55 years and above, around 3.1 million new nurses will be required to replace them between 2023 and 2030. This is purely to fill the gap created by the nurses exiting the workforce and does not take into account the additional number of nurses required to maintain densities (due to population growth) or to address increasing health needs and workforce shortage or nurse attrition. Experienced nurses can play an important role in the nursing workforce through the dissemination and transfer of knowledge (prior to retiring), which

Figure 5.4 **Percentage of nursing personnel aged below 35 years and 55 years or over, by WHO region**



Note: Latest available data over the period 2018–2023. Data were reported for less than half of the population in the South-East Asia and Eastern Mediterranean regions.
Source: NHWA; 2024.

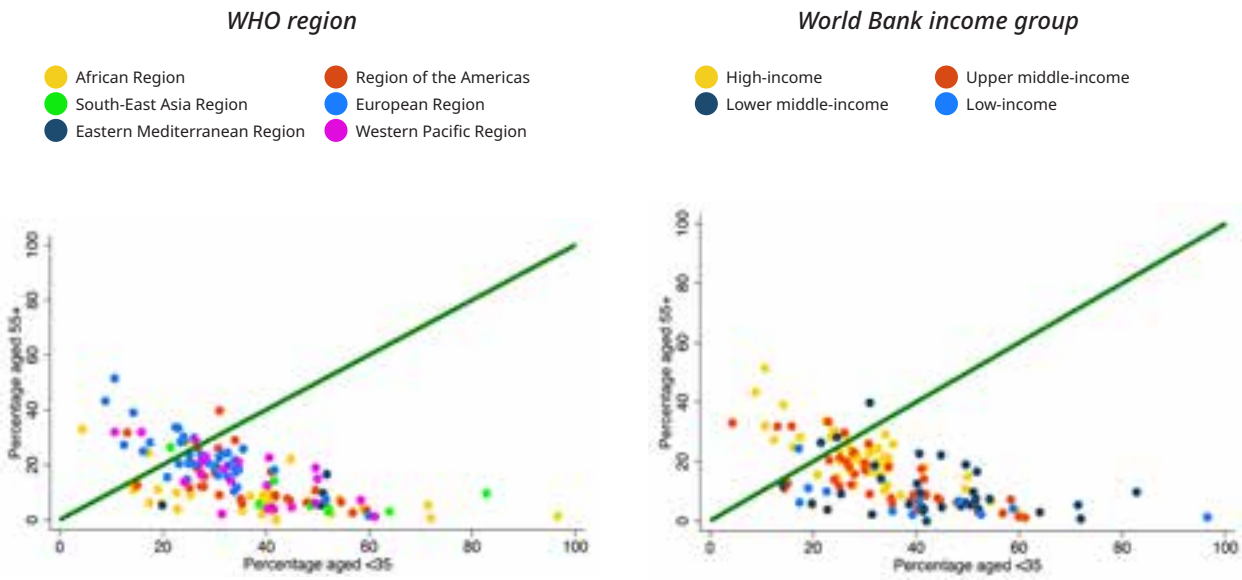
can enhance professional development for new nurses *(154)*.

64. The relative proportions of young and near-retirement nurses are provided by region and income group (see Fig. 5.5). The dots represent WHO Member States and the green line is indicative of equal proportions of both near-retirement nurses and young nurses. Countries above the line have a higher proportion of near-retirement nurses than nurses entering the workforce. Some 20 countries, the majority of which are high-income and from the European Region, are at risk regarding maintaining their nursing workforce stock constant due to its age structure. This is an increase from the 2018 data included in *State of the world's nursing 2020* in which 18 countries had an ageing workforce. Countries in the European Region have taken note of the trend and have targeted increased investment, innovation and partnerships to avert further health and care workforce shortages in the future *(155)*.

5.2.2 Sex profile of the nursing workforce

65. In 2024, there has been measurable improvement in the reporting of disaggregated data for nursing personnel. Data from 150 Member States on the distribution of nursing personnel by sex demonstrate that 85% of nursing personnel globally

Figure 5.5 **Relative proportions of nurses aged over 55 years and below 35 years, by WHO region and by World Bank income group**



Note: Analysis includes data for the latest year reported in the period 2018–2023 from 106 countries on the distribution of nursing personnel by age group. Each dot represents a country. The green line indicates where the number of nurses near retirement (aged 55 years and above) equals the number of young nurses (aged below 35 years) in the workforce.
Source: NHWA; 2024.

were female, ranging from 91% in the Western Pacific Region to 66% in the African Region (see Table 5.5). This represents a slight decrease from the status reported in *State of the world's nursing 2020,* which indicated that 89% of the nursing workforce was female. The African and Eastern Mediterranean regions have the highest proportion of males in the nursing workforce (34% and 27%, respectively) and a 20% higher proportion as compared with the Americas and the Western Pacific regions (13% and 9%, respectively).

66. Although generally a feminized occupation, 15 out of the 150 reporting countries reported higher numbers of male nurses than female nurses. Ten of these countries are in the African Region and all except one are classified as LICs. Lower representation of women in the health and care sector is often associated with women's lower overall participation in the labour market *(156, 157)*.

5.2.3 Foreign-born and foreign-trained nurses

67. In the 80 countries which reported data on the distribution of nurses by place of birth, about one in seven nurses, or approximately 15% is foreign born (see Table 5.6). The data from 2018 included in *State of the world's nursing 2020* indicated that one in eight nurses were either foreign born or foreign trained – aggregating data on these two indicators (foreign born and foreign trained). Thus the two indicators in the 2020 and 2025 reports are not directly comparable on this dimension. The limited number of countries reporting on this indicator also limits the inferences that can be made. Across all regions, however, nurses consistently represent

Table 5.5 **Proportion of female and male nursing personnel by WHO region**

WHO REGION	Number of countries reporting/total	Proportion of female nursing personnel	Proportion of male nursing personnel
African Region	34/47	66%	34%
Region of the Americas	31/35	87%	13%
South-East Asia Region	10/11	84%	16%
European Region	39/53	85%	15%
Eastern Mediterranean Region	13/21	73%	27%
Western Pacific Region[a]	23/27	91%	9%
Global	**150/194**	**85%**	**15%**

Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 150 countries on the distribution of nursing personnel by sex. [a] Data reported for less than half of the population.
Source: NHWA; 2024.

Table 5.6 **Proportion of foreign-born nursing personnel, by WHO region and by World Bank income group**

BY WHO REGION	Number of countries reporting/total	Proportion of foreign-born nurses
African Region[a]	16/47	3%
Region of the Americas	21/35	6%
South-East Asia Region[a]	5/11	8%
European Region[a]	23/53	14%
Eastern Mediterranean Region[a]	7/21	61%
Western Pacific Region[a]	8/27	26%
BY WORLD BANK INCOME GROUP		
High-income[a]	41/64	23%
Upper middle-income[a]	23/54	8%
Lower middle-income[a]	12/50	1%
Low-income[a]	4/26	3%
Global	**80/194**	**15%**

Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 80 countries on the distribution of nursing personnel by place of birth. Data refer to the proportion of count of foreign-born nurses divided by all nurses. [a] Data were reported for less than half of the population.
Source: NHWA; 2024.

A team of nurses coordinating patient care in Thailand. © WHO/Christine McNab

the largest population of mobile health workers *(158)* (see Box 5.4).

68. Reliance on foreign-born nurses ranges from a relatively small share in the reporting countries of Africa and the Americas (3% and 6%, respectively), to a larger share in the Western Pacific (26%) and the Eastern Mediterranean (61%). However, the limited number of countries reporting on this indicator could render the aggregated data figures less representative for a given region. For example, while the Eastern Mediterranean has a high proportion of foreign-born nurses, this figure does not include updated data from the most populous countries in the region and excludes data from a number of countries that have little to no reliance on foreign-born nurses. The reporting HICs had the greatest share of foreign-born nurses (23%), while the reporting lower middle-income (1%), upper middle-income countries (8%) and LICs (3%) had lower shares. This pattern is consistent with the 2018 data reported in *State of the world's nursing 2020,* when HICs had

Box 5.4 Pathways, drivers and challenges for internationally mobile nurses

International mobility can occur through a number of pathways, including direct individual application, arrangements mediated by government-to-government agreements, employment via a recruitment agency, through education programmes, and relevant immigration and trade policies. The introduction of regulatory flexibilities, mutual recognition of credentials, harmonization of education standards or other regulatory requirements also facilitate mobility.

Particular attention has been paid to the drivers of international mobility and migration, often referred to as "push" and "pull" factors. While every nurse's circumstances differ, common migration motivations cited in research on nurses from source countries include: the prospect of better economic conditions, increased renumeration, better working conditions, opportunities for educational and professional advancement, and familial connections in destination countries that facilitate their transition *(159–178)*. Other sources indicate that language and geographical proximity strongly influence migratory patterns among nursing personnel *(179)*.

Nurses who migrate can fill crucial workforce needs in destination countries *(180)*. However, internationally mobile nurses may not obtain professional recognition to work as a nurse in a destination country and may instead take a job as a care worker, working below their education, training and normal scope of practice *(181–185)*. While it may be an easier entry pathway than for a professional nurse, help improve required language skills, or facilitate taking the national nursing exam, nurses working in care worker roles represents a loss of potential health workforce capacity also for the destination country and can result in progressive deterioration of specific competencies by the nurse. This is an issue not only of "deskilling", but also restricts the positive dividends from women's economic empowerment gained through employment as a nurse. Data are not currently available on the number of nurses using the care worker pathway to migrate to destination countries, nor on how many eventually re-enter the nursing profession.

a share of 15.2% foreign-born nurses while the other income categories had less than 1% each. While international migration often involves migrating from a lower income to a higher income country (following wage gradients – see section 7.3 on wages), the patterns of migration are not always straightforward (see Box 5.5).

69. Overall, about one in nine nurses is foreign trained (11%) among the 87 countries that have reported data on the distribution of nursing personnel by

First aid training for ambulances nurses in Afghanistan. © WHO

Box 5.5 Circular international migration

Circular migration refers to the short-term, repeated movement of health workers between countries, ultimately returning to their home nations. This approach has been proposed as an effective strategy to alleviate the negative impacts of migration on the health systems of source countries. Meanwhile, diaspora health workers are health professionals who have relocated from their country of origin to work abroad but maintain strong connections with their home countries and continue to contribute to their health systems despite residing elsewhere. The positive contributions of diaspora health workers can be leveraged to support the health systems in their countries of origin. However, neither circular migration nor diaspora contributions alone are likely to fully address the challenges posed by excessive unplanned migration on the health systems of low- and lower middle-income source countries.

A scoping review found that circular migration among diaspora health workers is limited, primarily occurring between geographically close and linguistically aligned countries *(186)*. To enhance the impact of circular migration, policies should focus on strengthening relationships between governments and health workers, harmonizing training and reciprocal recognition of qualifications between source and destination countries, and ensuring secure travel. For countries that do not share geographic proximity, circular migration might be encouraged through incentives such as reduced travel costs, flexible licensing and practice regulations, economic incentives and enhanced security measures.

Many diaspora health workers who do not engage in circular migration continue to support their home countries' health systems. Their ongoing engagement is more likely when transactional barriers are low and when home governments consistently address the root causes of health worker emigration while improving local living conditions. This approach of putting in place enablers for both circular migration and diaspora contributions can contribute to mitigating the negative impacts of health worker migration and support the attainment of national and global health objectives *(14, 186, 187)*.

A nurse in Mongolia provides care at a health facility, supporting essential health services for the population. © WHO/Yoshi Shimizu

place of training (see Table 5.7). A high proportion of foreign-trained nurses is present among the reporting countries from the Western Pacific (22%) and South-East Asia regions (19%), while reporting countries from the African and Americas regions have a low share of foreign-trained nurses (6% each). Comparing the share of foreign-trained nurses by income group reveals that the reporting HICs have a high share of foreign-trained nurses (16%), with about one in six nurses in these countries having been trained abroad, while only 1% of nurses are foreign trained in the reporting LICs. A higher prevalence

Table 5.7 **Proportion of foreign-trained nursing personnel, by WHO region and by World Bank income group**

BY WHO REGION	Number of countries reporting/total	Proportion of foreign trained nurses
African Region	19/47	6%
Region of the Americas	21/35	6%
South-East Asia Region	5/11	19%
European Region[a]	25/53	10%
Eastern Mediterranean Region[a]	4/21	14%
Western Pacific Region[a]	13/27	22%
BY WORLD BANK INCOME GROUP		
High-income	40/64	16%
Upper middle-income[a]	20/54	6%
Lower middle-income	21/50	8%
Low income[a]	6/26	1%
Total	**87/194**	**11%**

Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 87 countries on the distribution of nursing personnel by place of training. Data refer to the count of foreign-trained nurses divided by all nurses.
[a] Data reported for less than half of the population.
Source: NHWA; 2024.

of foreign-trained nurses among the reporting countries in the South-East Asia and Western Pacific regions may reflect limitations in their nursing education capacity, whereas the higher prevalence in the reporting HICs may reflect those who had in-migrated and were also foreign born.

5.2.4 Nursing distribution by facility ownership

70. Within countries, another potential source of inequity may be observed through nurse availability in health settings. This section observes the distribution of nurses by facility, or whether nurses are employed in public facilities, private for-profit facilities, and private not-for-profit facilities (see Table 5.8). Globally, an average of 70% of nurses worked in the public sector, while 18% of nurses work in private for-profit facilities, and 11% work in private not-for-profit facilities. The pattern remained broadly consistent when analysed by region and income group.

Table 5.8 **Proportion of nurses in public, private for-profit and private for not-for-profit facilities, by WHO region and by World Bank income group**

	Number of countries reporting/total	Proportion of nurses employed in		
BY WHO REGION		Public facilities	Private for-profit facilities	Private not-for-profit facilities
African Region	19/47	76%	13%	11%
Region of the Americas	21/35	58%	17%	25%
South-East Asia Region[a]	5/11	68%	28%	4%
European Region[a]	25/53	73%	19%	8%
Eastern Mediterranean Region	4/21	70%	28%	2%
Western Pacific Region[a]	13/27	61%	35%	4%
BY WORLD BANK INCOME GROUP				
High-income[a]	40/64	66%	21%	13%
Upper middle-income[a]	20/54	70%	20%	10%
Lower middle-income[a]	21/50	66%	25%	10%
Low-income	6/26	78%	11%	11%
Total	**87/194**	**70%**	**18%**	**11%**

Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 87 countries on the distribution of nursing personnel by facility ownership. Percentages may not sum to exactly 100% due to rounding.
[a] Data reported for less than half of the population.
Source: NHWA; 2024.

5.3 Nursing personnel projection to 2030 and shortage

5.3.1 Projection of nursing stock and density to 2030

71. To assess the dynamic of the reported nursing stock in various data releases since 2013 and its projection to 2030, the most recent data for 2023 were compared with the previous release in the *Global strategy on human resources for health: workforce 2030* (for 2013) and with *State of the world's nursing 2020* (for 2018). The projection to 2030 was based on a simple stock and flow model published in 2022 *(188)* (see Annex 3 for details).

72. The global stock of nurses reported was 20.7 million in 2013 (including midwifery personnel); 27.9 in the 2018 data release (in *State of the world's nursing 2020*); and 29.8 million in 2023 (in *State of the world's nursing 2025*). It is projected to further increase to 36 million by 2030, which corresponds to an average 2.7% annual growth rate (see Table 5.9). The increase in stock by 2030 is particularly high in the South-East Asia and Western Pacific regions primarily because of the size of the populations in India and China. This is essentially the same projection of nursing stock in 2030 as was estimated in *State of the world's nursing 2020* (35.9 million).

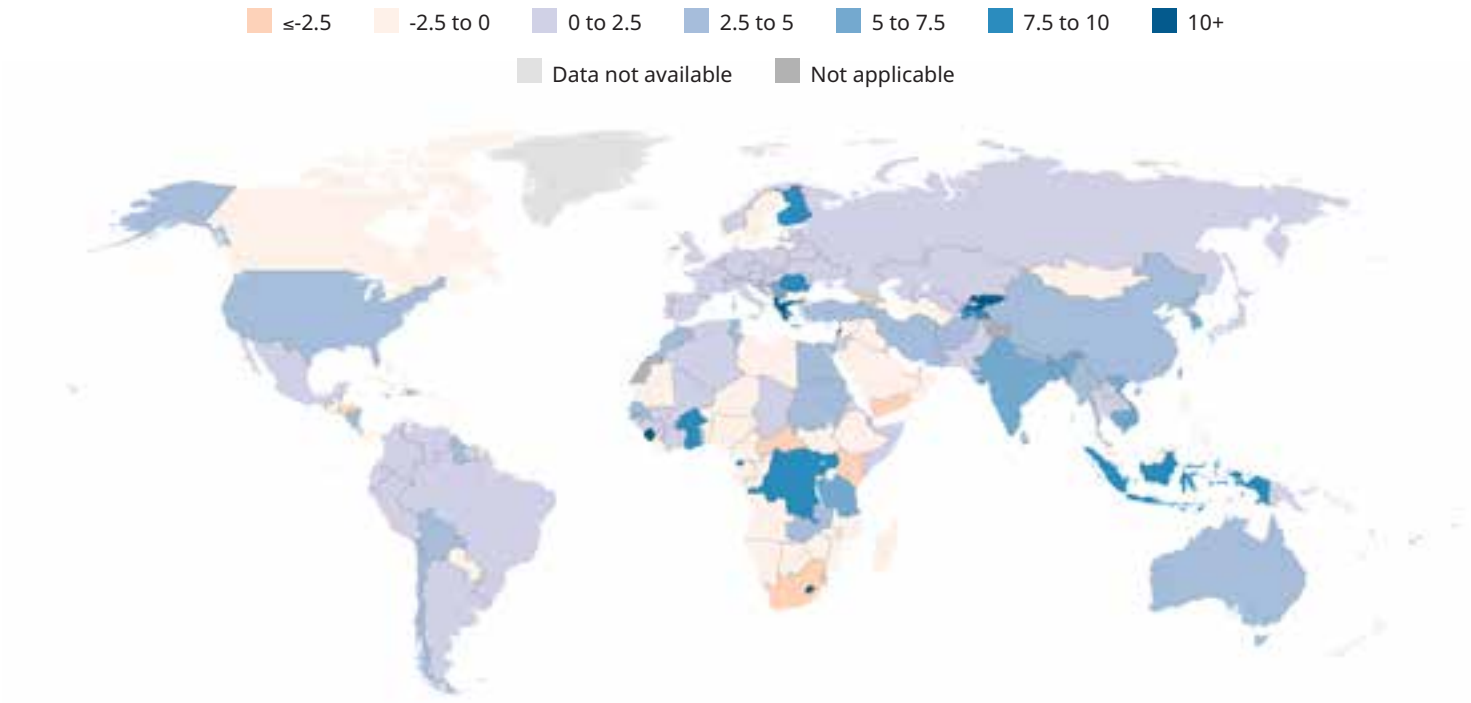
Table 5.9 **Estimated nursing personnel stock (in millions) for years 2013, 2020 and 2023, and projected to 2030 from various data releases**

DATA RELEASE	*Global strategy on human resources for health: workforce 2030*	*State of the world nursing 2020*	*State of the world nursing 2025*	
Year of reporting	2013 nurses/midwives	2018 nurses	2023 nurses	2030 nurses, projected
African Region	1.0	0.9	1.7	2.1
Region of the Americas	4.7	8.4	7.5	8.9
South-East Asia Region	2.9	3.3	3.6	5.5
European Region	6.2	7.3	7.2	8.2
Eastern Mediterranean Region	1.3	1.1	1.3	1.5
Western Pacific Region	4.6	6.9	8.5	9.7
Global	**20.7**	**27.9**	**29.8**	**35.9**

Notes: This table presents stock of nurses from various data releases since the *Global strategy on human resources for health: workforce 2030*. The data presented for years 2013 and 2018 have not been retrospectively adjusted: they are reported as in the original published sources in *Global strategy on human resources for health: Workforce 2030* and in *State of the world's nursing 2020*.
Sources: *Global strategy on human resources for health: workforce 2030; State of the world's nursing 2020;* NHWA data portal for *State of the world's nursing 2025*.

73. To account for population size and demographic trends, the change in density of nurses between 2023 and 2030 was estimated (see Fig. 5.6). While a large increase was observed for most countries between 2013 and 2023, some countries marked in light pink on the map, particularly in the WHO African and Eastern Mediterranean regions, could record decreases in their density by 2030. In some of these countries, the demographic situations (e.g. high fertility and population growth rates) or civil strife and ongoing conflicts, coupled with insufficient capacity of the education sector and absorption capacity of the health sector, may be important factors contributing to the decreases in density. Of concern, many of the countries expected to experience a decline in their nursing personnel density are on the *WHO health workforce support and safeguards list 2023*, indicating a likely persistence in the years ahead of the health workforce challenges these countries face. In all regions, some countries are projected to increase their nursing personnel density by more than 2.5% annually, which may reflect effects of investments in domestic production of nurses and in employment or retention efforts in some countries.

Figure 5.6 **Annual percentage change in nursing personnel density between 2023 and projected to 2030**



Source: NHWA; 2024.

5.3.2 Shortage of nursing personnel

74. The shortage estimation for nursing personnel was defined, for countries with a low density of nursing personnel, as the number of nurses required to reach the median density of nurses (27.5 nurses per 10 000 population), which was observed in 2013 across 194 WHO Member States. Using this density threshold, the shortage was estimated to be 6.2 million in 2020, reducing to 5.8 million in 2023 and further projected to decline to 4.1 million by 2030 (see Table 5.10). Because of data improvements, including retrospectively, these updated shortages do not directly compare with the estimation of 5.9 million nurses reported for 2018 in *State of the world's nursing 2020*. The revised estimation of shortage for 2018, based on 2023 data, would be 6.2 million. While this analysis shows a global improvement in the nursing personnel shortage, progress is unevenly distributed across and within WHO regions. At the regional level, the Americas and the Western Pacific are not projected to experience any decrease in their shortage. The African and Eastern Mediterranean regions will only see slight decreases and will bear nearly 70% of the global shortage of nurses by 2030 – an increase from estimations with 2020 data when these two regions bore 58% of the global nursing shortage. As compared with their projected nursing personnel stock, the closure of their shortage by 2030 would necessitate an approximate doubling of their nursing stock.

75. This is a similar level of inequity as documented in *State of the world's nursing 2020,* in which it was projected that by 2030, 89% of the shortage would be borne by low- and lower middle-income countries. To close the global nursing shortage by 2030, it was estimated that countries with shortages would need to increase their domestic production of nurses, alongside an improved absorption rate, by an average of 8% per year.

Table 5.10 **Estimated nursing personnel shortage (in millions) for years 2020 and 2023, and projected to 2030**

	Nursing personnel shortage (millions)		Projection
REGION	2020	2023	2030
African Region	2.4	1.9	1.8
Region of the Americas	0.2	0.2	0.2
South-East Asia Region	2.1	2.2	0.8
European Region[a]	–	–	–
Eastern Mediterranean Region	1.2	1.2	1.0
Western Pacific Region	0.2	0.2	0.2
Global	**6.2**	**5.8**	**4.1**

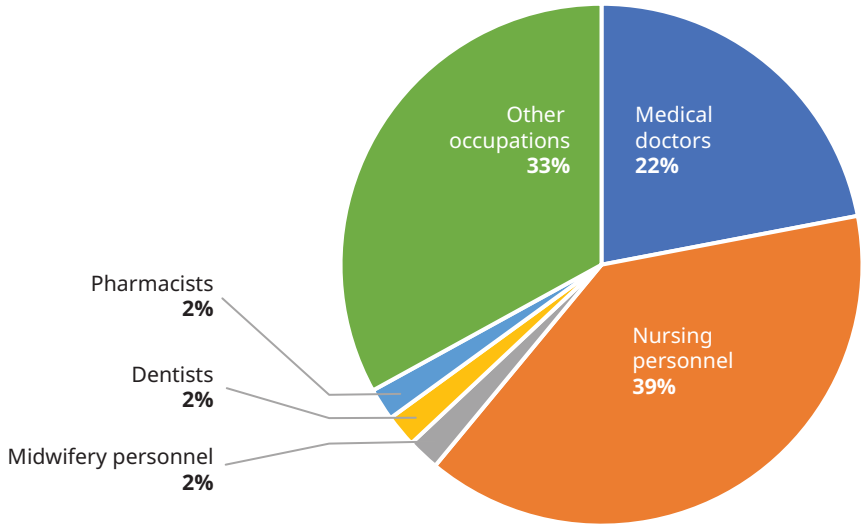
Note: [a] Not applicable – countries above the benchmark density are excluded from this estimation.

76. As with the methods used for *State of the world's nursing 2020,* shortages were estimated considering the benchmark density value used in the *Global strategy for human resources for health: workforce 2030*. While this means that countries above the benchmark are not included in this estimation, it is not suggesting that countries above the benchmark are not experiencing shortages of nurses, for example, against nationally identified service delivery targets and health system configurations. All countries are encouraged to conduct specific estimations of shortages, applying methodologies that account for factors such as population and workforce ageing, changing epidemiological patterns, optimized roles of health workers in service delivery and other labour market dynamics.

77. Any progress on the shortage of nursing personnel would impact the broader global health workforce gap – projected to be above 11 million by 2030 – as nursing personnel account for 39% of the global shortage in 2023 (see Fig. 5.7).

