National health workforce accounts

Health workforce levels and trends 2026



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World Health Organization

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Abbreviations

CHWs	community health workers
FETP	field epidemiology training programme
GHO	Global Health Observatory
GHWA	Global Health Workforce Alliance
GHWS	Global Health Workforce Statistics
GSHRH	Global Strategy on Human Resources for Health: Workforce 2030
HCWs	health and care workers
HICs	high-income countries
HLMA	health labour market analysis
HRH	human resources for health
HRHIS	human resources for health information system
HWF	health workforce
ISCO	International Standard Classification of Occupations
LICs	low-income countries
LMICs	lower middle-income countries
NHWA	National Health Workforce Accounts
OECD	Organisation for Economic Co-operation and Development
ROs	regional offices
SDGs	Sustainable Development Goals
UHC	universal health coverage
UMICs	upper middle-income countries
UN	United Nations
USAID	United States Agency for International Development
WCOs	WHO country offices
WISN	Workload Indicators of Staffing Need
WHO	World Health Organization

Executive summary

Over the last 20 years, there has been an increasing realization of the importance of having reliable and up-to-date data on the health and care workforce at the national level in order to understand the health labour market and to inform the development, implementation and review of health workforce (HWF) policies and plans. *The Joint Learning Initiative* in 2004, the *World health report in 2006* and the report titled *"A universal truth: no health without a workforce"* in 2013 highlighted the need for countries to invest resources in strengthening HWF data and evidence to effectively manage and monitor their HWF. The *Global Strategy on Human Resources for Health: Workforce 2030* (GSHRH) outlines the policy agenda to ensure a HWF that is fit for purpose to attain universal health coverage (UHC), health security and the Sustainable Development Goals (SDGs). One of its four objectives is to strengthen data on human resources for health (HRH), for monitoring and ensuring accountability for the implementation of national and regional strategies, and the GSHRH. Accordingly, the National Health Workforce Accounts (NHWA) was adopted as an important means to support countries in their national HWF policy-making and planning and to track their efforts towards UHC, the SDGs, the global milestones of the GSHRH and other health objectives.

The *National health workforce accounts: health workforce levels and trends 2026* intends to provide readers a snapshot of the status of NHWA implementation and the global and regional HWF levels and trends based on official country data shared by national focal points to the World Health Organization (WHO) through the WHO NHWA data platform.

Results and Key Statistics:

1. NHWA implementation:

Since the launch of the NHWA in 2017, there has been a tremendous improvement in the availability and quality of HWF data at national, regional and global levels, as a result of Member States' efforts to strengthen their HRH situation, develop robust HRH information systems, improve their data and evidence, and use these data to inform evidence-based HRH plans and policies.

- 206 countries, territories and areas (including 98% of WHO Member States) have appointed focal points who coordinate national multi-sectoral efforts to compile and share HWF data annually on the NHWA data platform.
- 178 countries (92%) reported data on the platform during the 2025 NHWA data cycle; 192 countries (99%) have data available for the last five years (2020–2024).
- 186 countries (96%) have data available on the NHWA platform for more than 10 indicators or sub-indicators.
- 192 countries (99%) have stock data on the NHWA platform for more than 5 occupations.

- More than 100 countries have reported data across key HWF topics covering density and distribution, such as stock, activity level, graduates and HWF distribution by sex, age group, place of birth, place of training and facility ownership.
- Data availability for key HWF topics has increased almost 20-fold from 2018 to 2025.

2. Health workforce global and regional levels and trends:

Stock data for several occupational groups of the health and care workforce have been reported by more than 100 countries. Analysis of selected countries which reported data for more than 20 occupations in the last five years reveals that the share of different health occupations varies by country, depending on the national health systems agenda, priorities, settings and service delivery models.

According to the latest available data, substantial disparities persist in HWF density, both by WHO region and by World Bank income group.

- The highest densities of medical doctors, nursing and midwifery personnel, dentists and pharmacists are in the European Region followed by the Region of the Americas, while the African Region has the lowest health worker density across all the above occupations.
- Density of health workers is highly proportionate with income groups, with high-income countries (HICs) having the highest density of health workers and low-income countries (LICs) having the lowest density, across all occupations.

There has been a 52% increase in global HWF density from 44.8 per 10 000 population reported in 2006 to 67.9 reported in 2025, but variations in this trend can be observed by occupation and by WHO region.

3. Population and health workforce ageing:

The proportion of the global population aged 65 years and above is about one in 10 in 2024 – with HICs having the highest share (nearly one out of five) – and this is projected to become about one in eight by the year 2030, increasing by 21% globally.

The share of workers aged 55 years and above (i.e. those who are expected to retire on average in the upcoming 10 years) varies by occupation and income group.

- HICs have a higher share of health workers aged 55 years and above compared to LICs, with nearly one out of three medical doctors retiring within the next 10 years in HICs.

The pattern of ageing workforce (the share of health workers aged 55 years and above is greater than the share of those less than 35 years) is marked for medical doctors in HICs and to a lower extent in upper middle-income countries (UMICs).

The ageing of the population would induce an increased health need, hence it is not sufficient for countries to maintain the current HWF density.

- 67 countries would not be able to maintain their age-standardized HWF density of 2024 by the year 2030.
- An additional 832 000 health workers are needed just to maintain the age-standardized HWF density, primarily in HICs.

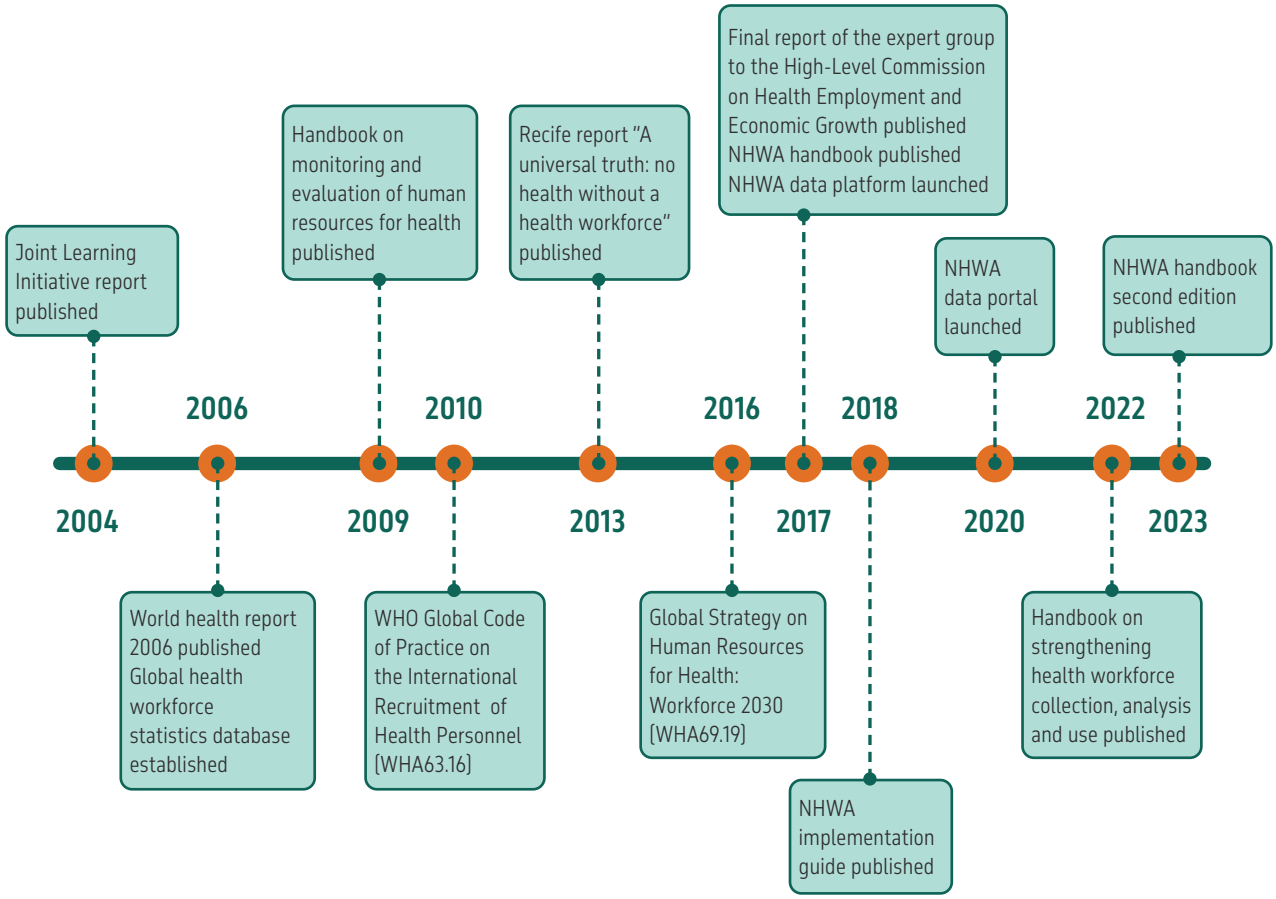
1.

Introduction

1.1 Historical overview of health workforce data strengthening efforts

Since the onset of the 21st century, there has been an increasing impetus on the central role of health workers in developing and ensuring robust health systems and on the need for countries to mobilize resources to strengthen their health workforce (HWF), and in particular to generate robust HWF data and evidence (**Fig. 1**). *The Joint Learning Initiative* – a consortium of more than 100 health leaders – recognized in 2004 that the health crisis can only be overcome if countries develop national human resources for health (HRH) strategic plans and increase their investments in HWF education, employment and retention, yet acknowledged that HWF data and research is sparse and called on countries to strengthen the evidence base and bridge the knowledge-action gap *(1)*. The World Health Organization (WHO) presented a global HWF profile in the *World health report 2006* and called for national leadership and global solidarity to create significant structural improvements in all countries *(2)*. Building on this report, WHO established a *Global health workforce statistics* database in the public domain, with annual data updates by the WHO Secretariat on HWF stock data by health occupations and limited demographics data. Subsequently, WHO collaborated with the United States Agency for International Development (USAID) and the World Bank to develop a handbook that documented methodologies for HWF monitoring and evaluation and shared country experiences *(3)*. In 2013, the report titled *"A universal truth: no health without a workforce"*, which was commissioned by WHO and the Global Health Workforce Alliance (GHWA) Secretariat to consolidate the latest information available on HRH and inform the global community on how to accelerate progress towards universal health coverage (UHC), it presented a 10-point agenda for policy-makers, one of which was to build the data, evidence base and strategic intelligence required to implement and monitor policy objectives and to effectively manage their HWF *(4)*.

Fig. 1: Timeline for HWF information strengthening – initiatives, resolutions and publications



In 2016, WHO's *Global strategy on human resources for health: workforce 2030* (GSHRH) outlined the policy agenda to ensure a HWF that is fit for purpose to attain UHC and the Sustainable Development Goals (SDGs) *(5)*. It acknowledged the importance of better HRH data and evidence as a critical enabler to enhance advocacy, multi-sectoral dialogue, planning, policy-making, governance and accountability at national, regional and global levels. Adopted by the Sixty-ninth World Health Assembly in May 2016 under Resolution 69.19, the GSHRH urged Member States to "implement policy options towards consolidating a core set of HRH data ... as well as progressive implementation of national health workforce accounts (NHWA), to support national policy and planning ..." *(6)*. One of the GSHRH's global milestones for 2020 was that "all countries are making progress on sharing data on HRH through NHWA and submit core indicators to the WHO Secretariat annually" *(5)*. During the COVID-19 crisis, many countries around the world faced disruptions in the delivery of essential health services and challenges with emergency preparedness and response. This highlighted the need for countries to develop a multidisciplinary workforce that is capable of delivering the essential public health functions and to monitor their national workforce capacity *(7)*.

1.2 What is the NHWA?

The NHWA can be defined as a system by which countries progressively improve the availability, quality, and use of HWF data through monitoring of a set of indicators to support achievement of UHC, SDGs and other health objectives.

Box 1 Core principles of the NHWA

The core principles of the NHWA are as follows:

- Multi-stakeholder and multi-sectoral governance mechanism of the national NHWA data
- System strengthening approach
- Progressive self-paced implementation
- Parsimonious approach to collecting validated indicators / proxies
- Inclusive country-owned and country-led (through the vital role of NHWA focal points) process in prioritising and reporting indicators and terminology at national level
- Continuous updating mechanism using valid, reliable and diverse data sources (no primary data collection)
- Annual data release

Source: (13)

Various technical tools and guidance have been developed to assist countries in NHWA implementation, such as the handbook containing a standardized set of HWF indicators and meta-data *(8)*, the implementation guide *(9)*, the NHWA online data platform for focal points to report HWF data on *(10)*, and a job aid to map the national job titles of health and care workers (HCWs) with the appropriate HWF occupational group listed in the NHWA [*(11)*, as available in the International Standard Classification of Occupations(ISCO-08)]. In addition, the NHWA data portal is openly accessible and contains the latest available global HWF data for key indicators, country profiles, occupation profiles and other visualizations and resources *(12)*. In 2023, the NHWA was revised, based on an extensive assessment of five years of its implementation and feedback from NHWA focal points, regional offices and technical experts from various sectors, and an updated handbook containing an optimized set of indicators and various examples of NHWA data use was released *(13)*.

The implementation of the National Health Workforce Accounts (NHWA) supports countries in carrying out both Workload Indicators of Staffing Need (WISN) assessments and Health Labour Market Analysis (HLMA) *(14,15)*. By establishing NHWA, countries are able to strengthen their health information systems and enhance collaboration among multiple stakeholders. Many of the data elements typically collected for WISN exercises correspond closely with NHWA indicators. Countries that have already applied the WISN methodology cover NHWA indicators related to workforce stock and distribution, employment conditions, and remuneration.

Conversely, countries that begin implementing NHWA often conduct an initial mapping of their national health information systems, generating the baseline data required for WISN studies. Both NHWA indicators and the WISN approach rely on common data components outlined in the WHO Health Labour Market Framework. Similarly, a HLMA can be performed more quickly and cost-effectively when NHWA has been implemented, thus ensuring that the country already has data on key indicators related to various aspects of the health labour market. Further, the conduct of a HLMA can provide additional relevant information on certain HWF topics that can be channelled back into the NHWA. In addition, there is a clear alignment of activities between NHWA implementation, the HLMA approach and the WISN process, such as engagement of stakeholders through formation of technical working groups and steering committees, compilation analysis and triangulation of HWF data, use of this data and information to facilitate the development of HWF policies and strategies as well as their monitoring and evaluation, and the broader efforts to strengthen information systems *[16]*.

