

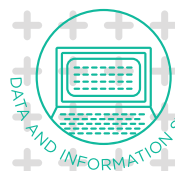
# National Health Workforce Accounts: A Handbook





World Health  
Organization

# National Health Workforce Accounts: A Handbook



National health workforce accounts: a handbook.  
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## Abbreviations and acronyms

<b>CPD</b>	continuing professional development
<b>FETP</b>	Field Epidemiology Training Programme
<b>FTE</b>	full-time equivalent
<b>GSHRH</b>	Global Strategy on Human Resources for Health: Workforce 2030
<b>HRH</b>	human resources for health
<b>HRHIS</b>	human resource for health information system
<b>HWF</b>	health workforce
<b>IHR</b>	International Health Regulations (2005)
<b>ILO</b>	International Labour Organization
<b>ISCO</b>	International Standard Classification of Occupations
<b>ISIC</b>	International Standard Industrial Classification
<b>MDS</b>	WHO minimum data set for health workforce registry
<b>NHWA</b>	National Health Workforce Accounts
<b>ODA</b>	official development assistance
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OoP</b>	out-of-pocket (expenses)
<b>SDG</b>	United Nations Sustainable Development Goal
<b>TVET</b>	Technical and vocational education and training
<b>UHC</b>	universal health coverage
<b>UN</b>	United Nations
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WHO</b>	World Health Organization

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# Part I

National Health  
Workforce Accounts  
in context

## Universal health coverage and the Sustainable Development Goals: a common challenge for all countries

A health workforce (HWF) of adequate size and skill mix, as well as required teachers and trainers, are critical to the attainment of any population health goal. This includes the achievement of universal health coverage (UHC) (WHO 2017c) and the health-related targets of the United Nations Sustainable Development Goals (SDGs). Yet countries globally are affected by health workforce challenges of a multifaceted nature, such as difficulties in the education and training, deployment, performance and retention of their health workforces (WHO 2016c). A suboptimal allocation of health workers is one of the main challenges that directly influences the availability, accessibility, quality and performance of national health services (McPake et al. 2014). In the worst case, this may leave populations with inadequate access to the health services they need. It is clear that efforts to achieve the SDGs and UHC are thwarted by these HWF challenges. Therefore, the World Health Organization (WHO) and its partners developed the Global Strategy on Human Resources for Health: Workforce 2030 (GSHRH), which sets out the policy agenda to ensure a health workforce that is fit for purpose to attain the targets of UHC and the SDGs (WHO 2016c).

### The Global Strategy on Human Resources for Health

The Global Strategy on Human Resources for Health: Workforce 2030 (WHO 2016c), adopted by the Sixty-ninth World Health Assembly in May 2016 under resolution WHA69.19, aims to ensure universal accessibility, acceptability, coverage and quality of health workforces within strengthened health systems (World Health Assembly 2016). This can be achieved through adequate investments and the implementation of effective policies at national, regional and global levels. To realize this, the GSHRH presents multiple objectives including strengthening HWF data, evidence and knowledge. Translated into global milestones to be achieved by 2020 and 2030 respectively, this implies that *“All countries are making progress on health workforce registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration (Milestone 5).”*

Responsible change in any country will rely on the availability, completeness and quality of HWF data. More specifically, registries are essential to track health workforce capacity and dynamics, and so is sharing data, indicators and accounts on the health workforce between countries. Member States urgently need to strengthen or establish national health personnel information systems to collect and analyse reliable and up-to-date health workforce data. These data can help to assess the appropriateness and effectiveness of health workforce policies and can potentially be translated into effective health workforce policies and plans.

## The Action Plan of the High-Level Commission on Health Employment and Economic Growth

In line with the GSHRH, the High-Level Commission on Health Employment and Economic Growth published 'Working for Health and Growth' (High-Level Commission on Health Employment and Economic 2016), a report and five-year action plan for health employment and inclusive economic growth. The three agencies that support the action plan are the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD) and WHO. This report was reviewed by the Seventieth World Health Assembly, which recommended enforcement of the High-Level Commission's recommendations (World Health Assembly 2017). The High-Level Commission formulated its vision as follows: *"Accelerate progress towards universal health coverage and attaining the goals of the 2030 Agenda for Sustainable Development by ensuring equitable access to health workers within strengthened health systems"*. This vision is translated into 10 recommendations to transform national health workforces for the SDGs, and to develop labour market policies accordingly. To enlarge and attain a fit-for-purpose health workforce, actions across all sectors involved with the health labour market are required. These are challenges for all countries, which require having access to data, indicators and health workforce accounts, and the capacity to analyse these data for labour market analysis. Recommendation 10 of the Action Plan clarifies this: *"Undertake robust research and analysis of health labour markets, using harmonized metrics and methodologies, to strengthen evidence, accountability and action"*. This aligns with the milestones of the GSHRH by stressing the importance of immediate action on data, indicators and health workforce accounts. It also highlights the need for harmonized metrics and methodologies among nations. This is a goal that can only be achieved by joint and coordinated action. The National Health Workforce Accounts (NHWA) supports countries to achieve this.

## Benefits of the National Health Workforce Accounts

### Benefits at the global level

From the Action Plan of the High-Level Commission, and specifically the GSHRH, the concept of NHWA is clearly promoted as an important means to support countries in their national HWF policy and planning. The Sixty-ninth World Health Assembly adopted resolution WHA69.19 in support of its implementation (World Health Assembly 2016). The purpose of the NHWA is to facilitate the standardization of health workforce information systems for interoperability, i.e. the ability to exchange health workforce data within broader subnational or national health information systems, as well as within international information systems. In this way, rapid aggregation and display of health workforce data for decision-making can be fully realized, and the NHWA can serve as a guiding and supporting tool for countries to inform national evidence-based HWF policy decisions. The NHWA can support labour market analysis, aimed at informing

specific policy design, and examine the causal impact of policy change (McPake et al. 2014, Scott et al. 2016). Additionally, the NHTA can track and support countries' HWT efforts towards UHC, the SDGs and the global GSHRH milestones. The NHTA will do this by:

- creating a harmonized, integrated approach for annual and timely collection of health workforce information
- improving the information architecture and interoperability, and
- defining core indicators in support of strategic workforce planning and global monitoring.

## Benefits at the national level

The NHTA indicators have been selected with clear policy relevance in mind, so that they can be used by any country according to its own specific needs. While designed to support a coherent framework for HWT policy analysis and design, the NHTA can be implemented and used in a *flexible, modular* way. It is important for countries to note that while the 10 NHTA modules provide full coverage of indicators for all components and policy domains and form a natural whole, there is also significant room for selecting country-specific indicators. As countries strongly differ in terms of the build-up of their education sector, health labour market dynamics and health services, they will differ in their need to develop and conduct policies across these components. Hence, countries can select and *prioritize* NHTA modules according to their specific needs and goals at a given time, and eventually work towards selecting and covering the entire NHTA. This is not a goal in itself, however, and a flexible approach should always be taken.

The NHTA is progressive in nature, so that some of the benefits for countries will be immediate, while others will become available over the longer term. The more indicators available at national and subnational level, the better the overview of the health workforce landscape will be, along with the potential for more sophisticated analyses, more efficient health workforce policies, and progress towards UHC. Once the NHTA system is fully developed and implemented at national level, the main benefits of using NHTA are:

- A better understanding of the HWT, including its size, characteristics and distribution; from this, countries can generate insight into the needs and possibilities for strengthening their health workforce.
- High-quality information on the HWT that informs evidence-based policy decisions according to country needs.
- A stronger HWT through identifying significant improvements in health service coverage and health outcomes, especially if causal links with health system characteristics can be established.
- An ability to guide and inform the transformation and scale-up of HWT education and training in support of UHC.
- Strengthened policies, strategies and plans, through intersectoral policy dialogue among the relevant ministries that may include those of education, health and finance.

- Cross-cutting investments – in all modules of the NHTA – that will foster the demands of data-driven plans and policies, and capacity-building.
- Improved measuring and monitoring of HWT trends, systematic research on health system developments and resilience planning.

To conclude, the NHTA can inspire countries to address or reconsider major policy questions related to current HWT challenges and optimizing planning systems, such as:

- Is the current health workforce available, accessible, acceptable and of the appropriate competencies to provide good quality health services?
- How can the current gaps be partially addressed by improving performance through better allocation of resources, through increasing productivity, through effective retention policies, and through effective public–private partnerships?
- How can the current gaps be partially addressed by increasing investments in education and production, and/or increasing in-migration?
- How can policies and strategies aimed at improving performance and increasing inputs be financed (costing of policies and strategic options, including investments and recurring costs (salaries); negotiations with the government (ministries of finance, education, labour) as well as negotiations with the private sector)?
- How can the production of health workers replace the health worker loss caused by exits? Can financial incentives for health workers stimulate them to settle in underserved areas and lead to a more balanced geographical distribution of the HWT across the country or region?

## Benefits at the regional level

Apart from the benefits at national level, the NHTA can also ease the comparability of the HWT landscape at regional level and globally. Through country reporting and international comparisons, the NHTA may facilitate cross-country capacity-building, information and knowledge exchange, as well as more sophisticated research about future trends of health workforces within and across systems.

## National Health Workforce Accounts: concept and overview

### The underpinning framework

The concept of the NHTA is closely aligned with the health labour market framework for UHC (Sousa et al. 2013) (Figure 1), which also takes a central place in the High-Level Commission's report *'Working for health and growth: investing in the health workforce'* (High-Level Commission on Health Employment and Economic 2016). This framework provides a comprehensive picture of the education sector and health labour market dynamics, in which the economy,

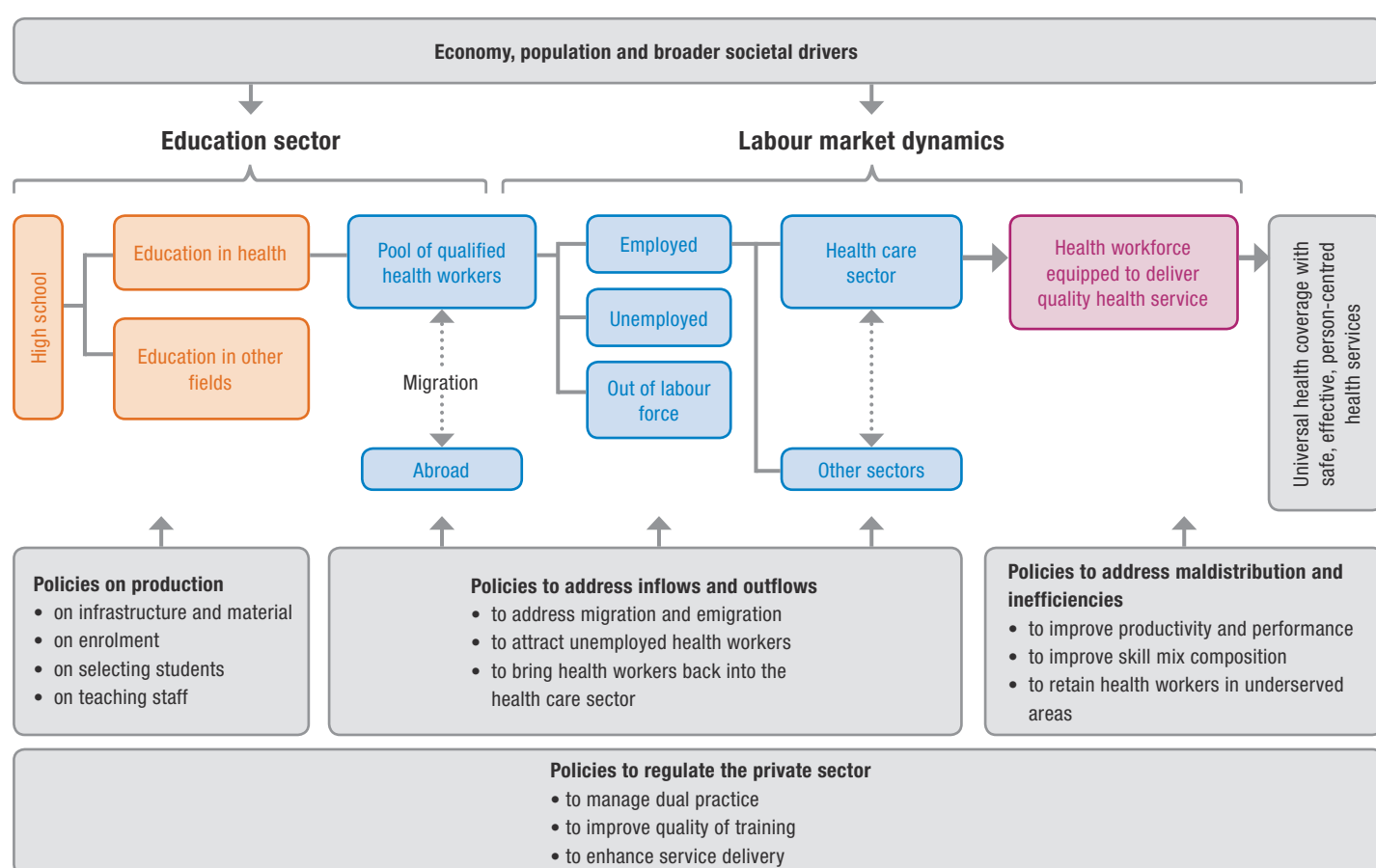
population and society act as drivers to attaining UHC and optimal health-care services as the outcome. In this sense, the health labour market framework offers tangible directions for countries in terms of HWF policies that may contribute to achieving the GSHRH milestones, UHC and the SDGs.