78. The present shortage estimation was estimated considering a stable absorption of 70% of new graduates in the health labour market. It is plausible that the economic instabilities and uncertainties related to international development assistance would impair the absorption capacity of graduates, in particular for LICs. To factor this in, an alternative scenario was developed considering a varying absorption capacity from 70% in HICs to 40% in LICs. Under this alternative scenario, the projected shortage to 2030 would be estimated as 4.8 million nurses (as compared with 4.1 million in the main scenario) – a 27% decrease compared with 2023 (as compared with a 29% decrease in main scenario). Under this alternative scenario, South-East Asia Region would be most affected with a shortage of 1.2 million nurses by 2030.

Figure 5.7 **Distribution of the global health workforce shortage in 2023 by occupations**



Source: NHWA; 2024.

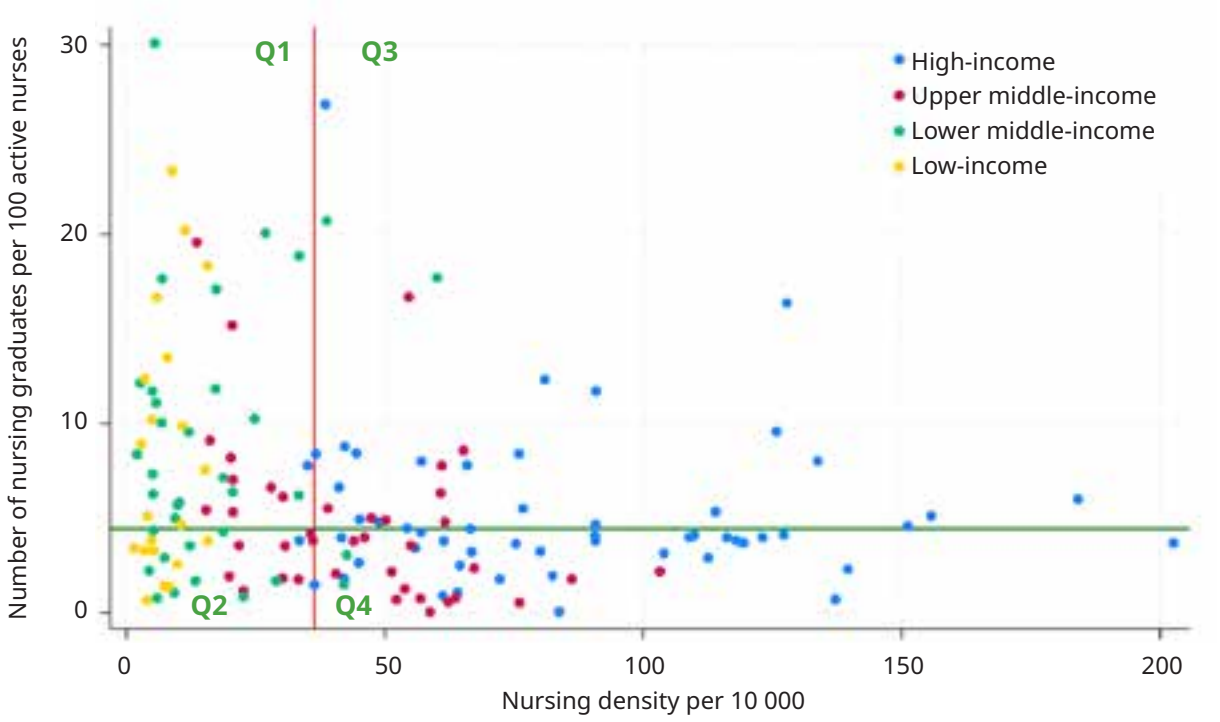
79. Alternative approaches to estimate or project nursing personnel shortage exist *(189)*. Some of these identify higher ambition levels for health and care needs, with differing assumptions on education and attrition. WHO acknowledges the varied approaches, and their strengths and weaknesses, but maintains consistency with its broader health workforce development approach for the SDG era in this report *(190)*.

5.3.3 Production required to tackle nursing shortage by 2030

80. The analysis of the distribution of nurses' stock, density and shortages showed important disparities across and within regions. Several labour market factors jointly influence the nursing challenges and among countries with lower densities each has specific issues to address. One common factor, further discussed below, is a country's capacity to educate and employ nursing personnel (see Fig. 5.8).

81. This analysis shows that among countries with a lower density, a good proportion of them have a

Figure 5.8 **Dot plot of the nursing density and ratio of graduates to stock by country and by World Bank income group in 2023**



Notes: Analysis includes data for the latest year in the period 2018–2023 from countries that reported on the stock of nursing personnel and the number of nursing graduates. Each dot represents a country. The green line represents the median ratio of graduate to stock across all countries, the red line represents the median nursing personnel density. Q1, Q2, Q3 and Q4 represent four quadrants to characterize different countries' situation.
Source: NHWA; 2024.

graduate to stock ratio above the median (quadrant Q1) and a group of countries have a ratio exceeding 10 nursing graduates per 100 active nurses. As a consequence, while those countries with low density and low ratio of graduates to stock (quadrant Q2) should strengthen their production capacity, a large proportion of countries already have adequate production capacity to renew their nursing workforce and to grow their stock if they are absorbed into jobs. For these countries, other actions would be required, such as securing employment of newly graduated nurses, or addressing other failures in the health labour market, for example, excessive unmanaged out-migration.

82. Among countries with a higher density of nursing personnel, similarly, this analysis shows contrasting situations. While some countries have both a high density and a high production capacity (quadrant Q3) and should ensure that trained nurses find jobs, other countries have a low production capacity (quadrant Q4) and, combined with an ageing nursing workforce, would rely more on migration of nurses. For these countries, to avoid being dependent on foreign-trained nurses, efforts should be dedicated in developing their training facilities and promoting nursing education *(191)* (see Box 5.6 for examples of health workforce planning for different challenges and opportunities with respect to nurses' education and employment).

Box 5.6 Examples of nursing workforce planning

WHO has supported HLMA in 49 countries around the world to inform national health workforce policies and investment plans *(7)*, including for the nursing workforce *(192–195)*. An example of the importance of the health labour market lens for health workforce planning comes from the experience of Ghana. To increase the density of nurses, the government invested in nursing education and increased the number of graduates from public and private nursing schools *(196)*. Public sector jobs had not been commensurately increased, thus the graduates could not be absorbed into the health system and remained unemployed for a number of years *(197)*. Subsequent assessments of workforce density and distribution across health facilities quantified gaps and resulted in an increased budget for employment and crystalized the need to conduct an HLMA for evidence-informed policies to correct health labour market failures *(198)*.

In Lesotho, an HLMA conducted prior to developing the national health workforce strategy, revealed the shortages of nursing personnel had been underestimated; urgent action to expand investments in education, recruitment, equitable distribution and retention were indicated *(199)*.

An HLMA in Tajikistan identified that while nurses led almost two-thirds of primary healthcare clinics, there was a need to expand their scope of practice to better meet population health needs, particularly in rural areas *(200)*. Resulting policy suggestions for nursing centred on improving nursing education, enhancing nurses' skills, strengthening the professional regulatory framework and increasing nurses' remuneration *(200)*.

Nursing students in the Democratic Republic of the Congo gather outside their training facility, preparing to begin the day. © WHO/Hugh Kinsella Cunningham

CHAPTER 6

Education

STRATEGIC DIRECTION

Nurse graduates match or surpass health system demand and have the requisite knowledge, competencies, attitudes to meet national health priorities.

KEY FINDINGS

- The overall mean nurse graduates-to-stock ratio stands at 6.4 nurse graduates per 100 active nurses globally, with substantial variations by region and income group, including the highest ratio in the South-East Asia Region (8.1).
- The overall nurse graduates-to-population ratio stands at 25.3 per 100 000 population globally, with the European Region showing the highest ratio (42.7 per 100 000 population).
- Among the 43 countries reporting the sex distribution of nursing graduates, 82% are female.
- Among the Member States that responded on nursing education regulation and standards, 90% have policies for faculty qualifications, 88% employ accreditation mechanisms for education and training institutions, and 77% engage in cooperative efforts between these institutions and regulatory bodies.
- 100% of responding countries in the South-East Asia Region reported the existence of faculty standards (compared with 68% in the Americas), while accreditation mechanisms were most common among the responding countries in the European Region (96%) and least common in Africa (78%), with a notable gap between HICs (97%) and LICs (58%).
- 62% of responding countries reported having standards for interprofessional education, while 45% and 57% reported having measures incorporating social determinants of health and social accountability into accreditation mechanisms for nursing education and training programmes, respectively.
- Cooperation between health workforce education and regulatory bodies was reported in fewer than two-thirds of the responding countries in Africa and the Americas, and only 56% of LICs (compared with 89% in HICs).
- 140 countries reported the duration of their nursing pre-service education programmes, with a majority (53%) indicating 3-year programmes and 31% indicating 4-year programmes.
- Globally, 9% of countries reported an average duration of nursing education of 2 years and 8% reported 5 years, with the Western Pacific and African regions showing the highest percentages of 3-year programmes (65% and 62%, respectively).

83. This section describes aspects of the "education pipeline" of nurses, the gender distribution among nurse graduates, the status of education regulation, and the duration of pre-service nursing education. Highly relevant topics for nursing that are not well covered by the global indicators, such as bachelor's degree education for nurses, use of digital health technology in nursing education, challenges in clinical learning environments and investments needed in nursing faculty, are described in the boxed text in this chapter.

84. The health education system represents the "supply" side of the health labour market and its production needs to relate directly, in both quantitative and qualitative terms, with the jobs and employment factors addressed in Chapter 5. Within nursing education, it is paramount to ensure that students learn the skills and competencies they will need in health service delivery settings and that there are enough graduates to meet demand in the health system to avoid shortages and gaps in service delivery. The number of graduate nurses may not match the diverse health needs and priorities in a given population due to inadequate capacity and infrastructure in education institutions, or due to a mismatch in their core competencies or restrictions in their scope of practice. Whatever the reason, a shortage of graduates can negatively impact the effective coverage of the health and care workforce and hinder progress towards UHC. Investments are needed to strengthen institutional capacity, including nursing faculty, and mechanisms for ensuring a high-quality education *(41, 201)*.

6.1 Dynamics of student nurse entry and exit

85. Monitoring the education pipeline is critical for efficient workforce planning and to assess the additional investments in education and training required to match health system needs.

86. The overall mean nurse graduates-to-stock ratio is 6.4 nurse graduates per 100 active nurses globally, with substantial variations by region and by income group (see Table 6.1). This ratio is slightly higher than the 6.2 nurse graduates per 100 active nurses reported in *State of the world's nursing 2020*. The graduates-to-stock ratio is highest in the South-East Asia Region (8.1 nurse graduates per 100 active nurses) and lowest in the Region of the Americas (5.1 nurse graduates per 100 active nurses).

87. Comparing by income group reveals that the mean number of graduates per 100 active nurses is highest in the low-income and lower middle-income countries (8.3 and 8.7, respectively) and lowest in the HICs and upper middle-income countries (5.3 and 4.8, respectively). While these countries may have a relatively younger age structure and a higher ratio due to the lower denominator representing an insufficient nursing stock, this finding might also indicate that some LICs are making significant efforts to increase their nursing workforce production capacity. However, commensurate investments are needed in nursing jobs to avoid unemployment which can fuel outmigration. On the other hand, HICs would need to target investments at expanding domestic production of nurses to rely less on foreign-born nurses from low- and lower middle-income countries.

Table 6.1 **Production of graduate nurses, by WHO region and by World Bank income group**

BY WHO REGION	Number of countries reporting/total	Mean number of nursing graduates per 100 active nurses (min–max)	Mean number of nurse graduates per 100 000 population
African Region	40/47	7.6 (0.8–30.1)	9.5
Region of the Americas	25/35	5.1 (< 1–9.1)	22.7
South-East Asia Region	9/11	8.1 (3.5–15.1)	14.4
European Region	50/53	5.6 (< 1–26.9)	42.7
Eastern Mediterranean Region	14/21	5.6 (< 1–17.1)	9.0
Western Pacific Region[a]	13/27	7.5 (1.5–20.1)	37.5
BY WORLD BANK INCOME GROUP			
High-income	55/64	5.3 (< 1–26.9)	43.7
Upper middle-income[a]	40/54	4.8 (< 1–19.6)	17.8
Lower middle-income	35/50	8.7 (< 1–30.1)	16.0
Low-income	21/26	8.3 (< 1–23.3)	7.2
Total	**151/194**	**6.4 (< 1–30.1)**	**25.3**

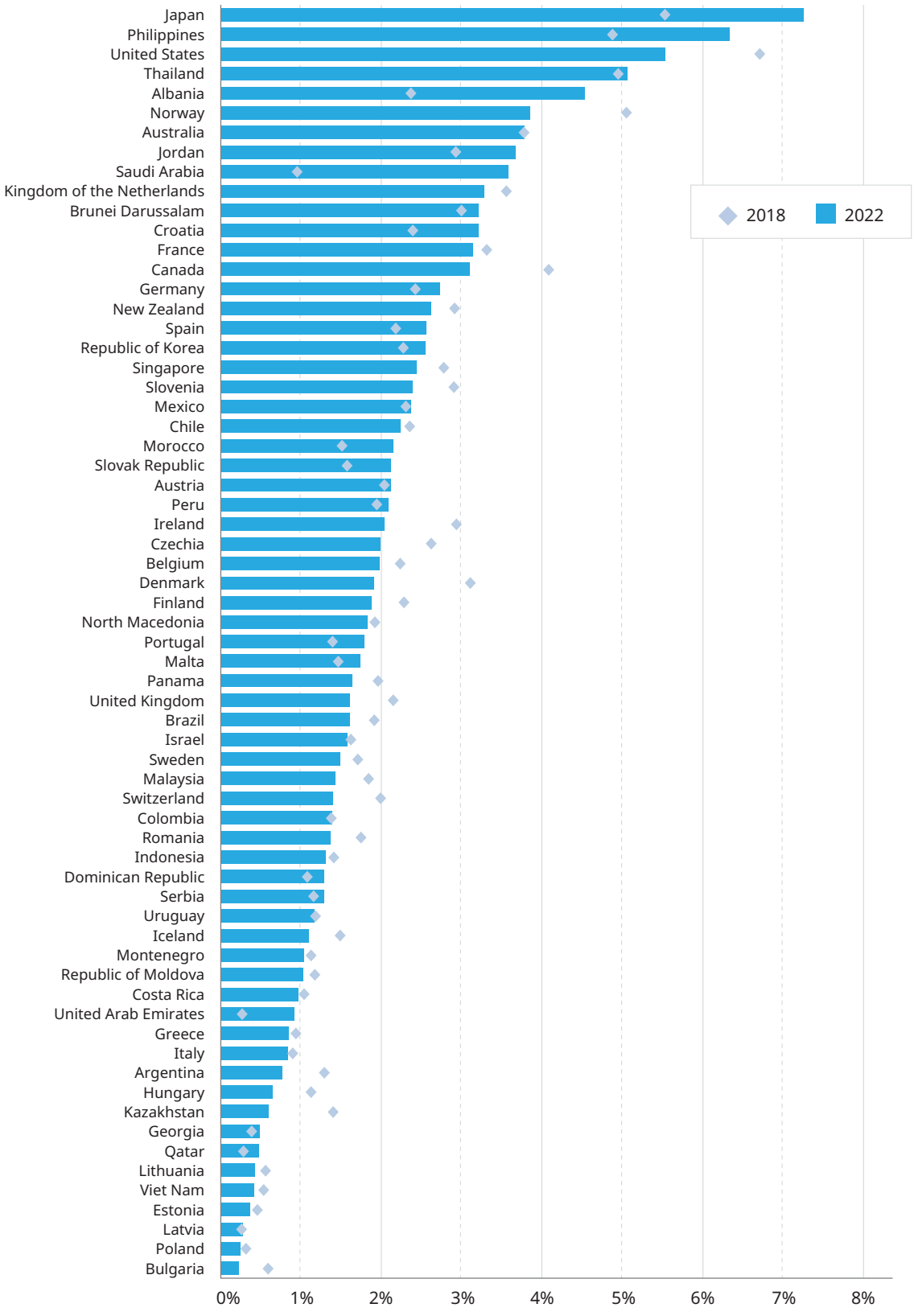
Notes: Latest available data over the period 2018–2023. [a] Data reported for less than half of the population.
Source: NHWA; 2024.

88. In analyses developed for the Fifth Global Forum for Human Resources for Health, it was estimated that an increase in health worker graduates of 8–12% was needed in countries characterized by severe shortages or very high expected turnover due to age structure in order to double the stock of health workers in 10 years *(25)*. In the nursing workforce, 8.3 graduates per 100 active stock is approximately what is needed to double the stock of nurses over 10 years, in the absence of migration and attrition, and presuming timely employment upon graduation. While they have higher attrition rates due to retirement, this ratio does not broadly apply to HICs.

89. The overall nurse graduates-to-population ratio is 25.3 nurse graduates per 100 000 population worldwide (see Table 6.1), higher than the 2018 data reported in *State of the world's nursing 2020* at 22.6 per 100 000. The European Region had the highest ratio (42.7 nurse graduates per 100 000 population) Categorizing countries by World Bank income groups shows a positive relationship between income group and the number of nurse graduates per 100 000 population.

90. A survey that explored the interest of 15-year-old students in pursuing careers as nurses found it had decreased in at least half of OECD countries between 2018 and 2022, with the largest reductions in the Canada, Denmark, Ireland, Norway, the United Kingdom and United States *(202)*. Reductions in interest in pursuing nursing as a profession were found in non-OECD countries as well (see Fig. 6.1).

Figure 6.1 **Percentage of secondary students reporting intent to enrol in nursing school from PISA surveys 2018 and 2022 (N=61 countries)**



Note: Displaying for countries reporting both in PISA 2018 and PISA 2022.
Source: OECD, PISA 2018 and 2022 Database.

91. Data from only 43 countries which reported the distribution by nursing graduates by sex indicate that 82% of nursing graduates are female (see Table 6.2). It is more imbalanced in the Western Pacific Region (10 female graduates for every male graduate) and more balanced in the Eastern Mediterranean and African regions (two female graduates for every male graduate).

Nursing students in Viet Nam complete patient records as part of routine documentation and care coordination. © WHO/Yoshi Shimizu

Table 6.2 **Proportions of female and male nurse graduates, by WHO region**

WHO REGION	Number of countries reporting/total	Proportion of female graduates	Proportion of male graduates
African Region[a]	5/47	67.1%	32.9%
Region of the Americas[a]	13/35	87.0%	12.9%
South-East Asia Region[a]	5/11	82.9%	17.1%
European Region[a]	10/53	85.5%	14.5%
Eastern Mediterranean Region[a]	6/21	68.9%	31.1%
Western Pacific Region[a]	4/27	90.3%	8.7%
Total	**43/194**	**81.6%**	**18.3%**

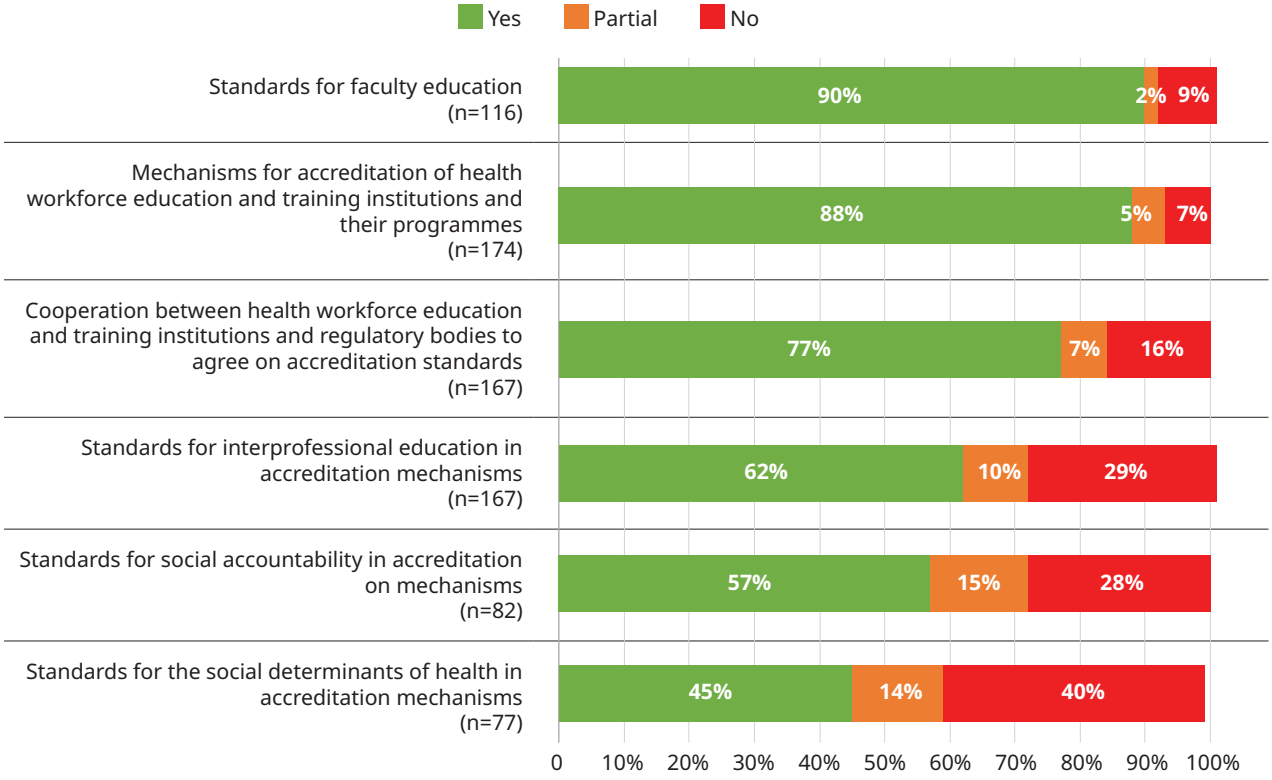
Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 43 countries on the distribution of nursing graduates by sex. [a] Data reported for less than half of the population.
Source: NHWA; 2024.

Nursing students in Japan participate in a clinical simulation exercise using a training mannequin. © WHO/Yoshi Shimizu

6.2 Nursing education regulation and standards

92. Accreditation mechanisms and quality standards for health workforce education and training programmes help ensure that all health workers are equipped with the competencies to meet population health needs. Fig. 6.2 and Table 6.3 show the status of various education regulations and standards for nursing, as reported by Member States. Most of the responding countries reported the existence of the following policies for nursing education: standards for faculty qualifications (90%), mechanisms for accreditation of health workforce education and training institutions

Figure 6.2 **Percentage of responding countries that reported existence of education related regulations and standards**



Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

Table 6.3 **Percentage of responding countries that reported the existence of various nursing regulations on education and training, by WHO region and by World Bank income group**

	National and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes	National and/or subnational standards for social accountability in accreditation mechanisms	National and/or subnational standards for the social determinants of health in accreditation mechanisms	National and/or subnational standards for interprofessional education in accreditation mechanisms	Cooperation between health workforce education and training institutions and regulatory bodies to agree on accreditation standards	Existence of standards for faculty qualifications
BY WHO REGION						
African Region	78% (32/41)	60% (12/20)	47% (9/19)	70% (28/40)	64% (14/22)	90% (20/22)
Region of the Americas	91% (31/34)	47% (7/13)	23% (3/13)	44% (15/34)	63% (10/16)	68% (13/19)
South-East Asia Region	90% (9/10)	40% (4/10)	60% (6/10)	40% (4/10)	80% (8/10)	100% (9/9)
European Region	96% (51/53)	50% (18/27)	56% (15/27)	65% (34/52)	90% (27/30)	90% (36/40)
Eastern Mediterranean Region	75% (12/16)	67% (4/6)	0% (0/6)	57% (8/14)	83% (5/6)	92% (12/13)
Western Pacific Region	90% (18/20)	67% (2/3)	100% (2/2)	53% (9/17)	100% (2/2)	88% (14/16)
BY WORLD BANK INCOME GROUP						
High-income	97% (58/60)	64% (21/33)	52% (16/31)	66% (38/58)	89% (31/35)	94% (50/53)
Upper middle-income	89% (42/47)	47% (8/17)	25% (4/16)	51% (23/45)	67% (12/18)	76% (19/25)
Lower middle-income	91% (39/43)	63% (15/24)	55% (12/22)	66% (27/41)	75% (18/24)	93% (26/28)
Low-income	58% (14/24)	38% (3/8)	38% (3/8)	65% (15/23)	56% (5/9)	90% (9/10)
Global	**88% (153/174)**	**57% (47/82)**	**45% (35/77)**	**62% (103/167)**	**77% (66/86)**	**90% (104/116)**

Notes: Latest available data over the period 2018–2023. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
Source: NHWA; 2024.

and their programmes (88%), and cooperation between education and training institutions and regulatory bodies to agree on accreditation standards (77%). As compared with *State of the world's nursing 2020,* this represents an increase in the standards for faculty qualifications (from 77%) and almost no change in accreditation measures (from 89% in *State of the world's nursing 2020*) (see Box 6.1 and Table 6.3).

Box 6.1 Challenges and opportunities to support and sustain nursing faculty

Shortages of nursing faculty are reported the world over, limiting the intake of nursing students or the quality of education, thus contributing to the nursing shortages and broader challenges *(203–208)*. The American Association of Colleges of Nursing found that 65 766 qualified applicants were rejected from graduate and baccalaureate nursing programmes in the United States in 2023 due to a lack of faculty and resources *(209)*.