Since its launch in 2017, thanks to combined efforts of the three levels of WHO, over 500 HRH experts from more than 150 countries in all WHO regions benefited from NHWA trainings or country support. This has resulted in a harmonized understanding of the standardized measurement approach developed by WHO and a tremendous improvement in HWF data availability and quality. The NHWA has succeeded in its mandate of fostering an integrated approach for annual and timely collection of HWF information and defining core indicators in support of strategic workforce planning and monitoring at national, regional and global levels. Through the progressive implementation of the NHWA, countries have been able to strengthen their national human resources for health information systems (HRHIS) to collect and analyse reliable and up-to-date HWF data on stock, subnational distribution, distribution by sex, distribution by age group, distribution by place of training and/or place of birth, education and other topics, and utilize this data to drive evidence-based HWF planning and policy-making at national level *[17]*. At the global and regional levels, the NHWA data has been used to measure key characteristics of the global HWF and has been instrumental in the development of various seminal knowledge products *[18–33]*. In addition, the NHWA has become the official mechanism to monitor various global initiatives and frameworks *[34–43]*.

1.3 About this report

This report is the inaugural edition of an annual series on the levels and trends of the health and care workforce, based on the data shared by countries to WHO through the NHWA, and is intended to provide a snapshot of the current and past situation at the global and regional levels. This report is also intended for the NHWA focal points, as requested by them during the assessment of the NHWA, to advance their understanding of the HWF situation and embrace the pertinence of their data sharing.

The report presents (i) the progress on NHWA implementation and HWF data availability (**Chapter 2**), (ii) recent statistics from NHWA on HWF stock, geographical distribution and trends (**Chapter 3**), and (iii) analytics on a selected thematic topic which will differ each year (**Chapter 4**). This year's selected thematic topic is on the ageing of the population and the HWF and their implications.

2.

NHWA implementation

2.1 NHWA data process

Prior to the NHWA process, the WHO Secretariat published annual updates on health workforce stock data by health occupations and limited demographics data to the global health workforce statistics database, through a data mining process. Currently, at the national level, NHWA focal points convene multi-stakeholder and multisectoral (e.g. education, finance, labour, private sector) working groups which oversee the collection, collation and analysis of HWF data, by following best practices for HRHIS such as diversification of data sources, triangulation of data, and data quality assessments *(9)*. These focal points are in most cases senior authoritative officials in the Ministry of Health – usually directors of the HWF department or unit – or at specialized government agencies which are designated to collect health-related information and statistics. Focal points then share the HWF data on behalf of their country following the NHWA norms and standards annually *(13)*. Data can be shared up to the penultimate year. In case the country has been able to gather more accurate data for previous years, then the focal point also provides retrospective updates. These data are then assessed by the NHWA Secretariat located within the Health Workforce Data and Learning Analytics Unit at WHO headquarters through data quality processes involving data analysis, triangulation of information, and other methods *(44)*. In case any discrepancies are identified, requests are sent to focal points for consultation and clarification (see Annex 2 for more details on the NHWA data cycle). WHO provides technical support to focal points for the progressive implementation of the NHWA, through its three levels as well as in collaboration with partners. The country validated data is then published and disseminated as a global public health good through various channels such as the NHWA data portal, the Global Health Observatory (GHO), the World Health Data Hub (WHDH) and SDG 3.c.1 reports to the Secretary-General of the United Nations (UN), to name a few. The SDG 3.c.1 indicator reports on health worker density and distribution and includes medical doctors, nursing and midwifery personnel, dentists and pharmacists. Complementary to the data release, the validated data is used to develop knowledge products that cater to national, regional and global needs.

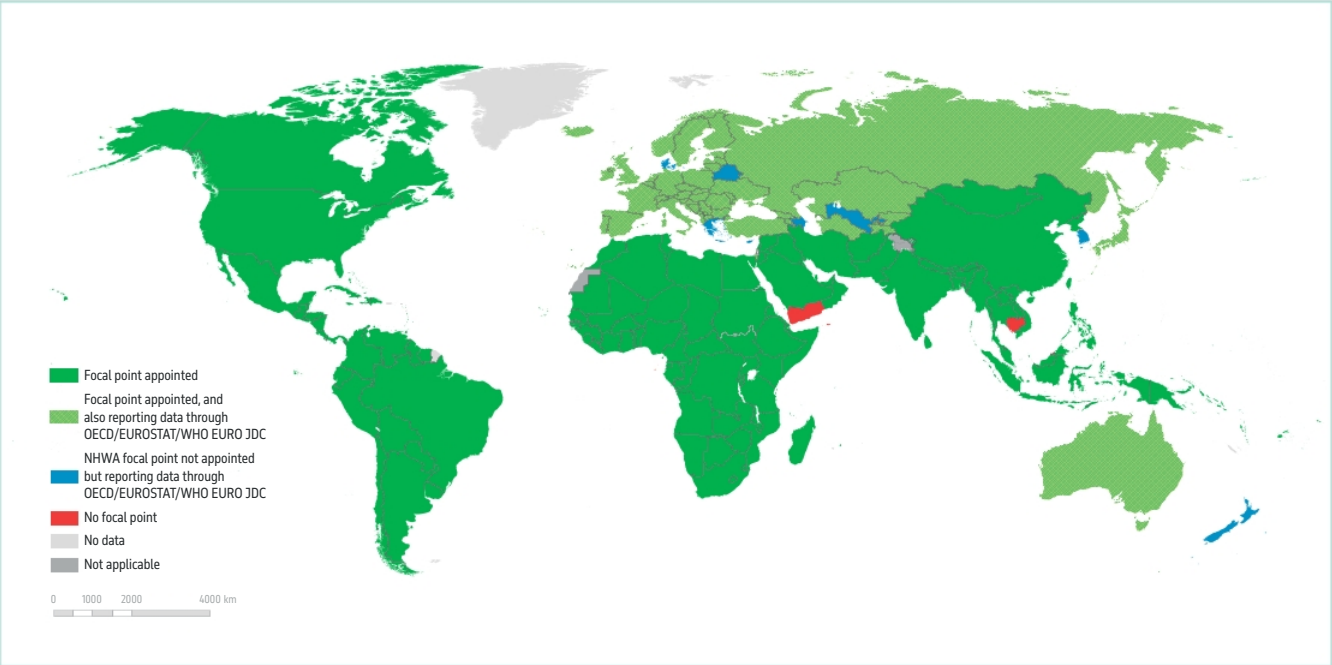
The present report draws on official country data shared thus far by WHO Member States on the NHWA platform (including the 2025 data reporting cycle) following data quality checks, which is subsequently referred to in the report as the 2025 NHWA data release. These data are also available on the NHWA data portal *(12)*.

2.2 Status of NHWA focal points in 2025

As of December 2025, 206 countries, territories and areas have appointed national focal points to collect, collate, analyze and report HWF data annually on the NHWA platform or through other official channels to the NHWA, such as the Joint Data Collection on Non-Monetary Health

Care Statistics by the Organisation for Economic Co-operation and Development (OECD), Eurostat and WHO Regional Office for Europe. This includes 190 of the 194 WHO Member States (98%) (Fig. 2).

Fig. 2: Status of focal points for the National Health Workforce Accounts, as of December 2025



Source: WHO National Health Workforce Accounts, 2025

2.3 Status of health workforce data in 2025

This section presents key results based primarily on the 2025 NHWA data release and some trends that depict the improvement in HWF data availability over time.

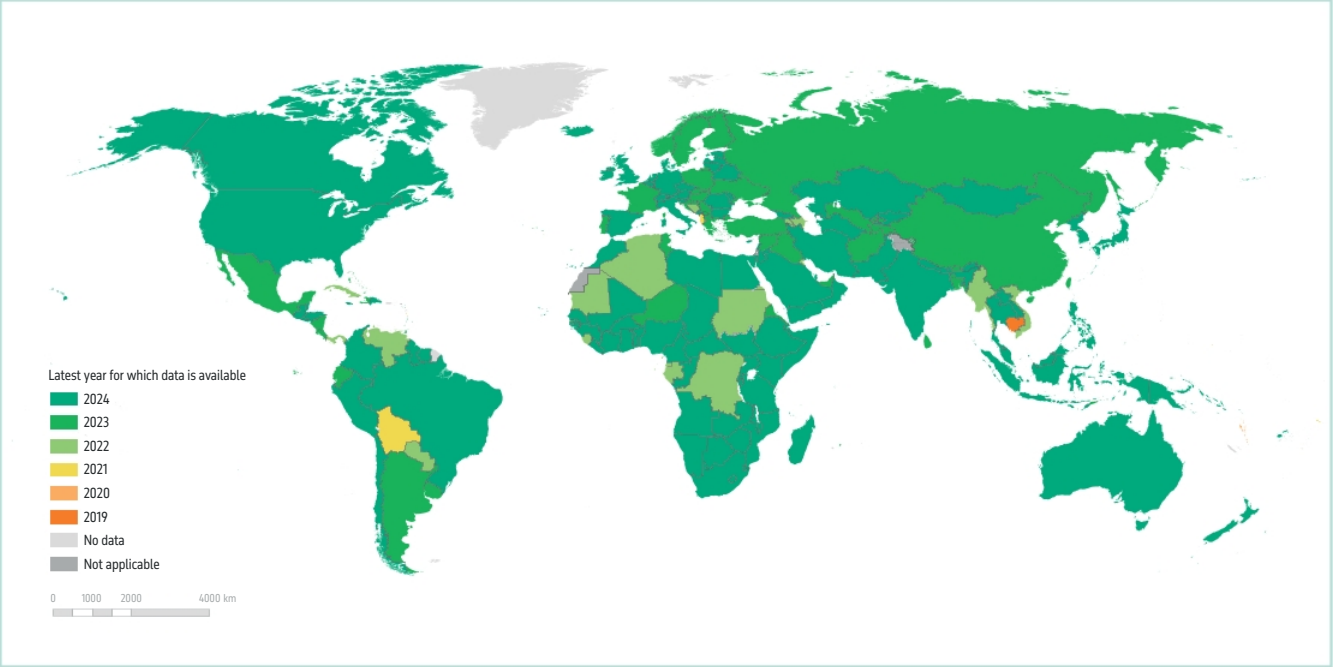
i) Overall data reporting status:

178 countries (92%) reported at least one new data point on the NHWA data platform during the latest year (2025) while all 194 countries have shared data during the last five years (2021–2025).

ii) Overall data availability status:

Fig. 3 maps each country by the latest year for which data was available. 116 countries (60%) have at least one data point available for any indicator or for any occupation on the NHWA data platform for the most recent year (2024) while 192 (99%) countries have data available for the last five years (2020–2024).

Fig. 3: Distribution of countries by latest year of data availability in the NHWA data platform



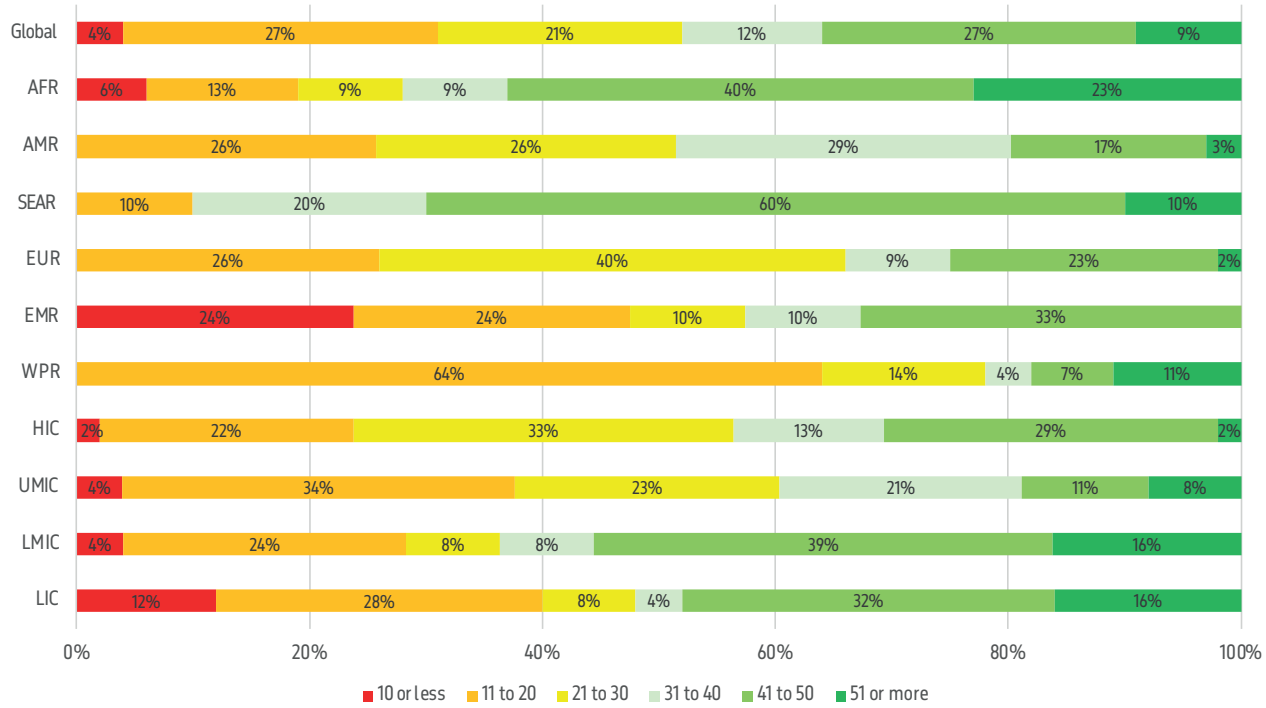
Source: *WHO National Health Workforce Accounts, 2025*

Note: *Based on the most recent year for which data was entered by countries for any indicator or for any occupation on the NHWA data platform. Focal points can only share data for up to the penultimate year, hence the latest year for data availability is 2024.*

iii) Data availability across indicators:

Member States are reporting data for multiple indicators and sub-indicators on the NHWA data platform. 186 countries (96%) have data available on the NHWA platform for more than 10 indicators or sub-indicators while 133 countries (69%) have data available for more than 20 indicators or sub-indicators (**Fig. 4**).

Fig. 4: Share of countries by the number of indicators and sub-indicators for which data is available on the NHWA data platform



Source: WHO National Health Workforce Accounts, 2025

WHO regions: AFR: African Region, AMR: Region of the Americas, SEAR: South-East Asia Region, EUR: European Region, EMR: Eastern Mediterranean Region, WPR: Western Pacific Region.