At the lower level of the framework, four specific groups of policies are included that can tackle health workforce challenges and support attaining equitable access to quality health services:

1. Policies on production
2. Policies to address inflows and outflows
3. Policies to address maldistribution and inefficiencies
4. Policies to regulate the private sector.

The first three policies are related to different parts of the education sector and health labour market dynamics and are interrelated in an ‘input–throughput–output’ sequence within the system. The policies to regulate the private sector cover the full scope of the health labour market.

**Figure 1: The health labour market framework**



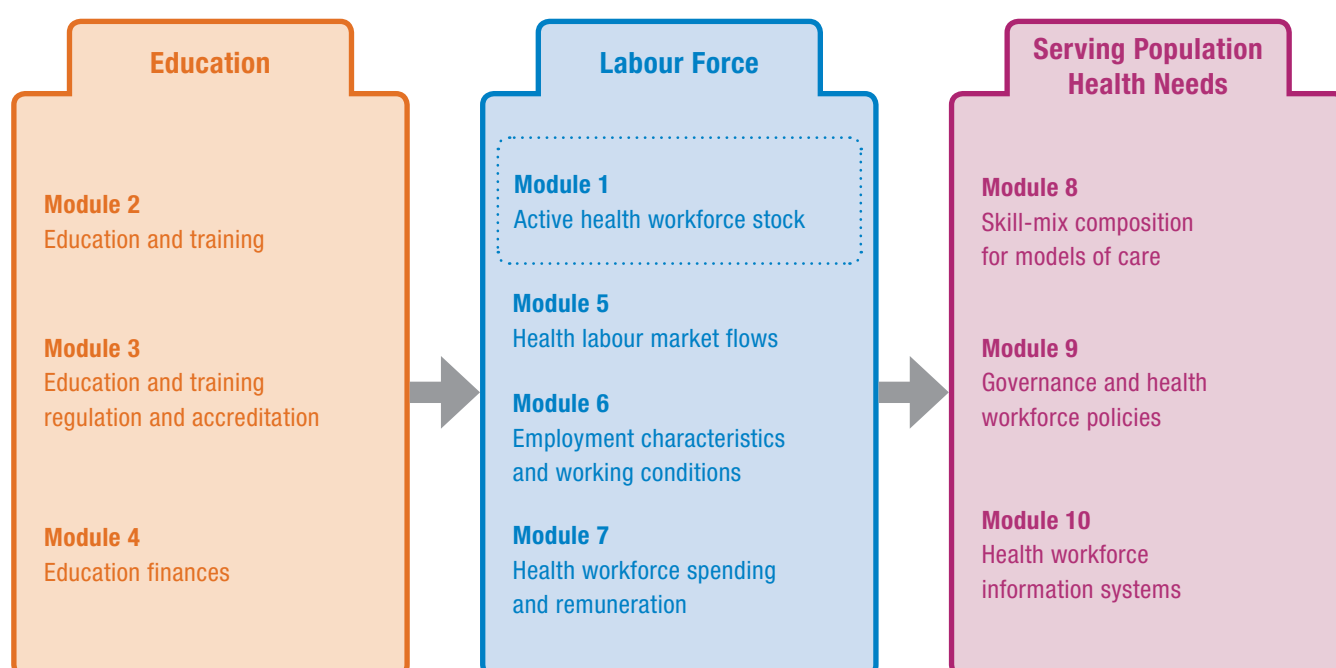
The development process of the NHTA is described in Annex 1.



## A modular approach

The NHWA contains a set of 78 core indicators, spread over 10 modules, that aim to support national-level HWF policies to progress towards UHC and SDGs. The indicators in the 10 modules feed into three crucial labour market components: the education component, the labour force component and the component serving population health needs (Figure 2).

**Figure 2: Overview of labour market components supported by the NHWA modules**



The aim and content of each of the 10 modules are described in more detail below. Module 1 is the key starting point to the NHWA framework as it collects the most crucial information on the health workforce.

### **Module 1: Active health workforce stock**

This module provides a comprehensive overview of the composition and distribution of the HWF. Indicators are gathered on geographical distribution, distribution by age and by sex, institutional sector and facility types. Regarding policy relevance, this module helps to explore whether the current workforce is adequate to provide UHC-oriented services. It enables the detection of gaps in certain professions or competencies and mismatches in geographical or sectoral distribution. Understanding HWF composition and distribution enables the planning and implementation of policy interventions on HWF education, retention, or reallocation of resources. Module 1 contains separate indicators on the distribution of health workers, which allows monitoring progress towards halving inequalities in access to a health worker (Global milestone 1, by 2030)(WHO 2016c). Indicators on the share of foreign-trained and foreign-born health workers are also related to GSHRH which targets that countries should make progress towards halving the dependency on foreign-trained health professionals through implementing the WHO Global Code of Practice (WHO 2010f).

Next, as shown in the left-hand column of Figure 2, three modules are set up to support policies on the education component, being the base and ‘input’ of health workforces and the NHWA.

### **Modules 2, 3 and 4: Education**

These modules have been developed to support the sustainable expansion and reform of HWF education and training to increase the quantity, quality and relevance of the health workforce, and in so doing strengthen national health systems and improve population health outcomes. Information from the modules will help guide and inform efforts to reorient and gear the health workforce towards addressing the social determinants of health, health promotion, disease prevention, primary care, and towards offering people-centred, integrated, community-based services. This HWF includes all types of health, social, and support workers.

### **Module 2: Education and training**

This module provides information on capacity and quality, including listing and mapping HWF education and training institutions, and information on applications, admissions, exit / drop-out and graduation. Indicators are aligned with SDG 4 (Education) targets and indicators supporting intersectoral coordination, for example on gender equality. The module enables the planning and monitoring of policies on student selection and admission, enrolment and teaching staff.

### **Module 3: Education and training regulation and accreditation**

This module supports mechanisms to coordinate an intersectoral HWF agenda. Indicators based on education regulation provide information on quality assurance, and education and training requirements. Accreditation mechanisms and their standards are of key importance, so that national education plans for the health workforce are aligned with the national health plan to ensure that all health workers have the skills that match the needs of the population. An indicator on in-service training looks to align health sector training with other educational sector-wide policies and programmes, including technical and vocational education and training within a framework of lifelong learning. These indicators can add information to enhance the quality and relevance of HWF education and training, and identify areas of intervention in the regulation or management of education and training.

### **Module 4: Education finances**

This module seeks to support an effective financing architecture that strengthens intersectoral collaboration between health and education sectors, as well as investment in lifelong learning systems. These data can be used to support retention policies, advance understanding on targeted investments that promote equitable access to education and lifelong learning opportunities, as well as identify and commit adequate budgetary resources for investments in transformative education, skills and job creation.

Policies to address inflows and outflows in the health workforce can be tracked through the following three labour force modules, in addition to Module 1.

#### **Module 5: Health labour market flows**

Entries to and exits from the labour market are measured in Module 5. Indicators on entries differentiate the results of domestic efforts from dependency on foreign health workers, and monitor both voluntary and involuntary exits. Information about the balance of the health labour market is gathered by tracking vacancies and unemployment, with a disaggregation at subnational level if possible. A better understanding of the magnitude and the drivers of flows can provide a basis for effective recruitment and retention policies.

#### **Module 6: Employment characteristics and working conditions**

This module addresses employment characteristics and working conditions. It can facilitate the progressive implementation and review of causal and descriptive labour market analyses. The distribution of health workers according to working time and labour market characteristics is essential to understanding HWF dynamics, and builds upon important initiatives such as the International Labour Standards on Working time and on Work-life balance. The indicators on working conditions can serve as input for progressing towards decent work for all, as promoted by SDG 6.

#### **Module 7: Health workforce spending and remuneration**

In this module, expenditures on the health workforce and remunerations in the health sector are mapped, including an oversight of earnings in the private sector where relevant. Data on these indicators can make an important contribution to decent work as promoted by SDG 6 and to gender equality under SDG 5. Moreover, economic analyses are crucial for budget negotiations with the government (e.g. ministries of finance, labour, education) as well as with private sector representatives.

The right-hand column of Figure 2 concerns policies to address the outcome dimensions of the NHTWA framework, i.e. serving population health needs, through the three modules described below.

#### **Module 8: Skill mix composition for models of care**

In order to achieve UHC, the availability of skilled health workers is essential in different settings. Module 8 contains indicators on skill mix composition of the health workforce. It builds upon the other module indicators by decomposing the structure of the workforce by sector and occupational group. This provides insight on how the type of labour supply matches the health-care needs and population composition of countries. This skill-mix to case-mix alignment is crucial, in particular for developments to improve and integrate patient-centred care by doctors, nurses and allied professionals. The availability of skills needed for different services is also addressed, with an emphasis on primary care. Two policy-specific indicators complement this module, i.e. on the availability of the HWF to implement the International Health Regulations(WHO 2005a) and the existence of an applied epidemiology training programme.

#### **Module 9: Governance and health workforce policies**

This module includes governance and health workforce policy indicators. The governance indicators reveal whether the country is able to coordinate an intersectoral HWF agenda and has a central HWF unit. The indicators on health workforce policies provide information on whether the country has processes to plan for the health workforce, whether education plans are aligned with the national health plan, and whether institutional models exist to assess health care staffing needs. This module is key to demonstrate whether the country has mechanisms to effectively use and apply information collected under indicators in the other modules.

#### **Module 10: Health workforce information systems**

This module defines indicators on the status of human resource for health information systems (HRHIS), data management and their use in line with GSHRH 2020's milestones to track the health workforce. The indicators describe whether the national HRHIS is ready to meet international reporting requirements on the health workforce. Other indicators address the extent to which HRHIS can track outputs from education and training institutions, entrants to the labour market, the number of active stock on the labour market, the number of exits from the labour market and the geocoded location of health facilities.

All indicators in the 10 NHTWA modules are specified in the descriptive pages with standard information. Annex 2 provides an overview of the metadata used in these standard descriptive pages.

## Implementation of the NHTWA

The NHTWA contains indicators with clear policy relevance across the entire spectrum of HWT priorities and those related to the health labour market framework. The implementation of the NHTWA is a country-led activity, building on national systems and using existing mechanisms to coordinate data-gathering for the evaluation of the health workforce.

WHO has developed a set of tools to help countries implement the NHTWA. These include, in addition to the Handbook, an implementation guide and a web platform for data reporting, visualization, and conducting international comparisons.

The WHO regional offices can provide direct support in the implementation of the NHTWA and respond to queries from countries in their region. The Health Workforce Department at WHO headquarters can also provide support to countries; queries on NHTWA can be sent by email to [hrhstatistics@who.int](mailto:hrhstatistics@who.int).

We also welcome continuing feedback from users by email to [hrhstatistics@who.int](mailto:hrhstatistics@who.int) to further improve the present handbook.

## Potential use of the NHTWA

As described in the metadata sheets, the NHTWA includes both numeric and ‘capability’ indicators that provide information on regulation and other mechanisms related to the health workforce. Tangible examples on what implementation of the NHTWA can mean for countries, and how it can support them in policy-making at national level, are provided in Annex 3.

It is implicit that the availability of the institutional processes, plans and units listed in *Module 9: Governance and health workforce policies* maximizes in each case the use of the indicators in a policy relevant direction. In addition, specific reporting related to the relevant policy questions can be achieved, particularly for those listed in *Module 10: Health workforce information systems*.

## Methodological note on implementation

### Annual measurement

The monitoring of indicators in the NHTWA is expected to occur on annual basis, although more regular monitoring schemes are possible. This implies reporting on indicators to cover a period of one year. Where data reporting is expected less regularly, this is marked in the individual indicator descriptive sheets.

Measurements may be performed using three different time frames.

### **Cross-sectional measurement**

Such measurement provides a snapshot of a metric for a specific year, as at the end of the year. For example, the density of health workers metric for 2017 corresponds to the density of workers at 31 December 2017.

### **Cumulative measurement**

Such metrics are accumulated throughout a year and correspond to the cumulative sum of a variable observed from 1 January to 31 December. For example, the total expenditure on the health workforce in 2017 supposes the sum of all HWF expenditures in 2017, i.e. all expenditures from 1 January to 31 December 2017 should be included. Similarly, the number of attacks on health workers in 2017 corresponds to the total number of attacks occurring between 1 January and 31 December 2017.