Canada, the United Kingdom and United States have quantified their nursing faculty shortages including the age demographics contributing to the issue. One-third of faculty who were employed in 2015 in the United States were expected to retire by 2025 *(210)*; in Canada 52.8% of faculty were aged over 50 and 19.9% aged over 60 *(211)*; in the United Kingdom, over a third (37.6%) of the academic workforce were aged between 51 and 60 *(212)*. Data indicate common challenges of recruiting faculty due to lack of competitive salaries and qualified faculty mentors *(211–214)*. Several strategies implemented in the United States to entice nurses to earn graduate degrees and assume faculty roles include providing low-interest loans to enrol in graduate programmes and loan cancellation for those who work as faculty (Health Resources and Services Administration), government grants to support schools of nursing to increase the number of nursing students and faculty, programme enhancement and infrastructure modernization grants (Congress bill 3770), government (Department of Veterans Affairs) funded scholarships for baccalaureate and advanced nursing degrees *(215, 216)*. Most of these funding mechanisms come with a service obligation of 1–3 years. Similar nursing workforce initiatives to address faculty shortages at the state level have also been successful *(217)*.

The expectations for academic faculty go beyond teaching students and include research and publication, institutional leadership and management, and programme design and implementation – often with new digital health modalities and online technologies *(218–219)*. Common faculty concerns include: unsupportive leadership, stressful work environments *(214)*, low compensation, unrealistic workload, lack of appreciation and personal/family issues *(222)*. Job satisfaction, organization commitment and supportive workplace culture positively influenced faculty job and career satisfaction, and intent to stay *(219, 223)*. Conversely, work-life imbalance decreased faculty job and career satisfaction and increased intention to leave the job *(221, 223–225)*.

Formalized and structured orientation and mentorship are needed to enhance the novice nursing faculty's transition to the academic setting and role expectations *(221, 226–228)*. Academic programmes and faculty will need technical and financial support to incorporate digital health technologies into all levels of nursing education to ensure nurses have the requisite competencies to support patient care and population health such as electronic health records, telehealth, decision support systems, mobile applications, robotics and AI tools among others *(229–233)*. Academic programmes and faculty from computer science and engineering could be employed, or modes of interprofessional learning adopted to bring specialized knowledge of digital competencies into nurse education *(234–236)*.

93. The percentage of responding countries that reported the existence of "standards for interprofessional education" (62%) was slightly lower than in *State of the world's nursing 2020* (73%). The measures regarding the inclusion of "social determinants of health" and "social accountability" in accreditation mechanisms for nursing education and training programmes were the lowest at 57% and 45% of the responding countries, respectively. Caution is required in interpreting the results regarding education regulations and standards as self-reported measures of the presence of these measures and policies do not equate to actual implementation (see Box 6.2).

94. Data on the existence of regulatory and accreditation mechanisms for nursing education and training programmes, disaggregated by region and by income group have been summarized (see Table 6.3). The existence of faculty standards was reported by 100% of the responding countries in South-East Asia and only 68% of countries in the Americas but did not show a pattern by income classification. The reported existence of accreditation mechanisms was highest among the responding countries in the European Region (96%) and lowest in the African Region (78%), conversely with a large difference by income classification: 97% of the responding HICs reported accreditation mechanisms, whereas only 58% of LICs did so.

Box 6.2 Interprofessional education

Interprofessional education (IPE) equips health professionals with the skills to integrate their expertise within a cohesive and collaborative framework as part of multidisciplinary teams. Despite its importance, IPE efforts often face challenges, particularly in coordinating schedules across disciplines, which can complicate implementation *(237, 238)*. Simulation-based IPE has shown great promise, significantly improving teamwork culture and fostering positive attitudes among students, highlighting its effectiveness as a teaching tool *(239)*. In the Islamic Republic of Iran, simulation-based IPE for anaesthesiology students not only enhanced attitudes toward interprofessional teamwork, but also strengthened collaboration among health professionals *(239)*. IPE has positively impacted health outcomes in diabetes care, emergency department culture, patient satisfaction, operating room collaboration, reduced clinical error rates and improved management of care in domestic violence and mental health care *(240)*. However, this approach also requires substantial financial investment and technological resources, which can limit its widespread adoption *(237)*.

Cultural attitudes and interpersonal skills at individual level, and broader dynamics of competition among professions, often undermine team cohesion, representing significant barriers to interprofessional collaboration *(241, 242)*. In rural Australia, these barriers compounded with organizational challenges, limit the effectiveness of IPE and interprofessional care highlighting the need for improved collaboration across the health system *(241)*. Additionally, both educators and students may develop cultural and professional biases about their roles or each other, further complicating IPE implementation in training programmes *(237)*.

This indicates a particular need to advance mechanisms to ensure the quality and relevance of nursing education and training in these countries. Standards for IPE were reported in fewer than two-thirds of the responding countries in the African and Americas regions, and 75% of the responding LICs and 89% in HICs. This represents a lost opportunity to educate and train nurses in a manner that will prepare them for interprofessional team-based care. While the existence of standards specific to digital health was not explored, there has been an expansion in the use of digital tools in nursing education (see Box 6.3).

Box 6.3 Digital health technology in nursing education

The COVID-19 pandemic accelerated the transition to technology-enhanced learning *(243)*. Technologies from learning management systems to social media platforms continue to be utilized in all levels of nursing education *(244–246)*. Online distance learning programmes, combined with appropriate opportunities for clinical training, can enhance the diversity of students in nursing programmes *(247, 248)* and offer potential students in rural areas better access to nursing education *(249, 250)*.

Although online learning during the pandemic was valued by students and faculty, post-pandemic nursing education has moved toward blended approaches using both in-person and technology-based approaches due to limitations with online only learning approaches, student and faculty preferences, the resources required to deliver learning online, and barriers some people face accessing digital forms of education *(251–254)*. Barriers to digital forms of nursing education include limited internet access, a lack of computing equipment and technical support, poorly designed technologies, the absence or limited inclusion of digital health curricula, and varying levels of digital literacy among students and faculty *(229, 255–259)*. Low digital literacy levels among some nursing students hinder their learning and professional development *(260, 261)*. During the COVID-19 pandemic when learning moved fully online, some students incurred personal costs to access and participate in online learning requiring internet access and personal digital devices *(262, 263)*.

In-person mentoring of distant or rural nursing students can be augmented by mobile and digital technologies that enable students to access electronic educational resources in clinical settings *(264–267)*. Virtual simulation using teleconferencing, virtual reality applications and other technologies along with associated instructional frameworks that include standardized patient scenarios and debriefing techniques are increasingly employed to teach undergraduate students core clinical skills and competencies in didactic settings, particularly when physical teaching spaces, high-fidelity simulation equipment and other resources are limited, or when access to clinical or real-world environments are restricted or geographically inaccessible such as some areas of primary care *(229, 268–272)*. These approaches may also be useful for graduate or continuing education of nurses, particularly those that pursue advanced practice and leadership roles *(273)*.

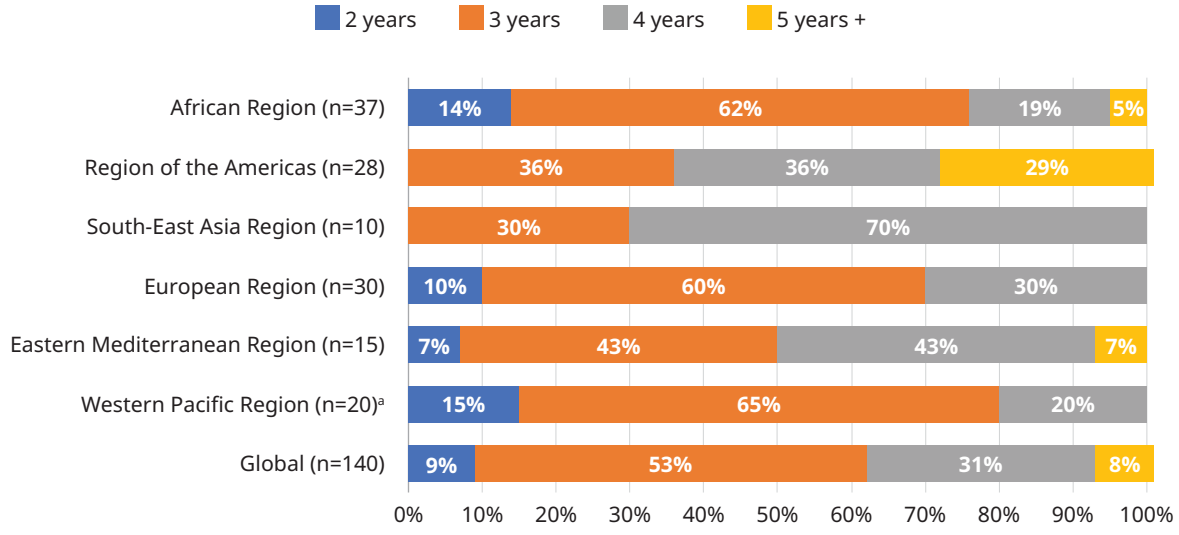
Recent innovations in generative AI tools have led to some faculty to develop AI chatbots that support undergraduate nursing students in developing clinical skills *(274, 275)*, as well as advanced content for graduate students and practising nurses *(276)*.

6.3 Duration of pre-service nursing education

95. A total of 140 countries reported data on the duration of their nursing pre-service education programmes (see Fig. 6.3). A majority (53%) of countries reported the duration of nursing education to be 3 years, while 31% of countries reported 4-year programmes, hence a cumulative total of 84% of countries reported having either 3- or 4-year programmes. The 2023 findings on the duration of nursing education cannot be directly compared with those reported in *State of world's nursing 2020* because the 2023 data were collected separately for the two categories of nurses (professionals and associate professionals); for *State of world's nursing 2020*, it was reported only for the professional category and for fewer than 100 countries.

Students from the UWI School of Nursing, Mona campus in Jamaica, take part in a site visit. © S. Chisholm Ford

Figure 6.3 **Distribution of countries by duration of education of nursing personnel (in years), by WHO region**



Note: Analysis includes data for the latest year reported in the period 2018–2023 from 139 countries on the duration of nursing education and training programmes (in years). Nursing personnel refers to nursing professionals, nursing associate professionals and nurses not further defined. [a] Data reported for less than half of the population.
Source: NHWA; 2024.

These 3- and 4-year durations in the 2023 data likely correspond to a university-level diploma or bachelor's degree programme for entry into the nursing profession. The evidence base on the benefits of a bachelor's level degree in many contexts – and the challenges in others – continues to grow (see Box 6.4).

96. Globally, 9% of countries reported 2-year programmes and 8% of countries reported 5-year programmes. The Western Pacific and African regions had the most countries reporting 3-year programmes (65% and 62%, respectively). South-East Asia had the most countries reporting 4-year programmes (70%), followed by the Eastern Mediterranean Region (43%).

Box 6.4 Bachelor's level education in nursing

Having a variety of levels of nursing education available at the same time is common in all country income groups. The baccalaureate degree is widely believed to confer a greater level of critical thinking, clinical judgement and leadership, which can result in a variety of positive outcomes at patient, facility and nurse levels, including improvements in measures of re-admission and mortality *(29, 277)*. However, the available studies continue to be from HICs and primarily hospital settings, which limits the generalizability to additional settings and country contexts.

National-level surveys found Bachelor of Science in Nursing (BSN) students were satisfied with their programme, citing a "deeper and more concrete knowledge" and increased competency in critical thinking, evidence-based practice and holistic care *(278–280)*. However, evidence from some countries which have introduced the BSN suggests confusion by employers, the public and other health professionals about the differentiation of tasks between those with certificate- or diploma-level education and those with the BSN *(281–283)*. The confusion can lead to non-differentiated task assignments, underutilization of the BSN nurses' skills, and no difference in wages or career advancement prospects, which contribute to dissatisfaction and, ultimately, leaving the profession *(220, 282–284)*. This may be related to the lower social standing of nurses and public perception of what nurses do – even those with bachelor's degrees *(220, 282, 283, 285)*.

Introducing a bachelor's degree programme for nursing programme is resource intensive *(219, 283, 286)* due to demands on the education environment and faculty and the availability of appropriate clinical placements. Faculty concerns include preparation and training in innovative teaching methods, lack of educational devices and facilities and faculty support in the educational organization and system *(219)*. Lack of adequate numbers of faculty constrains admissions and hinders quality of education, often requiring recruitment of foreign nursing faculty thus forgoing graduate study opportunities for national faculty *(283, 285, 287)*. The literature suggests establishing a standardized national curriculum for bachelor's level competencies aligned with population health needs, and coordination between nursing programmes and health employers, state and multilateral heath institutions, regulators and other relevant partners for accreditation of programmes. These processes also challenge health sector employers to differentiate roles and salaries based on the skill sets of nurses, which is necessary to grow the 'demand' for BSN graduates.

More than one-quarter (29%) of countries in the Americas reported the education programme as 5-years, which may reflect master's-level programmes. The Western Pacific Region had the highest percentage of countries (15%) educating nurses in 2-year programmes, followed by 14% of reporting countries in Africa. New technologies used in nursing education, such as AI, hold the potential for some benefits but also reasons for caution (see Box 6.5).

Box 6.5 AI in nursing education

Interactive and adaptive educational resources to improve learning, supporting students with communication (including writing) skills, facilitating critical thinking and enhancing faculty and student digital literacy can be created using AI techniques and tools *(230, 288, 289)*. AI can be integrated into educational and administrative technologies and digital pedagogies to enhance the delivery of content, to track and encourage student engagement in didactic and clinical training, and to offer tailored support services and personalized learning experiences and feedback to students. Appropriate steps to minimize the risk of students using AI tools to write assignments will ensure the integrity of nurse education *(290, 291)*.

Faculty utilize generative AI tools to create digital educational resources (text, audio, images, video, animation) for nursing curriculum to support student learning *(292)*. However, faculty require training, equipment and resources (didactic and clinical) to introduce AI tools into pedagogical practice. AI can also support student assessment but should be balanced with other assessments (e.g. objective structured clinical examinations, group work, presentations, reflective assignments) to holistically evaluate learning. Patients are likely to use AI tools for health requiring nurses to be knowledgeable and proficient in AI *(291)*. The UN Educational, Scientific Cultural Organization's AI competency frameworks for education *(293)* and the WHO's ethical framework for AI for health *(294)* can aid the application of AI in nursing education and practice. The digital divide could exacerbate inequitable access to AI tools, reducing opportunities for faculty and students to leverage AI for learning *(295)*.

Examples

- Faculty created a chatbot to help nursing students acquire knowledge and skills in obstetric vaccine administration, improving learning as well as engagement and self-efficacy *(274)*.
- A virtual conversational agent for nursing students supported clinical decision-making and patient safety. Students found the chatbot content informative and useful in clinical environments but suggested improvements in its design and function *(275)*.
- A deep-learning algorithm helped train nurses in echocardiogram use. This approach could speed up diagnosis of diseases via nurse-led ultrasonography, which may be valuable in low-resource settings *(296)*.
- Patient case studies were generated using ChatGPT which was connected to a mannequin, enabling conversations with nursing students, making the simulated scenario more interactive and responsive to enhance learning *(297)*.

Strengths, weaknesses, opportunities and threats of AI

- **Strengths:** AI can process large amounts of data (i.e. text, images, audio and video) quickly, enabling AI tools to respond to faculty and students relatively accurately with written and audio-visual outputs. AI can adjust its responses over time, potentially delivering more personalized learning experiences in real-time *(298)*.
- **Weaknesses:** Dependence of AI on data which, if of poor quality, can cause biased outputs. AI can also fabricate results (known as "hallucinations"), requiring faculty and students to remain critical of AI outputs *(295)*.
- **Opportunities:** Creating interactive and adaptive educational resources to improve learning, supporting students with communication (including writing) skills, facilitating critical thinking, and enhancing faculty and student digital literacy *(288)*.
- **Threats:** Copyright, consent, privacy and plagiarism concerns; lack of accountability for AI outputs and decision-making of faculty and students; loss of human creativity, emotion and expertise if AI is used excessively; automation of teaching and assessment, which may replace faculty and education administrators or management; and digital inequality in the access and use of AI in nurse education *(299)*.

A nursing student in the Lao People's Democratic Republic checks a patient's blood pressure during a clinical training session. © WHO/Yoshi Shimizu

CHAPTER 7

Service delivery

STRATEGIC DIRECTION

Nurses work to the full extent of their education and training in safe and supportive work environments.

KEY FINDINGS

- Globally, 92% of responding countries reported having a professional regulatory body for nursing, with all regions showing high percentages.
- Examinations to ensure initial competency or "fitness for practice" of nurses are used in 76% of the responding countries worldwide.
- Globally, 62% of the responding countries reported having APN roles. By income classification, LICs reported the highest percentage of APN roles (74%), potentially reflecting a strategy to optimize higher skilled nursing professionals where medical doctor availability is limited.
- APN roles are more common in responding countries with lower densities of medical doctors, suggesting they may serve as a strategy to address access challenges in those areas.
- Globally, 55% of the responding countries reported having laws or policies regulating working hours and conditions.
- 94% of the responding countries globally reported laws or policies ensuring a minimum wage with no notable differences by region or income group.
- 59% of the responding countries reported measures to prevent attacks on health workers. Responding countries in the South-East Asia Region reported the highest percentage (90%), while those in the Americas reported the lowest (36%).
- 42% of responding countries reported the existence of packages of care for mental well-being with significant regional variations, ranging from 74% in the Eastern Mediterranean to 31% in the Americas.
- Globally, 78% of the responding countries indicated the presence of mechanisms promoting health worker safety. This was present among 83% of the responding HICs, compared with 71% of LICs.
- 43% of the responding countries reported having mechanisms for in-kind remuneration to promote rural retention, with the highest in the Western Pacific (67%) compared with 25% in the Eastern Mediterranean.
- HICs are the only group where entry-level wages exceed US$ 2000 per month. In contrast, LICs, lower middle-income countries and upper middle-income countries generally offer wages mostly below US$ 1000 month, with much less variation within these groups. This difference remains when adjusting for PPP.

97. This chapter focuses on two key areas of service delivery by nurses. The first, professional regulation of nursing practice, examines the existence of nursing regulatory bodies, mechanisms to ensure initial and continuing competency of nurses, and advanced practice nursing. The second, working conditions of nurses, presents the country-reported existence of laws and policies to ensure the protection and support of nurses in their work environment, with a dedicated section on nurse wages.

7.1 Regulation of nursing practice

98. The regulation of health workers, including nurses, is essential to protect the public interest through patient safety, but in addition it can also contribute to broader health system priorities, including health professionals' education, the distribution of health workers, workforce planning and mobilization, cost management and addressing challenges related to the international mobility of health workers *(300–302)* (see Box 7.1).

Box 7.1 The potential impacts of regulatory measures on the mobility and availability of nurses

The need to recruit and retain nurses during the COVID-19 pandemic catalysed a relaxation of sovereign nursing standards and regulations in some places *(303)*. While these temporary, often ad hoc, reductions in immigration and nursing regulation restrictions were not intended to remain in perpetuity or be part of a larger harmonization scheme, the evaluation of these mechanisms is necessary if they are to inform future regulatory reforms or harmonization initiatives *(304–306)*. Other high-level events, such as individual countries leaving an economic bloc characterized by some regulatory convergence had the opposite impact on the flow of nurses between jurisdictions that earlier had mutual recognition of standards *(307, 308)*.

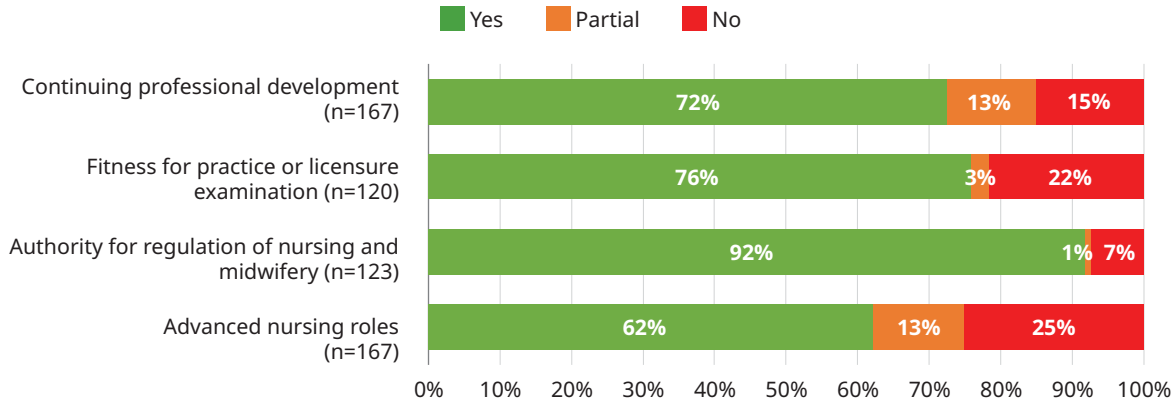
Mutual recognition agreements and other efforts to harmonize cross-jurisdictional nursing regulatory standards have evolved in South-East Asia through the Association of Southeast Asian Nations (ASEAN); in the European Union (EU) and European Economic Area (EEA) through the Bologna Process; and across the Caribbean through Caribbean Community (CARICOM) initiatives *(29)*. The literature since 2020 reflects various attempts by countries to advance these harmonization efforts through educational reform, increased investment and regulatory strengthening *(284, 309–316)*.

99. Data are presented from countries responding to indicators about the existence of an official regulatory body for nursing, whether there is a "fitness for practice" or licensure examination, and CPD, which is often required for maintenance of registration or licensure (see Fig. 7.1 and Tables 7.1 and 7.2). A separate indicator examined the extent to which countries reported the presence of APN roles.

100. Globally, 92% of responding countries reported the existence of a professional regulatory body for nursing. All regions have high percentages, ranging from 100% among the responding countries in South-East Asia to 85% in the Eastern Mediterranean. While regional-level differences exist, there is no discernible pattern by country income classification: upper middle-income countries reported the lowest percentage at 72%; all other three income group categories had 97% or 100%.

101. Examinations to ensure initial competency or "fitness for practice" of nurses prior to being awarded a licence to practise are used in 76% of responding countries globally. This is highest among the responding countries in the African and South-East Asia regions (86% and 89%, respectively) and lowest in the Eastern Mediterranean Region (57%).

Figure 7.1 **Percentage of responding countries that reported existence of aspects related to professional regulations and nursing practice**



Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

Substantive evidence continues to support the efficacy, efficiency, quality and satisfaction with nurse-provided care

Table 7.1 **Percentage of responding countries that reported existence of various nursing regulations and aspects of nursing practice (% Yes), by WHO region**

	African	Americas	South-East Asia	European	Eastern Mediterranean	Western Pacific	**Global**
Authority for regulation of nursing and midwifery	95% (21/22)	90% (19/21)	100% (9/9)	90% (37/41)	85% (11/13)	94% (16/17)	**92% (113/123)**
Fitness for practice/licensure examination	86% (18/21)	68% (13/19)	89% (8/9)	74% (29/39)	57% (8/14)	83% (15/18)	**76% (91/120)**
National systems for continuing professional development	69% (27/39)	67% (22/33)	70% (7/10)	83% (43/52)	83% (10/12)	57% (12/21)	**72% (121/167)**
Advanced nursing roles	76% (29/38)	64% (21/33)	80% (8/10)	51% (27/53)	71% (10/14)	47% (9/19)	**62% (104/167)**

Notes: Latest available data over the period 2018–2023. Numbers in parentheses indicate the number of countries reporting Yes over the total number of countries that responded to that indicator. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
Source: NHWA; 2024.

Table 7.2 **Percentage of responding countries that reported existence of various nursing regulations and aspects of nursing practice (% Yes), by World Bank income group**

	HICs	UMICs	LMICs	LICs	**Global**
Authority for regulation of nursing and midwifery	98% (53/54)	72% (21/29)	97% (29/30)	100% (10/10)	**92% (113/123)**
Fitness for practice/licensure examination	80% (41/51)	62% (18/29)	87% (26/30)	60% (6/10)	**76% (91/120)**
National systems for continuing professional development	82% (49/60)	60% (27/45)	73% (29/40)	73% (16/22)	**72% (121/167)**
Advanced nursing roles	63% (38/60)	52% (24/46)	67% (28/42)	74% (14/19)	**62% (104/167)**

Notes: Latest available data over the period 2018–2023. Numbers in parentheses indicate the number of countries reporting Yes over the total number of countries that responded to that indicator. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
UMICs upper middle-income countries; LMICs lower middle-income countries.
Source: NHWA; 2024.

102. By country income classification, lower middle-income countries reported the highest use of licensure examinations (87%) while LICs reported the lowest (60%). In some countries, the step of taking a licensure exam is the beginning of an opportunity to institute a unique identifier for each nurse which is maintained throughout the tenure of their registration (see Box 7.2).

Box 7.2 Unique nurse identifier system

A unique nurse identifier (UNI) system can be helpful in health workforce planning and management by tracking nurse licensure, specialization and deployment across regions. It enables real-time monitoring of available staff, helping authorities quickly reassign resources during public health emergencies and address coverage gaps *(317)*.

In the United States, the National Council of State Boards of Nursing Identifier (NCSBN ID) is initiated when a student registers for the national licensure exam. It is stored as a key field of the Nursys® system allowing the public, employers and nurses themselves to get real-time reports on their licensure status across all jurisdictions as a single report. A complementary voluntary system called eNotify provides timely reminders of re-licensure requirements or changes in their status, ensuring up-to-date workforce information *(318, 319)*.

In India, the Nurses Registration and Tracking System was developed by the Indian Nursing Council for similar purposes. This system is linked with a nurse's Aadhaar information (similar to a social insurance number), thereby ensuring non-duplication of nurses. The system maintains a live register of qualified Indian nurses working domestically and abroad *(320)*.