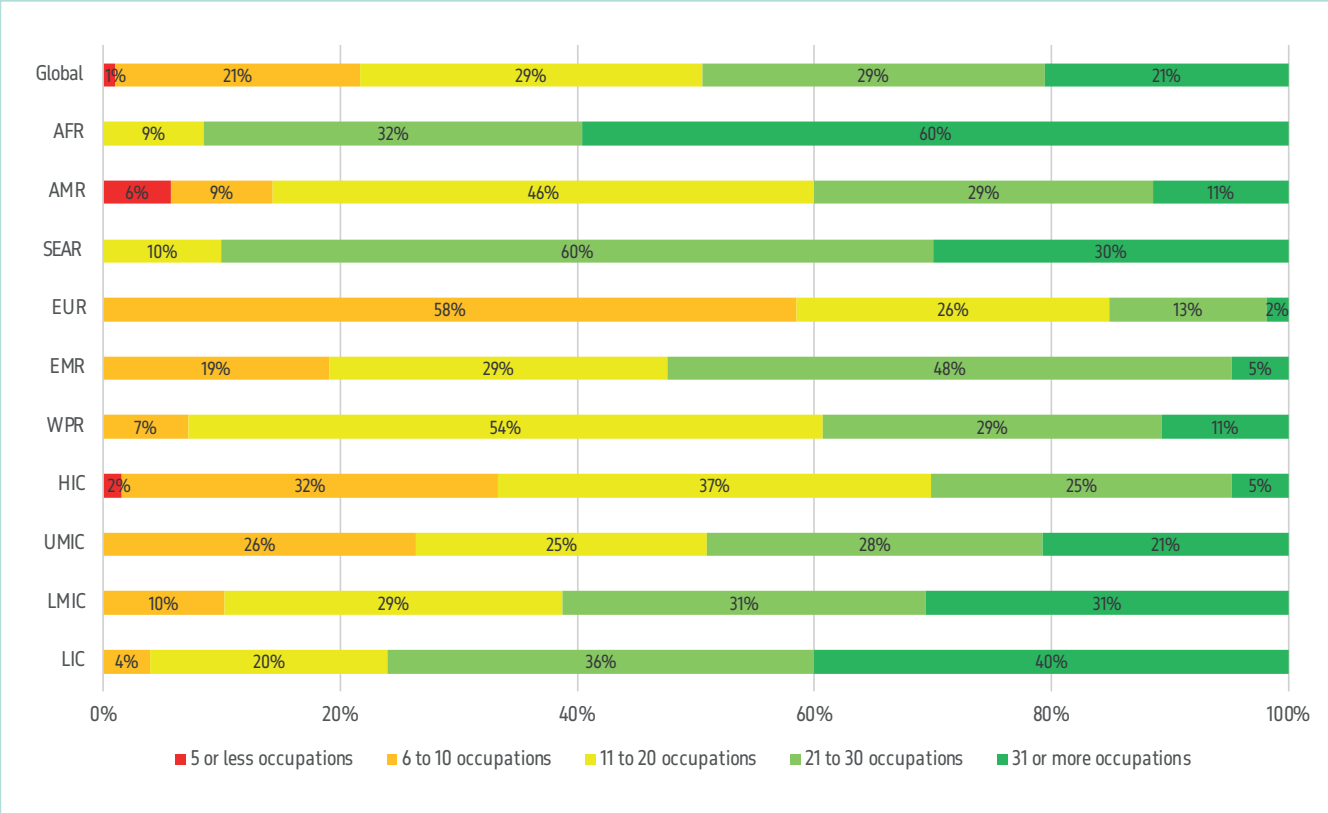
Income groups: HICs: high-income countries, UMICs: upper middle-income countries, LMICs: lower middle-income countries, LICs: low-income countries. World Bank Group country classifications by income level for Fiscal Year 2026 were used.

Note: Sum of percentages may be less than or exceed 100% due to rounding.

iv) Stock data availability across occupations:

Member States are progressively sharing data on more occupation s of the health and care workforce (**Annex 1**). 192 countries (99%) have stock data on the NHWA platform for more than 5 occupations while 152 countries (78%) have stock data for more than 10 occupations (**Fig. 5**).

Fig. 5: Share of countries by the number of occupations for which stock data is available on the NHWA data platform



Source: WHO National Health Workforce Accounts, 2025

WHO regions: AFR: African Region, AMR: Region of the Americas, SEAR: South-East Asia Region, EUR: European Region, EMR: Eastern Mediterranean Region, WPR: Western Pacific Region.

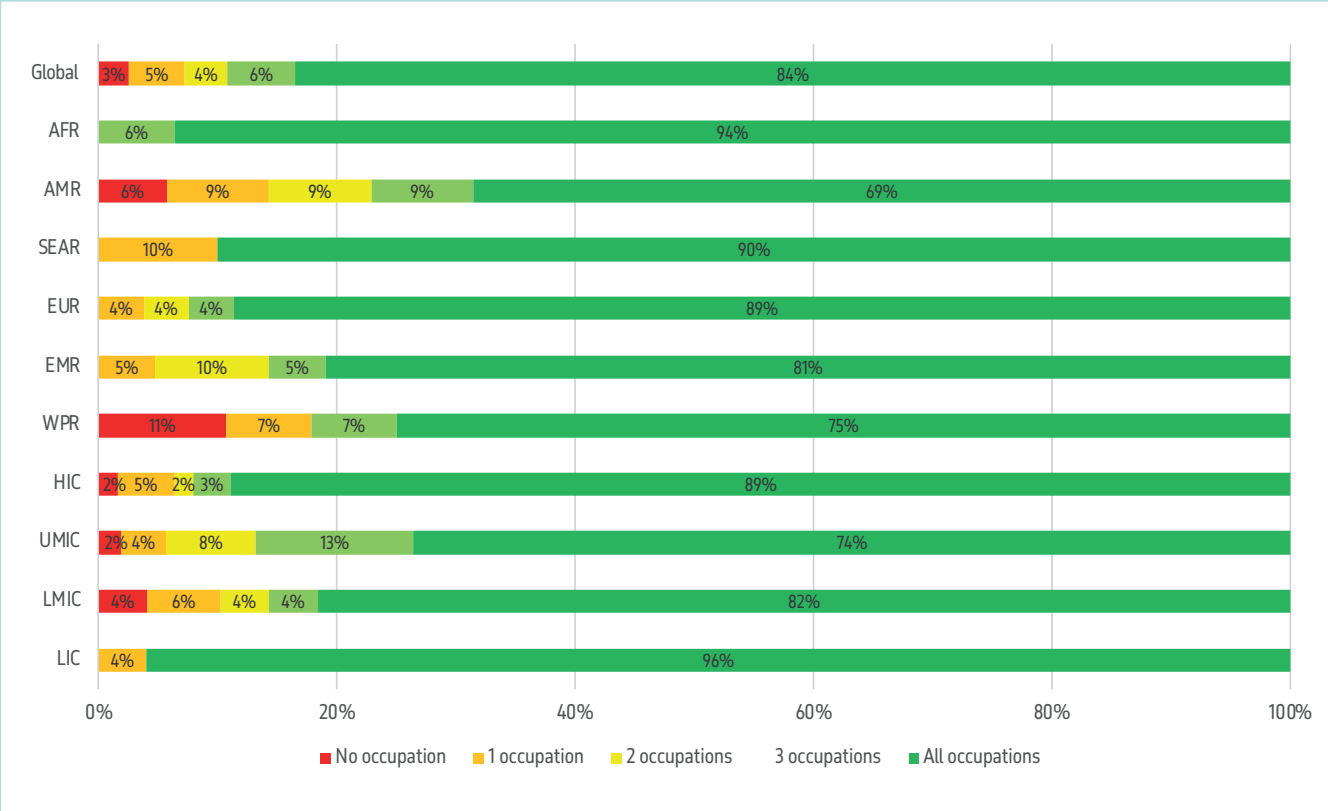
Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.

Note: Sum of percentages may be less than or exceed 100% due to rounding.

v) Timeliness of stock data reporting for SDG 3.c.1 occupations:

Countries are reporting stock data for the SDG 3.c.1 occupations in a timely manner, and 162 countries (84%) had shared stock data for all these occupations at least once in the last five years (2020–2024) (**Fig. 6**).

Fig. 6: Share of countries by the number of SDG 3.c.1 occupations for which stock data are available on the NHWA data platform in the last five years (2020–2024)



Source: WHO National Health Workforce Accounts, 2025

WHO regions: AFR: African Region, AMR: Region of the Americas, SEAR: South-East Asia Region, EUR: European Region, EMR: Eastern Mediterranean Region, WPR: Western Pacific Region.

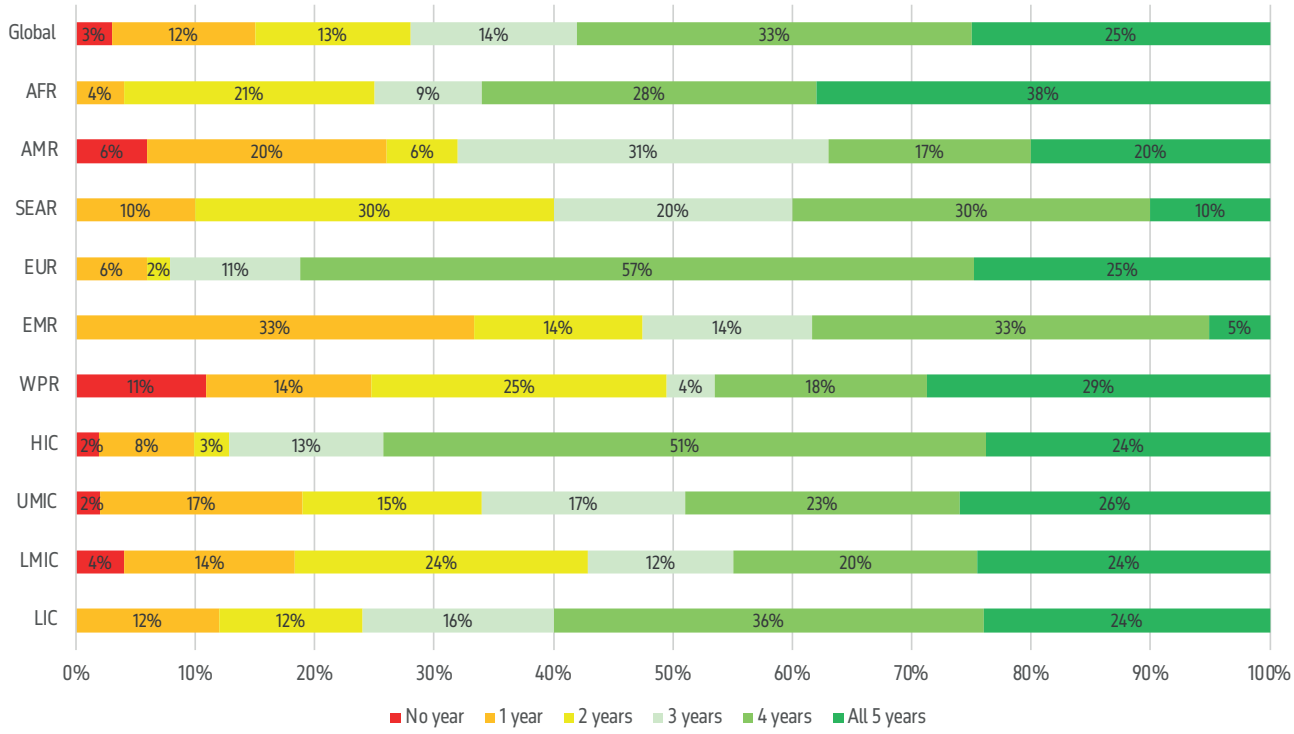
Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.

Note: SDG 3.c.1 occupations include medical doctors, nursing and midwifery personnel, dentists and pharmacists. Sum of percentages may be less than or exceed 100% due to rounding.

vi) Periodicity of stock data reporting for SDG 3.c.1 occupations:

Countries are sharing data for the SDG 3.c.1 occupations regularly, and 139 countries (72%) had shared stock data for any of these occupations at least thrice in the last five years (2020–2024) (**Fig. 7**).

Fig. 7: Share of countries by the number of years out of the last five years (2020–2024) for which stock data for SDG 3.c.1 occupations are available on the NHWA data platform



Source: WHO National Health Workforce Accounts, 2025

WHO regions: AFR: African Region, AMR: Region of the Americas, SEAR: South-East Asia Region, EUR: European Region, EMR: Eastern Mediterranean Region, WPR: Western Pacific Region.

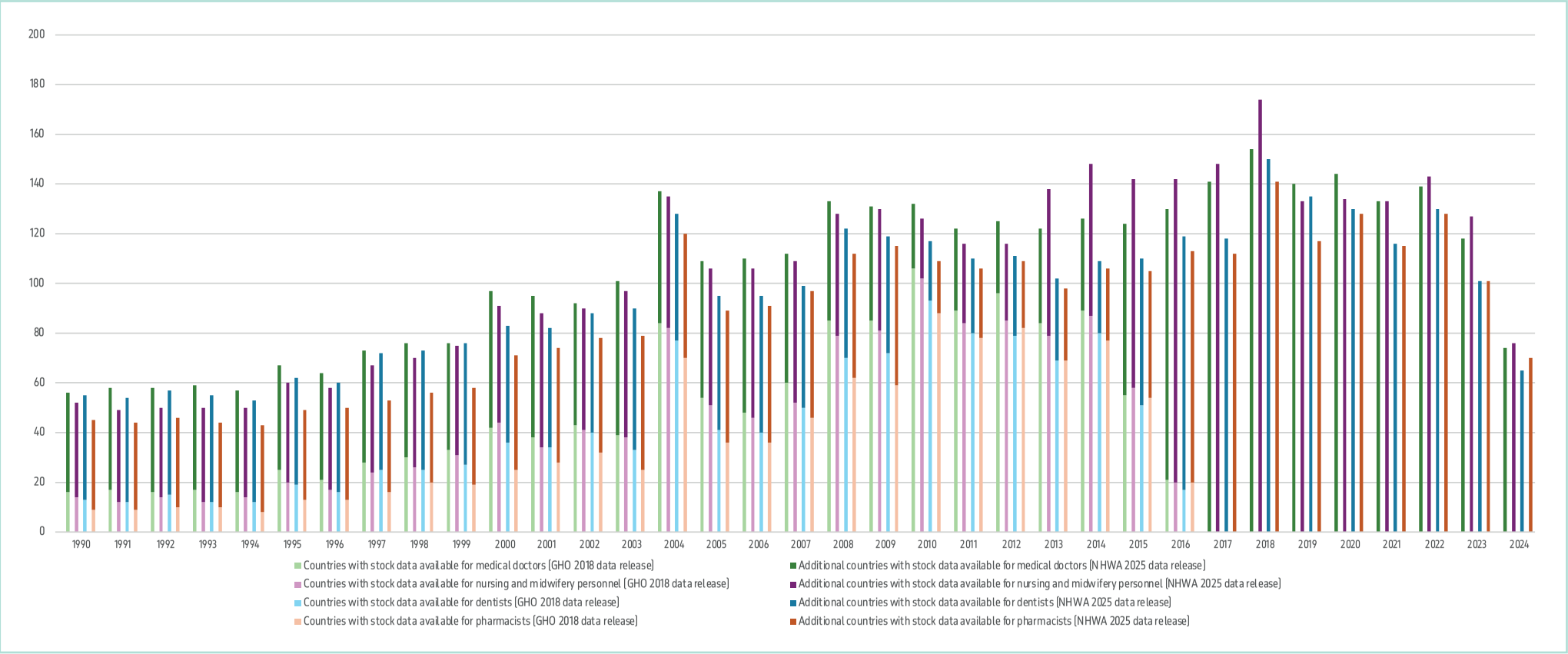
Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.