### **Measurement of flows of individuals from a cohort**

Indicators including the notion of flow have to be considered carefully, particularly for the definition of the denominator to use. For these indicators, the cohort to which the indicator belongs should be defined. For inflow, the denominator should be defined at the end of the year as new entries belong to the cohort measurable at the end of the period. For outflow, the denominator should be defined at the beginning of the year as the exits belong to the cohort observed at the beginning of the year.

For example the entry rate in the labour market in 2017 corresponds to health workers entering between 1 January and 31 December 2017. The cohort to be used as the denominator should therefore be the number of active health workers as of 31 December 2017 because the newcomers belong to this cohort and were not part of the cohort of workers as of 31 December 2016.

In contrast, the exit rate of workers in 2017 corresponds to health workers leaving the health system between 1 January and 31 December 2017. The cohort to be used in this case is the number of active workers as of the preceding year, i.e. 31 December 2016 because those who exit no longer belong to the cohort of workers observed as at 31 December 2017.

### **Level of disaggregation**

At least one level of disaggregation is necessary to describe each indicator. Disaggregation factors with a specific definition to enable harmonization of data gathering have been proposed for each indicator. The standard use of a comma “,” or of the word “and” is proposed in the present document to distinguish between single and multiple levels of disaggregation. A comma

“,” between two or more factors indicates that the stratification is to be conducted independently of each factor. An “and” indicates that the stratification is to be conducted jointly on two (or more) factors.

For example, disaggregation “by occupation, by occupation and age” should be read as: first a disaggregation by occupation only, which corresponds to summarizing the indicator in a column; second, a disaggregation combining information on occupation and age, which corresponds to summarizing this indicator in a table with occupation in rows and age groups in columns.

The disaggregations proposed in the Handbook are ordered by level of complexity, and it is expected that the first level of disaggregation is initially monitored. Progressive implementation of the NHWA will enable the monitoring and reporting of more complex levels of disaggregation. For instance, a disaggregation “by occupation, by occupation and sex, by occupation and subnational level” could be first implemented “by occupation”, then “by occupation and sex”, and “by occupation and subnational level” implemented in subsequent years when data become available.

### Disaggregation by subnational level

For some indicators, a disaggregation by subnational level is indicated. These subnational levels should be defined according to Member States’ needs. The use of a disaggregation based on administrative units down to the first or second subnational level is recommended (depending on the structure of administrative units and the size of subnational territories), without overlaps between the administrative units. Examples of subnational administrative units are states, regions, provinces, counties, and districts.

### Currency

Several indicators cover financial information available from health labour market data. Such indicators can be collected at national level using the official currency in a specific country. However, for information reported at international level, currencies should be standardized to the US dollar. The United Nations Treasury provides operational rates of exchange (<https://treasury.un.org/>) for the conversion of currencies, with monthly rates reported for each country for the 10 preceding years. For indicators reported as a sum over a whole year, the mid-year conversion rate should be used.

### Population estimates

Several indicators are expressed as density computed with a population size as denominator. Such population size data would usually be reported by national statistical offices based on census data or inter-census estimates. For the purposes of international comparisons, standard



population estimates will be used instead of national estimates, such as those from the World Population Prospects estimated by the United Nations Population Division. Therefore, the numerator data from these indicators are to be recorded.

### **List of occupations**

Throughout the Handbook, indicators for the NHTWA are defined by occupations of the health workforce. It is strongly recommended to use occupation definitions following the most recent international classification. The proposed list of occupations in Annex 4 is based on the International Standard Classification of Occupations (ISCO-08) (International Labour Organization 2012). Countries are encouraged to register detailed information at the unit level of ISCO-08 (4-digit level) to better inform on HWT statistics. If data are not yet readily available with the suggested precision in Annex 4, an occupational group may be used instead.

### **Health workers and social workers**

The NHTWA primarily focuses on health workers. For the majority of indicators, only health workers are considered and social workers employed in health facilities should be removed from the calculation of various metrics. However, for a comprehensive overview of health-related activities, countries are encouraged to keep track of data pertaining to social workers, in particular their density and their distribution.

### **Deviation from definitions**

The NHTWA indicator definitions and calculation methods are based on agreed international classifications when available. However, as data availability and definitions used at national level may vary, Member States are encouraged to report data even in cases where it is not possible to follow the methodology stated in NHTWA Handbook. In such cases, the deviation from the standard definition should be noted, and a detailed description of the methodology used should be reported.





# Part II

National Health  
Workforce Accounts –  
Indicators

# Modular overview with corresponding dimensions

## 1 Active health workforce stock

### Stock

- Health worker density
- Health worker density at subnational level

### Distribution

- Health worker distribution by age group
- Female health workforce
- Health worker distribution by facility ownership
- Health worker distribution by facility type

### Migration

- Share of foreign-born health workers
- Share of foreign-trained health workers

### Distribution

- Share of workers across health and social sectors

## 2 Education and training

### Applications

- Master list of accredited health workforce education and training institutions
- Duration of education and training
- Applications for education and training

### Admissions

- Ratio of admissions to available places
- Ratio of students to qualified educators for education and training

### Exit / drop out

- Exit / drop-out rate from education and training programmes

### Graduation

- Graduation rate from education and training programmes

## 3 Education and training regulation and accreditation

### Regulation

- Standards for the duration and content of education and training

### Accreditation

- Accreditation mechanisms for education and training institutions and their programmes
- Standards for social accountability
- Standards for social accountability effectively implemented

- Standards for social determinants of health
- Standards for interprofessional education
- Agreement on accreditation standards

### Lifelong learning

- Continuing professional development
- In-service training

## 4 Education finances

### Financing of higher education

- Total expenditure on higher education
- Total expenditure on health workforce education
- Average tuition fee per student

### Investment

- Investment in transformative education and training

### Education expenditure

- Expenditure per graduate on health workforce education

- Cost per graduate of medical specialist education programmes
- Cost of qualified educators per graduate

### Lifelong learning

- Total expenditure on in-service training and continuing professional development

## 5 Health labour market flows

### Entry into labour market

- Graduates starting practice within one year
- Replenishment rate from domestic efforts
- Entry rate of foreign health workers

### Exit from labour market

- Voluntary exit rate from health labour market
- Involuntary exit rate from health labour market

### Labour market imbalances

- Unemployment rate
- Vacancy rate

## 6 Employment characteristics and working conditions

### Working time

- Standard working hours
- Health workers with a part-time contract

### Decent work

- Regulation on working hours and conditions
- Regulation on minimum wage
- Regulation on social protection

### Labour market characteristics

- Health worker status in employment
- Regulation on dual practice
- Regulation on compulsory service

### Working conditions

- Measures to prevent attacks on health workers
- Attacks on health-care system

## 7 Health workforce spending and remuneration

### Health workforce expenditure

- Total expenditure on health workforce
- Total official development assistance on health workforce

### Health workforce remuneration

- Total expenditure on compensation of health workers
- Public expenditure on compensation of health workers

- Entry-level wages and salaries
- Policies on public sector wage ceilings

### Decent work

- Gender wage gap

## 8 Skill-mix composition for models of care

### Sectoral workforce composition

- Percentage of health workforce working in hospitals
- Percentage of health workforce working in residential long-term care facilities
- Percentage of health workforce working in ambulatory health care

### Skill distribution

- Specialist surgical workforce
- Family medicine practitioners
- Existence of advanced nursing roles

### International Health Regulation capacity

- Availability of human resources to implement the International Health Regulations
- Applied epidemiology training programme

## 9 Governance and health workforce policies

### Governance

- Mechanisms to coordinate an intersectoral health workforce agenda
- Central health workforce unit

### Health workforce policies

- Health workforce planning processes
- Education plans aligned with national health plan

- Institutional models for assessing health care staffing needs

## 10 Health workforce information systems

### HRHIS for international reporting

- HRHIS for reporting on International Health Regulations
- HRHIS for WHO Code of Practice reporting
- HRHIS for reporting on skill attendance at birth requirements

### HRHIS to track HWF

- HRHIS for reporting on outputs from education and training institutions
- HRHIS for tracking the number of entrants to the labour market
- HRHIS for tracking the number of active stock on the labour market

- HRHIS for tracking the number of exits from the labour market
- HRHIS for producing the geocoded location of health facilities





# Module 1

## Active health workforce stock

### Module summary

This module provides a comprehensive overview of the size, composition and distribution of the health workforce. The indicators address several dimensions of HWF composition such as demographic characteristics, sectoral distribution and dependency on foreign health workers.

#### Stock

- 1–01 Health worker density
- 1–02 Health worker density at subnational level

#### Distribution

- 1–03 Health worker distribution by age group
- 1–04 Female health workforce
- 1–05 Health worker distribution by facility ownership
- 1–06 Health worker distribution by facility type

#### Migration

- 1–07 Share of foreign-born health workers
- 1–08 Share of foreign-trained health workers

#### Distribution

- 1–09 Share of workers across health and social sectors

Dimension: Stock

<b>Indicator name</b>	Density of health workers per 10 000 population
<b>Numerator</b>	Number of health workers, defined in headcounts
<b>Denominator</b>	Total population
<b>Disaggregation</b>	By occupation, by occupation and activity level
<b>Definition</b>	<p>Number of health workers per 10 000 population.</p> <p>For activity level the following categories are recommended: practising health workers, professionally active health workers, and health workers licensed to practise.</p> <p>Total population as estimated by the UN Statistics Division. In case of other methodology used, WHO recalculates densities according to the UN Statistics population data in order to harmonize the densities and ensure comparability.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Activity level</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> <li>• Professional council/chamber/association registers</li> <li>• Labour force surveys</li> <li>• Population census data</li> <li>• United Nations Statistics Division population data</li> </ul>
<b>Further information and related links</b>	(WHO 2015a, OECD et al. 2016, International Labour Organization 2012)
<b>Additional references</b>	(WHO et al. 2009, USAID and CapacityPlus 2015, WHO 2015c, Pan American Health Organization 2011, Touré et al. 2013, WHO Regional Office for the Western Pacific 2007, WHO 2007)



Abbreviated name

## Health worker density at subnational level



Dimension: Stock

<b>Indicator name</b>	Density of active health workers per 10 000 population at subnational level
<b>Numerator</b>	Number of active health workers at subnational administrative units, defined in headcounts
<b>Denominator</b>	Total population at subnational level
<b>Disaggregation</b>	By occupation
<b>Definition</b>	<p>Number of active health workers per 10 000 population in the given subnational administrative unit. Preferably, the location where the health worker works should be taken into account when subnational levels are defined according to Member States' needs. The use of administrative units to the first or second subnational level is recommended (depending on the structure of administrative units and the size of subnational territories), without overlaps between the administrative units. Examples of subnational administrative units: states, regions, provinces, counties, and districts.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Subnational level</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> <li>• Professional council/chamber/association registers</li> <li>• Population census data</li> <li>• Health facility database (with location)</li> <li>• United Nations Statistics Division population data</li> </ul>
<b>Further information and related links</b>	(WHO 2015a, WHO et al. 2009, USAID and CapacityPlus 2015)
<b>Additional references</b>	(WHO 2015c, OECD et al. 2016, OECD 2016)

<b>Indicator name</b>	Percentage of active health workers in different age groups
<b>Numerator</b>	Number of active health workers in a specific age group
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation
<b>Definition</b>	Percentage of active health workers in the given age groups, by occupation. Age groups considered are the following: > 25, 25–34, 35–44, 45–54, 55–64, ≤ 65.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Age group</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> <li>• Professional council/chamber/association registers</li> <li>• Labour force surveys</li> <li>• Population census data</li> </ul>
<b>Further information and related links</b>	(WHO 2015c, OECD et al. 2016, WHO et al. 2009)
<b>Additional references</b>	(International Labour Organization 2013, USAID and CapacityPlus 2015)

Abbreviated name  
**Female health workforce**



Dimension: Distribution

<b>Indicator name</b>	Percentage of female health workers in active health workforce
<b>Numerator</b>	Number of active female health workers
<b>Denominator</b>	Total number of active male and female health workers, defined in headcounts
<b>Disaggregation</b>	By occupation
<b>Definition</b>	Percentage of female health workers in active health workforce, by occupation.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Sex</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> <li>• Labour force surveys</li> <li>• Population census data</li> </ul>
<b>Further information and related links</b>	(WHO 2015c, WHO et al. 2009, OECD et al. 2016)
<b>Additional references</b>	(USAID and CapacityPlus 2015, WHO 2007)

<b>Indicator name</b>	Percentage of active health workers employed by type of facility ownership
<b>Numerator</b>	Number of active health workers, defined in headcounts, working in facilities owned by the given institutional sector
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation and facility ownership
<b>Definition</b>	<p>Percentage of active health workers employed in facilities by type of ownership (public, private not-for-profit, private for-profit).</p> <p>The categories of facility ownership can be aligned to institutional sector definitions of the System of National Accounts (SNA 2008).</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Facility/institution ownership type</li> <li>• Institutional sector</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> </ul>
<b>Further information and related links</b>	(WHO et al. 2009, USAID and CapacityPlus 2015, European Communities et al. 2008)
<b>Additional references</b>	(WHO 2007)