These types of systems can also support workforce forecasting by enabling longitudinal tracking of nurses' career trajectories, including their transitions between students and practitioner roles, specialties and practice settings *(321)*. Such information can inform continuing educational needs, capacity planning and help address workforce shortages proactively. Embedding the UNI in electronic patient records provides nursing intervention data on patient recovery trajectories and optimal care compliance *(317)*. A global UNI could potentially enhance the ability to evaluate the effectiveness of workforce development initiatives and the impact of targeted recruitment and retention strategies *(82)*.

103. Requiring proof of CPD or continued education is a regulatory mechanism employed by 72% of the responding countries globally. The Eastern Mediterranean Region, which reported the fewest countries using a licensure exam to assess initial competency, reported the highest percentage of countries (83%, along with the European Region) using CPD to ensure continuing competency. There was no apparent pattern by country income classification: HICs had the highest percentage (82%), while upper middle-income countries had the lowest percentage (60%). While the majority of countries in all regions have CPD systems, these data do not describe the content of the CPD nor whether it is accredited or otherwise assured for relevance to the country context or continued competencies required of nurses in a given health services setting. CPD ideally will support the essential core competencies of nurses including for expanded roles in health delivery settings serving populations living longer with complex and chronic health conditions (see Box 7.3).

Box 7.3 Digital learning models to upskill and reskill nurses

Health system planners face increased pressure to upskill and reskill nurses to address increasingly complex population health management needs worldwide. New digital learning models – centred on micro-learning, micro-credentialling, digital badges and macro-certifications – are gaining traction as flexible, accessible pathways for professional growth. These models could disrupt existing education offerings for continuing education and reshape how nurses acquire and demonstrate competencies, especially in lower resourced countries where traditional continuing education models are less accessible.

Accessing advanced nursing education in a digital age

On-the-job learning for more specialized care delivery can be augmented by micro-credentialling programmes – both micro-learning and macro-certification programmes (a macro-certification is similar to a qualification but achieved through multiple micro-credentials within a broader themes) *(322)*. Nurses can earn micro-credentials – small, stackable certifications – validating specific knowledge, skills and competencies. These micro-credentials can be earned faster and with a targeted focus to meet specific needs. Micro-credentials can also prepare nurses for broader macro-certifications in more general areas of study such as rehabilitation care. Digital micro-credentials can allow nurses to showcase their on-the-job learning *(323)*. Nurses who provide advanced care but lack qualifications will benefit significantly from the formal learning pathways offered through micro-credentialling programmes, and the recognition of learning achievement that digital badges and micro-credentials offer.

Digital badges visually represent knowledge, skills or competencies and are key to this ecosystem. They can provide an immediate, recognizable way for nurses to showcase their expertise and competence to employers, peers and regulatory bodies. Digital badges can also be shared across social media, professional networks and digital resumés, in turn promoting career mobility and helping employers quickly identify suitable candidates.

Benefits of digital micro-credentials for advanced practice

Digital micro-credentialling has the potential to shape in a positive way global nursing practices by improving mobility across borders and by bridging gaps in health worker competence to meet the expectation set out in training standards and regulatory frameworks *(324)*. Micro-learning, micro-and macro-credentialling and digital badges are not just tools for upskilling; they can also support reskilling of nurses as health demands shift. Further, where the assessment of learning achievement leading to the award of the badge or micro-credential relates to demonstration of knowledge, skills and/or competencies which can be acquired through formal, informal and non-formal learning, this allows nurses to be recognized for competencies earned through on-the-job learning *(325)*.

A future with accessible and portable digital micro-credentials

Learning that leads to micro-credentialling and digital badges will play a crucial role in preparing nurses for future health systems *(326)*. As health delivery models shift toward value-based care and population health management, nurses may need to acquire skills in data analytics, telehealth and remote patient monitoring for example. Micro-learning platforms can provide rapid training in these areas, while digital micro-credentials and macro-certifications evidence nurses' expertise.

Digital micro-credentialling, micro-learning, macro-certifications and badging augment traditional educational models for nurses. As health systems evolve, digital credentialling will help ensure that nurses are qualified to meet the increasingly complex challenges of population health management.

104. Substantive evidence continues to support the efficacy, efficiency, quality and satisfaction with nurse-provided care *(327)*. Globally there is a trend toward the expansion of nursing roles, including in models that aim to optimize the contributions of nurses in "advanced nursing roles" and specialty care *(88)*. Similar trends in evidence can be seen in the area of nurse-led clinics and advanced practice nursing *(328–330)*. As countries deploy nurses in advanced and specialty care capacities, requiring more technical, scientific and independent practice capabilities, specialty certification can be used for standardizing the requirements for the role, including assessing initial and continued competence. While commonplace in the United States and growing in a few other high-income Anglophone countries, evidence on the impact of specialty nursing certification is lacking and indicates that health system level assessments should determine if specialty nursing certification is likely to contribute to aims to holistically care for people living with multimorbidity *(331)*.

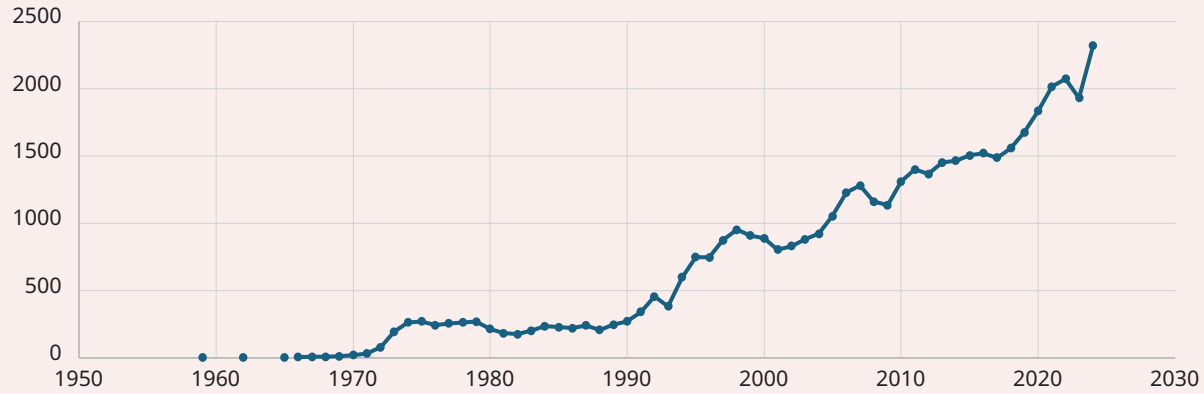
105. Advanced practice nurses are nurses with advanced training, typically at master's degree level, and a wider scope of practice, compared with registered nurses, often including the authority to diagnose, prescribe medications, order diagnostic tests, initiate referrals, and admit and discharge patients to hospital and other services *(332)*. The most common professional titles are advanced practice nurses (APN), nurse practitioners and clinical nurse specialists *(333, 334)* (see Box 7.4).

Flavia Naudi displays the tablet used to record health data digitally at the Railways Health Clinic in Kisumu, Kenya. © WHO/Genna Print

Box 7.4 Advanced practice nursing

A growing body of substantive evidence supports the effectiveness of APN roles in enhanced quality of care, patient health and satisfaction outcomes, strengthened collaborative practice models, and delivering specialized services across various settings, patient populations and acuity levels *(329, 335–338)*. There has been rapid growth in scholarly interest in APNs since the 1990s, despite the dominance in the literature of evidence authored by and referring to the experience of English-speaking HICs (see Fig. 7.2a). While much of the outcomes-based research has been concentrated in countries where APNs have worked the longest, additional evidence suggests that APNs contribute significantly to improved access to care, particularly in underserved areas, where APNs often serve as primary care providers, bridging gaps in health services delivery, continuity, quality and patient satisfaction *(339–346)*.

Fig. 7.2a Papers published on advanced practice by year of publication



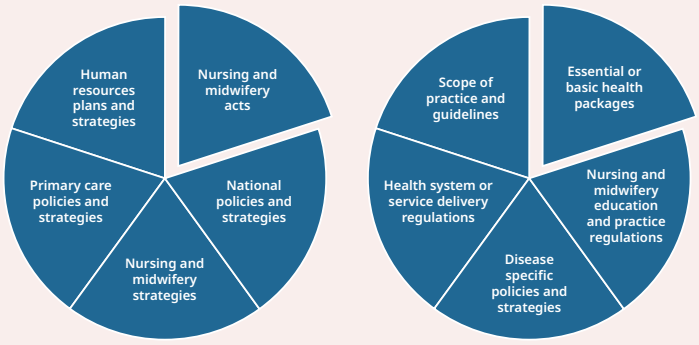
Source: Scopus search on 9 March 2025 "(TITLE-ABS-KEY(("Advanced Practice Nurs*" OR "APRN" OR "Certified nurse Midwife" OR "Nurse Practitioner" OR "Clinical Nurse Specialists" OR "Certified Registered Nurse Anesthetists")))" Search years: 1950–2024; Results: 45 471 articles.

Countries may have different reasons for implementing APN roles: one study found that LICs and lower middle-income countries developed the role to care for underserved populations, whereas many HICs did so to address doctor or specialty care shortages *(347)*. International Council of Nurses guidelines provide suggested requirements for APN legislation, education, regulation (title, credentials, scope of practice) and practice standards *(332)*. However, there is vast heterogeneity in these areas around the world *(334, 343, 348)* and varying stages of advancement of APN roles, from countries with no formal recognition of APN roles to jurisdictions with established advanced practice roles *(334, 349)*.

Key aspects in the development and implementation of APN roles include clear endorsement by the government of the use of such practitioners in addressing health needs and establishment of this level of practice in legislation or regulations. There are a variety of legislative and policy avenues through which the establishment of APN roles can be facilitated, including national health policies and strategies, primary care policies, human resources for health plans, and nursing and midwifery acts (see Fig. 7.2b) *(350–354)*. These policies not only provide a route for introducing the APN role in the service of achieving health system priorities, but they also provide a foundation for recognizing and expanding APN roles, ensuring that nurses are equipped to meet complex health needs.

Following establishment of the APN role in legislation and policy, a robust regulatory framework is essential for standardizing practices and ensuring quality of care *(352, 355–359)*. Many countries with APN roles still require improvements in regulations that standardize practice, particularly in terms of specifying the scope of practice and maintaining competence *(102, 360)*. Other key aspects include standardized educational programmes, competency frameworks adaptable to local context, and evaluation of and evidence on the impact of these roles. Jurisdictions with well-defined APN roles, established regulations, and a clear scope of practice are able to effectively integrate APN roles into their health systems and demonstrate the potential of APNs to enhance health and care delivery and outcomes *(330, 361)*.

Fig. 7.2b Legislative and policy landscape that contributes to the assessment of determining APN development stage



Similar to the variety of legislative and policy avenues through which to integrate APN roles, there a variety of regulatory levers that can be used to advance and strengthen the implementation of APN roles, including from broad public health law to nursing-specific legislation and professional certification models *(352, 353, 358, 362)* (see Fig. 7.2c). Advocacy for supportive policies and regulations that enable the full scope of practice for APNs, along with efforts to enhance public awareness and understanding of APN roles, will increase acceptance and utilization *(363)*. Efforts to advance APNs in lower middle-income countries and LICs suggest first establishing that countries have the health workforce resources and a demonstrated need for the role and there should be support from the country's key stakeholders in education, policy and regulation, and a systematic, participatory and evidence-based approach *(363–366)*.

Fig. 7.2c Regulatory levers that can be used to advance APN stage development

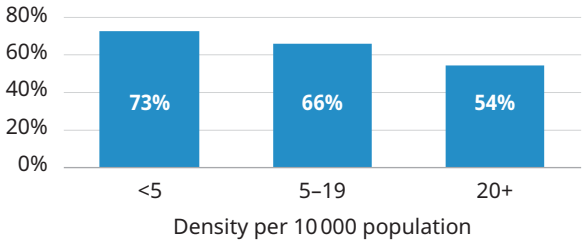
Advanced practice nursing represents a powerful strategy for addressing global health challenges and achieving UHC. While significant progress has been made in many countries, there remains variability in development and implementation worldwide. The path forward requires collaborative efforts to strengthen the evidence base, address barriers and foster supportive policy environments. By leveraging the skills and expertise of APNs, health systems can improve access to quality care, enhance health outcomes, and build more resilient and responsive health workforces *(367, 368)*.

106. Globally, 62% of responding countries reported the presence of APN roles, which is an increase from 53% reported in *State of the world's nursing 2020*. Another 13% of responding countries indicated they had "partial" establishment of the APN role. The regions of South-East Asia and Africa had the highest percentages of countries reporting APNs (80% and 76%, respectively). The Western Pacific Region had the lowest percentage (47%), suggesting potential for further development of advanced nursing roles to improve health service delivery (see Box 7.5).

107. By income classification, LICs have the highest percentage of countries reporting APN roles (74%), which may reflect a strategy to maximize the use of higher skilled nursing professionals in contexts with limited doctor availability.

Similar to the findings of *State of the world's nursing 2020,* APN roles are more common in countries with lower densities of medical doctors, potentially indicating a strategy to address access challenges in those areas (see Fig. 7.3).

Figure 7.3 **Percentage of responding countries with advanced nursing role by level of density of medical doctors per 10 000 population**



Note: Latest available data over the period 2018–2023.
Source: NHWA; 2024.

Box 7.5 Effective nurse management of NCDs in Tonga

A nurse conducts a home visit in Tonga to monitor a patient's blood pressure as part of NCD outreach services. © Stanford Mafuahingano

Tonga responded to the increasing public health burden of NCDs by adopting comprehensive changes in policy, systems and delivery of services. A key component of the strategy was the development of the Advanced Diploma in Nursing for the prevention, detection and management of NCDs, with 20 specialist NCD nurses graduating in 2014 *(369–371)*.

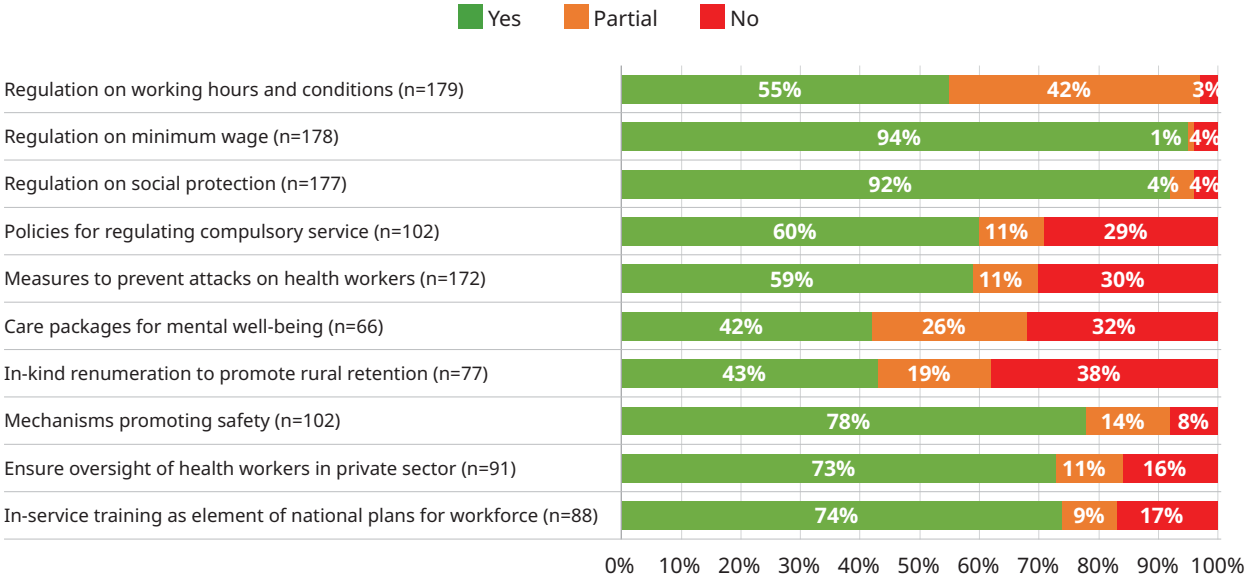
An NCD outreach programme was developed, with multidisciplinary teams for screening and provision of care and referral; it had a strong focus on diabetes, hypertension and rheumatic heart disease. An evaluation conducted in 2015 *(372)* focused on service delivery and found that NCD patients were being detected, managed and supported in far greater numbers. Importantly, communities shared positive feedback about ease of access to care and being looked after by nurses. To enable this success, NCD nurses needed to operate to the full extent of their role, including caring for people with disabilities, which needed specific measures. Some of the challenges included inequity in resources. To leverage and build on this positive experience, Tonga has developed an NCD Action Plan 2023–2025 *(370)*, which includes a plan for training of the next group of NCD nurses to optimize health outcomes for the population and which will require sustainable investments in quality nursing education.

7.2 Working conditions

108. The UN and the ILO have long promoted the Decent Work agenda, striving to create safe, inclusive and rights-respecting workplaces in every country, advocating for opportunities that ensure fair wages, safe working conditions, social protection and the right to organize for workers worldwide. This section explores the existence of national or subnational laws or policies related to various aspects of working conditions, with responses presented as a Yes/Partial/No, noting that self-reporting of the existence of these measures does not necessarily imply the measures have been implemented (see Fig. 7.4 and Tables 7.3 and 7.4). The response rate for all indicators can be found in Annex 4.

109. The reported existence of national or subnational laws and policies on working conditions varies greatly depending on the topic of the law or policy, with some being widely implemented and some only in a minority of countries (see Fig. 7.4). The existence of laws or policies to protect health workers from excessive work hours or unsafe conditions were reported by 55% of the responding countries.

Figure 7.4 **Percentage of responding countries that reported existence of laws or policies on various aspects of working conditions for health workers**



Notes: Latest available data over the period 2018–2023. Numbers in parenthesis indicate the total number of countries that responded to that particular indicator.
Source: NHWA; 2024.

The responding countries in South-East Asia had the highest reported percentage of these protections in place (70%) while those in the Western Pacific had the lowest (21%). By income group, HICs had the most countries (63%) reporting provisions regarding working conditions and hours, while LICs had the fewest (48%). Other sources have described a related pattern in that excessive working hours, defined as working over 48 hours per week, were more frequently reported by nurses and midwives in low- and lower middle-income countries, many in Africa *(373)*.

Table 7.3 **Percentage of responding countries that reported existence of various laws and policies related to working conditions (% Yes), by WHO region**

	African	Americas	South-East Asia	European	Eastern Mediterranean	Western Pacific	**Global**
Regulation on working hours and conditions	65% (28/43)	50% (17/34)	70% (7/10)	68% (36/53)	40% (6/15)	21% (5/24)	**55% (99/179)**
Regulation on minimum wage	95% (40/42)	94% (32/34)	90% (9/10)	94% (50/53)	94% (15/16)	96% (22/23)	**94% (168/178)**
Regulation on social protection	86% (36/42)	91% (31/34)	100% (10/10)	98% (51/52)	93% (14/15)	88% (21/24)	**92% (163/177)**
National/subnational policies for regulating compulsory service	54% (15/28)	52% (11/21)	88% (7/8)	64% (21/33)	50% (3/6)	67% (4/6)	**60% (61/102)**
Measures to prevent attacks on health workers	67% (28/42)	36% (12/33)	90% (9/10)	58% (31/53)	75% (9/12)	55% (12/22)	**59% (101/172)**
National/subnational care packages for mental well-being of health workers	54% (7/13)	31% (4/13)	67% (2/3)	33% (10/30)	75% (3/4)	67% (2/3)	**42% (28/66)**
Mechanisms for in-kind renumeration to promote rural retention	42% (11/26)	36% (5/14)	50% (1/2)	46% (13/28)	25% (1/4)	67% (2/3)	**43% (33/77)**
Mechanisms promoting health worker safety	79% (23/29)	68% (13/19)	75% (6/8)	86% (31/36)	60% (3/5)	80% (4/5)	**78% (80/102)**
Mechanisms to ensure oversight of the activities of health workers within the private sector	64% (16/25)	75% (12/16)	71% (5/7)	79% (27/34)	60% (3/5)	75% (3/4)	**73% (66/91)**
In-service training as an element of national education plans for the health workforce	68% (15/22)	57% (8/14)	70% (7/10)	84% (27/32)	88% (7/8)	50% (1/2)	**74% (65/88)**

Notes: Latest available data over the period 2018–2023. Numbers in parentheses indicate the number of countries reporting Yes over the total number of countries that responded to that indicator. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
Source: NHWA; 2024.

Table 7.4 **Percentage of responding countries that reported existence of various laws and policies related to working conditions (% Yes), by World Bank income group**

	HICs	UMICs	LMICs	LICs	Global
Regulation on working hours and conditions	63% (39/62)	51% (25/49)	53% (24/45)	48% (11/23)	55% (99/179)
Regulation on minimum wage	93% (57/61)	94% (46/49)	98% (44/45)	91% (21/23)	94% (168/178)
Regulation on social protection	98% (61/62)	92% (45/49)	91% (40/44)	77% (17/22)	92% (163/177)
National/subnational policies for regulating compulsory service	49% (17/35)	66% (19/29)	70% (19/27)	55% (6/11)	60% (61/102)
Measures to prevent attacks on health workers	67% (39/58)	50% (25/50)	52% (22/42)	68% (15/22)	59% (101/172)
National/subnational care packages for mental well-being of health workers	39% (12/31)	44% (8/18)	46% (6/13)	50% (2/4)	42% (28/66)
Mechanisms for in-kind renumeration to promote rural retention	39% (12/31)	59% (10/17)	44% (8/18)	27% (3/11)	43% (33/77)
Mechanisms promoting health worker safety	83% (35/42)	77% (17/22)	75% (18/24)	71% (10/14)	78% (80/102)
Mechanisms to ensure oversight of the activities of health workers within the private sector	79% (30/38)	74% (14/19)	68% (15/22)	58% (7/12)	73% (66/91)
In-service training as an element of national education plans for the health workforce	77% (27/35)	61% (11/18)	88% (22/25)	50% (5/10)	74% (65/88)

Notes: Latest available data over the period 2018–2023. Numbers in parentheses indicate the number of countries reporting Yes over the total number of countries that responded to that indicator. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
UMICs upper middle-income countries; LMICs lower middle-income countries.
Source: NHWA; 2024.

> **These percentages suggest that, while some regions are making efforts, there is a general need for more comprehensive and widespread mental well-being programmes.**

During the COVID-19 Pandemic, the Global Health and Care Worker Compact was developed to further support countries to improve safe working environments for health workers (see Box 7.6).

110. The presence of national or sub-national laws or policies around ensuring a minimum wage was reported by 94% of the responding countries globally, with no discernible difference by regional or country income grouping. This is higher than what was reported in the *State of the world's nursing 2020,* in which 89% of responding countries reported such policies. While the presence of social protections also had a high global average (92%) and consistency with *State of the world's nursing 2020* (91%), there was a notable difference between the percentage of countries reporting this provision in South-East Asia (100%) as compared with Europe (51%). By country income classification, 77% of the responding LICs reported laws on social protections in the work environment, while the rest of the country income groups were between 94% and 98%.

111. Compulsory service policies for health and care workers were present in 60% of the responding countries. These policies were more commonly reported

Box 7.6 The Global Health and Care Workers Compact

The COVID-19 pandemic highlighted significant issues related to the protection and safeguarding of health workers *(374)*. While most, if not all, of the issues were not novel, political leadership and attention resulted in a 2021 World Health Assembly resolution (WHA74.14) *(375)* requesting WHO to develop the Global Health and Care Workers Compact *(376)*, which was recognized by Member States in a subsequent resolution (WHA75.17) *(19)*.

High-level political leaders recognized the need to invest in safe, inclusive, resourced and rights-driven working environments that reflect the human and labour rights of health workers, honour their duty of care towards these workers, and create the enabling environment to attract, support and retain the human beings at the core of providing health.

The Care Compact consolidates international laws, treaties, resolutions and standards to guide countries and employers to outline policy recommendations and actions in four domains, including:

- Preventing harm (protection from occupational hazards, providing health and mental health services, protection against violence and harassment and protection from attacks in situations of fragility, conflict and violence);
- Ensuring inclusivity (equal treatment and non-discrimination);
- Providing resources (fair and equitable remuneration, social protection, enabling work environments); and
- Safeguarding rights (freedom of association and collective bargaining and whistle-blower protection and freedom from retaliation).

The Care Compact recommends creating governance and policy mechanisms for safe, healthy, rights-respecting and supportive work environments for health and care workers. An online Health and Care Worker Policy Lab (https://www.hcwpolicylab.org) houses these resources. Active adoption, advocacy for and promotion of the Care Compact principles should be at the centre of the nursing policy agenda.

in South-East Asia (88%) compared with the Americas (52%). LICs reported the highest percentage (70%) and HICs had a lower percentage (49%) than other income groups, indicating a differential level of use of compulsory service as a policy instrument.

112. Measures to prevent attacks on health workers were reported in 59% of the responding countries, representing an increase from the 37% of countries reported in *State of the world's nursing 2020*. This was found to be highest among the responding countries in South-East Asia (90%) and lowest in the Americas (36%) (see Box 7.7).

113. The existence of packages of care for mental well-being was reported by only 42% of the responding countries, with wide differences ranging from 74% among the responding countries in the Eastern Mediterranean to 31% in the Americas.

Nursing students participate in a clinical simulation exercise at a training centre in the Caribbean. © Jon Reyes

Box 7.7 Attacks on health and the impact on nurses

Attacks on health can deprive people of urgently needed care, reducing access and undermining health systems and long-term public health goals. Attacks, violence and conflict also cause involuntary displacement of nurses, including across national borders *(377–380)*. Involuntarily displaced nurses trying to work in their new setting can face long wait times and limited information regarding work permits in their destination countries *(381)*.