Note: SDG 3.c.1 occupations include medical doctors, nursing and midwifery personnel, dentists and pharmacists. Sum of percentages may be less than or exceed 100% due to rounding.

vii) Trend in stock data availability for SDG 3.c occupations over time:

The frequency of countries with stock data reported for the SDG 3.c.1 occupations (medical doctors, nursing and midwifery personnel, dentists and pharmacists) per year from 1990 onwards was compared in the 2025 NHWA data release (containing data for the period 1990–2024) vis-à-vis the 2018 Global Health Workforce Statistics (GHWS) dataset, published in the GHO (containing data for the period 1990–2016), which can be considered as the "pre-NHWA" or baseline dataset. Spikes in data reporting tend to coincide with the preparation or publication of earlier landmark HWF reports. For instance, the spike in the number of countries reporting stock data for 2004 in the GHWS 2018 data release corresponds to the preparatory phase of the *World Health Report 2006 [2]*. Similarly, the spike in countries reporting stock data for nursing and midwifery personnel during the period 2013–2018 in the NHWA 2023 data release aligns with the preparation of the *State of the World's Nursing 2020 [20]* and the *State of the World's Midwifery 2021 [21]*. In contrast, the progressive implementation of the National Health Workforce Accounts (NHWA) across countries has led to a more sustained level of reporting and has largely avoided such spikes in recent HWF reports, such as the *State of the World's Nursing 2025 [26]*. Overall, there is a drastic improvement in data availability for these occupations, from 4736 unique data points in 2018 to 13 755 unique data points in 2025 – an increase of 2.9 times (**Fig. 8**). Significantly, even when the same time period of 1990–2016 is compared for both datasets, the number of unique data points has doubled from 4736 in 2018 to 9787 in 2025, indicating that countries continue to update their retrospective data and improve their longitudinal time trends.

Fig. 8: Evolution of stock data availability for SDG 3.c.1 occupations between the 2018 GHO data release and the 2025 NHWA data release

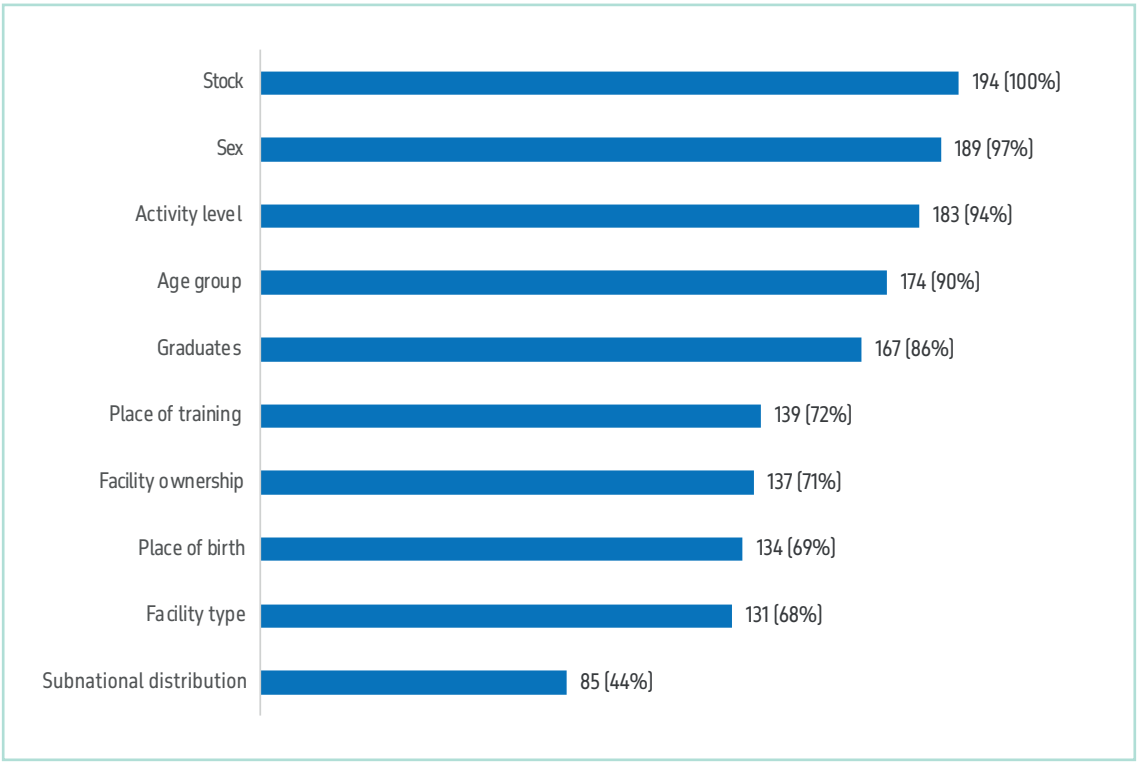


Source: WHO Global Health Workforce Statistics, 2018 ; WHO National Health Workforce Accounts, 2025

viii) Data availability for key HWF topics:

The progressive implementation of the NHWA by countries is also contributing to the diversification of HWF data to inform policies and plans. There is a high availability of data across key HWF topics, such as stock, activity level, graduates and HWF distribution by various parameters such as sex, age group, place of birth, place of training, facility ownership, facility type and subnational level, with most of them having some data for at least 100 countries (**Fig. 9**).

Fig. 9: Status of data availability for key HWF topics



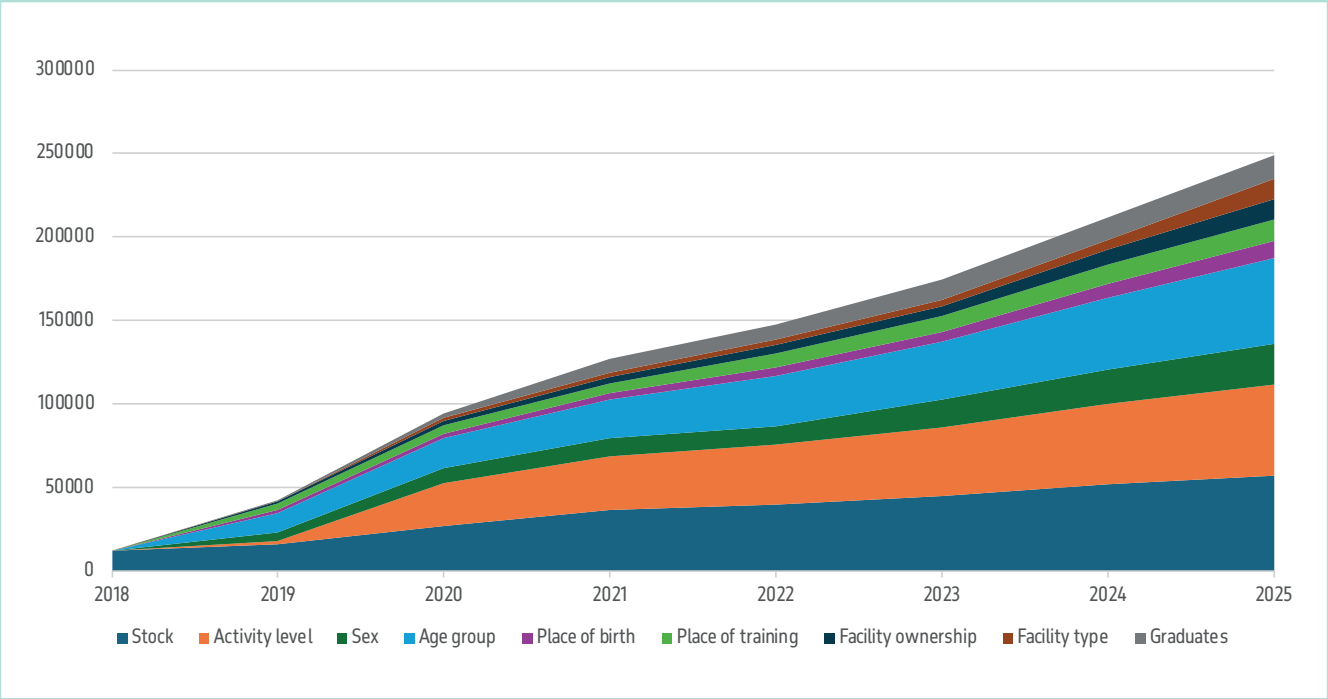
Source: *WHO National Health Workforce Accounts, 2025*

Note: *Member States were considered to have data available for a topic if data was reported for that topic for any disaggregate for at least one HWF occupation.*

ix) Trend of data volume for key HWF topics:

The number of data points across successive annual NHWA data releases were compared with the HWF dataset from the GHO as of 2018 to assess the increase in data availability for key HWF topics over the last seven years. **Fig. 10** indicates an almost exponential increase in data availability over time (almost 20-fold), from 12 587 data points in 2018 to 248 873 in 2025. In addition, there has been a diversification of HWF data over time, with more data now available for key HWF topics, compared to the pre-NHWA dataset which only contained stock data.

Fig. 10: Trend of data volume for key HWF topics in the NHWA data platform by year of data release



Note: Based on the total number of data points reported by countries for key HWF topics in each data release

In summary, there has been a tremendous improvement in the availability of HWF data over the last few years, across multiple occupations and various HWF topics. This is primarily due to the efforts by Member States to strengthen their HWF situation, develop robust HRHIS, improve HWF data and evidence, and use these data to inform evidence-based HWF plans and policies. The leadership of the NHWA focal points across the world at national level has been critical in catalyzing the progressive implementation of the NHWA in their respective countries and paving the way to enable the use of NHWA data to measure and monitor key characteristics of the HWF at global, regional and national levels, identify key issues facing the HWF, develop notable knowledge products and inform evidence-based planning and policy-making processes at national, regional and global levels.

3.

Health workforce global and regional levels and trends

3.1 Global and regional estimates

Member States have been sharing stock data for several occupations of the health and care workforce. Table 1 presents the list of occupational groups in the NHWA data platform, along with the frequency of countries which have shared stock data for these occupations. Data is available for occupations such as medical doctors, nursing personnel, dentists, pharmacists, midwifery personnel, physiotherapists, dental assistants and therapists, dental prosthetic technicians, medical imaging and therapeutic equipment technicians, medical and pathology laboratory technicians, environmental and occupational health and hygiene professionals, pharmaceutical technicians and assistants, medical and pathology laboratory scientists, community health workers (CHWs), paramedical practitioners, administrative staff, optometrists and ophthalmic technicians for over 100 countries, while data is available for personal care workers for nearly 100 countries.

Table 1: Status of stock data reporting by occupation

Occupational groups listed in the NHWA	Number of countries for which stock data is available (out of 194) [N (%)]
1 – Medical doctors	194 (100%)
2 – Nursing personnel	194 (100%)
3 – Midwifery personnel	181 (93%)
4 – Dentists	193 (99%)
5 – Dental assistants and therapists	142 (73%)
6 – Dental prosthetic technicians	133 (69%)
7 – Pharmacists	191 (98%)
8 – Pharmaceutical technicians and assistants	129 (66%)
9 – Paramedical practitioners	106 (55%)
10 – Medical and pathology laboratory scientists	110 (57%)
11 – Medical and pathology laboratory technicians	136 (70%)
12 – Medical imaging and therapeutic equipment technicians	138 (71%)
13 – Environmental and occupational health and hygiene professionals	125 (64%)
14 – Environmental and occupational health inspectors and associates	86 (44%)
15 – Traditional and complementary medicine professionals	73 (38%)
16 – Traditional and complementary medicine associate professionals	44 (23%)

Occupational groups listed in the NHWA	Number of countries for which stock data is available (out of 194) [N (%)]
17 – Community health workers	108 (56%)
18 – Personal care workers in health services	97 (50%)
19 – Physiotherapists	174 (90%)
20 – Physiotherapy technicians and assistants	91 (47%)
21 – Dieticians	90 (46%)
22 – Nutritionists	87 (45%)
23 – Audiologists and speech therapists	84 (43%)
24 – Optometrists and ophthalmic opticians	105 (54%)
25 – Dispensing opticians	48 (25%)
26 – Medical prosthetic technicians	68 (35%)
27 – Medical records technicians	70 (36%)
28 – Medical assistants	56 (29%)
29 – Ambulance workers	61 (31%)
30 – Social work and counselling professionals	91 (47%)
31 – Social work associate professionals	48 (25%)
32 – Biomedical engineers	60 (31%)
33 – Psychologists	75 (39%)
34 – Medical secretaries	23 (12%)
35 – Managerial staff	64 (33%)
36 – Administrative staff	106 (55%)
37 – Health information systems personnel	49 (25%)
38 – Engineering and maintenance staff	43 (22%)
39 – Other non–medical professional staff	58 (30%)
40 – Other non-medical support staff	54 (28%)
41 – Epidemiologists (incl. FETP course graduates)	42 (22%)

Source: *NHWA data platform – December 2025 update*

Note: *This includes the latest available stock data, irrespective of year.*

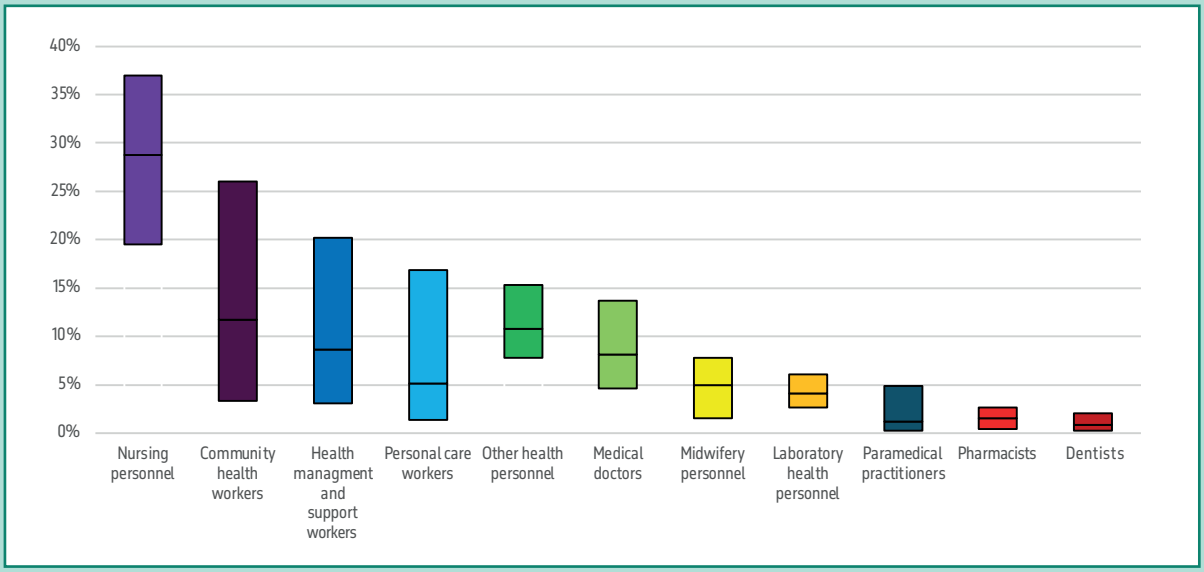
Box 2: Distribution of share of health occupations in selected countries

An in-depth analysis was conducted in selected countries[1] (n=72) with data for more than 20 occupations within the last 5 years, of which majority are from the WHO African Region. This analysis illustrates that share of the different health occupations[2] across countries vary, adapting to the national health systems agenda, priorities, settings and service delivery models (Fig. 11).