Abbreviated name  
**Health worker distribution by facility type**



Dimension: Distribution

<b>Indicator name</b>	Percentage of active health workers employed by facility type
<b>Numerator</b>	Number of active health workers, defined in headcounts, working in a specific facility type
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation
<b>Definition</b>	<p>Percentage of active health workers employed in the given facility type, by occupation.</p> <p>Health facility types based on the classification of System of Health Accounts:</p> <ul style="list-style-type: none"> <li>• Hospitals (HP.1)</li> <li>• Residential long-term care facilities (HP.2)</li> <li>• Providers of ambulatory health care (HP.3)</li> <li>• Ancillary services (HP.4, including transportation, emergency rescue, laboratories and others)</li> <li>• Retailers (HP.5, including pharmacies)</li> <li>• Providers of preventive care (HP.6).</li> </ul>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Facility type</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> </ul>
<b>Further information and related links</b>	(WHO 2015c, OECD et al. 2011, WHO Regional Office for the Western Pacific 2007)

<b>Indicator name</b>	Percentage of active foreign-born health workers
<b>Numerator</b>	Number of active foreign-born health workers
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation
<b>Definition</b>	This indicator will capture the information on health workforce coming from abroad.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Foreign-born health workers</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Health facility data</li> <li>• Population census data (data mainly available on place of birth, not place of training)</li> </ul>
<b>Further information and related links</b>	(WHO 2015c, Wismar et al. 2011, OECD 2016)
<b>Additional references</b>	(EU Joint Action on Health Workforce Planning and Forecasting 2016a, WHO et al. 2009)

Abbreviated name

## Share of foreign-trained health workers



Dimension: Migration

<b>Indicator name</b>	Percentage of active foreign-trained health workers
<b>Numerator</b>	Number of active foreign-trained health workers
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and country of training
<b>Definition</b>	Percentage of active foreign-trained health workers in the active health workforce.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Foreign-trained health workers</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Health facility data</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2016, WHO 2015c, EU Joint Action on Health Workforce Planning and Forecasting 2016a)
<b>Additional references</b>	(WHO et al. 2009, OECD 2016)

<b>Indicator name</b>	Percentage of workers in the health and social sector to total civilian workers
<b>Numerator</b>	Number of persons working in health or social sector, in headcounts
<b>Denominator</b>	Total number of persons employed, defined in headcounts
<b>Disaggregation</b>	Health and social sectors defined by ISIC codes 86, 87, and 88
<b>Definition</b>	<p>Ratio of the number of persons working in health and social sector to the total number of persons employed in the civilian labour force. Total civilian corresponds to the total labour force excluding armed forces.</p> <p>People working in health and social sectors include those working in the following divisions of the International Standard Industrial Classification (ISIC) Rev. 4:</p> <ul style="list-style-type: none"> <li>• 86 Human health activities</li> <li>• 87 Residential care activities</li> <li>• 88 Social work activities without accommodation.</li> </ul> <p>This indicator aligns with the indicator “Total health and social employment” of OECD Health Statistics.</p> <p>In case of lack of data on ISIC activities, the ratio between health employment and total civilian employment can be used for approximation.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Economic activity classification</li> <li>• Employment</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Labour force surveys</li> <li>• Tax registries, insurance or pension fund registries</li> </ul>
<b>Further information and related links</b>	(United Nations 2008, WHO 2016c, OECD 2017a)
<b>Additional references</b>	(OECD 2016, WHO 2015c, OECD 2011b)





# Module 2

## Education and training

### Module summary

Module 2 addresses capacity and quality, and gender equality in health workforce education and training. These are aligned with education sector (SDG 4) indicators, which can assist in coordinating policies on production. The module also addresses gender equality and equitable access to education and training.

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#### Applications

- 2-01** Master list of accredited health workforce education and training institutions
- 2-02** Duration of education and training
- 2-03** Applications for education and training

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#### Admissions

- 2-04** Ratio of admissions to available places
- 2-05** Ratio of students to qualified educators for education and training

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#### Exit / drop out

- 2-06** Exit / drop-out rate from education and training programmes

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#### Graduation

- 2-07** Graduation rate from education and training programmes

# Master list of accredited health workforce education and training institutions

Dimension: Applications

<b>Indicator name</b>	Existence of a master list of accredited health workforce education and training institutions that is up to date and available in the public domain (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	Existence of a master list of accredited health workforce education and training institutions that is up to date and available in the public domain.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Master list</li> <li>• Accreditation</li> <li>• Health workforce education and training institution</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National Statistical Service</li> <li>• Ministry of Labour and Human Resources</li> <li>• Ministry of Education</li> <li>• Labour Bureau, Ministry of Labour and Employment</li> </ul>
<b>Further information and related links</b>	(UNESCO 2015a, WHO 2015c)

Abbreviated name  
**Duration of education and training**



Dimension: Applications

<b>Indicator name</b>	Duration of health workforce education and training, by health workforce education and training programme
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	Duration of health workforce education and training is the number of years required to complete a full curriculum for each health workforce education and training programme.
<b>Glossary</b>	Health workforce education and training programme
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Education</li> <li>• Database on education and training statistics</li> <li>• Education and training institutions</li> </ul>
<b>Further information and related links</b>	(WHO 2013e, Pan American Health Organization 2011, WHO 2015c)

<b>Indicator name</b>	Ratio of applications for health workforce education and training to training places
<b>Numerator</b>	Number of applications for education and training places
<b>Denominator</b>	Total number of places available
<b>Disaggregation</b>	By health workforce education and training programme, by sex, by health workforce education and training programme and by sex
<b>Definition</b>	Applications for the first year of a health workforce education and training programme divided by the number of training places for this first year.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce education and training place</li> <li>• Health workforce education and training programme</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Education</li> <li>• Ministry of Higher Education</li> <li>• Databases on education and training statistics; education and training institutions</li> </ul>
<b>Further information and related links</b>	(WHO 2013e, Pan American Health Organization 2011, WHO 2015c)

Abbreviated name  
**Ratio of admissions to available places**



Dimension: Admissions

<b>Indicator name</b>	Ratio of admissions in health workforce education and training programmes to available places
<b>Numerator</b>	Total number of admissions in the first year of a health workforce education and training programme
<b>Denominator</b>	Total number of places available for the first year of a health workforce education and training programme
<b>Disaggregation</b>	By health workforce education and training programme, by sex
<b>Definition</b>	Ratio of admissions in health workforce education and training programmes to available places.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Applications</li> <li>• Enrolment</li> <li>• Health workforce education and training programme</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	Databases on education statistics; education and training institutions
<b>Further information and related links</b>	(WHO 2016c, UNESCO 2017)

<b>Indicator name</b>	Ratio of students enrolled in health workforce education and training programmes to qualified educators in a given year
<b>Numerator</b>	Total number of students enrolled in health workforce education and training programmes in a given year
<b>Denominator</b>	Total number of qualified educators for health workforce education and training programmes in the same year
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>Ratio of students enrolled in health workforce education and training to qualified educators in a given year, by health workforce education and training programme.</p> <p>Purpose: To measure the level of human resources input in terms of the number of educators in relation to the size of the student population. The results can be compared to established national norms on the number of students per educator for each health workforce education and training programme.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce education and training place</li> <li>• Health workforce education and training programme</li> <li>• Qualified educators</li> <li>• Students</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	Databases of health education and training institutions
<b>Further information and related links</b>	(UNESCO 2009, UNESCO 2017)

Abbreviated name

## Exit / drop-out rate from education and training programmes



Dimension: Exit / drop out

<b>Indicator name</b>	Rate of students from a cohort exiting a health workforce education and training programme without completion
<b>Numerator</b>	Number of students from a cohort not completing or repeating a year of a health workforce education and training programme
<b>Denominator</b>	Number of students from the same cohort who enrolled in a health workforce education and training programme the previous year
<b>Disaggregation</b>	By health workforce education and training programme, by sex
<b>Definition</b>	<p>Rate of students from a cohort leaving a health workforce education and training programme without completion, by health workforce education and training programme, by sex.</p> <p>The exact drop-out rate can also be calculated from longitudinal information on students following cohorts of students over several years. If such data are available, the drop-out rate estimated on the most recent complete cohort can be reported.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Drop-out</li> <li>• Health workforce education and training programme</li> <li>• Sex</li> <li>• Student</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	Databases of health education and training institutions
<b>Further information and related links</b>	(UNESCO 2009, UNESCO 2017, Pan American Health Organization 2011)

<b>Indicator name</b>	Ratio of the number of students graduating from a health workforce education and training programme to the number of students enrolled in first year of the same education and training programme
<b>Numerator</b>	Number of graduates from a cohort of a health workforce education and training programme
<b>Denominator</b>	Number of students enrolled in first year of the same health workforce education and training programme
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	This indicator aims to approach the graduation rate using data available on an annual basis. The exact graduation rate can also be calculated from longitudinal information on students following cohorts of students. If such data are available, the graduation rate estimated from the most recent complete cohort can be reported.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Graduate</li> <li>• Health workforce education and training programme</li> <li>• Sex</li> <li>• Student</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	Databases of health education and training institutions
<b>Further information and related links</b>	(WHO 2016c, WHO 2015a)





# Module 3

## Education and training regulation and accreditation

### Module summary

Module 3 covers regulation and accreditation of education institutions.

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#### Regulation

**3–01** Standards for the duration and content of education and training

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#### Accreditation

**3–02** Accreditation mechanisms for education and training institutions and their programmes

**3–03** Standards for social accountability

**3–04** Standards for social accountability effectively implemented

**3–05** Standards for social determinants of health

**3–06** Standards for interprofessional education

**3–07** Agreement on accreditation standards

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#### Lifelong learning

**3–08** Continuing professional development

**3–09** In-service training

<b>Indicator name</b>	Existence of national and/or subnational standard on the duration and content of health workforce education and training (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>Existence of national and/or subnational standard on the duration and content of health workforce education and training, by health workforce education and training programme.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Are entry requirements to health workforce education and training programmes established concerning age, previous studies, previously acquired competence by study and past professional experience?</li> <li>2. Are the total number of hours to be spent on health workforce education and training established?</li> <li>3. Is there a list of knowledge, skills and competencies to be acquired during health workforce education and training?</li> </ol>
<b>Glossary</b>	Health workforce education and training programme
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Ministries of Education, Higher Education or similar</li> </ul>
<b>Further information and related links</b>	(European Union 2013, WHO 2013e, WFME 2015)

Abbreviated name

## Accreditation mechanisms for education and training institutions and their programmes



Dimension: Accreditation

<b>Indicator name</b>	Existence of national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Have national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes been established?</li> <li>2. Are national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes compulsory?</li> <li>3. Are there national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes that are not compulsory?</li> <li>4. If established, do national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes take into account national education plans for the health workforce, as described in indicator 09_04?</li> </ol>
<b>Glossary</b>	Accreditation mechanisms
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Ministries of Education, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Legitimate bodies, statutory corporations</li> <li>• Professional council/chamber/association registers</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2013c, WHO Regional Office for the Eastern Mediterranean 2011)
<b>Additional references</b>	(WHO and WFME 2004, Commission on Collegiate Nursing Education 2013, International Pharmaceutical Federation 2014)

<b>Indicator name</b>	Existence of national and/or subnational standards for social accountability in accreditation mechanisms (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is social accountability included or reflected within national and/or subnational standards?</li> <li>2. Is there an involvement of civil society, other social stakeholders and communities in accreditation mechanisms?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Accreditation mechanisms</li> <li>• Accreditation standards</li> <li>• Social accountability</li> <li>• Health workforce education and training programme</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(Boelen and Heck 1995, WHO 2016c, WHO Regional Office for the Eastern Mediterranean 2015)
<b>Additional references</b>	(WHO 2013b, WFME 2015)

# Standards for social accountability effectively implemented

Abbreviated name



Dimension: Accreditation

<b>Indicator name</b>	National and/or subnational standards for social accountability in accreditation mechanisms are effectively implemented (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Do national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programmes require compulsory reporting on implementation of national or subnational standards on social accountability?</li> <li>2. Do the communities served by the health workforce education and training institutions participate in the decision-making of these institutions?</li> <li>3. Do students learn and train in the communities that the health workforce education and training institution serves (community placements)?</li> <li>4. Do health workforce education and training institutions measure their impact on the health system and populations they serve?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Accreditation mechanisms</li> <li>• Accreditation standards</li> <li>• Social accountability</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(WHO 2013b, WHO 2016c, WHO Regional Office for the Eastern Mediterranean 2015)
<b>Additional references</b>	(WFME 2015, Frehywot et al. 2010)