Data from WHO's Surveillance System for Attacks on Health Care indicate that between 1 January 2018 and 31 March 2025, there were more than 8300 incidents of attacks reported from 22 countries/territories with over 3000 deaths and over 6000 injuries of health workers and patients *(382)*. Global guidance exists on how to protect, prevent and mitigate consequences of attacks on health *(383)*.

Measures that can support nurses and other health workers in post-conflict settings and reduce attrition include providing opportunities for professional development, incorporating financial incentives, establishing flexibility and identifying staff with strong community links *(381, 384)*. Nurses who are refugees may provide particularly appropriate and empathetic care for refugee populations and enhance care in complex contexts *(380)*. Researchers have called for additional policies and initiatives to provide sustainable reintegration solutions for repatriated health workers *(385)*.

These percentages suggest that, while some regions are making efforts, there is a general need for more comprehensive and widespread mental well-being programmes.

By country income classification, half of the responding LICs reported the presence of mental well-being care packages compared with 39% in HICs (see Box 7.8).

Box 7.8 The importance of protecting the mental health and well-being of health and care workers

Nurses make up approximately 44% of the health workforce involved in the delivery of mental health care *(386)* working in hospitals, urgent care centres, primary care clinics, community health centres, long-term care facilities, schools and homes. This wide-ranging presence enables them to effectively identify, treat, care for and support individuals experiencing mental health conditions *(387)* and to expand the overall workforce capacity to offer mental health services. Strengthening nursing competencies through pre-service education, in-service training and postgraduate programmes focused on mental, neurological and substance use care will enhance primary care mental health services and contribute to achieving UHC *(388)*.

In response to international decisions that emphasized the obligations of governments and employers to protect the workforce, the *Our duty of care* report *(389)* recommends 10 policy actions across three areas: implementing evidence-based intersectoral policies and plans; investing in mental health care and support; and strengthening human resources for health and care. The International Council of Nurses *Guidelines on mental health nursing 2024* provide a unifying framework, informing and supporting stakeholders including the public, governments, health care professionals, policy-makers and educators, in understanding and implementing best practices in mental health nursing. The guidelines advocate for the development of robust policies, strategic plans and educational frameworks that facilitate consistent, high-quality care and innovative research in mental health nursing around the world *(388, 389)*.

114. Measures promoting health worker safety were reported by 78% of the responding countries, demonstrating a general recognition of the importance of ensuring a safe working environment for health workers. The presence of these mechanisms ranged from 60% among the responding countries in the Eastern Mediterranean to 89% in South-East Asia. The difference by country income classification was slightly less marked: HICs reported the highest percentage (83%) while LICs reported 71% (see Box 7.9).

Box 7.9 Occupational health and safety

Even with high compliance by employers to occupational health and safety standards nurses still face workplace violence, inadequate engineering and administrative controls, limited personal protective equipment access, exposure to blood and bodily fluids, and sharps injuries, underscoring the need for better training, resources, and improved staffing ratios to prevent thousands of deaths annually and save millions in health costs, benefiting patients, health staff and systems overall *(390–394)*. Psychosocial hazards, including stress and burnout, further exacerbate occupational risks, leading to reduced patient safety, lower care quality, decreased nurse productivity and retention and low patient satisfaction *(395)*. Additionally, an ageing nurse population intensifies these risks, as older nurses experience more musculoskeletal injuries leading to fewer hours worked *(264, 396)*.

Box 7.9 (continued)

Global guidance outlines key components for occupational health and safety programmes at all levels, with immediate priorities to expand personal protective equipment distribution, improve controls, eliminate hazardous practices, psychological empowerment strategies, and enhance staffing through education, mandated ratios, and strengthening regulatory frameworks *(391, 392, 395, 397–400)*. Increased research in LMICs is crucial to identify disparities and tailor interventions to specific socioeconomic contexts *(393, 394)*. Investing in safety training, vaccination programmes, equitable resource distribution and robust nurse staffing strategies will manage emerging and known hazards, ensuring a sustainable and resilient nursing workforce *(393, 394, 400–402)*.

115. Laws and policies that ensure oversight of health workers operating in the private sector were reported by 73% of the responding countries. This was highest among the responding countries in the European Region (79%) followed by the Americas and Western Pacific regions (75% each), suggesting greater attention to oversight of private sector health workers in these regions. There was a slight differential by country income classification: LICs reported the lowest percentage (58%) of private sector oversight mechanisms while HICs reported the highest (79%).

116. Mechanisms for in-kind remuneration to promote rural retention were reported by only 43% of the responding countries. This was found to be highest among the responding countries in the Western Pacific (67%) compared with the Americas (36%). By country income classification, they were least reported in LICs (25%), compared with between 36% and 46% for the other income groups (see Box 7.10).

Box 7.10 Improving health worker retention in rural and remote areas: the Indonesia Afirmasi Pendidikan Tinggi (ADik) Papua Scholarship Programme

Indonesia faced a significant health workforce shortage in rural and remote areas, with many trained professionals migrating to urban centres for better opportunities. To address this, the Indonesian Government initiated the ADik Papua Scholarship Programme, targeting students from remote, border and island regions, offering them opportunities to pursue health education at 48 public universities and 22 polytechnic schools across Indonesia. The programme aimed to increase the likelihood that graduates from these rural backgrounds will return to their communities to practise health, improving the quality of education and fostering a sense of responsibility toward their hometowns *(403)*. By providing financial support and access to a range of health disciplines, the programme has successfully increased the retention of nurses in rural areas from 40 970 (2016) to 69 427 (2018), helping bridge the health gap between urban and rural populations *(404)*. The ADik Papua Scholarship Programme has shown positive results, with students more likely to return to rural areas after graduation, contributing to a more equitable distribution of health professionals and improving health delivery *(404)*. This initiative demonstrated how targeted educational policies can help address workforce shortages in underserved regions *(405, 406)*.

7.3 Wages and salaries

117. Like all occupations, the entry-level wages and salaries of nurses can vary across countries and even within the same country. Some aspects in the process of wage setting that occur at the country level include the extent of government coordination and involvement (e.g. across the health sector, the national level or at the province level, or across local governments), a country's labour and social policies, the prevalent health labour market conditions, facility ownership, the cost of living in a given area, and the power of collective bargaining by trade unions and professional associations, and even employers' association in some countries, and fiscal pressures *(407–409)*. Other factors that can determine nurse wages include education, experience and working time or contract modalities. Self-employed nurses may have different access to employment, labour and social protections, such as the laws and policies on working hours, minimum wage, and occupational safety and health.

118. The global median entry-level wage of nurses was US$ 774 per month, with significant differences by WHO region and World Bank income group (see Table 7.5). At one end of the spectrum, countries in the South-East Asia Region offered entry-level nurses an average of US$ 500 per month, whereas countries in the European Region offered entry-level nurses a median of US$ 2508 per month. Comparison of the average

Table 7.5 **Monthly median, minimum and maximum entry-level wage and salaries in US$ and in PPP$, by WHO region and by World Bank income group**

	Number of countries reporting/ total	Entry level wage and salary [median (min–max)] (US$)	Entry level wage and salary [median (min–max)] (PPP$)[b]
BY WHO REGION			
African Region[a]	22/47	480 (150–1384)	1320 (377–3146)
Region of the Americas	23/35	1100 (255–5961)	1827 (442–8920)
South-East Asia Region	7/11	500 (275–953)	1472 (936–2851)
European Region[a]	10/53	2508 (450–5835)	3376 (1060–5368)
Eastern Mediterranean Region[a]	7/21	800 (500–2860)	2629 (1051–5928)
Western Pacific Region[a]	13/27	775 (250–3852)	1641 (527–8413)
BY WORLD BANK INCOME GROUP			
High income[a]	23/64	2302 (915–5961)	3147 (1333–8920)
Upper middle income[a]	25/54	705 (250–1800)	1516 (527–3482)
Lower middle incomes	24/50	539 (231–2077)	1338 (442–8413)
Low income[a]	10/26	360 (150–2556)	945 (377–5928)
Total (n=81)	**82/194**	**774 (150–5961)**	**1656 (377–8920)**

Notes: Analysis includes data for the latest year reported in the period 2018–2023 from 82 countries on the average monthly entry-level wages and salaries of nurses. [a] Data reported for less than half of the population. [b] Purchasing power parity in constant 2021 $ international, calculated from country-level estimation on US$ and PPP$ from the International Comparison Program, World Development Indicators Database, World Bank.
Source: NHWA; 2024.

entry-level wages by income group showed a correlation, with higher average entry-level wages in HICs (US$ 2302 per month) than in LICs (US$ 360 per month). The wage distribution, disaggregated by World Bank income group, shows HICs being the only group where entry-level wages exceeded US$ 2000 per month. In contrast, LICs, lower middle-income countries and upper middle-income countries generally offered wages that were mostly below US$ 1000 per month, with much less variation within these groups. This difference highlights the economic challenges faced by nurses in low- and lower middle-income countries, where wages were not only lower but also more uniform.

119. Analysis conducted for this report suggests that women may be paid less than men even in the same occupation, where the labour market attributes of women in the health and care sector are often undervalued *(156)* (see Box 7.11).

120. In addition to the US$ per month figure, the wages can be expressed in terms of purchasing power parity (PPP) to take into account the capacity for buying goods in each country. Wages adjusted for PPP reflect disparities both across and within WHO regions, as well as World Bank income groups. The European and Eastern Mediterranean regions had the highest median PPP and very similar ranges for the lowest and highest reported wages; while the African and South-East Asia regions had the lowest median PPP average entry wages. Within regions, there were wide difference between the lowest and highest entry level wages, particularly in the Americas and Western Pacific.

121. By income group, median wages expressed in terms of PPP in HICs were twice as high as in upper middle-income countries, and three times higher than in LICs. Interpreted in economic terms, this indicates that the earnings of nurses in HICs can, on average, buy three times the amount of goods and services than the earnings of nurses in LICs. The factors of higher wages, lower cost of living, alongside factors like working conditions, can be compelling contributors to decisions about international migration from low- to high-income countries *(408, 410)*.

Box 7.11 Gender pay gaps in nursing

Globally women face a 24-percentage point pay gap compared with men across the health and care sector. The sector is one where women are overrepresented in the lower paid occupational categories, whereas men are more highly represented in the highest paid occupational categories. The occupational segregation across the sector along with other factors results in gender pay gaps that are larger than those observed in other sectors *(156)*.

When looking at gender pay gaps in nursing using a sample of 31 countries where data were disaggregated sufficiently to allow for such an analysis (see Annex 3) there was a mean hourly raw gender pay gap of around 7% (for reference, the raw hourly gender pay gap across the health and care sector for this subset of 31 countries is 18%). Therefore, although women continue to make up the larger share of the nursing workforce, men continue to earn more than women, both per hour and monthly.

Fabiana Zepeda Maribel Arias, Chief of Nursing Programs at the Mexican Institute of Social Security, stands outside the institute, reflecting leadership and resilience.
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CHAPTER 8

Leadership

STRATEGIC DIRECTION

Increase the proportion and authority of nurses in senior health and academic positions and continually develop the next generation of nursing and midwifery leaders.

KEY FINDINGS

- 82% of the responding countries globally reported the presence of GCNOs, up from 71% in *State of the world's nursing 2020.*
- Responding countries in the Western Pacific Region reported the highest percentage of GCNOs at 93% and Africa and the Americas both at 86%. There was no discernible pattern by income classification.
- GCNOs have a critical role in ensuring that nurses in their countries help manage and mitigate health effects of climate change.
- Approximately two-thirds of the responding countries reported the existence of nursing leadership development programmes, with the highest percentages in Europe (78%) and the Eastern Mediterranean (76%) and the lowest in Africa (43%).
- There is a notable difference by income classification: 80% of the responding HICs reported having nursing leadership development programmes, compared with only 25% of LICs.
- Similar to what was described in *State of the world's nursing 2020,* a slightly higher score on regulation of education and service delivery was found for countries with nursing leadership development programmes.
- In the 27 responding countries, the average share of women in senior management positions in the ministry of health was 55%.

122. This chapter describes the extent of countries reporting a GNCO, or equivalent position, and those countries reporting nursing leadership development programmes; a new measure presents the representation of women in health workforce leadership positions, as reported by a smaller number of countries.

123. Effective nursing leadership and governance contribute to shaping robust health policies and strategic workforce planning to ultimately improve health services delivery and population health outcomes. There are multiple roles and settings (government, academia, regulators, employers) in which nursing leaders can shape policies and management of the nursing workforce; this report focuses in particular on the role of GCNOs. While they may have different roles and responsibilities across the world *(46, 411, 412)*, core functions centre on understanding nursing workforce policy, strategy, management and implementation, as well as providing input into health policy and decision making (see Box 8.1).

Sana Gul, a representative of the Nursing Now Challenge, speaks during a session at the Seventy-sixth World Health Assembly in Geneva, 2023.
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Box. 8.1 Typologies of government chief nursing officers in the European Region

In 2022, the WHO Regional Office for Europe undertook efforts to better understand the roles and responsibilities of government chief nursing and midwifery officers (GCNMOs) and senior nursing and midwifery leaders in influencing policy. The purpose of the enquiry was to support Member States to make progress towards appointing or strengthening GCNMOs in their countries and to explore the enablers to support GCNMOs and/or senior nursing and midwifery leaders to work more effectively to support improved health outcomes *(413)*.

After interviewing 35 GCNMOs in the region, five "typologies" best described the model or arrangement of the GCNMO vis a vis the ministry of health. Each model is briefly described below.

Focal point: In this model, the GCNO is external to the government and recognized as a leader in academia, nursing and midwifery professional associations or unions, or in clinical management. They are often nominated by ministries of health to engage in nursing and midwifery meetings and forums on behalf of the government. They provide reports of meetings and advice to the government on nursing and midwifery matters, but they are not responsible for planning and policy decisions.

Dispersal model: In this model nurses and midwives are employed by the ministry of health in various departments and divisions; there is not a lead for nursing and/or midwifery policy or management. The nurses or midwives in these positions are rarely in charge of their own department and they remain at a distance from central decision-making.

Programme model: This typically has a senior nurse or midwife assigned by the ministry of health to manage a specific programme (e.g. patient safety, health services or higher education). The role may include engaging across sectors, but the GCNMO is not in charge of nursing and midwifery workforce management, policy development, nor planning.

Advisory model: Here the GCNMO position is normally based in the government and is a nurse or midwife officer who is an expert advisor to senior policy-makers (often chief medical officers). The GCNMO in this model is engaged in national decision-making and may coordinate elements of nursing and midwifery, e.g. a taskforce on nursing. However, they do not have jurisdiction over nursing and/or midwifery workforces management.

Executive model: In this model a nurse and/or midwife employed by the ministry of health has line authority over the nursing or midwifery department. They shape health policy by steering nursing-related issues, including developing the profession and are responsible for managing budgets and for assuring the quality of nursing and/or midwifery staff; they may also set education and practice standards.

The study concluded that for GCNMOs to work effectively, they should have the following components:

- a mandate to carry out a full range of functions;
- access to informed decision-making and planning;
- support and resources to exercise their functions;
- roles engaging other senior nursing leaders and stakeholders; and
- individual leadership competencies, training and opportunities.

8.1 Government chief nursing officers

124. The existence of GCNO positions and leadership development programmes are reported by WHO region and by income group (see Table 8.1). The global-level presence of GCNOs was reported by 82% of the responding countries, reflecting an increase from the 71% reported in *State of the world's nursing 2020*. The Western Pacific Region had the highest percentage of the responding countries that reported having a GCNO (93%), followed by Africa and the Americas (86% each).

Table 8.1 **Percentage of responding countries that reported existence of chief nursing officer position and nursing leadership development programme, by WHO region and by World Bank income group**

BY WHO REGION	Chief nursing officer position	Nursing leadership development programme
African Region	86% (19/22)	43% (9/21)
Region of the Americas	86% (18/21)	71% (15/21)
South-East Asia Region	78% (7/9)	67% (6/9)
European Region	75% (30/40)	78% (31/40)
Eastern Mediterranean Region	75% (9/12)	76% (9/12)
Western Pacific Region	93% (15/16)	56% (9/16)
BY WORLD BANK INCOME GROUP		
High-income	81% (43/53)	80% (43/54)
Upper middle-income	76% (22/29)	57% (16/28)
Lower middle-income	89% (25/28)	62% (18/29)
Low-income	80% (8/10)	25% (2/8)
Global	**82% (98/120)**	**66% (79/119)**

Notes: Latest available data over the period 2018–2023. Numbers in parentheses indicate the number of countries reporting Yes over the total number of countries that responded to that indicator. For some indicators, the findings reported by the responding countries may not be representative of all countries in the region, hence these values may need to be interpreted with caution.
Source: NHWA; 2024.

125. GCNOs have potential influential leadership roles in shaping how countries are taking steps to reorient health systems towards primary healthcare. Many see these and other senior nurse leaders as having potential to help manage changing global health landscapes and advance the goals of global health security *(41, 414, 415)* (see Box 8.2).

Box. 8.2 Government chief nursing officers leadership on the climate and health agenda

GCNOs have a critical role in ensuring that nurses in their countries help manage and mitigate population-level health effects of climate change *(416)*. They are well positioned to establish strategic partnerships, for example, with environmental and public health agencies to be aware of local climate adaptation plans, disaster preparedness strategies and public health messaging *(417)* and ensure that nurses are deployed in ways that further common climate-related health priorities and respond to the health needs of communities impacted by climate change *(50)*.

GCNOs have an influential voice with which to advocate for and contribute to national policies to integrate climate resilience into health systems. This could include advocating for health systems to be prepared for climate-induced disruptions and for nurses to be trained in the necessary protocols to handle these disruptions effectively *(46)*. GCNOs can encourage employers to offer specialized training on change-induced health challenges, and create ongoing professional development opportunities for nurses to update their knowledge and skills in climate-related health issues.

Collaboration between the GCNO and academic institutions can help foster climate health literacy among student nurses so that graduates understand the ways in which climate change impacts health and well-being *(418)*. Updated competency-based curricula can help ensure that climate change education becomes a core component of nursing education and training programmes *(419)*. GCNOs can encourage and direct funding to research related to nursing roles and interventions related to climate change.

GCNOs can exemplify leadership in climate action by encouraging fellow nursing leaders to take active roles in climate advocacy and related health policy development from their perspectives *(66)*. GCNOs can also establish or focus nursing leadership development programmes on the climate agenda, so that early career nurses have leadership skills to articulate and advance the important roles that nurses play in addressing the health challenges posed by climate change and in mitigating the long-term impacts on population health *(417)*.

8.2 Nursing leadership development

126. Two-thirds of responding countries reported the existence of nursing leadership development programmes (see Table 8.1). This was highest in the European and the Eastern Mediterranean regions (78% and 76%, respectively), and lowest in the African and Western Pacific regions (43% and 56%, respectively), though both these regions reported having high percentages of countries with GCNOs. While 66% represents an increase globally from the 53% reported in *State of the world's nursing 2020,* there was a large difference in the presence of leadership development programmes by income classification: 80% of HICs reported such programmes, while only 25% of LICs did (see Box 8.3).

Box 8.3 Leadership development at the national tertiary hospital (Guido Valadares National Hospital), Timor-Leste

A functional analysis in 2014 *(420)* identified that nurses in middle management positions at the Ministry of Health Timor-Leste national tertiary hospital (Guido Valadares National Hospital) had low management capacity, with little formal background or training; at the same time, the primary hospital was facing a critical situation with hygiene and IPC. These challenges highlighted the urgent need for structural change and leadership development within the institution.

In response to these challenges, a leadership training programme supported by health partners was developed and implemented on site at the hospital. The programme was specifically designed for nursing and hospital leaders and included practical sessions that allowed participants to apply leadership concepts in real time. Participants also received continuous support through mentoring and focused sessions on leadership and management tailored to the health system environment *(421)*.

Following the programme, nurses were promoted and led newly formed Quality and IPC teams, responsible for quality improvement and change management across the hospital. They found enabling factors to be understanding their leadership styles and concepts of change management, quality improvement, identifying clinical risks, patient-focused care and communication strategies.

The leadership development programme positioned them to make key contributions during the hospital's leadership transformation. These nurses now lead their teams effectively while fostering a culture of continuous improvement and behavioural change. The leadership training programme at Guido Valadares National Hospital, now an annualized programme, has proven to be a pivotal initiative in improving management and technical skills and fostering a new generation of nursing leaders.

127. It could be expected that in countries where leadership is developed with the existence of a GCNO, more rapid progress could be observed in regulations on education and working conditions for nurses. However, no statistically significant correlation was found that having a GCNO improved education regulations and protections in the workplace, nor was it associated with the existence of APNs. Similar to what was described in *State of the world's nursing 2020,* a slightly higher score on regulation of education and service delivery was found for countries with nursing leadership programmes (see Box 8.4).

Box 8.4 Prioritizing leadership skills development for nurses

Investing in the leadership skills of nurses is pivotal for enhancing the effectiveness and resilience of health systems *(422)*. Dedicated investments in leadership development are needed to equip leaders with the competencies to influence health policy, manage workforces effectively, and drive systemic improvements and intersectoral collaboration *(422, 423)*. Many models and approaches for nursing leadership development exist and should empower nurses to assume pivotal roles within health systems, enabling them to identify and address sector-specific needs, expand their scopes of practice, and implement strategic changes *(287, 422–425)*. Harmonizing leadership training standards across different regions facilitates the mobility and recognition of skilled nursing leaders *(426)*.

Effective investment in leadership skills necessitates comprehensive education and training frameworks. In Africa, regulatory bodies and educational institutions play a crucial role in developing curricula that incorporate leadership and management training for midwives and nurses *(427)*. Establishing standardized competencies and professional standards ensures that leaders in nursing are uniformly prepared to meet the demands of their roles *(427)*. Sustaining effective nursing education and leadership development requires collaboration among ministries of health, professional associations and academic institutions, alongside organizational support, funding and a culture that fosters mentorship and professional growth *(422)*. Collaboration is vital in sharing best practices and resources for leadership development *(426)*.

Investing in leadership skills development for nurses is a strategic priority that underpins the broader goal of strengthening health systems. By providing comprehensive training, organizational support and fostering regional collaboration, health systems can cultivate a cadre of skilled leaders in nursing. Empowered nursing leaders are essential for building resilient, responsive and equitable health systems capable of addressing present and future health challenges.

128. The global health discourse has emphasized the importance of empowering women in the workplace, following long-standing struggles for gender equality in all aspects of work *(428)*. As a largely feminized workforce, nursing leadership can also be examined through the lens of the share of women in leadership positions in health. A global indicator on the share of women in senior management positions in the ministry of health was reported by 27 countries. In the 27 responding countries, the average was 55% of senior leadership positions in the ministry of health were held by women. This varied from 6% to 100%. While this information was reported by few countries, it included countries from all regions and showed differences: for example, among the 10 countries from the African Region, the average share of women in leadership was 24%; in the seven countries from the European Region, it was 65%.

A primary health care nurse in Ukraine stands at the reception of her clinic, prepared to begin consultations. © WHO

CHAPTER 9

Policy directions through 2030

129. The data and findings in this report underscore the continued relevance of the 12 policy priorities of the *Global strategic directions for nursing and midwifery 2021–2025*. This chapter provides an "area of emphasis" for each policy priority for the period 2026–2030. In addition, five emerging policy priorities are articulated in the areas of advanced practice nursing, gender, digital health technology, climate and health, and nurses working in fragile, conflict, and vulnerable settings.

130. All policy priorities and related actions will need to be supported by targeted investments and country-level collaboration across sectors of government, such as finance, labour and education, and by stakeholders including nurse educators, regulators, associations, employers, nongovernmental and civil society organizations.

9.1 Global strategic directions for nursing and midwifery policy priorities and areas of emphasis

9.1.1 Jobs/employment

Conduct nursing workforce planning and forecasting using a health labour market lens

131. Many high-income and European countries, in addition to expanding enrolment in pre-service education, will need to focus on retention of nurses to offset losses from retirement and decrease reliance on international recruitment. Many LICs and lower middle-income countries will need to increase the pool of graduate nurses, ensure absorption into the health system and improve working conditions to reduce excessive out-migration and account for population growth and growing labour markets. The impacts of employment policies and investments can be assessed in terms of increases in health and care workers, enhancement in skills and improved working conditions *(410)*.

Nurses in Tonga prepare supplies and complete documentation during a clinical training session. © WHO/Mesake 'Isileli Taukolo

Ensure adequate demand (jobs) with respect to health service delivery for primary healthcare and other population health priorities

132. Despite global growth since 2013, many countries still have insufficient nurse density, hindering their progress toward UHC. The priority is to accelerate growth in demand for nursing jobs, particularly in the African and the Eastern Mediterranean regions and in countries already demonstrating or projected to face declining workforce densities, such as those affected by conflict and other chronic complex emergencies, or those characterized by rapid population growth. This will require securing sustainable domestic and, where domestic resources are insufficient to adequately expand fiscal and economic space, external health workforce investments, aligned with national priorities and mechanisms, and consistent with the Lusaka Agenda. Existing regional mechanisms and opportunities for engagement are the Africa Health Workforce Investment Charter and the Eastern Mediterranean Regional Flagship Initiative: *Investing in a resilient health workforce,* both endorsed or adopted in 2024.

Attract, recruit and retain nurses where they are most needed

133. Recruitment and retention in rural and underserved areas remain large issues; the difference in densities within a country can be as high as tenfold *(188, 429)*. Implementing a "rural pipeline" has been successful in increasing the nurses returning to work in such areas. Countries should develop evidence-based recruitment and retention policies that are bundled, tailored to the local context and tackle the various root causes of the inequalities *(430)*.