Some countries have more paramedical practitioners than medical doctors such as Algeria, Burundi, Guinea, Kenya, Mozambique, Niger, Papua New Guinea, South Sudan, Uganda, United Republic of Tanzania, to name a few.

The share of nursing personnel is almost always higher than other health occupations, with over 40% in some countries such as Cameroon, Eswatini, Namibia, Oman, Tonga and United Arab Emirates, to name a few. However, in some countries, the share of CHWs is higher than the share of nursing personnel, such as Benin, Chad, Guinea-Bissau, Lesotho, Malawi, Senegal, Sierra Leone, Timor-Leste and Togo to name a few.

In these countries, the share of health occupations excluding medical doctors, nursing personnel, midwifery personnel, dentists and pharmacists range from 40%–65% (quartile 1–quartile 3), illustrating that the remaining health occupations constitute a significant proportion of the national HWF.



Note: The central line in each box depicts the median share of health occupations in these selected countries; lower and upper boundaries depict the first and third quartiles respectively.

[1] Countries included in this analysis are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Canada, Central African Republic, Chad, Cook Islands, Cote d'Ivoire, Dominican Republic, Eritrea, Estonia, Ethiopia, Fiji, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Iceland, India, Indonesia, Israel, Kenya, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Mali, Mauritius, Mozambique, Namibia, Nepal, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Qatar, Saint Vincent and the Grenadines, Samoa, Senegal, Seychelles, Sierra Leone, Slovakia, Solomon Islands, South Africa, South Sudan, Sri Lanka, Swaziland, Switzerland, Timor-Leste, Togo, Tonga, Turkey, Tuvalu, Uganda, United Arab Emirates, United Republic of Tanzania, United States of America, Uruguay, Zambia, Zimbabwe.

[2] "Laboratory personnel" includes medical and pathology laboratory scientists, medical and pathology laboratory technicians, and medical imaging and therapeutic equipment technicians. "Health management and support workers" includes managerial staff, administrative staff, health information systems personnel, engineering and maintenance staff, other non–medical professional staff, and other non-medical support staff. "Other health personnel" includes all the other occupational groups listed in the NHWA (please refer to Table A1.1).

In 2016, the GSHRH estimated the shortage of health workers to exceed 18 million by 2030 *(5)*. The adoption of the GSHRH and through it the progressive implementation of the NHWA has facilitated the obtention of reliable and annually updated information on the stock, demographics, distribution and mobility patterns of health workers to address national, regional and global level HWF challenges. An assessment using NHWA data showed that the global shortage reduced from 20 million in 2013 to 15 million health workers in 2020, with a projected decrease to 10 million by 2030 *(18)*, while a recent analysis showed an upward adjustment in the projected shortage of health workers by 2030 to 11.1 million *(45)*. Current health workers stock estimates (**Table 2**) almost break even with the 2030 projected stock values in the GSHRH and will exceed them as trend continues. Though there has been a tremendous increase in HWF globally, WHO regions with the highest burden of disease continue to have the lowest proportion of HWF to deliver the health services.

Table 2: Stock of health workers and number of countries reporting by WHO region for the SDG 3.c.1 occupations (latest available, 2015–2024)

WHO region	Medical doctors [millions [number of countries reporting]]	Nursing and midwifery personnel [millions [number of countries reporting]]	Dentists [millions [number of countries reporting]]	Pharmacists [millions [number of countries reporting]]
African Region	0.4 [n=47]	1.7 [n=47]	*<0.1 [n=46]*	0.1 [n=47]
Region of the Americas	2.8 [n=35]	7.4 [n=35]	*0.6 [n=35]*	0.6 [n=30]
South-East Asia Region	1.7 [n=10]	4.6 [n=10]	*0.4 [n=10]*	1.8 [n=10]
European Region	3.8 [n=53]	7.5[n=53]	0.6 [n=53]	0.6 [n=53]
Eastern Mediterranean Region	1.0 [n=21]	1.4 [n=21]	*0.3 [n=21]*	0.3 [n=21]
Western Pacific Region	5.1 [n=27]	10.1 [n=28]	*0.9 [n=26]*	1.1 [n=25]
Global	**14.8 [n=194]**	**32.7 [n=194]**	**2.8 [n=191]**	**4.5 [n=186]**

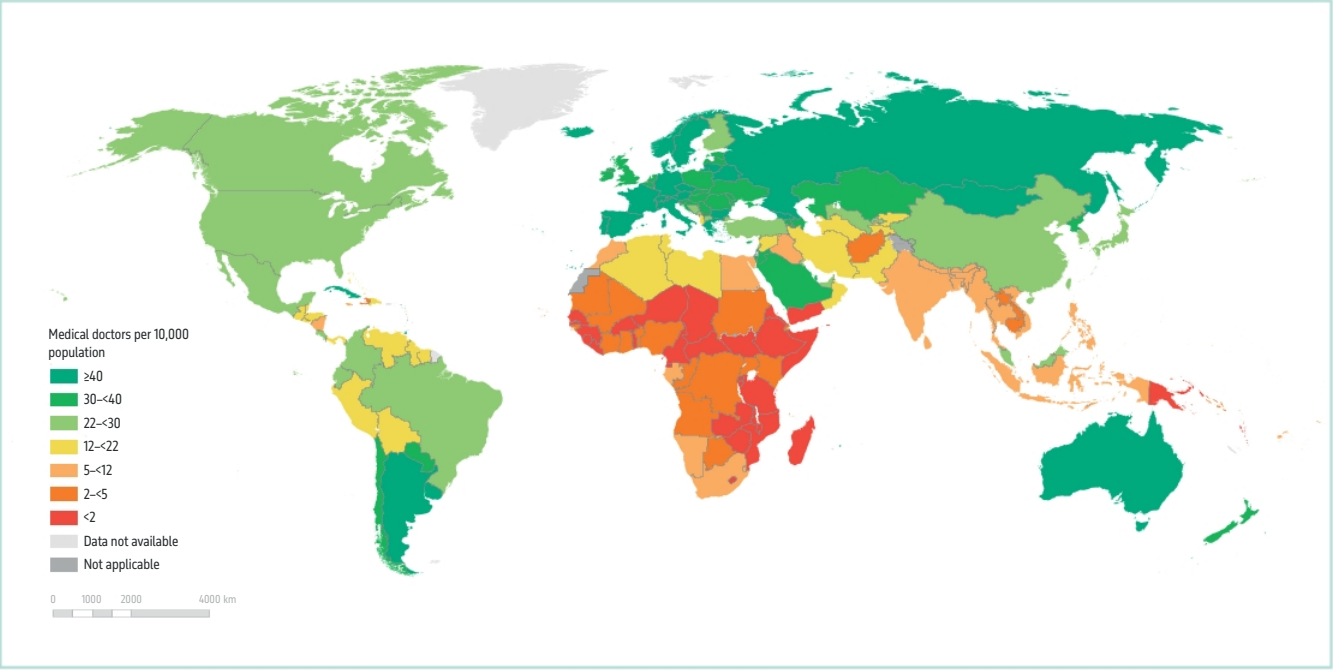
Source: WHO National Health Workforce Accounts, 2025

Note: Due to the update in data series, the global and regional estimates should not be compared to prior estimates published elsewhere.

Latest data available up to 2024 for 174 countries estimate approximately 1.7 million physiotherapists, with 53 countries in the European Region and 25 countries from the Region of the Americas constituting close to 76% of the personnel. Latest available data from 108 countries presents an estimated 4 million CHWs, of which 44 countries in the African Region, 8 countries from the South-East Asia Region and 15 countries from the Western Pacific Region constitute 23%, 41% and 22% of the personnel respectively. In this report, we will remain focused on the SDG 3.c.1 occupations.

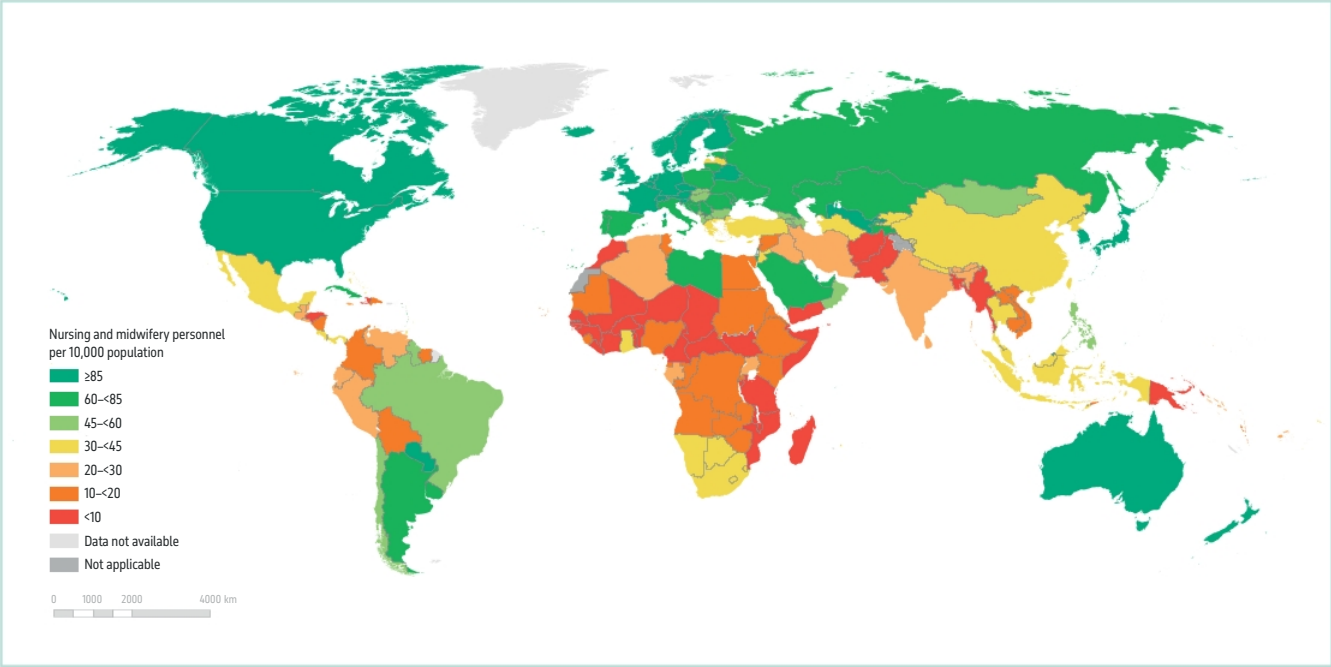
Fig. 12 to Fig. 15 represent the density of health workers in different occupations across countries, based on latest available data. Some countries in the Region of the Americas, European Region and Western Pacific Region have higher density of health workers across all occupations, while almost all of the countries in the African Region have much lower density of health workers.

Fig. 12: Density of medical doctors per 10 000 population (latest available, 2015–2024)



Source: WHO National Health Workforce Accounts, 2025

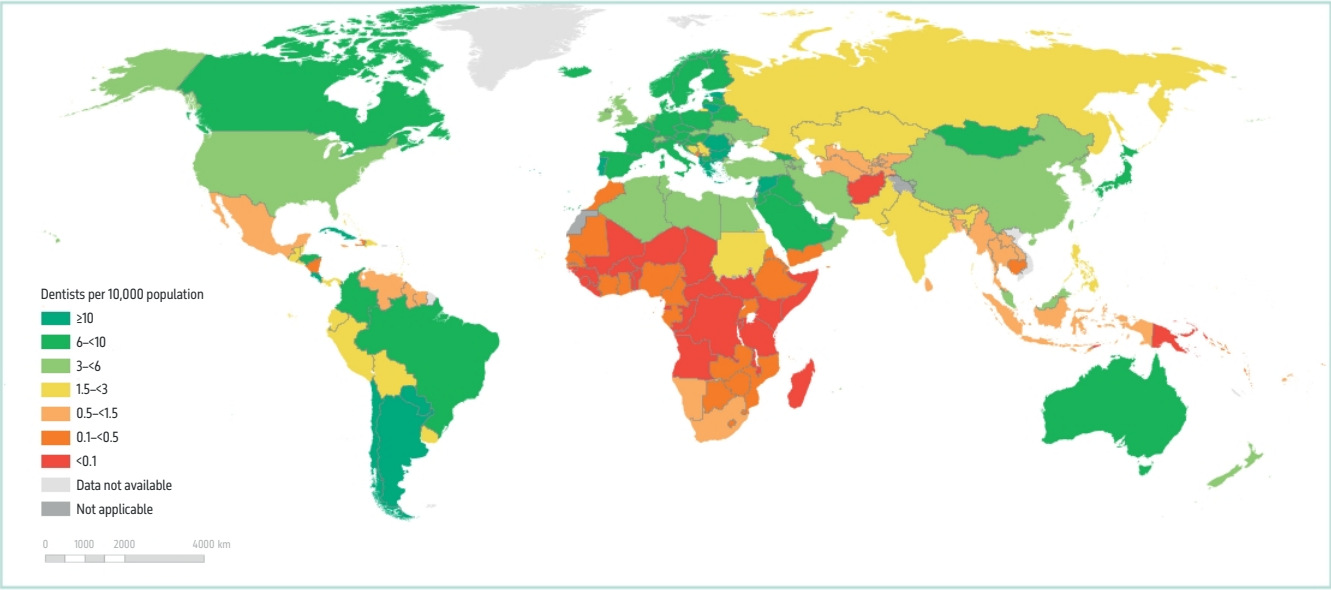
Fig. 13: Density of nursing and midwifery personnel per 10 000 population (latest available, 2015–2024)



Source: *WHO National Health Workforce Accounts, 2025*

Note: *Countries with data on nursing and midwifery personnel prior to 2015: Monaco*