<b>Indicator name</b>	Existence of national and/or subnational standards for the social determinants of health in accreditation mechanisms (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Are the social determinants of health included or reflected within national and/or subnational standards?</li> <li>2. Do health workforce education and training institutions measure social determinants of health in the populations they serve?</li> <li>3. Do health workforce education and training institutions adapt curricula according to social determinants of health in their communities?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Accreditation mechanisms</li> <li>• Accreditation standards</li> <li>• Health workforce education and training programme</li> <li>• Occupation</li> <li>• Social determinants of health</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(WHO 2008b, WHO 2016c, High-Level Commission on Health Employment and Economic 2016)
<b>Additional references</b>	(WHO 2016a, WHO 2013a, WHO 2014)

Abbreviated name  
**Standards for interprofessional education**



Dimension: Accreditation

<b>Indicator name</b>	Existence of national and/or subnational standards for interprofessional education in accreditation mechanisms (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	The following question should guide a response to this indicator: Is interprofessional education included or reflected within national and/or subnational standards?
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Accreditation mechanisms</li> <li>• Accreditation standards</li> <li>• Health workforce education and training programme</li> <li>• Interprofessional education</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(WHO 2010a, WHO 2016c, High-Level Commission on Health Employment and Economic 2016)
<b>Additional references</b>	(WHO 2016a)

<b>Indicator name</b>	Existence of cooperation between health workforce education and training institutions and regulatory bodies to agree on accreditation standards (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a coordinating mechanism or body in place for this task?</li> <li>2. Are various stakeholders at national and institutional level involved in the coordination process?</li> <li>3. Are there institutional mechanisms in place to coordinate accreditation systems, including negotiations with relevant ministries, government agencies and stakeholders?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Accreditation standards</li> <li>• Accreditation systems</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, High-Level Commission on Health Employment and Economic 2016, WHO 2010b)
<b>Additional references</b>	(USAID 2015)



Abbreviated name  
**Continuing professional development**



Dimension: Lifelong learning

<b>Indicator name</b>	Existence of national systems for continuing professional development (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By occupation
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Are there existing national and/or subnational systems for continuing professional development (CPD)?</li> <li>2. If national and/or subnational systems for CPD exist, are they compulsory?</li> <li>3. If compulsory, are they linked to relicensure?</li> <li>4. For occupations that have a national and/or subnational system for CPD, is it integrated into national education plans for the health workforce, for that occupation (see indicator 09_04)?</li> </ol> <p>If both compulsory and voluntary CPD exist for an occupation, then “Existing compulsory” should be chosen.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Continuing professional development</li> <li>• Continuing professional development (mandatory)</li> <li>• Lifelong learning</li> <li>• Occupation</li> <li>• Relicensure</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• National accreditation authorities</li> <li>• Professional bodies or associations</li> <li>• Legitimate bodies, statutory corporations</li> </ul>
<b>Further information and related links</b>	(European Union 2013, OECD 2016)
<b>Additional references</b>	(High-Level Commission on Health Employment and Economic 2016)

<b>Indicator name</b>	Existence of in-service training as an element of national education plans for the health workforce (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By occupation
<b>Definition</b>	<p>Existence of in-service training as an element of national education plans for the health workforce, aligned with the national health plan (see indicator 09_04).</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is in-service training integrated into larger national education-wide sector policies, strategies and plans?</li> <li>2. Does in-service training consider and take into account national policies, strategies and plans for transforming professional, technical and vocational education and training?</li> <li>3. Does in-service training consider and take into account national policies, strategies and plans for adult learning and higher education?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• In-service training</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health, Higher Education or similar</li> <li>• Ministries responsible for labour</li> </ul>
<b>Further information and related links</b>	(WHO 2013d, UNESCO 2015b)



# Module 4

## Education finances

### Module summary

This module addresses financing of and investment in health workforce education and training. It provides a companion to Module 7 – Health workforce spending and remuneration. The module maps and tracks expenditure on health workforce education and training, and provides information on the cost of health workforce development.

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#### Financing of higher education

- 4–01** Total expenditure on higher education
- 4–02** Total expenditure on health workforce education
- 4–03** Average tuition fee per student

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#### Investment

- 4–04** Investment in transformative education and training

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#### Education expenditure

- 4–05** Expenditure per graduate on health workforce education
- 4–06** Cost per graduate of medical specialist education programmes
- 4–07** Cost of qualified educators per graduate

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#### Lifelong learning

- 4–08** Total expenditure on in-service training and continuing professional development

<b>Indicator name</b>	Total expenditure on higher health education
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By public/private (OoP/ODA/other)
<b>Definition</b>	Total expenditure on higher education, by public and private sources.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Higher education</li> <li>• Public expenditure</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Integrated financial management information system: Ministry of Finance; Ministry of Health; Ministry of Education; Ministry of Defence (expenditure on military HWF education may fall under the Ministry of Defence budget)</li> <li>• Education management information system: Ministry of (Higher) Education; ministry or other accredited bodies responsible for technical and vocational education and training</li> <li>• National Bureau of Statistics – Government financial statistics departments</li> <li>• National Education Accounts</li> </ul>
<b>Further information and related links</b>	UNESCO 2016, OECD 2011a)
<b>Additional references</b>	(UNESCO-IIEP 2015, OECD 2017f)

Abbreviated name  
**Total expenditure on health workforce education**



Dimension: Financing of higher education

<b>Indicator name</b>	Total expenditure on health workforce pre-service education (current and capital)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By public/private (OoP and ODA)
<b>Definition</b>	<p>Total expenditure on health workforce education (current and capital) by public/private sources.</p> <p>Education here refers to pre-service education and does not include in-service education and training.</p> <p>Calculation method: divide total public expenditure on health workforce education in a given financial year by the gross national income of the country for the corresponding year and multiply by 100.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Total public expenditure</li> <li>• Pre-service education</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Integrated Financial Management Information System; Ministry of Finance; Ministry of Health; Ministry of Education; Ministry of Defence (expenditure on military HWF education may fall under the Ministry of Defence budget)</li> <li>• Education Management Information System: Ministry of (Higher) Education; ministry or other accredited bodies responsible for technical and vocational education and training</li> <li>• National Bureau of Statistics – Government financial statistics departments</li> <li>• National Health Accounts</li> <li>• National Education Accounts</li> </ul>
<b>Further information and related links</b>	(UNESCO 2009, UNESCO 2016, UNESCO-IIEP 2015)
<b>Additional references</b>	(OECD 2017f, OECD 2011a)

<b>Indicator name</b>	Average tuition fee per student per year enrolled in health workforce education and training
<b>Numerator</b>	Total tuition fees paid by students enrolled in health workforce education and training programmes for a given year
<b>Denominator</b>	Total number of students paying tuition fees enrolled in health workforce education and training programmes for a given year
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	<p>Average tuition fee per student enrolled in health workforce education and training per year, by health workforce education and training programme.</p> <p>This computation should exclude students exonerated from paying tuition fees.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce education and training programme</li> <li>• Student</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Finance</li> <li>• Ministry of Education</li> <li>• Databases on education statistics</li> <li>• Education and training institutions</li> </ul>
<b>Further information and related links</b>	(The World Bank 2015, UNESCO 2016)

Abbreviated name  
**Investment in transformative education and training**



Dimension: Investment

<b>Indicator name</b>	Investment in transformative education and training (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Existence of national health workforce strategies and national institutional financing reforms that identify and commit adequate budgetary resources for investment in transformative education.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Has a mechanism been established and/or supported to increase sustainable financing for expanding and transforming the health workforce?</li> <li>2. Do national health workforce strategies and institutional financing reforms identify and commit, respectively, adequate funding for investment in the International Health Regulations core capacities, including skills development of national and international health workers in humanitarian settings and public health emergencies?</li> <li>3. Is guidance available on financing lifelong learning systems that can strengthen priority health and social workforce cadres (including community-based health workers), and achieve integrated people- centred care?</li> </ol>
<b>Glossary</b>	Transformative education
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Integrated Financial Management Information System: Ministry of Finance; Ministry of Health; Ministry of Education; Ministry of Defence (expenditure on military HWF education may fall under this budget)</li> <li>• Education Management Information System: Ministry of (Higher) Education; ministry or other accredited body responsible for technical and vocational education and training</li> <li>• National Bureau of Statistics – Government financial statistics departments</li> <li>• National Health Accounts</li> <li>• National Education Accounts</li> </ul>
<b>Further information and related links</b>	(High-Level Commission on Health Employment and Economic 2016)

<b>Indicator name</b>	Expenditure per graduate enrolled in health workforce education and training programme
<b>Numerator</b>	Total expenditure on health workforce education
<b>Denominator</b>	Total number of graduates from health workforce education and training programmes
<b>Disaggregation</b>	By health workforce education and training programme, by institution ownership
<b>Definition</b>	Expenditure on health workforce education per graduate, by health workforce education and training programme, by institution ownership (public or private).
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce education and training programme</li> <li>• Graduate</li> <li>• Total expenditure on health workforce education</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Integrated Financial Management Information System: Ministry of Finance; Ministry of Health; Ministry of Education; Ministry of Defence (expenditure on military HWF education may fall under this budget)</li> <li>• Education Management Information System: Ministry of (Higher) Education; ministry or other accredited body responsible for technical and vocational education and training</li> <li>• National Bureau of Statistics – Government financial statistics departments</li> <li>• National Health Accounts</li> <li>• National Education Accounts</li> </ul>
<b>Further information and related links</b>	(OECD 2011a, UNESCO-IIEP 2015, UNESCO 2016)



# Cost per graduate of medical specialist education programmes

Abbreviated name



Dimension: Education expenditure

<b>Indicator name</b>	Recurrent costs of specialist medical education per graduate
<b>Numerator</b>	Total cost of specialist medical education
<b>Denominator</b>	Number of graduates from medical specialist programmes
<b>Disaggregation</b>	By specialty, by public/private (OoP and ODA)
<b>Definition</b>	Recurrent costs of education per graduate, by occupation, and by institutional sector. Specialties follow the OECD/Eurostat/WHO-EURO Joint Questionnaire list of medical specialties.
<b>Glossary</b>	Graduate
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Finance</li> <li>• Ministry of Education</li> <li>• Databases on education statistics</li> <li>• Education and training institutions</li> </ul>
<b>Further information and related links</b>	(EU Joint Action on Health Workforce Planning and Forecasting 2015, UNESCO 2016, OECD et al. 2016)

<b>Indicator name</b>	Cost of qualified educators per graduate
<b>Numerator</b>	Total recurrent costs of qualified educators
<b>Denominator</b>	Number of graduates from health workforce education and training programmes
<b>Disaggregation</b>	By health workforce education and training programme
<b>Definition</b>	Cost of qualified educators per graduate, by health workforce education and training programme.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce education and training programme</li> <li>• Graduate</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Finance</li> <li>• Ministry of Education</li> <li>• Databases on education statistics</li> <li>• Education and training institutions</li> </ul>
<b>Further information and related links</b>	(OECD 2011a, UNESCO-IIEP 2015, The World Bank 2015)
<b>Additional references</b>	(UNESCO 2016)

Abbreviated name

## Total expenditure on in-service training and continuing professional development



Dimension: Lifelong learning

<b>Indicator name</b>	Total expenditure on in-service training and continuing professional development
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By occupation, by public/private (OoP and ODA)
<b>Definition</b>	Total expenditure on in-service training and continuing professional development.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Continuing professional development</li> <li>• In-service training</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Integrated Financial Management Information System: Ministry of Finance; Ministry of Health; Ministry of Education; Ministry of Defence (expenditure on military HWF education may fall under this budget)</li> <li>• Education Management Information System: Ministry of (Higher) Education; ministry or other accredited body responsible for technical and vocational education and training</li> <li>• National Bureau of Statistics – Government financial statistics departments</li> <li>• National Health Accounts</li> <li>• National Education Accounts</li> </ul>
<b>Further information and related links</b>	(WHO 2013e, UNESCO 2016)





# Module 5

## Health labour market flows

### Module summary

Module 5 addresses the entries into and exits from the health labour market, and labour market imbalances. Indicators on entries differentiate the results of domestic efforts and dependency on foreign health workers; in addition, both voluntary and involuntary exits are monitored. The selected indicators relate to the GSHRH target on the reduction of barriers to access to health services, through the creation, filling and sustaining of jobs in the health and social care sectors.