Nurse Akter on duty in the dengue ward at Dhaka Medical Hospital, Bangladesh. © WHO/Fabeha Monir

Advance the WHO Global Code of Practice on the International Recruitment of Health Personnel (the Code)

134. The higher reliance on international recruitment of nurses in HICs, alongside the low density of nurses in many countries on the *WHO health workforce support and safeguards list 2023*, and the projected decreases in density in these countries through 2030 suggests a need to accelerate implementation of the Code. Urgent priorities are to strengthen adherence to the Code, including provisions outlined in the *WHO health workforce support and safeguards list 2023*, increasing investment in health systems and the health workforce of these countries and developing and implementing bilateral agreements that provide for mutual and proportional benefits for the health system of source countries. For *WHO health workforce support and safeguards list 2023* countries, close monitoring of the health labour market is essential, which needs to be coupled with specific policy and investment decisions to increase the domestic health workforce supply, support retention measures, including improving working conditions, and discourage active international recruitment in line with the provisions of the Code.

9.1.2 Education

Align the levels of nursing education with optimized roles within health and education systems

135. As more counties move towards bachelor's degrees for entry into the nursing profession, planning and coordination between academia, regulators and health facilities is essential to establish the roles and responsibilities of bachelor's degree prepared nurses relative to other types of nurses and health workers. Research on the impact of bachelor-level nurses should be expanded to include primary care settings and LMICs. Evidence, including longitudinal studies, is still limited in terms of patient and facility related outcomes of nurses from bridging and accelerated BSN programmes.

Optimize domestic production of nurses to meet or surpass health system demand

136. Many countries, particularly in the regions of Africa and the Eastern Mediterranean, need to increase domestic production capacity to keep up with growing populations, often with unmet and increasingly complex heath needs, and expanding labour market demand. HICs may need to increase the attractiveness of nursing careers and education in order to expand enrolment in nursing pre-service education in line with their health labour market needs. Bottlenecks to admitting or enrolling students can be caused by the availability of nursing faculty and clinical training sites, along with limitations in infrastructure and training equipment.

A nurse educator facilitates a clinical case review with nursing students and colleagues in a hospital in Taiwan, China. © Yun Chen, Nursing in Focus

Design education programmes to be competency-based, apply effective learning design, meet quality standards and align with population health needs.

137. Countries should ensure there is coordination on accreditation standards between health facilities and academia for aligning learning outcomes with the competencies needed by graduates to enter the labour market; this includes a need to maximize opportunities for suitable clinical practice sites for students. Clinical learning sites should also meet standards for supervision and skill development. The expansion of "blended learning" requires more investment in infrastructure and resources to support equitable and relevant digital education in didactic and clinical environments; standards for nursing education and training should include digital competencies that nurses need for contemporary practice *(431, 432)*.

Ensure faculty are properly trained in the best pedagogical methods and technologies, with demonstrated clinical expertise in content areas

138. Development, recruitment and retention of quality nursing faculty have not kept pace with demand in proliferating education settings. Evidence-based approaches to strengthen faculty capacities include formalized and structured orientation and mentorship to facilitate transitions to the academic setting and role expectations; appropriate remuneration and non-financial incentives; conducive working conditions; and career advancement opportunities. Faculty may need upskilling to develop and deliver education and training that provides nursing students with digital competencies to facilitate learning, professional development and patient care. Countries will need to make such upskilling available where needed.

A nurse conducts a maternal health check while a group of nursing students observe during a clinical training session in India. © Bijali Sinha, Nursing in Focus

9.1.3 Service delivery

Review and strengthen professional regulatory systems and support capacity building of regulators, where needed

139. Countries should review and revise nursing regulations to ensure that nurses can work to the full extent of their education, training and assessed competencies. For example, ensuring updated scopes of practice that are sufficiently differentiated for various types and levels of nurses (e.g. a generalist nurse vs a specialist or advance practice nurse). The content of CPD should help ensure necessary competencies for nurses in expanded roles and caring for increasingly complex population health needs, including the use of digital tools and technology for health. Regulations should be optimized to support a more equitable distribution and retention of nurses and contain measures for flexibilities and adaptions during emergencies to enhance availability while maintaining public safety.

Adapt workplace policies to protect and safeguard nurses

140. There is an urgent need for a coordinated response from governments, employers and society to protect and safeguard the mental health and well-being of nurses. Resources such as the Global Health and Care Workers Compact, *Our duty of care (389)* and the International Council of Nurses *(433)* provide guidance for country and facility level policies and interventions. A crucial component of a decent work environment is equitable and competitive remuneration. Features that could strengthen the salary scales for nurses include pay progression mechanisms that compensate staff with high levels of skills, experience or advanced practice; pay supplements that target hard-to-fill posts in areas with a high cost of living; and flexibilities in pension contributions and payments to encourage more nurses to remain in or return to the workforce *(408)*. Some countries may need to assess how their pay system supports gender equity (see section 9.2).

Nurses providing care in neonatal intensive care unit Al-Makassed Hospital, Jerusalem. © WHO

9.1.4 Leadership

Establish and strengthen senior leadership positions for nursing workforce governance and management and input into health policy

141. While there are more GCNOs, countries are encouraged to ensure their roles and responsibilities reflect a suitable level of seniority and linkages with the structures responsible for broader health workforce policies and management. GCNOs should be provided professional development opportunities and training in human resources for health leadership and management, including data reporting and use, and engagement in national policy processes and mechanisms, as well as regional and global forums. Nurse leaders in other health and social care positions can enhance health policy decision-making with nursing perspectives. Countries are encouraged to monitor and report on the gender of leaders within the health and social care sector.

Invest in leadership skills development for nurses

142. Nursing leadership development programmes have demonstrable positive impacts and should be expanded, particularly in LICs. Barriers such as lack of funding, too few senior policy-level nurses, or lack of exposure to leadership in education and training curricula *(434)* should be addressed with mobilization of resources and contextualized programmes that provide or strengthen needed competencies to senior nurses in a variety of settings. Many leadership development programmes focus on providing opportunities for policy engagement, decision-making, professional networks, and exposure to research and innovation to early career nurses as a way to enhance retention in the profession and facilitate career advancement *(435, 436)*.

An acute watery diarrhoea educational activity in a Khartoum school, Sudan. © WHO

9.2 Emerging policy priorities for 2026–2030

9.2.1 Emerging policy priorities

Further develop advanced practice nursing roles to increase access to high quality health services

143. Introduction and integration of APN should meet an identified need for the role, have acceptance by ministries of health, and reflect collaboration among ministry of health, education institutions, regulators, associations and employers. Successful implementation of APN roles requires consideration and context-specific adaptations of health system structure, educational infrastructure and health workforce policy *(29, 364, 437)*. There are a variety of policy windows and regulatory levers to enhance the understanding and application of APN roles for a greater impact on population health. Interprofessional collaboration, investment in education and professional development and ongoing policy support are also crucial for advanced practice nursing success. Standardized definitions of the occupational group for APN (as differentiated from nursing professionals) are necessary for accurate global monitoring and policy development.

Address gender-related bias, including equitable and competitive wages

144. There is an urgent need for collaborative and multisectoral solutions to ensure gender equality in the health and care sector. Context-specific approaches are needed to address drivers of feminization of nursing, such as cultural, societal gender norms and access to education, and support gender-equitable labour force participation. Gender responsive policies in education, hiring, deployment, management, retention and career advancement contribute to fairer and more inclusive environments for practising and prospective nurses. All countries should collect gender-disaggregated data and conduct intersectional gender analyses of the health labour market. The wages for nurses must be fair and equitable, reflect the hardship nature of many of nurses' roles and tasks, and reward equal pay for equal work.

Examining a patient's chest X-ray at a health facility in Kazakhstan. © WHO

Harness the potential of digital tools and technologies to meet population and health system needs

145. Nurses in both practice, education and leadership roles should be knowledgeable about using digital health tools and competent to work with relevant technologies. Such technologies can help with disease prevention, diagnosis, and management and workforce development *(438)*. Nurses must be prepared and fully supported to competently utilize digital technologies across areas of professional practice from education to practice, research and management. AI adoption, use and acceleration for health workforce learning and practice will require significant investments to build health workforce capacity, raising concerns on equity and inclusivity. Infrastructure and resources, including education of the workforce, legal and regulatory frameworks, mechanisms for data privacy and security, global technical and other standards and internet connectivity, are essential precursors to optimal use of digital and AI technologies for improved patient outcomes *(439)*.

Empower nurses to contribute to the climate agenda through education, advocacy, climate conscious practice in health settings and leadership

146. Academic partners will need to integrate learning outcomes on climate change and health impacts into competency-based nursing curricula and promote interdisciplinary study with environmental and public health. Nurses' roles in advocating for public health policies that address climate change should be recognized and supported. Nurses in health facilities can lead efforts to advocate for measures that reduce their carbon footprint, minimize waste and promote energy efficiency in their workplaces. Governments and health facilities can place more emphasis on climate-related health issues through dedicated professional roles, such as environmental health educators or public health advocates for climate resilience. Strategic partnerships by GCNOs can ensure nurses are educated and deployed in ways that enable them to advance the climate agenda in their communities.

Provide tailored support for nursing education, employment and working conditions in fragile, conflict-affected and vulnerable settings

147. Ensuring physical safety is paramount, including secure facilities, safe transportation to and from work, and protection from direct violence. Psychosocial support, counselling and mental health services should be provided. To sustain education and training programmes, remote and mobile learning should be maximized; faculty will need support to develop, share and teach online curricula. Employed nurses should be provided in-service training with a focus on practical skills, such as triage, emergency care and trauma management. Flexible certification or credentialling approaches should be used to register and recognize certifications. Salaries and compensation for nurses in conflict zones should be maintained, including through temporary mechanisms. In post-conflict situations, rehabilitation programmes can help reintegrate nurses, recognize the critical contributions made, provide reskilling as needed, and ensure compensation and support in transitions to prior roles.

A nurse at Talbisah Hospital, Syrian Arab Republic, holds a sign reading "I am a nurse I am #NotATarget", highlighting the risks faced by health workers in conflict zones. © WHO

All policy priorities and related actions will need to be supported by targeted investments and country-level collaboration across sectors of government, such as finance, labour and education, and by stakeholders including nurse educators, regulators, associations, employers, nongovernmental and civil society organizations.

A nurse provides care to a cholera patient at a treatment centre in Ethiopia during an outbreak, ensuring hydration and IV support. © WHO/Mulugeta Ayene

CHAPTER 10

Conclusion

148. While this report demonstrates a continuing trend of aggregate increase in the global nursing stock, the average growth masks widening inequalities and persisting losses in supply of nurses (from attrition, retirement and international migration). In many countries, hard-earned gains in the graduation rate of nurses are not resulting in improved densities due to the faster pace of population growth. Vulnerable populations, such as those in countries on the *WHO health workforce support and safeguards list 2023*, LDCs, countries affected by conflict and instability, those with high fertility levels and rapid population growth and SIDS, have witnessed and are facing further diminishment in nurse density, thereby threatening the availability of essential health services.

149. The clear impetus remains to scale up the nursing workforce, by expanding education and training capacity, increasing jobs for nurses in the health system, improving working conditions and strengthening leadership and governance that ultimately contributes to achieving health-related global goals. A critical early step is nursing workforce planning using a health labour market lens to identify and address issues in the education pipeline, gaps from education to employment, gaps in economic and fiscal space, under- and unemployment, age and gender profiles, and factors impacting retention and international migration.

150. While there will always be international migration, unfavourable working conditions and relatively low wages can be major "push" factors for nurses. This report found many countries without adequate measures to protect nurses and uphold their rights in their work environments; only 42% had services to support mental health and well-being. Median wages, even when adjusted for PPP, were three times greater in HICs than LICs. Analysis with gender-disaggregated wage data found that, although nursing remains an occupation that is highly segregated by gender and women continue to make up the larger share of the nursing workforce, men continue to earn more than women, both per hour and monthly.

151. The global nursing workforce is becoming increasingly professionalized. The global increase in countries using APN roles correlates with the growth in substantive evidence supporting the effectiveness of APNs in enhanced

access to and quality of care; patient, health care provider and organizational outcomes; and cost-effective health services delivery across various health settings, patient populations and acuity levels. Standardization of definitions of APNs as an occupational group and consistency in education, practice and regulation can help overcome barriers to an optimized role in health facility and community settings.

152. More countries than ever have a GCNO, indicating a prime opportunity for leveraging the leadership of these senior-most nurses. It is now incumbent upon countries to ensure that GCNO positions are adequately equipped with the requisite resources, political skills and especially authority and decision-making power to make positive contributions to health policy and nursing workforce planning. GCNOs are well placed to play a pivotal role in reorienting national health systems towards primary healthcare. The gaps in nursing leadership training in certain regions and in LICs should be filled to ensure equal opportunity for nurses to meet their full potential.

153. While *State of the world's nursing 2025* presents more data than the previous report, there are still substantial gaps in key areas, such as education capacity (applications, enrolments), the types of facilities nurses are working in, the share of foreign-born and foreign-trained nurses, and distribution of nurses at the subnational level. The engagement of GCNOs and other nursing stakeholders in data collation, reporting and use can help continue to improve availability for future reports.

154. The data and evidence in this report support the pivotal policy dialogue and evidence-based decisions required to continue and accelerate implementation of the *Global strategic directions for nursing and midwifery 2021–2025*. Investing in the education, employment and retention of nurses will stimulate economic growth by creating decent jobs for nurses and greater economic participation by women in the workforce. Gender-equitable investments in health and care work, coupled with gender-transformative policies, can help drive fairer and more inclusive economies.

> **Countries are urged to coordinate intersectoral policy dialogue and evidence-informed decision-making on where and how to invest in nursing to fully optimize its contributions to health services delivery and improvements in population health outcomes.**

155. It is now urgent to accelerate action on the areas of emphasis within the policy priorities of the *Global strategic directions for nursing and midwifery 2021–2025*, and advance efforts in the emerging priority areas of advanced practice nursing, gender equality, climate and health, digital heath and technology and nurses in fragile, conflict and vulnerable settings. Doing so will help put the full power of nursing behind efforts to minimize inequities in access, quality, acceptability of health services, and close the gap in achieving UHC through a primary healthcare approach. Using the data and findings in this report, countries are urged to coordinate intersectoral policy dialogue and evidence-informed decision-making on where and how to invest in nursing to fully optimize its contributions to health services delivery and improvements in population health outcomes.

156. The inequity trends across several domains highlighted by this report recur among and within regions, across and within countries, and by country income classification. While these findings may not be a surprise, they are not something to be accepted. To achieve the SDG targets, and particularly UHC, these inequities must be urgently addressed.

A nurse preparing intravenous medicine for a malnourished child at the hospital in Wau, South Sudan. © WHO

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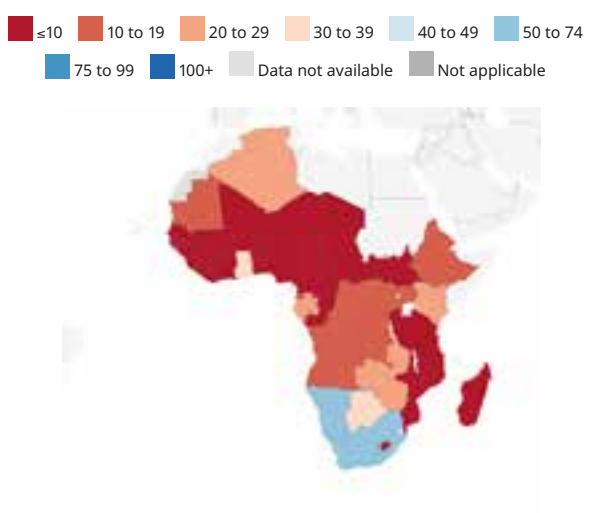
ANNEX 1

Consolidated data for each WHO region

African Region

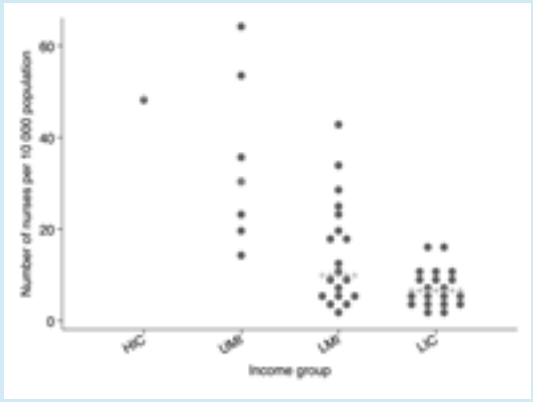


1.7 million nursing personnel

14.1 nursing personnel per 10 000 population

The WHO African Region consists of **47 Member States** with a population of **1.2 billion** in 2023

Distribution of nursing personnel density by World Bank income group



Jobs

Distribution of nursing personnel by subregion

Subregion	Stock[a]	Density per 10 000 population (min–max)
Northern and Western (n=17)	532 000	10.8 (2.6–33.4)
Eastern (n=16)	555 000	11.9 (1.5–48.8)
Middle (n=9)	225 000	10.9 (1.2–19.9)
Southern (n=5)	432 000	59.9 (5.4–63.7)

[a] Rounded to nearest thousand.

Mobility

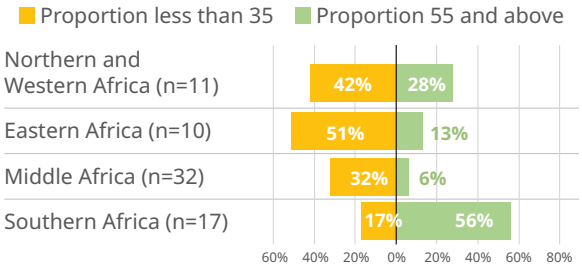
Foreign-born 3% from 16 countries

Foreign-trained 6% from 19 countries

Sex (from 34 countries): **66%** female; **34%** male

Age (from 28 countries): **39%** aged less than 35 years; **17%** aged 55 and above

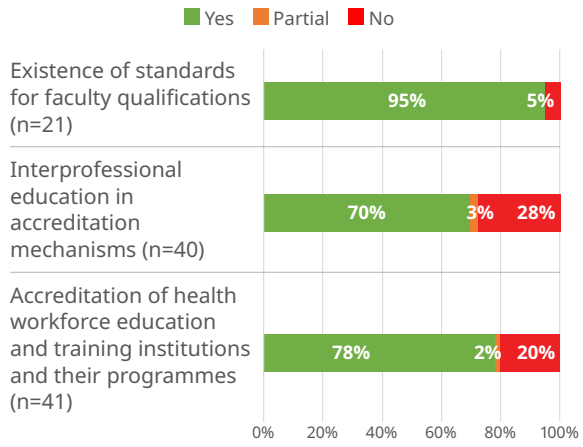
Age by subregion



Education

7.6	graduates per 100 active stock (from 40 countries)
9.5	graduates per 100 000 population
67%	female graduates (from 5 countries)
24%	of countries (from 37 countries) have a duration of training of 4 years and above

Education regulation

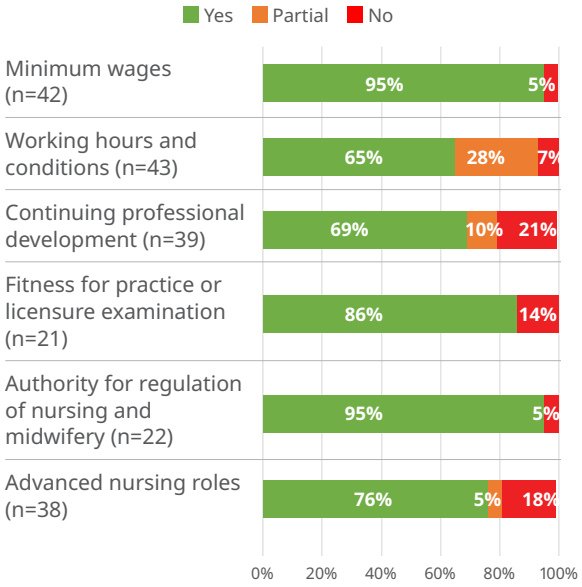


Graduate annual production by subregion

Subregion	Mean number of graduates per 100 active nurses (min–max)
Northern and Western (n=12)	9.1 (1.4–23.3)
Eastern (n=16)	6.6 (<1–18.3)
Middle (n=7)	7.0 (<1–20.2)
Southern (n=5)	7.4 (<1–30.1)

Service delivery

Regulations and working conditions



Leadership

86%

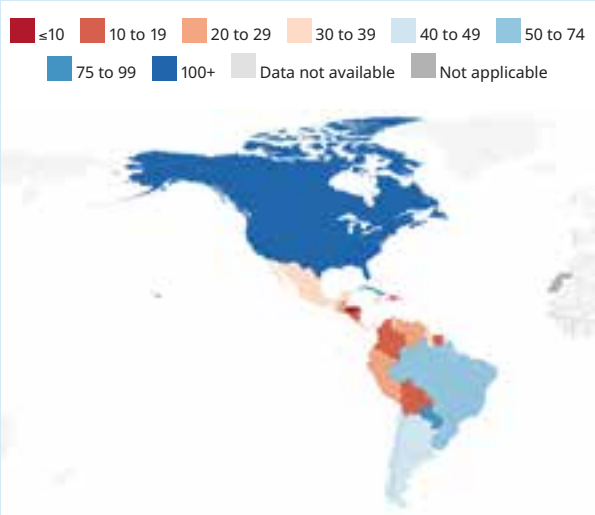
of countries (n=22) reported a **chief nursing officer or equivalent**

43%

of countries (n=21) have a **nursing leadership programme**

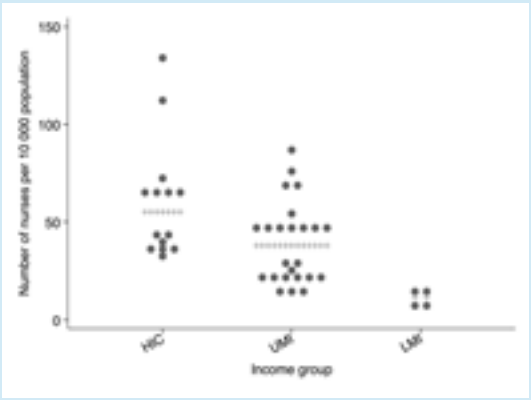
Note: Subgroups are as follows: **EASTERN AFRICA:** Burundi (BDI), Comoros (COM), Eritrea (ERI), Ethiopia (ETH), Kenya (KEN), Madagascar (MDG), Malawi (MWI), Mauritius (MUS), Mozambique (MOZ), Rwanda (RWA), Seychelles (SYC), South Sudan (SSD), Uganda (UGA), United Republic of Tanzania (TZA), Zambia (ZMB), Zimbabwe (ZWE); **MIDDLE AFRICA:** Angola (AGO), Cameroon (CMR), Central African Republic (CAF), Chad (TCD), Republic of the Congo (COG), Democratic Republic of the Congo (COD), Equatorial Guinea (GNQ), Gabon (GAB), São Tomé and Príncipe (STP); **SOUTHERN AFRICA:** Botswana (BWA), Eswatini (SWZ), Lesotho (LSO), Namibia (NAM), South Africa (ZAF); **NORTHERN AND WESTERN AFRICA**: Algeria (DZA), Benin (BEN), Burkina Faso (BFA), Cabo Verde (CPV), Côte d'Ivoire (CIV), Gambia (GMB), Ghana (GHA), Guinea (GIN), Guinea-Bissau (GNB), Liberia (LBR), Mali (MLI), Mauritania (MRT), Niger (NER), Nigeria (NGA), Senegal (SEN), Sierra Leone (SLE), Togo (TGO).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

Region of the Americas



The WHO Region of the Americas consists of **35 Member States** with a population of **1.037 billion** in 2023

Distribution of nursing personnel density by World Bank income group



7.5 million nursing personnel

72.2 nursing personnel per 10 000 population

Jobs

Distribution of nursing personnel by subregion

Subregion	Stock[a]	Density per 10 000 population (min–max)
Caribbean (n=13)	132 000	33.4 (7.1–76.0)
Central America (n=8)	498 000	27.3 (7.3–33.4)
South America (n=12)	1 820 000	42.0 (15.4–86.2)
Northern America (n=2)	5 037 000	131.5 (112.6–133.8)

[a] Rounded to nearest thousand.