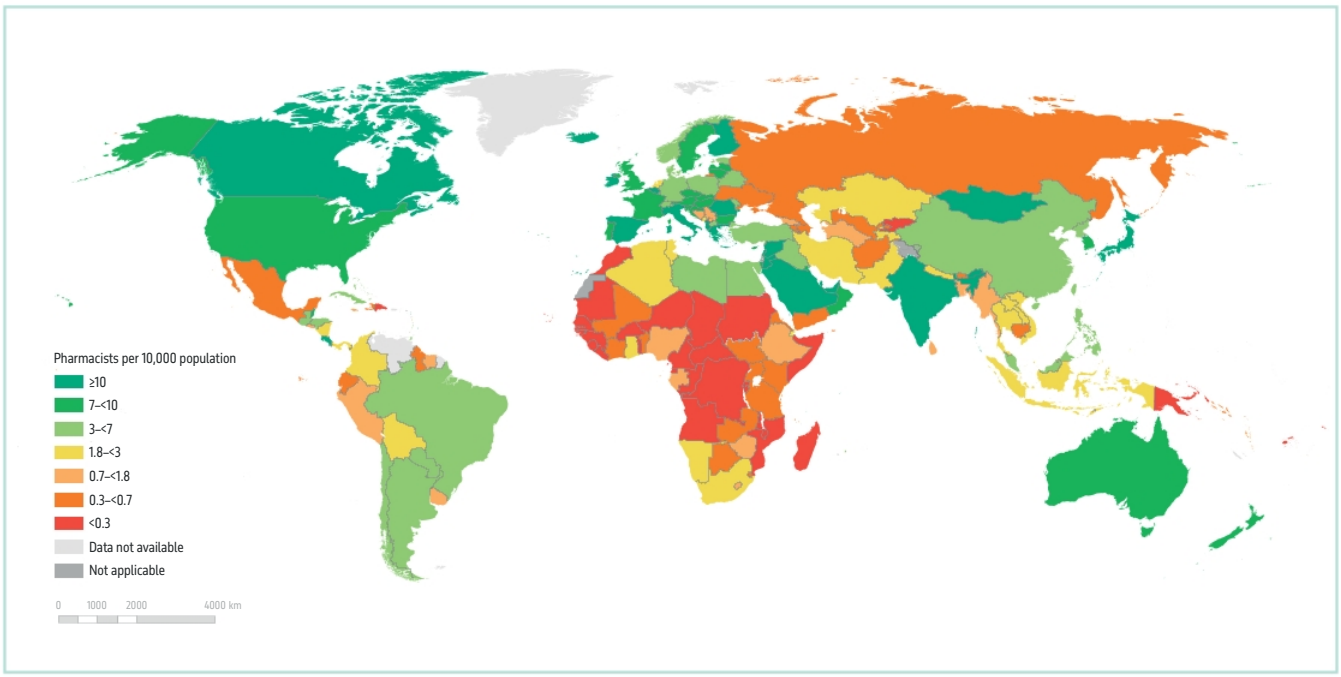
Fig. 14: Density of dentists per 10 000 population (latest available, 2015–2024)



Source: *WHO National Health Workforce Accounts, 2025*

Note: *Countries with data on dentists prior to 2015: Djibouti, Equatorial Guinea, Micronesia (Federated States of), Ukraine.*

Fig. 15: Density of pharmacists per 10 000 population (latest available, 2015–2024)



Source: WHO National Health Workforce Accounts, 2025

Note: Countries with data on pharmacists prior to 2015: Bahamas, Djibouti, Dominica, Marshall Islands, Mexico, Nicaragua, Ukraine, Vanuatu.

Estimates from the latest available data (**Table 3**) show that the global average density of nursing and midwifery personnel is two times that of medical doctors. The highest densities of medical doctors, nursing and midwifery personnel, dentists and pharmacists are in the European Region followed by the Region of the Americas, while the African Region has the lowest density across health occupations.

The data presents stark inequalities at the global and regional levels. The lowest density of medical doctors exists in the African Region at 0.4 per 10 000 population and the highest which is 215 times more exists in the European Region. The difference between the lowest and the highest densities is over 109, 168 and 234 times for nursing and midwifery personnel, dentists and pharmacists respectively.

Estimates across income groups show that density of health workers is highly proportionate with income groups. High-income countries (HICs) have the highest density of health workers while low-income countries (LICs) and lower middle income countries (LMICs) have the lowest density, across all health occupations.

Table 3: Density of health workers per 10 000 population (min-max) by WHO region and World Bank income group for the SDG 3.c.1 occupations (latest available, 2015–2024)

	Medical doctors	Nursing and midwifery personnel	Dentists	Pharmacists
By WHO region				
African Region	3.1 [0.4–30.2]	13.3 [2.0–62.0]	0.3 [<0.1–3.6]	0.9 [<0.1–8.0]
Region of the Americas	27 [2.9–85.1]	71 [7.3–123.9]	6.0 [0.2– 16.8]	6.4 [0.2–12.1]
South-East Asia Region	9.5 [5.5–31.0]	25.3 [2.0–59.6]	2.2 [<0.1–3.0]	10 [0.7–12.1]
European Region	40.0 [15.4–86.1]	80.2 [34.7–208.3]	6.0 [0.5–13.6]	6.4 [0.3–23.4]
Eastern Mediterranean Region	13.4 [0.6–34.1]	16.7 [1.9–86.1]	3.3 [<0.1–12.5]	4.3 [0.1–21.1]
Western Pacific Region	23.1 [0.5–46.0]	47.1 [8.1–144.3]	3.5 [<0.1–11.1]	5.0 [0.1–20.3]
By income group[a]				
HICs	3.2 [7.4–86.1]	100.4 [26.5–208.3]	6.7 [0.7–16.8]	9.5 [0.4–23.4]
UMICs	24.0 [1.5–85.1]	39.6 [13.7–107.6]	4.4 [0.1–16.0]	3.5 [0.1–12.9]
LMICs	8.7 [0.5–32.6]	21.7 [1.9–107.0]	1.8 [<0.1–12.5]	6.8 0.1–21.1]
LICs	3.5 [0.4–31.0]	10.7 [2.7–44.5]	0.8 [(<0.1–11.2]	1.0 [<0.1–16.6]
Global	**18.3 [0.4–86.1]**	**40.5 [1.9–208.3]**	**3.5 [<0.1–16.8]**	**5.6 [<0.1–23.4]**

Source: WHO National Health Workforce Accounts, 2025

[a] *Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.*

Note: Due to the update in data series, the global and regional estimates should not be compared to prior estimates published elsewhere.

3.2 Global and regional trends

The density of medical doctors, nursing and midwifery personnel, dentists and pharmacists has increased by 52% globally, from 44.8 per 10 000 population reported in 2006 to 67.9 reported in 2025, with the density of nursing and midwifery personnel increasing by nearly 60% (Table 4). Data presented in Table 4 are the estimated densities of the SDG 3.c.1 occupations per 10 000 population based on the data release for the years 2006, 2012, 2021 and 2025 respectively, and hence are to be compared with caution as these estimates were always purely based on the

latest available data at that time irrespective of year. Other factors to consider include variations in the number of countries reporting, methodological approaches and long-term improvement in data quality. Nevertheless, in almost all cases, densities of these health occupations have increased. It can be thus inferred that despite the above-mentioned differences in estimation methodologies, HWF density has continued to increase globally since 2006. Considering this increase in HWF density, it can be implied that the population has better access to health workers and, in turn, health services.

Table 4: Trend in HWF density per 10 000 population by occupation and by WHO region based on data reported in 2006, 2012, 2021 and 2025

WHO region	Medical doctors				Nursing and midwifery personnel				Dentists				Pharmacists			
	Year of data release				Year of data release				Year of data release				Year of data release			
	2006[a]	2012[b]	2021[c]	2025[e]	2006[ad]	2012[b]	2021[c]	2025[e]	2006[a]	2012[b]	2021[c]	2025[e]	2006[a]	2012[b]	2021[c]	2025[e]
African Region	2.1	2.3	2.9	3.1	9.3	10.2	12.9	13.3	0.3	0.3	0.3	0.3	0.8	0.5	0.8	0.9
Region of the Americas	19.4	23.0	24.5	27	48.8	73.7	81.6	71	10.5	6.3	5.8	6.0	1.3	5.3	5.1	6.4
South-East Asia Region	5.2	4.6	7.7	9.5	8.1	11.7	20.4	25.3	0.6	0.9	1.5	2.2	1	3.7	6.6	10
European Region	32.0	33.5	36.6	40	74.3	85.7	83.4	80.2	5.2	5.4	6.2	6.0	5	5.6	6.5	6.4
Eastern Mediterra-nean Region	7.4	8.4	11.2	13.4	11.1	15.8	16.5	16.7	1.6	1.6	2.6	3.3	0.7	2.2	3.3	4.3
Western Pacific Region	11.0	16.4	21	18.3	17.0	33.1	39.9	47.1	1.7	1.5	4.6	3.5	1.9	4.1	4.4	5.0
Global	**12.3**	**13.8**	**16.43**	**18.3**	**25.6**	**35.0**	**39.5**	**40.5**	**2.9**	**2.3**	**3.3**	**3.5**	**–**	**3.7**	**4.7**	**5.6**

[a] *World health statistics 2007*

[b] *World health statistics 2013*

[c] *World health statistics 2022*

[d] *Includes only nurses*

[e] *WHO National Health Workforce Accounts, 2025.*

4.

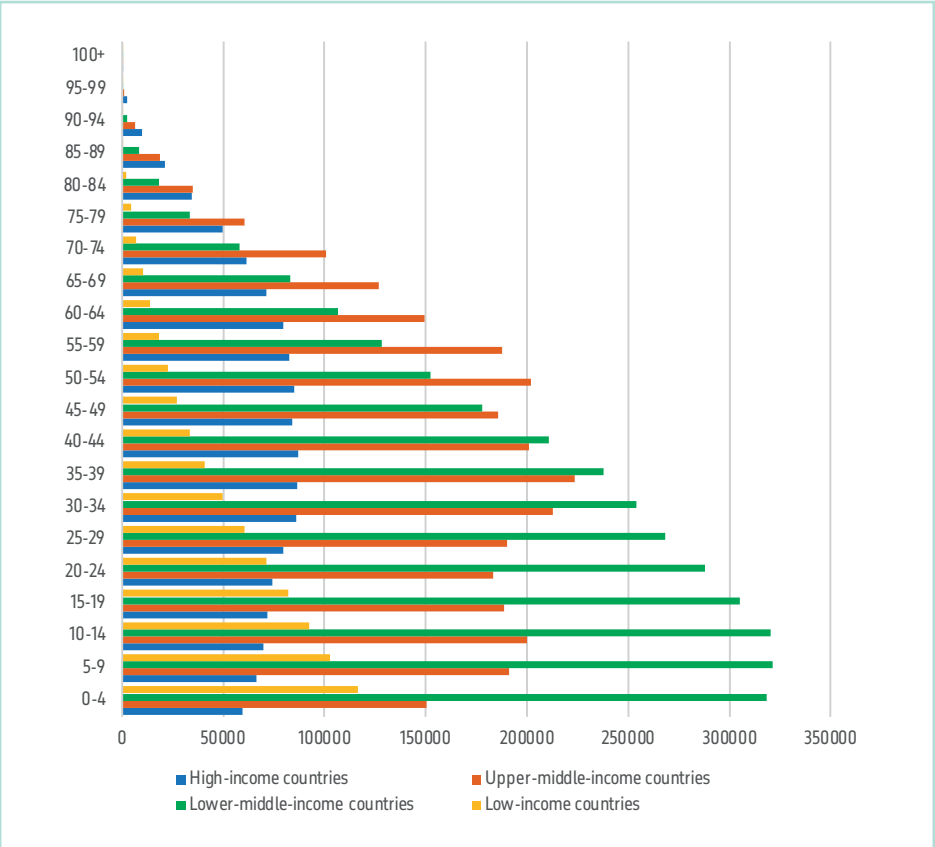
Thematic analysis – population and health workforce ageing

This chapter presents an analysis of the joint impact of population and HWF ageing. First, demographic statistics on global population ageing are presented, followed by those of health workers. The last section shows how both these phenomena would result in a HWF gap under a hypothesis of maintaining current (as in 2024) workforce to population density for each age group.

4.1 Global population demographic changes 2024–2030

Fig. 16 illustrates the population age distribution of countries based on the World Population Prospects 2024 and highlights substantial differences by income group, with LICs characterized by predominantly younger populations and HICs by relatively older populations *(46)*.

Fig. 16: Age population pyramid by World Bank income group in 2024, expressed as population size in 1000s by income group



Source: (46)

Note: World Bank Group country classifications by income level for Fiscal Year 2026 were used.

Despite these differences, all economic groups are projected to see a growth in their population from 2024 to 2030, and an even more pronounced growth of their population aged 65 years and more (**Table 5**). LICs are projected to see a rapid increase in their population with a 17% growth over the next 6 years while HICs are expected to experience a 1% increase during the same period. In 2024, HICs had the highest share of population aged 65 years and above, representing nearly one out of five inhabitants (compared with one out of 10 globally), and this population age group is projected to increase in all regions from 831 million inhabitants in 2024 to 1003 million inhabitants by 2030 *(46)*.

Table 5: Population demographic changes 2024–2030

Income group[a]	Total population [2024] (millions)	Population aged 65 years and above [2024] (millions)	Total population [2030] (millions)	Population aged 65 years and above [2030] (millions)	% increase in total population [2024–2030]	% increase in population 65 years and above [2024–2030]
HICs	1 265	252	1 279	284	1%	13%
UMICs	2 816	350	2 841	431	1%	23%
LMICs	3 294	204	3 537	257	7%	26%
LICs	757	25	882	31	17%	26%
Global	**8 133**	**831**	**8 539**	**1 003**	**5%**	**21%**

Source: (46)

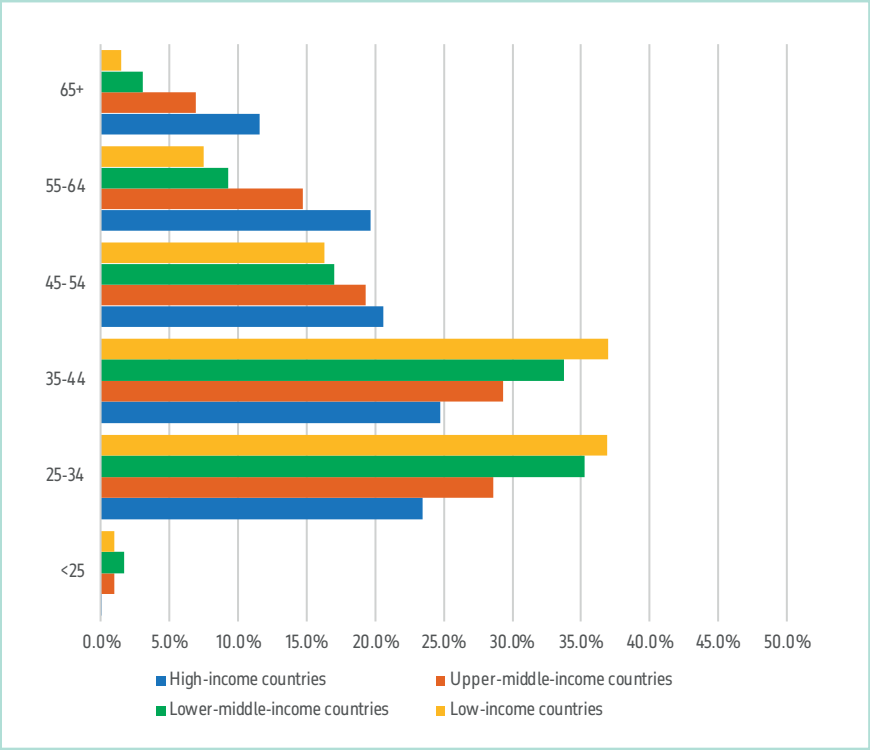
[a] *Income groups: HICs: World Bank Group country classifications by income level for Fiscal Year 2026 were used.*