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#### Entry into labour market

- 5-01** Graduates starting practice within one year
- 5-02** Replenishment rate from domestic efforts
- 5-03** Entry rate of foreign health workers

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#### Exit from labour market

- 5-04** Voluntary exit rate from health labour market
- 5-05** Involuntary exit rate from health labour market

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#### Labour market imbalances

- 5-06** Unemployment rate
- 5-07** Vacancy rate

<b>Indicator name</b>	Ratio of previous year graduates who started practice to total number of previous year graduates
<b>Numerator</b>	Number of previous year graduates who started practice within one year after graduation
<b>Denominator</b>	Number of previous year graduates
<b>Disaggregation</b>	By occupation, by occupation and sex
<b>Definition</b>	<p>Ratio of previous year graduates who started practice within one year after graduation to total number of previous year graduates, by occupation.</p> <p>For physicians, graduates who started internship/residency training after graduation are included in the list of graduates who started practice.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Occupation</li> <li>• Graduate</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Database on graduates of education and training programmes (individual or aggregate data)</li> <li>• Professional council/chamber/association registers</li> </ul>
<b>Further information and related links</b>	(WHO 2015c)

Abbreviated name  
**Replenishment rate from domestic efforts**



Dimension: Entry into labour market

<b>Indicator name</b>	Ratio of newly active domestic trained health workers to total stock of active health workers
<b>Numerator</b>	Number of newly active domestic trained health workers
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and sex
<b>Definition</b>	<p>Newly active health workers: health workers who started their activity in the given profession. In case data are available only for newly licensed health workers, the total number of licensed health workers should be used as denominator regardless of availability of data on active health workers. Only domestic trained health workers should be included. Health workers who started their activity after a temporary leave should also be counted.</p> <p>For total number of active health workers, data at the middle or the end of the reference year should be used.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Activity level</li> <li>• Domestic trained health worker</li> <li>• Newly active health worker</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health database</li> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> </ul>
<b>Further information and related links</b>	(WHO et al. 2009, USAID and CapacityPlus 2015, WHO 2015c)

<b>Indicator name</b>	Percentage of newly active foreign-trained health workers to total stock of active health workers
<b>Numerator</b>	Number of newly active foreign-trained health workers (in the given year)
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and sex
<b>Definition</b>	<p>Newly active health workers: health workers who start their activity in the given year in the given profession. In the event data are only available on newly licensed health workers, the total number of licensed health workers should be used as denominator regardless of availability of data on active health workers. In the absence of data on foreign-trained health workers, the number of foreign-born health workers starting practice can be used.</p> <p>For the total number of active health workers, data at the middle or the end of the year should be used.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Foreign-born health worker</li> <li>• Foreign-trained health worker</li> <li>• Newly active health worker</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health database</li> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2016, WHO et al. 2009, WHO 2015c)
<b>Additional references</b>	(USAID and CapacityPlus 2015, EU Joint Action on Health Workforce Planning and Forecasting 2016a, OECD 2015a, OECD 2016)



Abbreviated name

## Voluntary exit rate from health labour market



Dimension: Exit from labour market

<b>Indicator name</b>	Ratio of active health workers voluntarily leaving the health sector labour market to total stock of active health workers
<b>Numerator</b>	Number of health workers who became inactive in the health sector labour market due to emigration, temporary leave, change of sector, early retirement or other voluntary reason (in the given year)
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and sex
<b>Definition</b>	<p>Percentage of active health workers who became inactive in the health sector labour market due to emigration, temporary leave, change of sector, early retirement or other voluntary reason, disaggregated by occupation and by sex.</p> <p>For the total number of active health workers, data at the end of the previous year should be used.</p> <p>Only early retirement should be considered as voluntary exit; retirement at standard age is to be counted in the involuntary exit 05_05.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Activity level</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> </ul>
<b>Further information and related links</b>	(WHO et al. 2009, WHO 2007, EU Joint Action on Health Workforce Planning and Forecasting 2015)
<b>Additional references</b>	(WHO 2015a, USAID and CapacityPlus 2015, WHO 2015c, WHO Regional Office for the Western Pacific 2007)

Dimension: Exit from labour market

<b>Indicator name</b>	Ratio of active health workers involuntarily leaving the health sector labour market to total stock of active health workers, by occupation, by sex
<b>Numerator</b>	Number of health workers who became inactive in the health sector labour market due to death, retirement (excluding early retirement), suspension from work, long-term illness or other involuntary reason (in the given year)
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and sex
<b>Definition</b>	For total number of active health workers, data at the end of the previous year should be used. Retirement only includes workers stopping their activity at the standard age of retirement. Early retirement is excluded from this indicator and should be counted in the voluntary exit under 05_04.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Activity level</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Health workforce registry or database</li> <li>• Professional council/chamber/association registers</li> <li>• Aggregate data from health facilities (routine administrative records, Health Management Information System, District Health Information System census and/or survey)</li> <li>• Data from pension and/or retirement administration units</li> <li>• Mortality records</li> </ul>
<b>Further information and related links</b>	(WHO et al. 2009, WHO 2007, EU Joint Action on Health Workforce Planning and Forecasting 2015)
<b>Additional references</b>	(WHO 2015a, USAID and CapacityPlus 2015, WHO 2015c, WHO Regional Office for the Western Pacific 2007)

Dimension: Labour market imbalances

<b>Indicator name</b>	Unemployment rate
<b>Numerator</b>	Number of trained health workers currently unemployed
<b>Denominator</b>	Total number of active health workers in the labour force and unemployed health workers
<b>Disaggregation</b>	By occupation, by occupation and sex, by occupation and subnational level
<b>Definition</b>	<p>Unemployment rate as defined by national employment standard. Persons in unemployment are those of legal working age who are not currently employed, but who have actively sought employment and are available to take up a job opportunity. New graduates not in activity should also be included.</p> <p>For unemployed persons, occupation refers to the last job they held for which they are qualified. If information on the “last job held” is missing, the “occupation in which the jobseeker is seeking work” can be used.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Employment</li> <li>• Unemployment</li> <li>• Unemployment rate</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Statistics from employment offices</li> <li>• Labour force surveys</li> <li>• National health accounts surveys</li> <li>• Population census data</li> </ul>
<b>Further information and related links</b>	(International Labour Organization 2013, Eurostat 2017a, WHO et al. 2009)
<b>Additional references</b>	(USAID and CapacityPlus 2015)

Dimension: Labour market imbalances

<b>Indicator name</b>	Ratio of unfilled posts to total number of posts
<b>Numerator</b>	Number of funded full-time posts that have not been filled for at least six months, which employers are actively trying to fill
<b>Denominator</b>	Total number of funded full-time posts (filled and unfilled)
<b>Disaggregation</b>	By occupation, by occupation and by subnational level
<b>Definition</b>	Ratio of unfilled posts to total number of posts, by occupation and by subnational level.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Occupation</li> <li>• Job vacancy</li> <li>• Subnational level</li> <li>• Vacancy rate</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Labour force surveys</li> <li>• Health facility assessments</li> <li>• Employment offices and/or job agencies</li> </ul>
<b>Further information and related links</b>	(WHO Regional Office for the Western Pacific 2007, WHO et al. 2009, Eurostat 2010)



# Module 6

## Employment characteristics and working conditions

### Module summary

This module addresses employment characteristics and working conditions. It can facilitate the progressive implementation and review of labour market analyses, especially in combination with Module 5. It includes dimensions covering working time and labour market characteristics, which are essential to understanding health workforce dynamics, and builds upon important initiatives such as the International Labour Standards on Working time and on Work-life balance. The indicators under working conditions and the dimension of decent work can serve as input for progressing towards decent work for all, as promoted by SDG 6.

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#### Working time

- 6-01** Standard working hours
- 6-02** Health workers with a part-time contract

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#### Decent work

- 6-03** Regulation on working hours and conditions
- 6-04** Regulation on minimum wage
- 6-05** Regulation on social protection

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#### Labour market characteristics

- 6-06** Health worker status in employment
- 6-07** Regulation on dual practice
- 6-08** Regulation on compulsory service

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#### Working conditions

- 6-09** Measures to prevent attacks on health workers
- 6-10** Attacks on health-care system

<b>Indicator name</b>	Number of standard working hours per week as per national law/standards
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	At national level, by occupation if applicable
<b>Definition</b>	<p>Number of standard working hours per week as per national law/standards.</p> <p>Report standard working hours at national level, and disaggregate by occupation if regulations on standard working hours vary by occupation.</p>
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Employment laws, policies and regulations</li> <li>• Collective agreements</li> </ul>
<b>Further information and related links</b>	(Lee et al. 2007)

Abbreviated name

## Health workers with a part-time contract



Dimension: Working time

<b>Indicator name</b>	Percentage of employed health workers with a part-time contract
<b>Numerator</b>	Number of active health workers who have an employment contract that is below the national standard working hours, defined in headcounts
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation, by occupation and facility ownership
<b>Definition</b>	Ratio of employed health workers with a part-time contract to the total health workforce.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Part-time employment</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Facility database and/or surveys</li> <li>• Health workforce registry or database</li> <li>• Labour force surveys</li> <li>• Public service human resource and payroll administrations</li> </ul>
<b>Further information and related links</b>	(OECD 2017g)

<b>Indicator name</b>	Existence of national/subnational policies/laws regulating working hours and conditions (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By occupation
<b>Definition</b>	<p>Existence of national/subnational policies/laws regulating working hours and conditions. This indicator is measured by the following questions:</p> <p>Has the government and its competent authorities regulated:</p> <ol style="list-style-type: none"> <li>1. the maximum number of working days allowed per week?</li> <li>2. the premium for night work, for work on a weekly rest day, for overtime work (as a percentage of hourly pay)?</li> <li>3. whether non-pregnant and non-nursing women can work the same night hours as men?</li> <li>4. whether there are restrictions on night work, overtime or holiday work?</li> <li>5. the average paid annual leave for workers with 1, 5 and 10 years of tenure?</li> <li>6. whether regulations, laws or policies differ according to employment status?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Status in employment</li> <li>• Occupation</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Employment laws, policies and regulations
<b>Further information and related links</b>	(The World Bank 2017a)



Abbreviated name  
**Regulation on minimum wage**



Dimension: Decent work

<b>Indicator name</b>	Existence of national/subnational policies/laws regulating minimum wage (Yes/No)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	Existence of national/subnational policies/laws regulating minimum wage. This indicator is measured by the following capability question: Are health workers eligible to receive a minimal wage according to national/subnational laws?
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Employment laws, policies and regulations
<b>Further information and related links</b>	(International Labour Organization 2008)

<b>Indicator name</b>	Existence of national/subnational policies/laws regulating social protection (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Existence of national/subnational policies/laws regulating social protection. This indicator is measured by the following capability questions:</p> <p>Is there a national policy or programme regarding:</p> <ol style="list-style-type: none"> <li>1. maternity leave or pregnancy leave?</li> <li>2. parental leave?</li> <li>3. childcare support?</li> <li>4. leave entitlements to care for sick family members?</li> <li>5. leave entitlements for in-service training and continuing professional development?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Childcare support</li> <li>• Continuing professional development</li> <li>• In-service training</li> <li>• Leave entitlements to care for sick family members</li> <li>• Parental leave</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Employment laws, policies and regulations</li> <li>• Social security records</li> </ul>
<b>Further information and related links</b>	(OECD 2017e)

Abbreviated name  
**Health worker status in employment**



Dimension: Labour market characteristics

<b>Indicator name</b>	Percentage of active health workers who are self-employed
<b>Numerator</b>	Number of active health workers who are self-employed, defined in headcounts
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	By occupation
<b>Definition</b>	Percentage of health workers who are self-employed, by occupation.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Status in employment</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Facility surveys</li> <li>• Health worker registries</li> <li>• Public service human resources and payroll administrations</li> <li>• Labour force surveys</li> </ul>
<b>Further information and related links</b>	(WHO et al. 2009)

<b>Indicator name</b>	Existence of national/subnational policies/laws regulating dual practice (Yes/No)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Existence of national/subnational policies/laws regulating dual practice.</p> <p>This indicator is measured by the following capability questions:</p> <p>Is there a national policy or programme regarding:</p> <ol style="list-style-type: none"> <li>1. health workers working in a public service provision role and a role external to public services, i.e. in a completely separate private environment?</li> <li>2. health workers working in a public service provision role and a parallel role, i.e. in a private ward or clinic physically associated with a public facility but run as a separate business?</li> <li>3. health workers working in a public service provision role and another role within the public service, i.e. where private services are offered inside a public facility but outside public service operating hours or space?</li> </ol>
<b>Glossary</b>	Dual practice
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Employment laws, policies and regulations
<b>Further information and related links</b>	(McPake et al. 2016)

Abbreviated name  
**Regulation on compulsory service**



Dimension: Labour market characteristics

<b>Indicator name</b>	Existence of national/subnational policies/laws regulating compulsory service (Yes/No)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Existence of national/subnational policies/laws regulating compulsory service.</p> <p>This indicator is measured by the following capability questions:</p> <p>Is there a national policy or programme regarding:</p> <ol style="list-style-type: none"> <li>1. condition of service/state employment programmes for health workers?</li> <li>2. compulsory service with incentives for health workers?</li> <li>3. compulsory service without incentives for health workers?</li> </ol>
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Employment laws, policies and regulations
<b>Further information and related links</b>	(Frehywot et al. 2010)