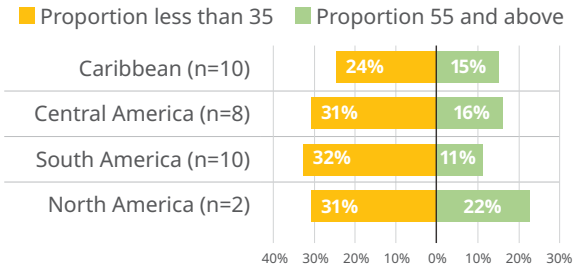
Mobility

Foreign-born 6%
from 21 countries

Foreign-trained 6%
from 21 countries

Sex (from 31 countries)	**87%** female	**13%** male
Age (from 28 countries)	**31%** aged less than 35 years	**19%** aged 55 and above

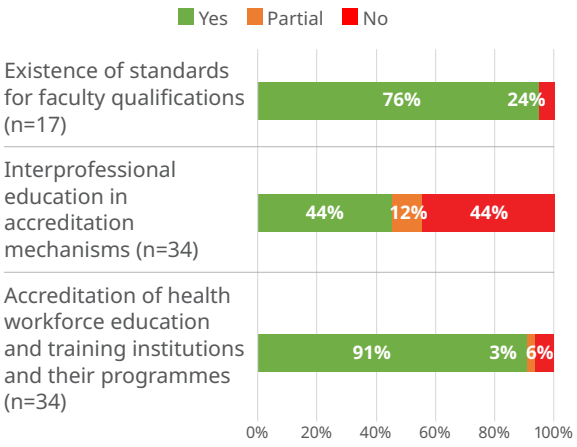
Age by subregion



Education

5.1	graduates per 100 active stock (from 25 countries)
22.7	graduates per 100 000 population
87%	female graduates (from 13 countries)
64%	of countries (from 28 countries) have a duration of training of 4 years and above

Education regulation

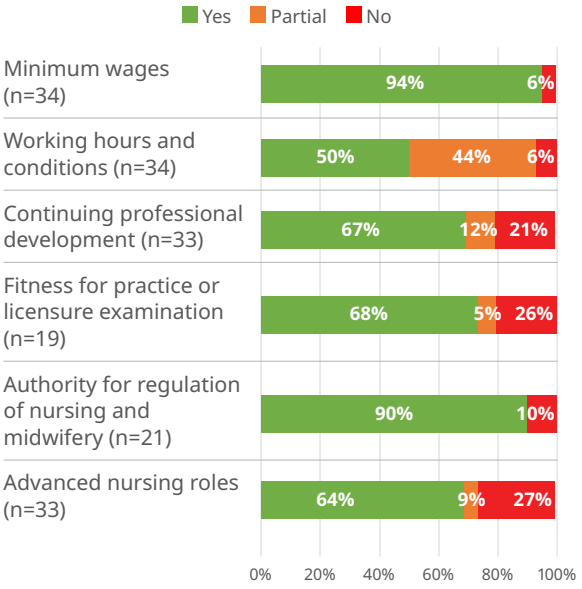


Graduate annual production by subregion

Subregion	Mean number of graduates per 100 active nurses (min–max)
Caribbean (n=9)	6.3 (< 1–9.1)
Central America (n=7)	3.8 (1.2–6.1)
South America (n=7)	4.7 (1.8–8.4)
Northern America (n=2)	5.5 (2.9–8.0)

Service delivery

Regulations and working conditions



Leadership

86%

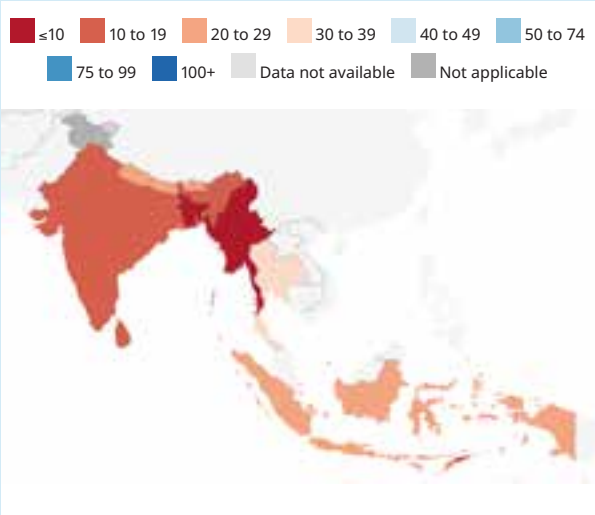
of countries (n=21) reported a
chief nursing officer or equivalent

71%

of countries (n=21) have a
nursing leadership programme

Note: Subgroups in the Region of the Americas are as follows: **CARIBBEAN**: Antigua and Barbuda (ATG), Bahamas (BHS), Barbados (BRB), Cuba (CUB), Dominica (DMA), Dominican Republic (DOM), Grenada (GRD), Haiti (HTI), Jamaica (JAM), Saint Kitts and Nevis (KNA), Saint Lucia (LCA), Saint Vincent and the Grenadines (VCT), Trinidad and Tobago (TTO); **CENTRAL AMERICA**: Belize (BLZ), Costa Rica (CRI), El Salvador (SLV), Guatemala (GTM), Honduras (HND), Mexico (MEX), Nicaragua (NIC), Panama (PAN); **SOUTH AMERICA**: Argentina (ARG), Bolivia (Plurinational State of) (BOL), Brazil (BRA), Chile (CHL), Colombia (COL), Ecuador (ECU), Guyana (GUY), Paraguay (PRY), Peru (PER), Suriname (SUR), Uruguay (URY), Venezuela (Bolivarian Republic of) (VEN); N**ORTH AMERICA**: Canada (CAN), United States (USA).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

South-East Asia Region

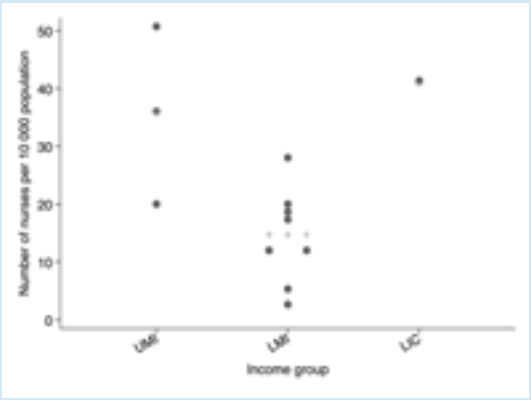


3.6 million nursing personnel

17.4 nursing personnel per 10 000 population

The WHO South-East Asia Region consists of **11 Member States** with a population of **2.1 billion** in 2023

Distribution of nursing personnel density by World Bank income group



Jobs

Mobility

Foreign-born 8%
from 5 countries

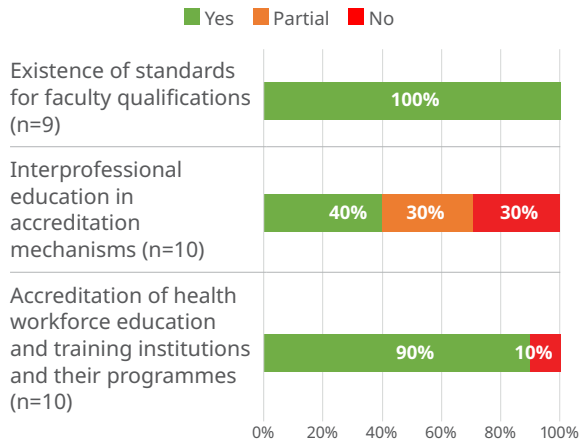
Foreign-trained 19%
from 5 countries

Sex (from 10 countries)	**84%** female	**16%** male
Age (from 8 countries)	**45%** aged less than 35 years	**9%** aged 55 and above

Education

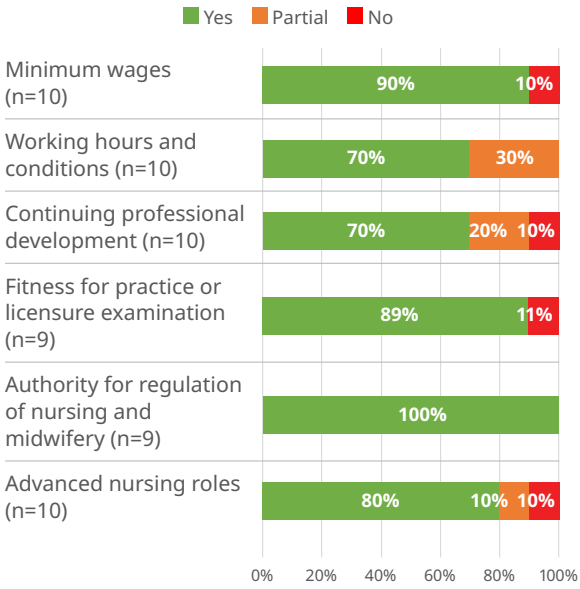
8.1	graduates per 100 active stock (from 9 countries)
14.4	graduates per 100 000 population
82.9%	female graduates (from 5 countries)
70%	of countries (from 10 countries) have a duration of training of 4 years and above

Education regulation



Service delivery

Regulations and working conditions



Leadership

78%

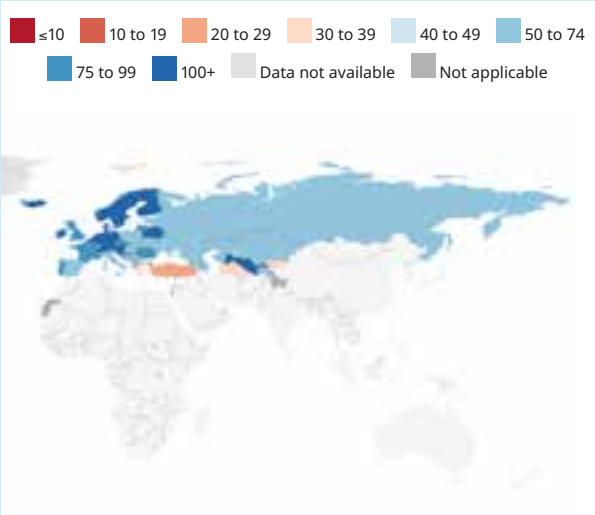
of countries (n=9) reported a
chief nursing officer or equivalent

67%

of countries (n=9) have a
nursing leadership programme

Note: List of countries included Bangladesh (BGD), Bhutan (BTN), India (IND), Sri Lanka (LKA), Maldives (MDV), Nepal (NPL); Indonesia (IDN), Myanmar (MMR), Democratic People's Republic of Korea (PRK), Thailand (THA), Timor-Leste (TLS).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

European Region

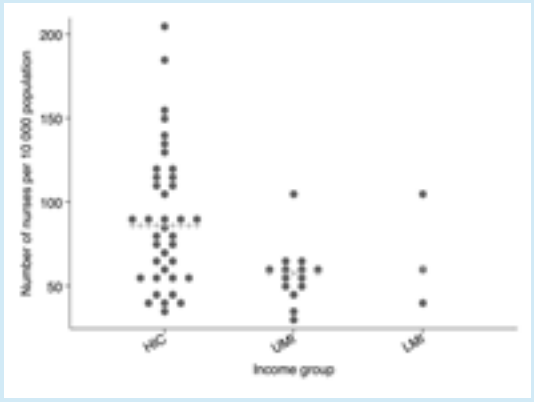


7.2 million nursing personnel

76.9 nursing personnel per 10 000 population

The WHO European Region consists of **53 Member States** with a population of **939 million** in 2023

Distribution of nursing personnel density by World Bank income group



Jobs

Distribution of nursing personnel by subregion

Subregion	Stock[a]	Density per 10 000 population (min–max)
Central Asia (n=5)	619 000	76.6 (33.3–106.8)
Eastern Europe (n=10)	1 948 000	68.1 (42.0–103.2)
Northern Europe (n=10)	1 083 000	100.3 (41.6–155.7)
Southern Europe (n=14)	952 000	63.5 (38.5–104.0)
Western Asia (n=6)	391 000	34.0 (28.0–58.7)
Western Europe (n=8)	2 228 000	111.9 (90.6–202.6)

[a] Rounded to nearest thousand.

Mobility

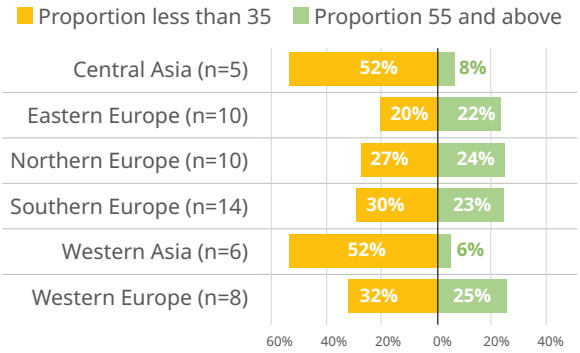
Foreign-born 14%
from 23 countries

Foreign-trained 10%
from 25 countries

Sex (from 39 countries)
85% female
15% male

Age (from 26 countries)
31% aged less than 35 years
21% aged 55 and above

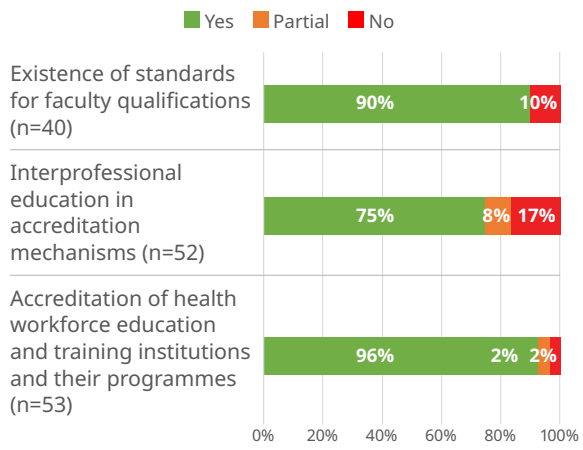
Age by subregion



Education

5.6	graduates per 100 active stock (from 50 countries)
42.7	graduates per 100 000 population
85.5%	female graduates (from 10 countries)
30%	of countries (from 30 countries) have a duration of training of 4 years and above

Education regulation

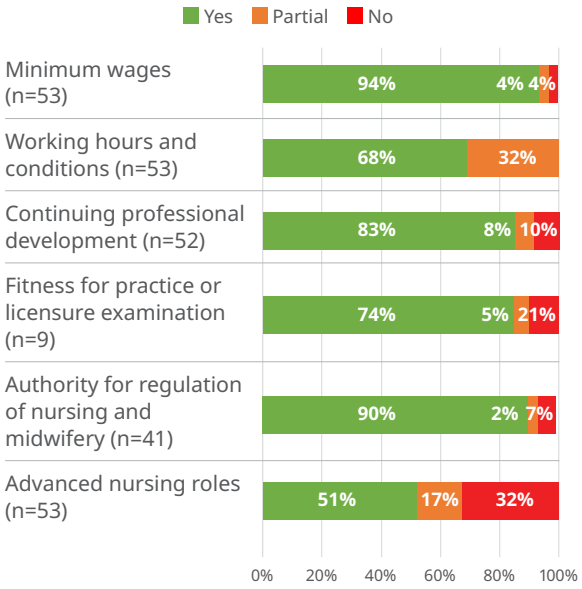


Graduate annual production by subregion

Subregion	Mean number of graduates per 100 active nurses (min–max)
Central Asia (n=4)	12.0 (1.7–20.7)
Eastern Europe (n=9)	4.8 (1.8–12.3)
Northern Europe (n=10)	5.3 (2.3–16.4)
Southern Europe (n=13)	6.6 (< 1–26.9)
Western Asia (n=6)	3.4 (< 1–8.0)
Western Europe (n=8)	3.9 (< 1–6.0)

Service delivery

Regulations and working conditions



Leadership

75%

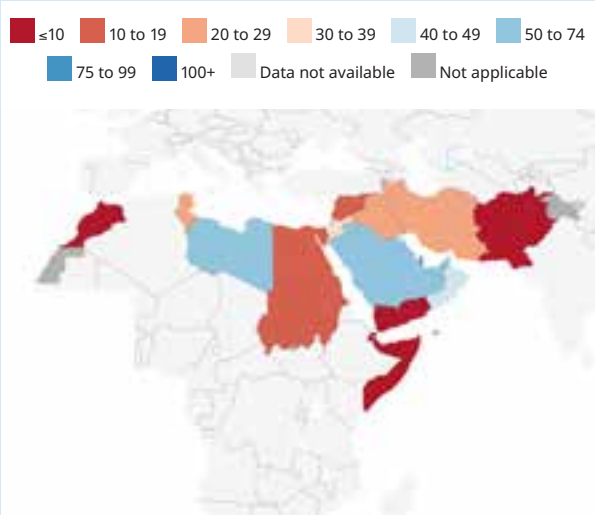
of countries (n=40) reported a
chief nursing officer or equivalent

78%

of countries (n=40) have a
nursing leadership programme

Note: Subgroups in the European Region are as follows: **CENTRAL ASIA:** Kazakhstan (KAZ), Kyrgyzstan (KGZ), Tajikistan (TJK), Turkmenistan (TKM), Uzbekistan (UZB); **EASTERN EUROPE:** Belarus (BLR), Bulgaria (BGR), Czechia (CZE), Hungary (HUN), Poland (POL), Moldova (MDA), Romania (ROU), Russian Federation (RUS), Slovakia (SVK), Ukraine (UKR); **NORTHERN EUROPE:** Denmark (DNK), Estonia (EST), Finland (FIN), Iceland (ISL), Ireland (IRL), Latvia (LVA), Lithuania (LTU), Norway (NOR), Sweden (SWE), United Kingdom (GBR); **SOUTHERN EUROPE**: Albania (ALB), Andorra (AND), Bosnia and Herzegovina (BIH), Croatia (HRV), Greece (GRC), Italy (ITA), Malta (MLT), Montenegro (MNE), North Macedonia (MKD), Portugal (PRT), San Marino (SMR), Serbia (SRB), Slovenia (SVN), Spain (ESP); **WESTERN ASIA:** Armenia (ARM), Azerbaijan (AZE), Cyprus (CYP), Georgia (GEO), Israel (ISR), Türkiye (TUR); **WESTERN EUROPE:** Austria (AUT), Belgium (BEL), France (FRA), Germany (DEU), Luxembourg (LUX), Monaco (MCO), Netherlands (Kingdom of the) (NLD), Switzerland (CHE).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

Eastern Mediterranean Region

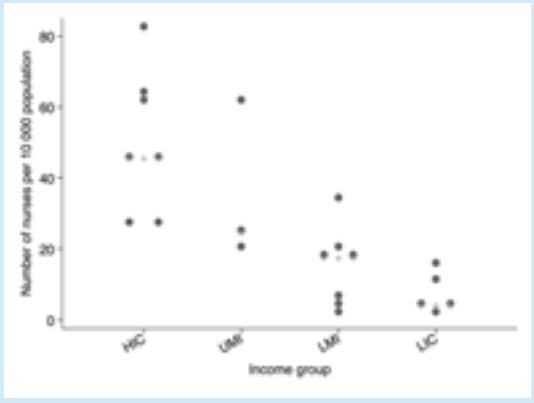


1.3 million nursing personnel

15.5 nursing personnel per 10 000 population

The WHO Eastern Mediterranean Region consists of **21 Member States** with a population of **804 million** in 2023

Distribution of nursing personnel density by World Bank income group



Jobs

Distribution of nursing personnel by subregion

Subregion	Stock[a]	Density per 10 000 population (min–max)
North Africa (n=6)	361 000	15.0 (2.1–62.2)
Middle East (n=15)	890 000	15.8 (1.2–83.7)

[a] Rounded to nearest thousand.

Mobility

Foreign-born 61%
from 7 countries

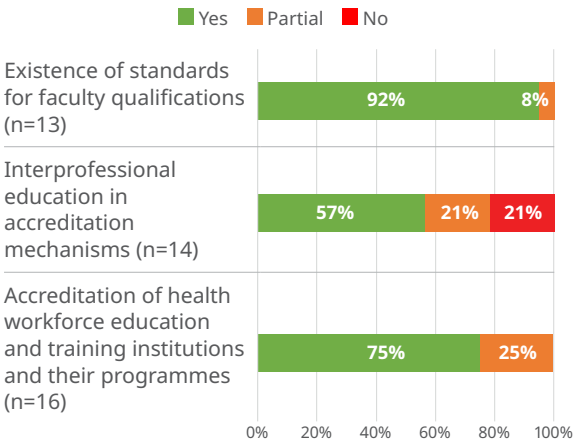
Foreign-trained 14%
from 4 countries

Sex (from 13 countries)	**73%** female	**27%** male
Age (from 5 countries)	**56%** aged less than 35 years	**6%** aged 55 and above

Education

5.6	graduates per 100 active stock (from 14 countries)
9.0	graduates per 100 000 population
68.9%	female graduates (from 6 countries)
50%	of countries (from 15 countries) have a duration of training of 4 years and above

Education regulation

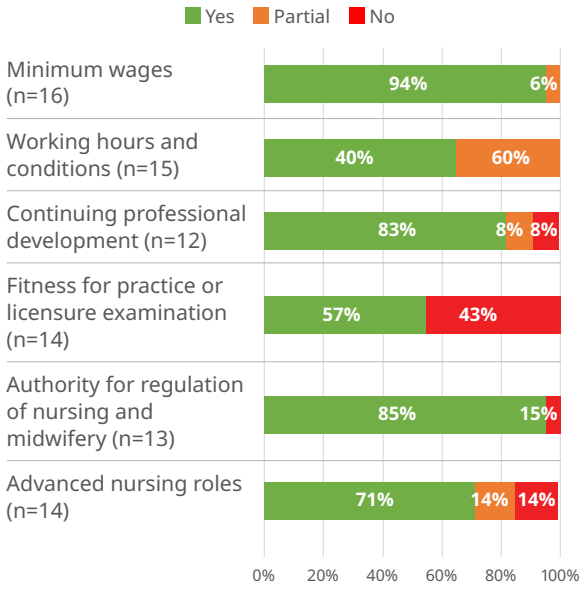


Graduate annual production by subregion

Subregion	Mean number of graduates per 100 active nurses (min–max)
North Africa (n=3)	6.8 (< 1–10.0)
Middle East (n=11)	5.2 (< 1–17.1)

Service delivery

Regulations and working conditions



Leadership

75%

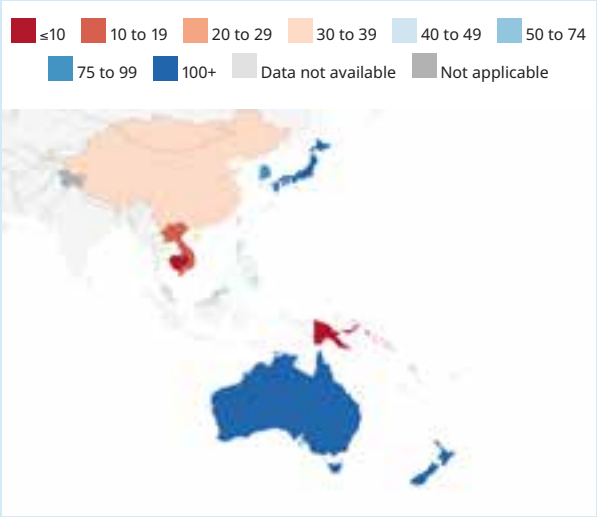
of countries (n=12) reported a
chief nursing officer or equivalent

76%

of countries (n=12) have a
nursing leadership programme

Note: Subgroups in the Eastern Mediterranean Region are as follows: A. **NORTH AFRICA**: Egypt (EGY), Morocco (MAR), Tunisia (TUN), Sudan (SDN), Libya (LBY), Somalia (SOM); B. **MIDDLE EAST**: Jordan (JOR), Afghanistan (AFG), Iran (Islamic Republic of) (IRN), Pakistan (PAK), Bahrain (BHR), Saudi Arabia (SAU), Lebanon (LBN), Djibouti (DJI), Iraq (IRQ), Yemen (YEM), Kuwait (KWT), Qatar (QAT), Oman (OMN), Syria (SYR), United Arab Emirates (ARE).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

Western Pacific Region

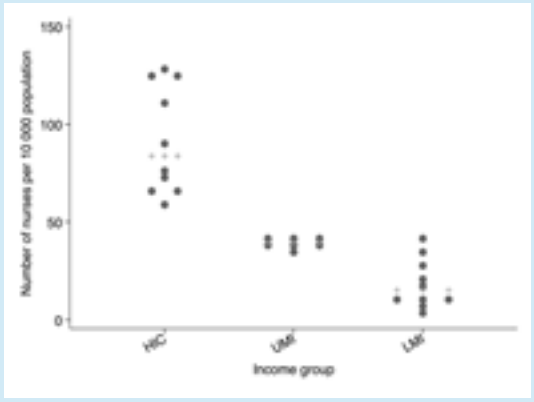


8.5 million nursing personnel

44.0 nursing personnel per 10 000 population

The WHO Western Pacific Region consists of **27 Member States** with a population of **1.9 billion** in 2023

Distribution of nursing personnel density by World Bank income group



Jobs

Distribution of nursing personnel by subregion

Subregion	Stock[a]	Density per 10 000 population (min–max)
Pacific Island countries (n=14)	13 000	9.7 (5.1–112.0)
Non-Pacific Island countries (n=13)	8 474 000	44.1 (5.8–127.1)

[a] Rounded to nearest thousand.