4.2 Health workforce ageing by occupation

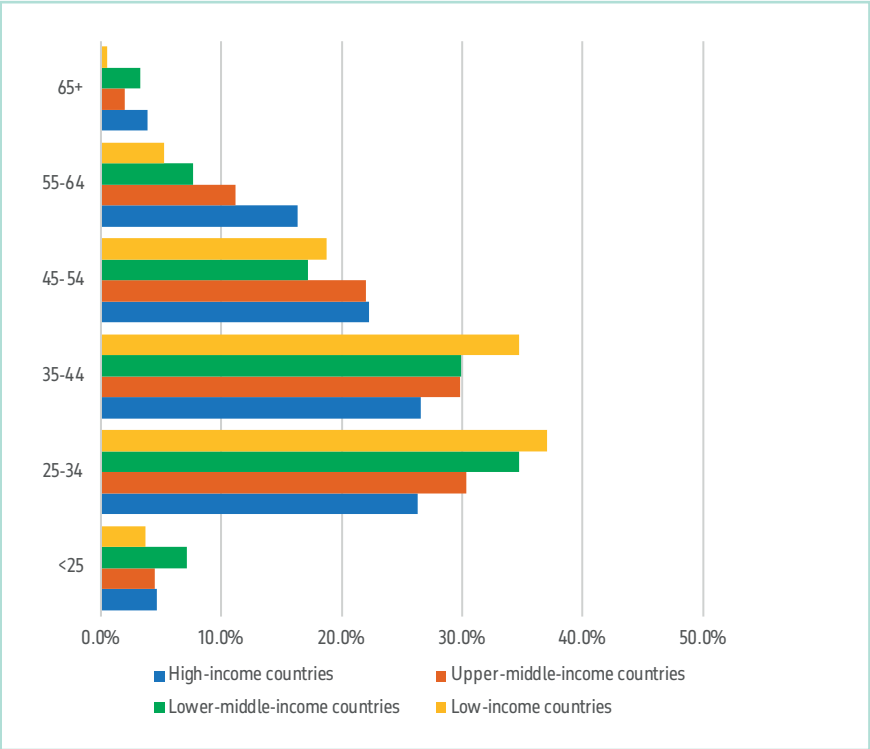
The age distribution of health workers is linked to the age distribution of the total population, showing similarly younger health workers in LICs and older health workers in HICs. However, notable differences can be seen when comparing specific occupations, with medical doctors being older on average than nursing personnel (**Fig. 17 (a) and (b)**). This may be attributed to the differing education and career pathways for the health occupations.

Fig. 17: Age distribution of (a) medical doctors and (b) nursing personnel, by income group

(a)



(b)



Source: *WHO National Health Workforce Accounts, 2025, latest available data for 122 countries for medical doctors and 142 countries for nursing personnel over the period 2015–2024.*

Note: *World Bank Group country classifications by income level for Fiscal Year 2026 were used.*

Health workers currently aged 55 years and above are expected to retire, and leave the health labour market within the next 10 years. **Table 6** shows the variation in the share of health workers aged 55 years and above by occupation and by income group. As noted above, medical doctors have the highest proportion of workers aged 55 years and above – nearly one out of four. Compared to LICs, HICs have a higher share of health workers aged 55 years and above, with nearly one out of three medical doctors expected to retire within the next 10 years in HICs.

Table 6: Average percentage of health workers aged 55 years and above (min-max) and number of countries, by income group

Income group[a]	Medical doctors	Nursing personnel	Midwifery personnel	Dentists	Pharmacists
HICs	31.21% [9%–55%] [n=51]	20.17% [1%–49%] [n=55]	25.97% [10%–72%] [n=29]	23.26% [2%–35%] [n=19]	17.89% [2%–42%] [n=17]
UMICs	21.68% [<1%–47%] [n=35]	13.22% [<1%–34%] [n=42]	18.12% [<1%–39%] [n=22]	20.93% [<1%–51%] [n=24]	18.35% [<1%–47%] [n=27]
LMICs	12.35% [3%–44%] [n=24]	10.95% [3%–64%] [n=34]	12.34% [<1%–46%] [n=22]	9.07% [<1%–27%] [n=20]	8.39% [<1%–35%] [n=21]
LICs	8.92% [2%–21%] [n=12]	5.74% [2%–10%] [n=11]	7.35% [<1%–32%] [n=11]	11.90% [<1%–32%] [n=7]	4.58% [<1%–15%] [n=9]
Total	**22.57% [<1%–55%] [n=122]**	**14.79% [<1%–64%] [n=142]**	**17.91% [<1%–72%] [n=84]**	**17.27% [<1%–51%] [n=70]**	**13.75% [<1%–47%] [n=74]**

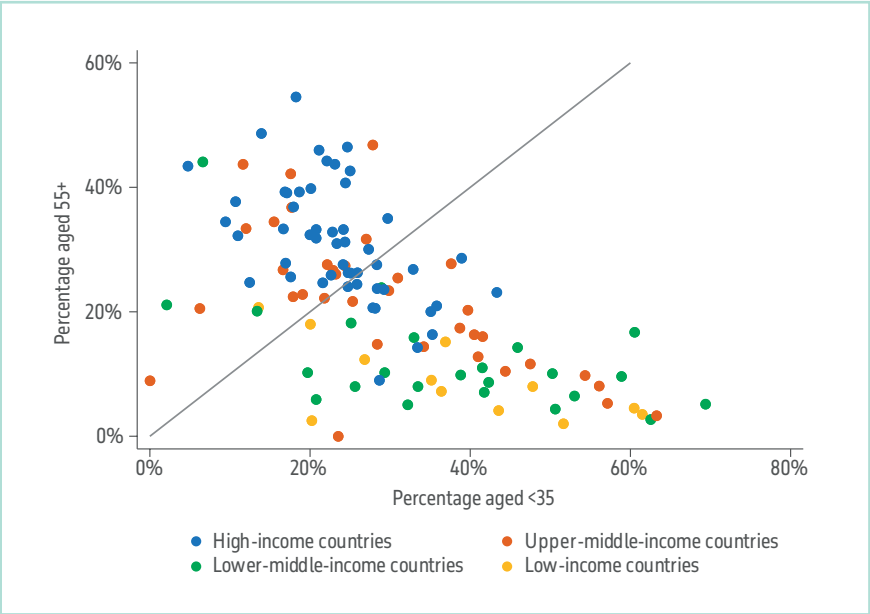
Source: WHO National Health Workforce Accounts, 2025 (latest available data over the period 2015–2024)

[a] *Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.*

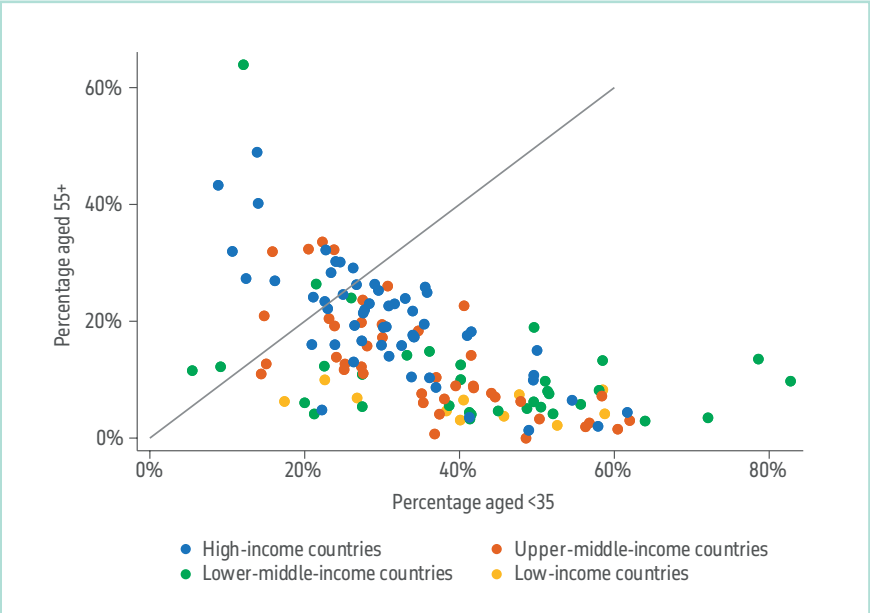
It is of interest to compare the share of health workers aged 55 years and above, i.e. leaving the health labour market in the next 10 years, with the share of those aged 35 years and below, i.e. those who approximately entered the health labour market in the last 10 years. The comparison of these shares can identify countries for which the exit from retirement is faster than entrance at a young age. The pattern of ageing workforce is marked in HICs and to a lower extent in upper middle-income countries (UMICs), as evidence indicates for medical doctors and nursing personnel (**Fig. 18 (a) and (b)**).

Fig. 18: Relative proportions of (a) medical doctors and (b) nursing personnel aged over 55 years and below 35 years, by income group

(a)



(b)



Source: WHO National Health Workforce Accounts, 2025 (latest available data over the period 2015–2024)
Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.
Note: Each dot represents a country. The diagonal line indicates where the number of workers near retirement equals the number of young workers.

4.3 Health workforce gap due to population and health workforce ageing 2024–2030

The global HWF stock is projected to increase faster from 2024 to 2030 (16% increase) than the global population during the same period (5% increase). In the European Region and the Region of the Americas, where the combined HWF size is higher than other regions, the estimated increase of the HWF is smaller (6% in the Region of the Americas and 5% in the European Region). Looking at the change in density of health workers between 2024 and the projection to 2030 shows that 45 countries are projected to have a lower density by 2030, with 17 of these countries being from the European Region.

The rapid increase in the older population, aged 65 years and above, described earlier would result in an increase in medical needs as this population age group usually requires more access to health services *(47)*. Consequently, in ageing populations, the maintenance of the national level of HWF density to 2030 would probably not be sufficient to cover the population's need for health workers. Accounting for this increased health needs in older age group, the HWF stock needs to be standardized. We therefore conducted a double standardization analysis of the HWF stock using (i) the change in age structure from 2024 to 2030, and (ii) an age-specific curve of health needs (see **Annex 3** for further details). The standard curve of health needs was selected based on averaging several curves showing health costs per capita by age. This double standardization enabled to estimate the age-standardized density of health workers needed by 2030 while accounting for the ageing population and the fact that older individuals have more medical needs.

Comparing the age-adjusted increase in HWF need to the projected HWF in 2030, it was estimated that 67 countries would be impacted, i.e., they would not have a sufficient HWF to maintain the age-adjusted need of their population (**Table 7**). This amounts to 22 additional countries to the already identified 45 countries projected to observe a decrease in their age-standardized HWF density, i.e. not able to provide the same coverage to their population as in 2024. These 67 countries will experience an overall gap of 832 000 health workers, representing 4.6% of their projected stock by 2030. This age-induced gap assessment is different from the HWF shortage of 11 million health workers projected by 2030 *(45)*, but because it is mostly affecting HICs, this gap can be considered as an additional shortage of health workers by 2030, and this might trigger an increased reliance on foreign health workers in these countries.

Table 7: Number of countries with projected change in HWF[a] stock by 2030 not sufficient to maintain age-standardized HWF density as in 2024 while accounting for population growth and ageing

	Number of countries	Difference in headcount[a] between projected stock and needs in 2030	Gap as percentage of the projected stock in 2030
By WHO region			
African Region	17	57 243	5.0%
Region of the Americas	9	294 546	4.0%
South-East Asia Region	6	48 525	3.8%
European Region	29	297 663	4.2%
Eastern Mediterranean Region	1	49	1.3%
Western Pacific Region	5	133 743	11.8%
By income group[b]			
HICs	35	526 983	3.8%
UMICs	17	172 383	6.1%
LMICs	10	128 592	10.7%
LICs	5	3 812	6.1%
Total	**67**	**831 769**	**4.6%**

[a] *HWF includes medical doctors, nursing personnel, midwifery personnel, dentists and pharmacists*

[b] *Income groups: World Bank Group country classifications by income level for Fiscal Year 2026 were used.*

5.

Conclusion

Over the last 20 years, data availability on various HWF characteristics have progressed substantially, in particular since the launch of the NHWA. More than 90% of WHO Member States have appointed focal points for annual reporting to the NHWA platform. Majority of countries have reported stock data for multiple occupations, have been reporting stock data periodically in the last 7 years, have reported data for various HWF key topics, and this has led to a substantial diversification of HWF data beyond stock since 2018. This progress has been driven by the leadership of NHWA focal points, who have been successful in strengthening the collection, analysis and use of HWF data at national level.

According to the latest available data, substantial disparities persist in HWF density, both by WHO region and by World Bank income group. From 2006 to 2025, there has been a substantial increase in HWF density at global level, with variations by WHO region and by occupation.

The demographic impact of ageing affects both health workers and the population they serve. 67 countries would not be able to compensate for the retirement of health workers by employment of young health workers and have a projected 832 000 health workers gap to maintain the age-standardized HWF density as in 2024. This gap affects mostly HICs and is therefore adding to the 11 million projected global shortage by 2030. Thus, this analysis underscores the importance of understanding and analyzing the health labour market dynamics.

This report has showcased the improvement of evidence base on HWF statistics, thanks to the efforts by countries to follow the core principles of NHWA implementation to enable more robust monitoring of HWF stock, demographics, migration, subnational equity, education and financing. This has required – and continues to require – sustained investments by countries to improve their capability to collect, analyze and report HWF data and to strengthen the capacity of their HRHIS. NHWA is a global public health good that helps countries to track their efforts towards UHC, the SDGs and other health objectives. To this effect, WHO strives to support countries in their progressive implementation of the NHWA and continues to engage and collaborate with donors and partner organizations to align national efforts towards strengthening the collection, analysis and use of HWF data and evidence in countries.

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Note: *All references were accessed on 20 March 2026.*

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Annexes

Annex 1:
List of occupations covered by the NHWA

In order to provide a comprehensive overview of the HWF, most of the quantitative indicators in the NHWA are disaggregated by occupation. While the NHWA data platform follows the structure outlined in the International Standard Classification of Occupations (ISCO-08), it includes selected additional health occupations that are collected as part of another initiative (the Joint Data Collection on Non-Monetary Health Care Statistics by OECD, Eurostat and WHO Regional Office for Europe) and occupations that are globally relevant but not explicitly listed in ISCO-08. The list below provides occupational group titles and corresponding ISCO-08 codes useful for monitoring the HWF.