<b>Indicator name</b>	Existence of national/subnational policies/laws for prevention of attacks on health workers (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is measured by capability questions on governmental measures to prevent incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health.</p> <p>Has the government and its competent authorities:</p> <ol style="list-style-type: none"> <li>1. made the reduction/elimination of workplace violence in the health sector an essential part of national/regional/local policies and plans on occupational health and safety, human rights protection, economic sustainability, enterprise development and gender equality?</li> <li>2. promoted the participation of all parties concerned with such policies and plans?</li> <li>3. revised labour laws and other legislation and introduced special legislation where necessary, and ensured the enforcement of such legislation?</li> <li>4. encouraged the inclusion of provisions to reduce and eliminate workplace violence in national, sectoral and workplace/enterprise agreements?</li> <li>5. requested the collection of information and statistical data on the spread, causes and consequences of workplace violence?</li> </ol>
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Government or legislative records
<b>Further information and related links</b>	(International Labour Office et al. 2002)

Abbreviated name  
**Attacks on health-care system**



Dimension: Working conditions

<b>Indicator name</b>	Number of attacks on health-care system in the past 12 months
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By primary object of attack
<b>Definition</b>	<p>Number of attacks on health-care system in the past 12 months, by primary object of attack:</p> <ul style="list-style-type: none"> <li>• Facility</li> <li>• Health-care provider</li> <li>• Transport</li> <li>• Patient.</li> </ul> <p>For health-care providers and patients, both components of physical and psychological attacks should be considered as follows:</p> <ul style="list-style-type: none"> <li>• Physical attacks: intentional use of physical force that harms another person physically, sexually or psychologically</li> <li>• Psychological attacks: intentional use of mental force, including threat of physical force, that can result in harm to physical, mental, spiritual, moral or social development. This includes verbal abuse, bullying/mobbing, harassment, and threats.</li> </ul>
<b>Glossary</b>	Primary object of attack
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• ILO/ICN/WHO/PSI Workplace Violence in the Health Sector: Survey Questionnaire</li> <li>• Labour force surveys</li> <li>• Police records</li> </ul>
<b>Further information and related links</b>	(WHO 2017a, International Labour Office et al. 2003)







# Module 7

## Health workforce spending and remuneration

### Module summary

This module addresses spending on, and remuneration of the health workforce. It provides, along with Module 4, the overall economic environment of the health workforce. It focuses in particular on its role in the inflows and outflows, as well as distribution across sectors, of health workers depicted in Modules 1, 5 and 8. Global statistics on health workforce expenditure in indicators 07\_01 and 07\_02 provide the overall resources dedicated to the health workforce. Indicators 07\_03 to 07\_06 provide details on the actual remuneration of health workers that could influence the attractiveness of health jobs. Indicator 07\_07 relates to remuneration and addresses specifically the gender wage gap.

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#### Health workforce expenditure

**7–01** Total expenditure on health workforce

**7–02** Total official development assistance on health workforce

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#### Health workforce remuneration

**7–03** Total expenditure on compensation of health workers

**7–04** Public expenditure on compensation of health workers

**7–05** Entry-level wages and salaries

**7–06** Policies on public sector wage ceilings

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#### Decent work

**7–07** Gender wage gap

<b>Indicator name</b>	Total expenditure on health workforce
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By facility ownership
<b>Definition</b>	Total expenditure on health workforce.
<b>Glossary</b>	Total expenditure on health workforce
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"><li>• Income tax data</li><li>• Ministry of Health records</li><li>• Ministry of Finance records</li><li>• National Statistics Office records</li></ul>
<b>Further information and related links</b>	(OECD et al. 2011, OECD et al. 2016, OECD 2011c)
<b>Additional references</b>	(WHO 2007, WHO Regional Office for Europe 2015)

Abbreviated name

## Total official development assistance on health workforce



Dimension: Health workforce expenditure

<b>Indicator name</b>	Total incoming financial support received from official development assistance allocated to health workforce
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	Total incoming financial support received from official development assistance, including scholarships and grants allocated to the health workforce, not only for wages but also salaries, training, and social protection.
<b>Glossary</b>	Official development assistance
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health records</li> <li>• Ministry of Finance records</li> <li>• National Statistical Office records</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2011, OECD 2011c)
<b>Additional references</b>	(WHO 2007)

<b>Indicator name</b>	Total expenditure on compensation of health workers
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By health care financing scheme
<b>Definition</b>	Total expenditure on compensation of health workers by health-care financing scheme.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Occupation</li> <li>• Remuneration</li> <li>• Health-care financing scheme</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<p>Wage and salaried workers (employees):</p> <ul style="list-style-type: none"> <li>• Ministry of Health records</li> <li>• Ministry of Finance records</li> <li>• Payroll data</li> <li>• Income tax data</li> <li>• General labour force surveys</li> <li>• Specific health worker surveys</li> </ul> <p>Self-employed workers:</p> <ul style="list-style-type: none"> <li>• Public/social health insurance</li> <li>• Income tax data</li> <li>• Specific health worker surveys</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2011, OECD 2011c)
<b>Additional references</b>	(WHO 2007)

Abbreviated name

## Public expenditure on compensation of health workers



Dimension: Health workforce remuneration

<b>Indicator name</b>	Public expenditure on compensation of health workers
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By compensation of employees
<b>Definition</b>	Expenditure on compensation of health workers from the public sector disaggregated by wages and salaries of employees, social contributions, and all others costs related to employees.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Remuneration</li> <li>• Compensation of employees</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<p>Wage and salaried workers (employees):</p> <ul style="list-style-type: none"> <li>• Ministry of Health records</li> <li>• Ministry of Finance records</li> <li>• Payroll data</li> <li>• Income tax data</li> <li>• General labour force surveys</li> <li>• Specific health worker surveys</li> </ul> <p>Self-employed workers:</p> <ul style="list-style-type: none"> <li>• Public/social health insurance</li> <li>• Income tax data</li> <li>• Specific health worker surveys</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2011, OECD 2011c)
<b>Additional references</b>	(WHO 2007)

<b>Indicator name</b>	Average entry-level wage and salary excluding social contributions
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	By occupation, by facility ownership, by occupation and facility ownership
<b>Definition</b>	<p>Average wage or salary received by health workers when entering the active health labour market, excluding social contributions.</p> <p>Disaggregation by facility ownership is suggested to distinguish between public versus private wages and salaries.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Remuneration</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<p>Wage and salaried workers (employees):</p> <ul style="list-style-type: none"> <li>• Ministry of Health records</li> <li>• Ministry of Finance records</li> <li>• Payroll data</li> <li>• Income tax data</li> <li>• General labour force surveys</li> <li>• Specific health worker surveys</li> </ul> <p>Self-employed workers:</p> <ul style="list-style-type: none"> <li>• Public/social health insurance</li> <li>• Income tax data</li> <li>• Specific health worker surveys</li> </ul>
<b>Further information and related links</b>	(OECD et al. 2011, OECD 2011c)
<b>Additional references</b>	(WHO 2007)

Abbreviated name  
**Policies on public sector wage ceilings**



Dimension: Health workforce remuneration

<b>Indicator name</b>	Existence of national/subnational policies or standards on public sector wage ceilings (Yes/No)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	Existence of national/subnational policies or standards on public sector wage ceilings. Such policies would generally be applicable not only to the health sector, but to the whole public sector.
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	Employment laws, policies and standards

<b>Indicator name</b>	Gender wage gap
<b>Numerator</b>	Difference between median earnings of men and women
<b>Denominator</b>	Median earnings of men
<b>Disaggregation</b>	By occupation, by occupation and status in employment, by occupation and sex
<b>Definition</b>	The gender wage gap is the unadjusted difference between median earnings of men and women relative to median earnings of men. Data refer to full-time employees and to the self-employed.
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Active health worker</li> <li>• Occupation</li> <li>• Remuneration</li> <li>• Status in employment</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<p>Wage and salaried workers (employees):</p> <ul style="list-style-type: none"> <li>• Ministry of Health records</li> <li>• Ministry of Finance records</li> <li>• Payroll data</li> <li>• Income tax data</li> <li>• General labour force surveys</li> <li>• Specific health worker surveys</li> </ul> <p>Self-employed workers:</p> <ul style="list-style-type: none"> <li>• Public/social health insurance</li> <li>• Income tax data</li> <li>• Specific health worker surveys</li> </ul>
<b>Further information and related links</b>	(OECD 2017b)





# Module 8

## Skill-mix composition for models of care

### Module summary

This module contains indicators on skill mix composition of the health workforce. It builds upon the other module indicators by decomposing the structure of the workforce by sector and occupational group. The last two indicators provide information on the availability of human resources to implement the International Health Regulations (WHO 2005a) and the existence of an applied epidemiology training programme.

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#### Sectoral workforce composition

- 8-01** Percentage of health workforce working in hospitals
- 8-02** Percentage of health workforce working in residential long-term care facilities
- 8-03** Percentage of health workforce working in ambulatory health care

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#### Skill distribution

- 8-04** Specialist surgical workforce
- 8-05** Family medicine practitioners
- 8-06** Existence of advanced nursing roles

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#### International Health Regulation capacity

- 8-07** Availability of human resources to implement the International Health Regulations
- 8-08** Applied epidemiology training programme

<b>Indicator name</b>	Percentage of health workforce working in hospitals
<b>Numerator</b>	Total number of active health workers working in hospitals, defined in headcounts
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Percentage of health workers working in hospitals among all health workers.</p> <p>Hospitals are defined as all types of hospitals, following the International Classification for Health Accounts 2011 (including HP1.1 General hospitals, HP1.2 Mental health hospitals, and HP1.3 Other specialized hospitals).</p>
<b>Glossary</b>	Health workforce
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National labour force surveys</li> <li>• National health workforce registries or databases</li> </ul>
<b>Further information and related links</b>	(WHO 2015a, OECD et al. 2016, International Labour Organization 2012)

Abbreviated name

## Percentage of health workforce working in residential long-term care facilities



Dimension: Sectoral workforce composition

<b>Indicator name</b>	Percentage of health workforce working in residential long-term care facilities
<b>Numerator</b>	Total number of active health workers working in residential long-term care facilities, defined in headcounts
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Percentage of health workers, excluding social care workers, working in residential long-term care among all health workers.</p> <p>A residential long-term care facility is any type of nursing and residential care facility defined in the HP2.1 and HP2.9 categories of the International Classification for Health Accounts 2011.</p>
<b>Glossary</b>	Health workforce
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National labour force surveys</li> <li>• National health workforce registries or databases</li> </ul>
<b>Further information and related links</b>	(WHO 2015a, OECD et al. 2016, International Labour Organization 2012)

<b>Indicator name</b>	Percentage of health workforce working in ambulatory health care (primary health care level facilities)
<b>Numerator</b>	Total number of active health workers working in ambulatory health care presumed to be primary health care level facilities, defined in headcounts
<b>Denominator</b>	Total number of active health workers, defined in headcounts
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Percentage of health workforce working in ambulatory health care presumed to be primary health care level facilities.</p> <p>Ambulatory care provision refers to individuals and organizations that deliver personal health-care services on an outpatient basis. This includes diagnosis, observation, consultation, treatment, intervention, rehabilitation services, and advanced medical technology and procedures even when provided outside of hospitals.</p>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Health workforce</li> <li>• Ambulatory care provision</li> </ul>
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National labour force surveys</li> <li>• National health workforce registries or databases</li> </ul>
<b>Further information and related links</b>	(Berman 2000, WHO 2015a, International Labour Organization 2012)

Abbreviated name  
**Specialist surgical workforce**



Dimension: Skill distribution

<b>Indicator name</b>	Density of specialist surgical workers per 100 000 population
<b>Numerator</b>	Total number of specialist surgical workers, defined in headcounts
<b>Denominator</b>	Total population
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	Density of specialist surgical workers, classified in ISCO-08 with code 2212, per 100 000 population. Specialist surgical workers are surgeons, obstetricians and anaesthesiologists.
<b>Glossary</b>	Health workforce
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National labour force surveys</li> <li>• National health workforce registries or databases</li> <li>• National medical specialist registries or databases</li> <li>• Population census data</li> </ul>
<b>Further information and related links</b>	(International Labour Organization 2012, The World Bank 2017b, WHO 2017d)

<b>Indicator name</b>	Density of family medicine practitioners per 100 000 population
<b>Numerator</b>	Total number of family medicine practitioners, defined in headcounts
<b>Denominator</b>	Total population
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Density of family medicine practitioners per 100 000 population.</p> <p>Family medicine practitioners are part of the generalist medical practitioners classified in ISCO-08 with code 2212. They are referred to as general practitioners in some countries, and as a specialization in others. They should provide person-centred, continuous and comprehensive medical care to individuals and families in their communities.</p> <p>This group does not include resident medical officers, medical interns or other generalist medical practitioners not in general practice activities.</p>
<b>Glossary</b>	Family medicine practitioner
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National labour force surveys</li> <li>• National health workforce registries or databases</li> <li>• National medical specialist registries or databases</li> <li>• Population census data</li> </ul>
<b>Further information and related links</b>	(International Labour Organization 2012)