Mobility

Foreign-born 26%
from 8 countries

Foreign-trained 22%
from 13 countries

Sex

(from 23 countries)

91% female

9% male

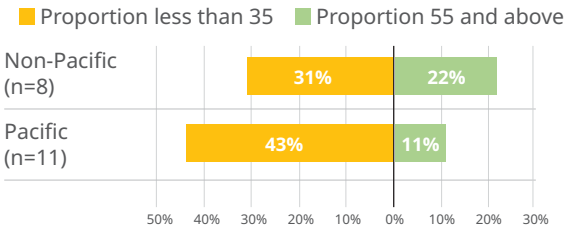
Age

(from 21 countries)

31% aged less than 35 years

21% aged 55 and above

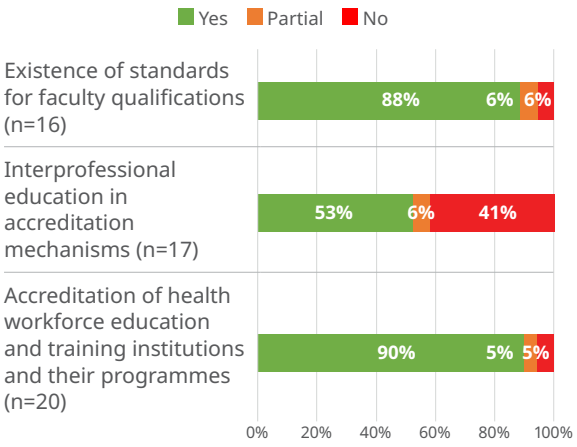
Age by subregion



Education

7.5	graduates per 100 active stock (from 13 countries)
37.5	graduates per 100 000 population
90.3	female graduates (from 4 countries)
20%	of countries (from 20 countries) have a duration of training of 4 years and above

Education regulation

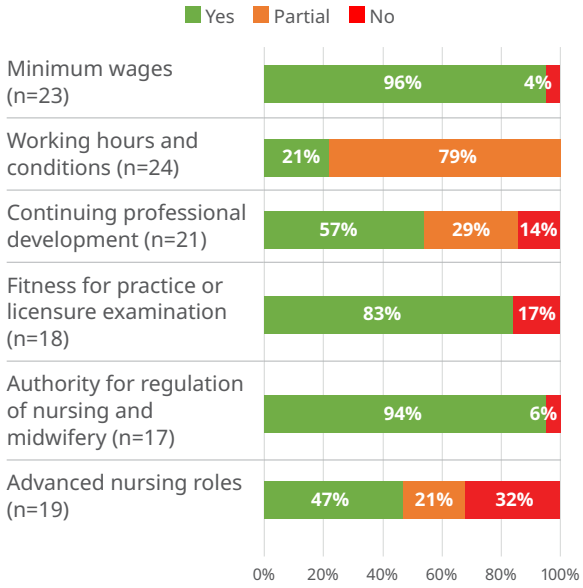


Graduate annual production by subregion

Subregion	Mean number of graduates per 100 active nurses (min–max)
Pacific Island countries (n=4)	10.6 (5.5–20.1)
Non-Pacific Island countries (n=9)	6.1 (1.5–11.7)

Service delivery

Regulations and working conditions



Leadership

93%

of countries (n=27) reported a
chief nursing officer or equivalent

56%

of countries (n=16) have a
nursing leadership programme

Note: Subgroups in the Western Pacific Region are as follows: A. **Pacific Island Countries** (PICs): Cook Islands (COK), Fiji (FJI), Kiribati (KIR), Marshall Islands (MHL), Micronesia, Federated States of (FSM), Nauru (NRU), Niue (NIU), Palau (PLW), Papua New Guinea (PNG), Samoa (WSM), Solomon Islands (SLB), Tonga (TON), Tuvalu (TUV), Vanuatu (VUT); B. **non-Pacific Island Countries:** Australia (AUS), Brunei Darussalam (BRN), Cambodia (KHM), China (CHN), Japan (JPN), Lao People's Democratic Republic (LAO), Malaysia (MYS), Mongolia (MNG), New Zealand (NZL), Philippines (PHL), Republic of Korea (KOR), Singapore (SGP), Viet Nam (VNM).
Source: Latest reported statistics over the period 2018–2023, NHWA (2024); United Nations Statistics Division (2024).

ANNEX 2

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 most common nursing job titles are registered nurse, enrolled 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, 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, this publication 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 this publication. For example, the ISCO classification and a country's system following ISCO would classify "nurse aides" as health care assistants, a broader support occupational group.

ISCO guidance provides detailed descriptions of which health workers should be counted under each category (Table A2.1). 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 3 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 systematically excludes nursing aides and nursing attendants, who belong to the health care assistant occupational group, not analysed in this publication.

Table A2.1 ISCO definitions of nursing personnel

Nursing Professionals

TASKS INCLUDE:

- planning, providing and evaluating nursing care for patients according to the practice and standards of modern nursing;
- coordinating the care of patients in consultation with other health professionals and members of health teams;
- developing and implementing care plans for the biological, social and psychological 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 plan;
- cleaning wounds and applying surgical dressings and bandages
- monitoring pain and discomfort experienced by patients and alleviating pain using a variety of therapies, including the use of painkilling drugs;
- planning and participating in health education programmes, health promotion and nurse education activities in clinical and community settings;
- answering questions from patients and families and providing information about prevention of ill-health, treatment and care;
- supervising and coordinating the work of other nursing, health and personal care workers;
- conducting research on nursing practices and procedures and disseminating findings such as through scientific papers and reports.

Nursing Associate Professionals

TASKS INCLUDE:

- 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 specialised care as needed;
- cleaning wounds and applying surgical dressings;
- updating information on patients' condition 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.

Source: Adapted from World Health Organization. *State of the world's nursing 2020*: investing in education, jobs and leadership. WHO; 2020, based on ILO International Standard Classification of Occupations. ILO; 2008. (https://www.ilo.org/public/english/bureau/stat/isco/).

ANNEX 3

Methods

A3.1 Data sources

Health workforce data were extracted for the 194 WHO Member States from the WHO NHWA data platform as of 20 December 2024. The NHWA data platform is prospectively completed by Member States over years and during 2024 a particular effort was made to collect, collate and report data for indicators that are relevant for the nursing workforce. Member States' NHWA focal points were invited to contribute to the *State of the world's nursing 2025* in February 2024 and during global webinars in March; this was followed up by regular emails and reminders. All levels of WHO (headquarters, regional offices, country offices) were involved in providing support to Member States. Progress in reporting was monitored with scorecards shared with all stakeholders involved in supporting countries. To facilitate the reporting, data profiles were shared with NHWA focal points in February, May and September 2024. In addition to NHWA focal points, GCNOs were invited to participate to the NHWA data reporting in the Global Partners Meeting for Nursing and Midwifery in May 2024.

Partner organizations were also invited to support national efforts to monitor and report these data to NHWA through webinars and workshops conducted during 2024. All stakeholders were encouraged to ensure national coordination with the support of NHWA focal points, to ensure that quality data were reported to WHO through the NHWA data platform. For countries already contributing to the OECD/Eurostat/WHO-Europe Joint Data Collection on Non-Monetary Health Statistics (JDC), data on stock, migration and graduates were uploaded to the NHWA data platform as an official reporting mechanism and the focal points of these Member States were asked to complete information for other indicators. In addition to data reported by Member States, when large gaps in information were observed on the stock statistics (this was the case for less than 10 countries), official publications on health statistics were searched to update stock data when possible.

After the data monitoring and reporting phase, from October to November 2024, the WHO Health Workforce Department conducted the data quality assessment through a series of analytics and data triangulation to identify outliers and potential errors in reporting. During this phase, the NHWA focal points of selected countries were consulted to clarify any deviation from trend or other data anomaly. All focal points were also asked to review their draft country profile with the reported data. This process of quality control and validation triggered individual exchanges and requests for clarification of information in the last quarter of 2024 and helped to ensure the accuracy and reliability of the reported data.

Data on the population for each country for the years 2018 to 2030 were extracted from the 2024 revision of World Population Prospects data prepared by the Population Division of the Department of Economic and Social Affairs of the UN Secretariat (data accessed 24 September 2024). Data on income group classification were extracted from the World Bank income group

classification released in July 2024, i.e. based on 2023 gross national income per capita (data accessed 24 September 2024). The World Bank income group provide a classification for 191 WHO Member States. Because data on nursing workforce were available for the three countries without a formal income classification, to avoid dropping information these countries were assigned a grouping based on their gross national income per capita, comparing with similar countries in their geographical area and to past classifications (2022 for Venezuela). As such, Cook Islands and Niue were assigned to the high-income group and Venezuela to the upper middle-income group.

A3.2 Analysis

The *State of the world's nursing 2025* data gathering followed the monitoring framework of the *Global strategic directions for nursing and midwifery 2021–2025 (1)*, which mostly uses NHWA indicators with six additional nursing-specific indicators. These additional indicators were all capacity indicators with categories Yes/Partial/No and they enabled capturing information on the existence of authority for regulation of nursing, fitness for practice or licensure examination, existence of standards for faculty qualifications, existence of GCNO or equivalent, existence of leadership development opportunities, and national association for pre-licensure and/or early career professionals. Metadata for these indicators are available upon request at: hrhstatistics@who.int.

To gather responses to these indicators, shared dynamic Excel spreadsheets were used throughout 2024 with the involvement of the GCNO or equivalent from Member States and NHWA focal points. These indicators were included in all scorecards and data profiles mentioned above. The reporting response rate for these indicators can be seen in Annex 4, Table A4.1.

For numerical indicators, the analysis aggregated results by region, income group or global. If numeric indicators were reported for at least 100 countries, and without major imbalance in reporting toward specific regions or income, then health workers were used as the unit of analysis. This implies that the raw data in numerator and denominators were summed for the category of interest before computation of ratios. This corresponds to considering population weights from each country. However, for indicators with reporting for less than 100 countries, or in case of major imbalance by region or income group, the unit of analysis considered was countries. In other words, it involves first calculating each ratio at country level prior to averaging them. This corresponds to an unweighted average. The latter approach, conducted when fewer countries reported, was used to limit the weight from more populated countries. In tables and figures aggregating data by broad category, a comment is given in "notes" to identify categories for which data were available for less than half of the population.

For qualitative indicators, data were aggregated at country level and reported as the share of countries reporting. The analysis of stock of nurses was based on the latest density reported by countries. Because countries could have reported their latest data for a different year than 2023, the latest density reported was applied to the population size of 2023 from each country to standardize the stock to the year 2023.

Projection of nursing stock and density to 2030 were based on a simple stock and flow model already used in *State of the world's nursing 2020* and more recently in a global analysis of stock, projection and shortage for year 2020 *(2)*. In a nutshell, this consists of starting with the stock of nurses in 2023 from each country and year by year to 2030 factoring in new graduates (70%) and removing nurses retiring, with an age at retirement set to 65 years of age. This 65 years age of retirement was used because:

- data on age were reported by 10-year groupings with a higher category of age being 65+, hence considering an alternative would have required further assumptions on an underlying unknown age grouping;
- several countries have a legal or actual age of retirement around 65 year of age; and
- the age of retirement is currently increasing in several countries.

This approximation factors in both the fact that some nurses retire at an earlier age than 65, and others at an older age. The OECD estimated that the average retirement age in OECD countries was at 63.6 years for women and 64.4 years for men, and projected to increase to 66.3 for men and 65.8 for women *(3)*.

The shortage of nurses was estimated, for countries with a density lower than the median density of nurses observed globally in 2013 (baseline), as the number of nurses needed to reach this median density. This approach is equivalent, compatible and comparable with *Global strategy for human resources for health: workforce 2030*, the *State of the world's nursing 2020* and the global health workforce analysis for 2020. The median density was 27.5 nurses per 10 000 population in 2013. This value is similar to the last digit to the value used in *State of the world's nursing 2020* (27.4 per 10 000) although this calculation was initially based on a threshold including other occupations (medical doctors and midwives). With a similar order of magnitude, this revised threshold does not change the magnitude of shortage estimation but can be easily interpreted as a measurement of progress on nurses alone as compared with the actual situation in 2013.

Countries do sometimes correct their data retrospectively for previous years in NHWA or in the JDC, and sometimes their whole time series. This usually is because of improved data quality due to a change in the data source, for example, reporting practising nurses for the whole time series while data were previously available only for licensed to practise nurses. Another example observed, mostly in the African Region, is the improvement of data availability for stock from the private sector, whereas in the past several countries had information only on publicly employed nurses. It must be noted that these corrections influenced the estimations only marginally.

Data on salaries were defined as average wage or salary in US$ received by nurses when entering the active health labour market, excluding social contributions. To enable comparison between regions accounting for costs of goods in each country, these salaries were also expressed in PPP$, using for each country the World Bank estimate of US$ and PPP$ conversion for year 2023.

The 31 countries used in the gender pay gap analysis (Box 7.11) were Angola, Bangladesh, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Cambodia, Côte d'Ivoire, Ecuador, Egypt, El Salvador, Eswatini, Guyana, Honduras, Jordan, Kenya, Lao People's Democratic Republic, Lebanon, Lesotho, Liberia, Maldives, Nepal, Pakistan, Philippines, Senegal, Sri Lanka, Thailand, Uganda, Uruguay, United States of America and Zambia.

ANNEX 4

NHWA indicators and data availability

A4.1 Data process and indicators used in State of the world's nursing 2025

As per the annual data reporting cycle through NHWA, focal points from WHO Member States were invited to submit from February 2024 to November 2024 the most recent available data on the nursing workforce through 47 indicators – 41 from the NHWA and six additional specific indicators (see Table A4.1). Of these indicators, 34 (28 NHWA and six additional) were sufficiently reported and with sufficient quality to be included in the report. The NHWA handbook provides detailed definitions and metadata for each indicator *(4, 5)*.

Table A4.1 The 47 indicators considered for *State of the world's nursing* 2025

	Indicator name	Indicator number	Response rate December 2024
Nurse workforce stock and distribution	Nursing personnel density[a]	1-01	100%
	Nursing personnel density at subnational level	1-02	26%
	Nursing personnel distribution by age group[a]	1-03	68%
	Nursing personnel distribution by sex[a]	1-04	78%
	Nursing personnel distribution by facility ownership[a]	1-05	49%
	Nursing personnel distribution by facility type	1-06	48%
	Nursing personnel distribution by place of birth[a]	1-07	49%
	Nursing personnel distribution by place of training[a]	1-08	52%
	Annual inflows of nursing personnel	1-09	15%
	Annual outflows of nursing personnel	1-10	16%
	Vacancy rate for nursing personnel	1-11	8%
	Nursing personnel distribution by type of contract	1-12	14%

	Indicator name	Indicator number	Response rate December 2024
Nursing education and training	Training places in nursing education and training institutions	2-01	39%
	Applications for nursing education and training programmes	2-02	31%
	Enrolments in nursing education and training programmes[a]	2-03	47%
	Graduates of nursing education and training programmes[a]	2-04	73%
	Duration of nursing education and training programmes[a]	2-05	72%
	Existence of national and/or subnational mechanisms for accreditation of nursing education and training institutions and their programmes[a]	2-06	90%
	Existence of national and/or subnational standards for social accountability in accreditation mechanisms for nursing education and training programmes[a]	2-07.1	42%
	Existence of national and/or subnational standards for the social determinants of health in accreditation mechanisms for nursing education and training programmes[a]	2-07.2	40%
	Existence of national and/or subnational standards for interprofessional education in accreditation mechanisms for nursing education and training programmes[a]	2-07.3	86%
	Existence of cooperation between nursing education and training institutions and regulatory bodies to agree on accreditation standards[a]	2-07.4	44%
	Existence of national systems for continuing professional development for nursing personnel[a]	2-07.5	86%
	Existence of in-service training as an element of national education plans for nursing personnel[a]	2-07.6	45%
Nursing workforce spending and renumeration	Expenditure on compensation of nursing personnel	3-01	8%
	Entry-level wages and salaries of nursing personnel[a]	3-02	42%
Nursing education finances	Total expenditure on nursing education	3-03	16%
	Expenditure per graduate of nursing education and training programme	3-04	16%
	Average tuition fee per nursing student	3-05	16%

Additional *State of the world's nursing* specific indicators

	Indicator name	Indicator number	Response rate December 2024
Employment characteristics and working conditions	Existence of national/subnational policies/laws regulating working hours and conditions[a]	4-01.1	92%
	Existence of national/subnational policies/laws regulating minimum wage[a]	4-01.2	92%
	Existence of national/subnational policies/laws regulating social protection[a]	4-01.3	91%
	Existence of national/subnational policies/laws regulating dual practice	4-01.4	54%
	Existence of national/subnational policies/laws regulating compulsory service[a]	4-01.5	53%
	Existence of national/subnational policies/laws for prevention of attacks on health workers[a]	4-01.6	89%
	Existence of national/subnational care packages for mental well-being of health workers[a]	4-01.7	34%
	Existence of mechanisms for in-kind renumeration to promote rural retention[a]	4-01.8	40%
	Existence of regulatory mechanisms for promoting health worker safety[a]	4-01.9	53%
	Existence of regulatory mechanisms to ensure oversight of the activities of health workers within the private sector[a]	4-01.10	47%
Skill-mix composition for models of care	Existence of advanced nursing roles[a]	4-01.12	86%
	Share of women in health workforce leadership roles[a]	4-03	14%
Additional State of the World's Nursing specific indicators	Existence of authority for regulation of nursing[a]	NN1	63%
	Fitness for practice or licensure examination[a]	NN2	62%
	Existence of standards for faculty qualifications[a]	NN3	60%
	Existence of GCNO or equivalent at national level[a]	NN4	62%
	Existence of leadership development opportunities[a]	NN5	61%
	National association for pre-licensure and/or early career professionals[a]	NN6	60%

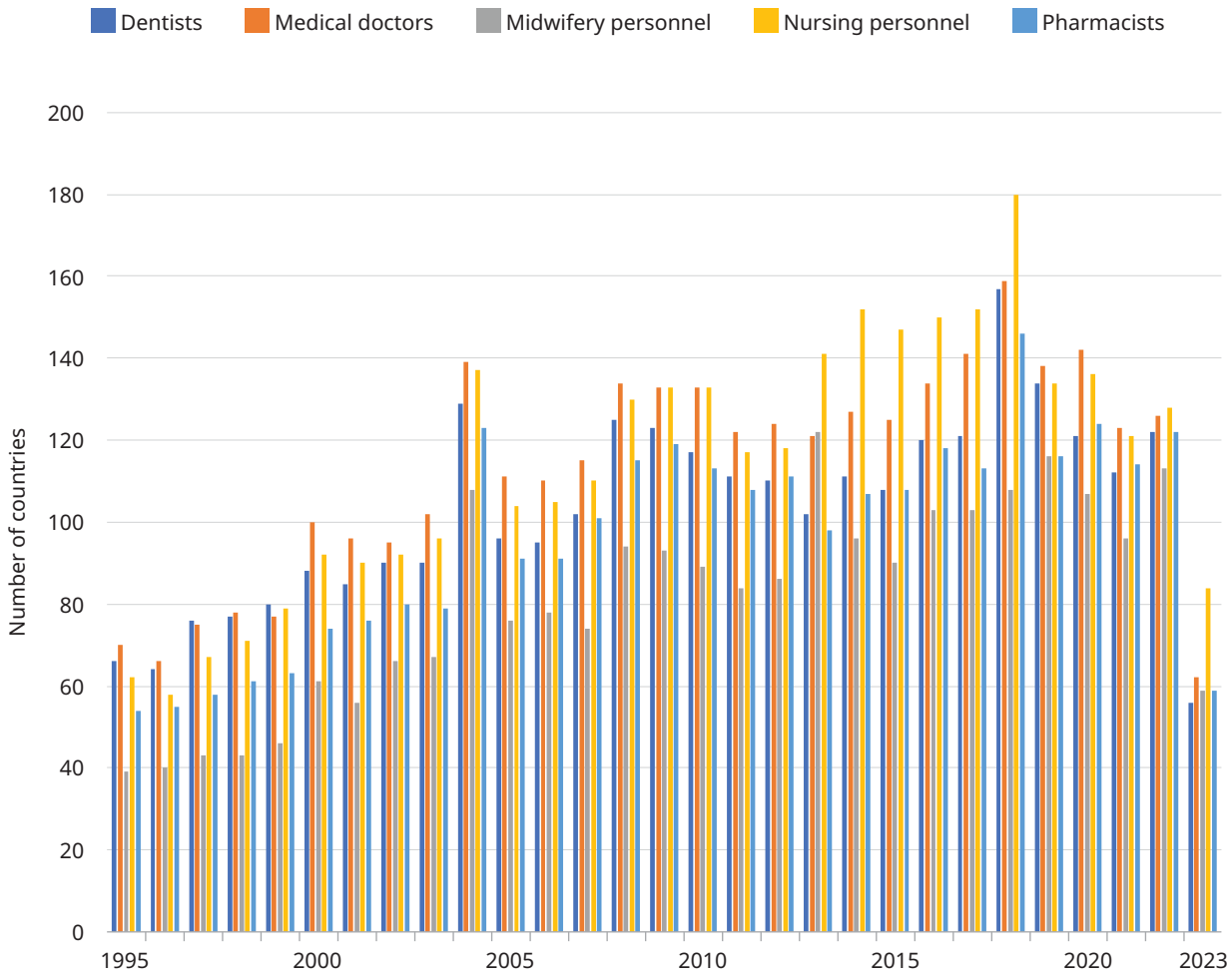
Notes: 41 indicators and sub-indicators were derived from the NHWA handbook and six were specifically designed for the present report. For further information on NHWA indicators, detailed information with metadata is available in the NHWA handbook (https://iris.who.int/handle/10665/374320). Metadata for the additional six additional State of the world's nursing indicators (labelled NN1 to NN6) are available on request at: hrhstatistics@who.int

[a] Indicators with sufficient number of countries reporting and for which data quality was considered as sufficient.

A4.2 Data reported

The continuously expanding data availability and completeness is shown in Fig. A4.1, specifically the number countries with reported data on the five SDG 3.c.1 health-related occupations (medical doctors, nursing and midwifery personnel, dentists, pharmacists). Nursing is consistently the highest or among the highest reporting levels, reflecting the expanded effort of countries worldwide to regularly collect and report data on the stock of the five health-related occupations.

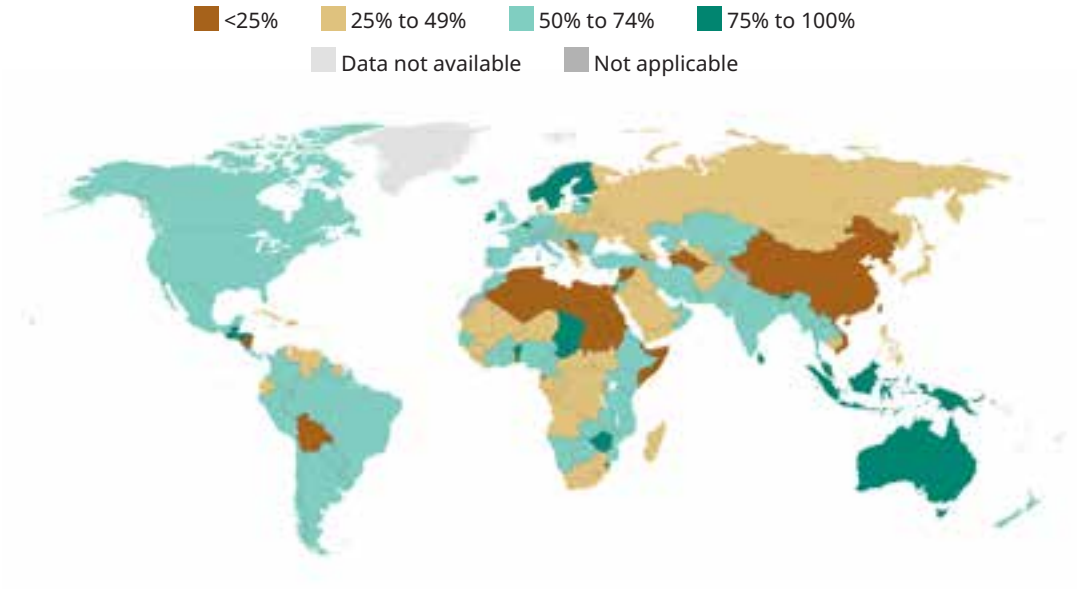
Figure A4.1 **Number of countries with workforce data available in the WHO NHWA data platform (1995–2023)**



Notes: The lag time in data availability and reporting explains the apparent downward trend in recent years. This is an expected phenomenon in official statistics and more data points are expected to become available for 2021–2023, maintaining a positive upward trend for nursing workforce stock data.
Source: NHWA; 2024.

A total of 194 WHO Member States reported data either directly via the NHWA data platform or through regional offices and other international processes such as OECD/Eurostat/WHO Europe JDC. Fig. A4.2 shows that majority of the countries were able to provide data for at least 50% to 75% of the indicators. The indicator on stock was well reported with recent data (i.e. 2020 and after) available for a great majority of the 194 Member States (see Fig. A4.3).

Figure A4.2 **Percentage of indicators reported for the State of the world's nursing report 2025**



Note: 28 NHWA indicators and six *Global strategic directions for nursing and midwifery 2021–2025* additional indicators.
Source: NHWA; 2024.

Figure A4.3 **Year of reporting for the stock of nursing personnel for the State of the world's nursing report 2025**

Source: NHWA; 2024.

A4.3 Limitations in data availability

While there was an overall improvement in data reporting and availability, there are still challenges with respect to gaps in data or in the quality of data reported. For example, while health workforce planning and HLMA require information on finance and expenditures, these indicators are difficult to monitor on a regular basis; their more limited availability limits the scope for analysis on the costs and feasibility of scale-up vis-à-vis fiscal space considerations.

Additional indicators that are central to understanding health labour market dimensions (e.g. inflows, outflows, vacancies) are not yet robustly reported by the majority of Member States. In terms of the "education pipeline", data availability on graduates has improved, but there is not yet consistent reporting on available training places (or seats), applications and enrolments.

A central issue with the retention of nurses, particularly in underserved areas, is working conditions, including but not limited to contracts and remuneration. While data on nurses' wages are presented for the first time in this report, they were available for less than half of countries; the type of contracts was reported by even fewer countries. Similarly, data reflecting the reliance on foreign-born and foreign-trained nurses were reported by less than half of countries, despite the prominent issue that international migration presents. Accelerating progress on the implementation of the Code will require strengthening reporting on these indicators.

While some of the low reporting rates highlight the difficulty with indicators based on data from other sectors (i.e. education, finance), some data and analysis limitations related to countries reporting data from different years or reporting data older than 5 years.

Despite these shortcomings, the data availability is much improved compared with *State of the world's nursing 2020*. Countries and partners are encouraged to accelerate further on the progressive implementation of NHWA, including through the involvement of nursing stakeholders.

Annex references

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