Table A1.1: List of occupational groups covered by the NHWA

Occupational title	ISCO-08 code
1 – Medical doctors	221
1.1 – Generalist medical practitioners (incl. family medicine practitioners)	2211
1.2 – Specialist medical practitioners	2212
1.2.1 – General pediatricians practitioners	
1.2.2 – Obstetricians and gynecologists	
1.2.3 – Psychiatrists practitioners	
1.2.4 – Medical group of specialists practitioners	
1.2.5 – Surgical group of specialists practitioners	
1.2.6 – Other specialists practitioners	
1.3 – Medical doctors not further defined	
2 – Nursing personnel	
2.1 – Nursing professionals	2221
2.2 – Nursing associate professionals	3221
2.3 – Nurses not further defined	
3 – Midwifery personnel	
3.1 – Midwifery professionals	2222
3.2 – Midwifery associate professionals	3222
3.3 – Midwives not further defined	
4 – Dentists	2261
5 – Dental assistants and therapists	3251

Occupational title	ISCO-08 code
6 – Dental prosthetic technicians	3214
7 – Pharmacists	2262
8 – Pharmaceutical technicians	3213
9 – Paramedical practitioners	2240
10 – Medical and pathology laboratory scientists	
11 – Medical and pathology laboratory technicians	3211
12 – Medical imaging and therapeutic equipment technicians	3212
13 – Environmental and occupational health professionals	2263
14 – Environmental and occupational health inspectors/ associates	3257
15 – Traditional and complementary medicine professionals	2230
16 – Traditional and complementary medicine associate professionals	3230
17 – Community health workers	3253
18 – Personal care workers in health service	532
18.1 – Health care assistants	5321
18.2 – Home–based personal care workers	5322
18.3 – Personal care workers in health service not elsewhere classified	5329
19 – Physiotherapists	2264
20 – Physiotherapy technicians and assistants	3255
21 – Dieticians	2265
22 – Nutritionists	2265
23 – Audiologists and speech therapists	2266
24 – Optometrists and ophthalmic opticians	2267
25 – Dispensing opticians	3254
26 – Medical prosthetic technicians	3214
27 – Medical records technicians	3252
28 – Medical assistants	3256
29 – Ambulance workers	3258
30 – Social work and counselling professionals	2635
31 – Social work associate professionals	3412

Occupational title	ISCO-08 code
32 – Biomedical engineers	2149
33 – Psychologists	2634
34 – Medical secretaries	3344
35 – Managerial staff	
36 – Administrative staff	
37 – Health information systems personnel	
38 – Engineering and maintenance staff	
39 – Other non–medical professional staff	
40 – Other non-medical support staff	
41 – Epidemiologists (incl. FETP course graduates)	
41.1 – Field Epidemiologists	

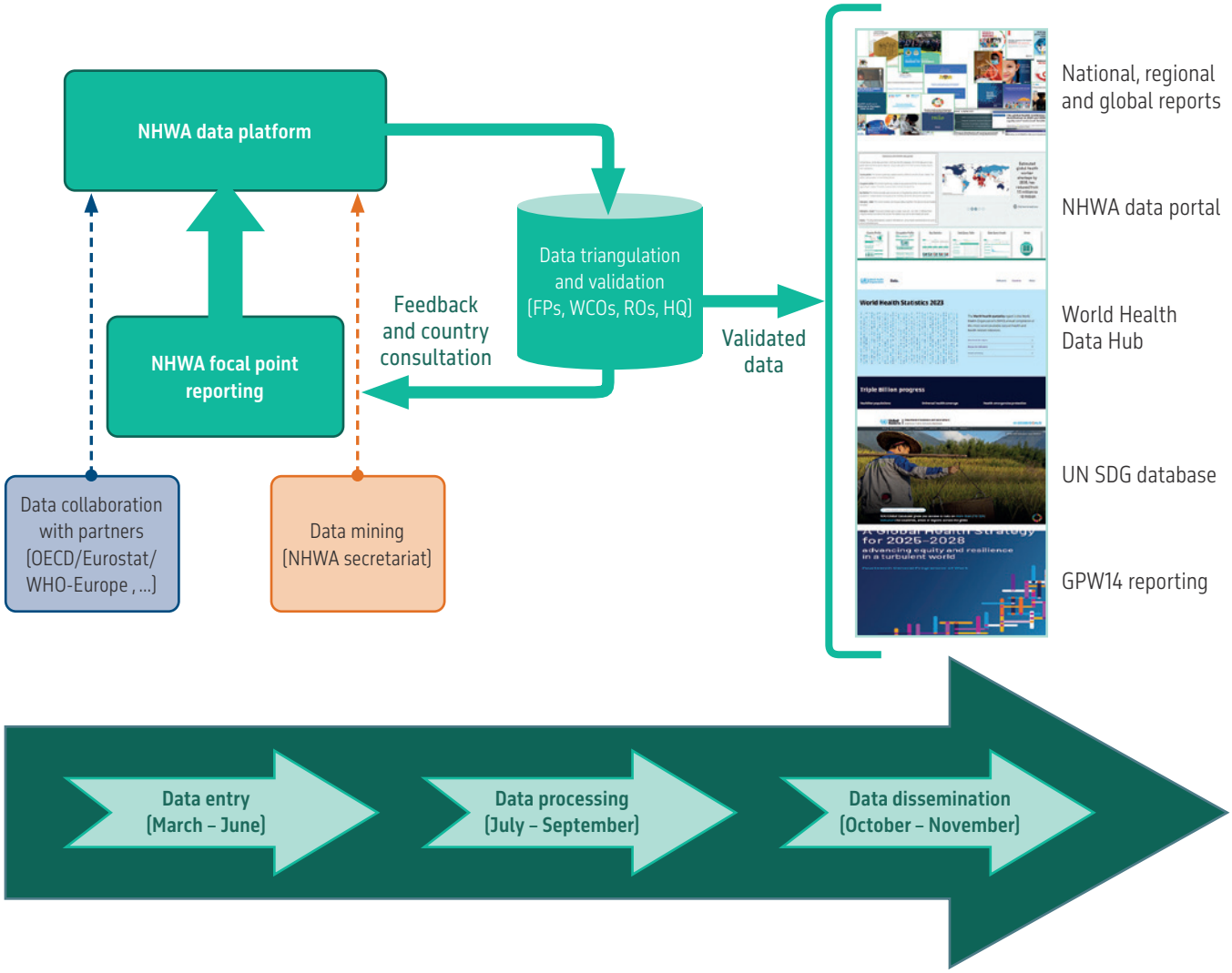
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Annex 2:
NHWA methodology

NHWA data cycle

Following the principles of the progressive implementation of the NHWA, countries are encouraged to report updated and most recent HWF statistics to WHO. This is in direct response to the World Health Assembly Resolution 69.19 urging all countries to report HWF data to WHO.

Fig. A2.1: NHWA data cycle



While the NHWA data platform remains open for data entry throughout the year, countries are encouraged to channel their data sharing efforts during specified periods to facilitate reporting to WHO and the UN SDGs (**Fig. A2.1**). In addition to data sharing by countries through the NHWA data platform, the NHWA Secretariat also integrates HWF data reported by countries through the Joint Data Collection on Non-Monetary Health Care Statistics by OECD, Eurostat and WHO Regional Office for Europe. Since the definitions of the occupations and indicators are aligned with the NHWA, these data are automatically uploaded onto the NHWA data platform each year. Furthermore, HWF data from other national sources such as labour force surveys (collated and published by ILO) and census (collated and published by IPUMS) are also periodically analyzed and incorporated on the NHWA data platform.

Following the data entry period from March to June, all data in the platform is processed and undergoes extensive data quality checks to identify outliers, missing data points and other data quality concerns. The identified data points are then brought to the attention of the focal points and WHO country and regional colleagues for immediate action to resolve them. Throughout the data entry and data processing stages, the NHWA Secretariat provides technical support to focal points through webinars and virtual meetings. The validated data in the NHWA data platform is then processed for data release to the NHWA data portal, GHO, World Health Data Hub and the UN SDG database.

The process of data gathering, data quality checks, data validation and data dissemination is led by the NHWA Secretariat located within the Health Workforce Data and Learning Analytics Unit at WHO headquarters, in close collaboration with regional counterparts. The NHWA Secretariat, in collaboration with regional offices and partners, also provides technical support to countries to strengthen the collection, analysis and use of HWF data and information, bolstered by robust national HRHIS, and drive evidence-based HWF planning and policy-making.

Density estimates

The figures for number of medical doctors include generalist medical practitioners and specialist medical practitioners. The ISCO-08 codes included here are 2211, 2212.

The figures for number of nursing and midwifery personnel include nursing personnel and midwifery personnel, whenever available. Due to varied education pathways and national occupational classifications, in many countries nurses trained with midwifery skills perform the functions of a midwife and may be counted as midwives. The ISCO-08 codes included here are 2221, 2222, 3221, 3222.

The figures for number of dentists include dentists. The ISCO-08 code included here is 2261.

The figures for number of pharmacists include pharmacists. The ISCO-08 code included here is 2262.

The global and regional average densities were estimated as the population weighted average of the national densities. In general, the denominator data for workforce density (i.e. national population estimates) are obtained from the population estimates prepared by the Population Division of the Department of Economic and Social Affairs of the UN Secretariat, of which the latest edition is the 2024 revision *(46)*.

Following the principles of progressive implementation of NHWA in countries, focal points periodically update latest and/or trend data, thereby improving the HWF data quality. Due to these updates in data, the global and regional estimates should not be compared to prior estimates published elsewhere.

Depending on the nature of the original data source, it may include only practising health workers or all those in the health occupation who are licensed to practice. Data on health workers tend to be more complete for the public health sector and may underestimate the active workforce in the private, military, nongovernmental organization and faith-based health sectors. Due to the differences in data sources, considerable variability may remain across countries in the coverage, periodicity, quality and completeness of the original data.

Annex 3: Methodology to estimate health workforce need

Age-standardization of the health workforce need

In the assessment of the impact of population ageing on the need, an age-standardization approach was used. The standardization was a double standardization on population age structure and on age-specific medical needs. As a result, the gap between the projected HWF by 2030 and the need based on 2020 HWF density was assessed while accounting for a change in the density due to change in the age structure of the underlying population.

To illustrate the computation, a country example is provided. In this example, the country has 56 292 health workers in 2020 and is projected to have 61 533 health workers by 2030 (refer to *[18]* for further details on methods). Its population is projected to grow from 5.9 million in 2020 to 6.3 million in 2030 and the share of those aged 65 years and above is projected to rise from 13.4% in 2020 to 22.5% by 2030. In this example, the HWF density is projected to increase from 96.2 per 10 000 population in 2020 to 98.3 in 2030 (**Table A3.1**).

Table A3.1: HWF statistics in the illustration country

	2020	2030
Stock	56 292	61 533[a]
Density per 10 000 population	96.2	98.3

[a] *Projected from a simple stock and flow model accounting for HWF ageing and graduation statistics.*

This example suggests that the country will see an improvement in both HWF stock and density, and therefore can even be surpassing the objective to maintain the HWF density as in 2020.

Table A3.2 illustrates the computation approach for estimating the age-adjusted HWF need by 2030 in 6 steps as follows:

a. Population statistics should be extracted by age group for 2020 and 2030, here from the UN's World Population Prospects *[45]*.
b. A standard curve should be identified illustrating different needs according to age. Here, data on total costs per capita and by age were extracted from a study from Kalseth and Halvorsen *[47]*, **Figure 2**) and the values were standardized to 100. It suggests that individuals aged 65 years and above would need about 3 times more health workers than those aged 25–34 years of age.

c. Age-specific weights can be computed multiplying population in 2020 by the standard curve value. This corresponds to a double weighting by age and by standard curve of needs. Column 'c1' represents absolute weights, and column 'c2' represents relative weights.

d. The stock is distributed by age group from multiplying the total stock observed in 2020, i.e., 56 292 health workers, by age-specific weights and dividing by the sum of weights. This enables to redistribute the total HWF size by age group.

e. The age-specific HWF density can be estimated based on the stock redistributed (d) and the population in 2020. Note that if no standard curve (b) is used (or a flat curve with equal weight by age group), the redistribution of health workers is only influenced by population structure and assumes a unique age-specific density similar to the total density (96.2 health workers per 10 000 population) for each age group.

f. Lastly, the number of health workers needed in 2030 to maintain the age-specific HWF density (e) in 2020 is estimated by multiplying the 2020 age-specific HWF density by the population in 2030.

Table A3.2: Estimation of the HWF need based on 2020 density but accounting for population age structure change and differential age-specific need.

a. Population			b. Standard curve on age-specific need	c1. Weights (absolute)	c2. Weights (relative)	d. Stock by age group	e. Density by age group per 10 000 in 2020	f. Need in 2030
				[a]x[b]	*[c1]/sum of [c1]*	*Stock 2020 x [c2]/100*	*[d] / [a_{2020}]*	*[a_{2030}]x[e]*
	Year 2020	Year 2020				Year 2020	Year 2020	Year 2030
<25 years	1 382 367	1 289 397	7.3	10 091 279	11.1	6 258	45.3	5 837
25–34 years	870 195	754 193	12.6	10 932 759	12.0	6 780	77.9	5 876
35–44 years	935 211	919 725	12.3	11 475 186	12.6	7 116	76.1	6 998
45–54 years	958 016	949 463	14.6	14 029 345	15.5	8 700	90.8	8 622
55–64 years	923 442	941 177	18.8	17 341 017	19.1	10 754	116.5	10 960
>64 years	781 111	1 408 511	34.4	26 905 644	29.6	16 685	213.6	30 086
Total	**5 850 342**	**6 262 466**	**100**	**90 775 230**	**100**	**56 292**		**68 380**

This analysis shows that when accounting for the change in population age structure, the HWF size in 2030 should be 68 380 to maintain the age-specific HWF density estimated for the year 2020, because older population have greater needs.

It must be noted that the projected stock by 2030 already factors in the ageing of the health workers in a stock and flow model. As a result, the comparison of the projected HWF stock and the age-standardization of HWF density by 2030 depicts both the phenomenon of ageing of the caregivers as well as that of ageing of the recipients of care. This analysis shows that the unadjusted positive increase observed in **Table A3.1** above from 56 292 to 61 533 is actually not sufficient to cover the age-adjusted needs of 68 380. And a density of 68 380 / 6 262 466 = 109.2 health workers per 10 000 population would be needed instead of the projected 98.3 per 10 000 population. The HWF gap between the age-specific need and the projected size can be estimated as 68 380 – 61 533 = 6 847. When presented as percentage increase, this analysis shows that the currently projected stock increase of 9% (61 533/56 292 – 1) should be raised to 21% (68 380/56 292 – 1) to maintain by 2030 the age-specific HWF density observed in 2020.

Annex 4:
NHWA focal points at national level who contributed to reporting and verification of data

This includes all the current and former NHWA focal points appointed by countries, territories and areas who have been instrumental in the progressive implementation of the NHWA at national level and have contributed to the reporting and verification of HWF data since the launch of the NHWA data platform.

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