Abbreviated name  
**Existence of advanced nursing roles**



Dimension: Skill distribution

<b>Indicator name</b>	Existence of advanced nursing roles (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is measured (or supported) by the following (capability) questions:</p> <ol style="list-style-type: none"> <li>1. Is there a commonly accepted definition of ‘nurse practitioner’?</li> <li>2. Is there another commonly accepted definition of other types of nurses working in advanced roles?</li> <li>3. Are there formal requirements to become a nurse practitioner or other type of advanced-practice nurse in terms of specified training, qualifications, experience, certification/registration, etc.?</li> <li>4. Are there ad-hoc/local methods for nurses being trained “on the job” to acquire specific skills that could lead to their employment in advanced roles?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Nurse practitioner</li> <li>• Advanced practice nurse</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Survey among country experts or informants</li> <li>• Policy and strategic documents of governments and competent authorities</li> </ul>
<b>Further information and related links</b>	(Buchan and Calman 2004, Delamaire and Lafortune 2010, ICN 2017)

# Availability of human resources to implement the International Health Regulations

Dimension: International Health Regulation capacity

<b>Indicator name</b>	Availability of human resources to implement International Health Regulation core capacity requirements (None/ Limited/ Developed/ Demonstrated/ Sustainable)	
<b>Numerator</b>	Not applicable	
<b>Denominator</b>	Not applicable	
<b>Disaggregation</b>	Not applicable	
<b>Definition</b>	<p>This indicator is measured (or supported) by the following (capability) items:</p> <ul style="list-style-type: none"> <li>No multidisciplinary human resource capacity available to implement IHR core capacities</li> <li>Multidisciplinary human resource capacity (epidemiologists, veterinarians, clinicians and laboratory specialists or technicians) available at national level</li> <li>Multidisciplinary human resource capacity available at national and intermediate level</li> <li>Multidisciplinary human resource capacity available as required at relevant levels of public health system (e.g. epidemiologist at national and intermediate level and assistant epidemiologist (or short course trained epidemiologist) at local level available)</li> <li>Capacity to send and receive multidisciplinary personnel within country (shifting resources) and internationally</li> </ul>	
<b>Glossary</b>	<ul style="list-style-type: none"> <li>International Health Regulations</li> <li>Public health workforce</li> </ul>	
<b>Data reporting frequency</b>	Every three years	
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>Ministry of Health</li> <li>Public health institutions</li> </ul>	
<b>Further information and related links</b>	(WHO 2005b)	



Abbreviated name  
**Applied epidemiology training programme**



Dimension: International Health Regulation capacity

<b>Indicator name</b>	Existence of an applied epidemiology training programme (None/ Limited/ Developed/ Demonstrated/ Sustainable)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is measured (or supported) by the following (capability) items:</p> <ul style="list-style-type: none"> <li>• No Field Epidemiology Training Programme (FETP) or applied epidemiology training programme established No capacity</li> <li>• No FETP or applied epidemiology training programme is established within the country, but staff participate in a programme hosted in another country through an existing agreement (at basic, intermediate and/or advanced level) Limited capacity</li> <li>• One level (basic, intermediate, advanced) of FETP or comparable applied epidemiology training programme in place in the country or in another country through an existing agreement Developed capacity</li> <li>• Two levels (basic, intermediate and/or advanced) of FETP or comparable applied epidemiology training programme(s) in place in the country or in another country through an existing agreement Demonstrated capacity</li> <li>• Three levels (basic, intermediate, advanced) of FETP or comparable applied epidemiology training programme(s) in place in the country or in another country through an existing agreement, with sustainable national funding Sustainable capacity</li> </ul>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Field Epidemiology Training Programme</li> <li>• International Health Regulations</li> <li>• Public health workforce</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Public health institutions</li> <li>• Educational and training institutions</li> </ul>
<b>Further information and related links</b>	(WHO 2005b)





# Module 9

## Governance and health workforce policies

### Module summary

The indicators in this module assess available mechanisms to effectively manage health workforce planning at national or regional level, and build on the information gathered under indicators presented in the other modules. This module consists of two governance and three health workforce policy indicators. The governance indicators reveal whether the country is able to coordinate an intersectoral health workforce agenda and has a central HWF unit. The indicators on health workforce policies provide information on whether the country has processes to plan the health workforce, whether the education plans are aligned with the national health plan, and whether institutional models exist to assess health-care staffing needs.

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#### Governance

**9–01** Mechanisms to coordinate an intersectoral health workforce agenda

**9–02** Central health workforce unit

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#### Health workforce policies

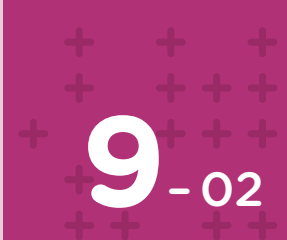
**9–03** Health workforce planning processes

**9–04** Education plans aligned with national health plan

**9–05** Institutional models for assessing health care staffing needs

<b>Indicator name</b>	Existence of institutional mechanisms or bodies to coordinate an intersectoral health workforce agenda (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>Mechanisms may be a national coordination committee involving, for example, interministerial Sustainable Development Goals committees, sector skills councils or similar high-level bodies with a leadership function for coordinating, developing and monitoring policies and plans on HWF, and negotiating intersectoral relationships with other line ministries, government agencies and other stakeholders.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a coordinating mechanism or body in place for this task?</li> <li>2. Are various stakeholders (ministries, public, private, nongovernmental and, international bodies) involved in the coordination process?</li> <li>3. Has an agenda been formulated?</li> <li>4. Has the agenda been approved at interministerial level (ministries of Education, Finance, Public Service, Health)?</li> </ol>
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Subnational level ministries of health</li> <li>• Institutions or units responsible for policies on health workforce</li> <li>• Relevant ministries according to the national government structure and constitutional arrangements/level of devolution</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2010c, EU Joint Action on Health Workforce Planning and Forecasting 2015)
<b>Additional references</b>	(WHO 2010e, WHO 2016d, WHO 2016b)

Abbreviated name  
**Central health workforce unit**

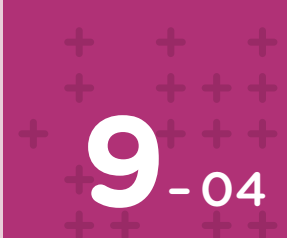


Dimension: Governance

<b>Indicator name</b>	Existence of a health workforce unit in the Ministry of Health responsible for developing and monitoring policies and plans on health workforce (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Are there functions to monitor health workforce policies and plans as part of the monitoring of health services development?</li> <li>2. Are there institutional mechanisms in place to coordinate an intersectoral health workforce agenda, including negotiations and intersectoral relationships with relevant other line ministries, government agencies and stakeholders?</li> </ol>
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Subnational ministries of health</li> <li>• Institutions or units responsible for policies on health workforce</li> <li>• Relevant ministries according to the national government structure and constitutional arrangements/ level of devolution</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2010c, EU Joint Action on Health Workforce Planning and Forecasting 2015)

<b>Indicator name</b>	Existence of mechanisms and models for health workforce planning (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Are clear and explicit health workforce planning objectives set up in the national health policy?</li> <li>2. Is there a coordinated communication and information flow among national-level intersectoral stakeholders?</li> <li>3. Is there a dedicated and established Human Resources for Health Planning Committee, a designated entity or a specific group at the national level responsible for the HWF?</li> <li>4. Is there a methodology established for HWF planning?</li> <li>5. Are complete data with full coverage of the population available in a sustainable manner to provide quantitative assessment required for HWF planning?</li> <li>6. Are policy actions based on the recommendations of the HWF Planning Committee implemented?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Occupation</li> <li>• Health workforce planning</li> <li>• Lifelong learning systems</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Regional ministries of health</li> <li>• Institutions or units responsible for policies on health workforce</li> </ul>
<b>Further information and related links</b>	(EU Joint Action on Health Workforce Planning and Forecasting 2016b, EU Joint Action on Health Workforce Planning and Forecasting 2015, WHO 2010c)
<b>Additional references</b>	(WHO 2010e, Ono et al. 2013)

Abbreviated name  
**Education plans aligned with national health plan**



Dimension: Health workforce policies

<b>Indicator name</b>	Existence of national education plans for the health workforce, aligned with the national health plan and the national health workforce strategy/plan (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Do education plans for the HWF match health worker competencies with population, health systems, and health labour market needs?</li> <li>2. Do plans take into account efforts to scale up transformative education and training?</li> <li>3. Do recognized institutes such as national public health institutes, universities and collaborating centres offer training courses on the implementation and monitoring of Health in All Policies and related concepts?</li> <li>4. Are strategic steps taken when considering and taking into account the workforce market needs and absorptive capacities for the education plan development?</li> </ol>
<b>Glossary</b>	Education
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministries of Health, Education and Labour</li> <li>• Regional ministries of health and education</li> <li>• Institutions or units responsible for policies on health workforce</li> <li>• Educational institutions</li> </ul>
<b>Further information and related links</b>	(World Health Assembly 2013, WHO 2010b, WHO 2016d)
<b>Additional references</b>	(International Labour Organization et al. 2016, WHO 2013f)

<b>Indicator name</b>	Existence of institutional models for assessing and monitoring staffing needs for health service delivery (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a mechanism and/or responsible body in charge of determining the number of health workers of a particular occupation required to effectively and safely deliver health services in health facilities?</li> <li>2. Is there a mechanism to assess the workload of health workers in health facilities?</li> </ol>
<b>Glossary</b>	<ul style="list-style-type: none"> <li>• Continuing professional development</li> <li>• In-service training</li> </ul>
<b>Data reporting frequency</b>	Every three years
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Regional ministries of health</li> <li>• Institutions or units responsible for policies on health workforce</li> <li>• Health facilities</li> </ul>
<b>Further information and related links</b>	(WHO 2015d, Pan American Health Organization 2011, EU Joint Action on Health Workforce Planning and Forecasting 2015)
<b>Additional references</b>	(WHO 1998, WHO Regional Office for the Western Pacific 2007)





# Module 10

## Health workforce information systems

### Module summary

This module supports the assessment of human resource for health information system (HRHIS) capacities at national level. The indicators in the 'HRHIS for international reporting' dimension provide information on whether the country has the appropriate information system to report on IHR, on the WHO Code of Practice(WHO 2010f), and on skill attendance at birth. The indicators in the 'HRHIS to track HWF' dimension assess how well the information system reports on various flow and stock features of the health workforce. Indicators in this module are aligned internally with those in other modules, and key global documents including the UN High-level Commission on Health Employment and Economic Growth recommendations(High-Level Commission on Health Employment and Economic 2016) and the Five-Year Action Plan (2017–2021)(International Labour Organization et al. 2016) as well as the Global Strategy for Human Resources for Health 2020 and 2030 milestones(WHO 2016c).

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#### HRHIS for international reporting

- 10-01** HRHIS for reporting on International Health Regulations
- 10-02** HRHIS for WHO Code of Practice reporting
- 10-03** HRHIS for reporting on skill attendance at birth requirements

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#### HRHIS to track HWF

- 10-04** HRHIS for reporting on outputs from education and training institutions
- 10-05** HRHIS for tracking the number of entrants to the labour market
- 10-06** HRHIS for tracking the number of active stock on the labour market
- 10-07** HRHIS for tracking the number of exits from the labour market
- 10-08** HRHIS for producing the geocoded location of health facilities

## Dimension: HRHIS for international reporting

<b>Indicator name</b>	Ability of HRHIS to generate information to report on International Health Regulations (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	This indicator will help assess whether the HRHIS has the capacity to report on IHR and submit core indicators to the WHO Secretariat annually, for example on indicator 08_08.
<b>Glossary</b>	International Health Regulations (2005)
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and regional ministries of health</li> <li>• Professional chambers</li> <li>• Institutions or units responsible for monitoring, or for policies on the health workforce</li> <li>• Ministry of Labour</li> <li>• National Statistical Office</li> </ul>
<b>Further information and related links</b>	(WHO 2005b, WHO 2015c, WHO 2008a)
<b>Additional references</b>	(EU Joint Action on Health Workforce Planning and Forecasting 2015)

Abbreviated name  
**HRHIS for WHO Code of Practice reporting**

**10-02**

Dimension: HRHIS for international reporting

<b>Indicator name</b>	Ability of HRHIS to generate information to report on implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	This indicator will help assess whether the HRHIS has the capacity to report on the WHO Global Code of Practice on the International Recruitment of Health Personnel, and submit core indicators to the WHO Secretariat annually, for example on indicator 05_03.
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• National Focal Point for WHO Code of Practice</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Ministry of Labour</li> <li>• National Statistical Office</li> </ul>
<b>Further information and related links</b>	(WHO 2010f)

<b>Indicator name</b>	Ability of HRHIS to generate information for reporting on skilled attendance at birth requirements (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	This indicator is related to the collection of data for health workforce stock indicators in Module 01 – Active health workforce stock.
<b>Glossary</b>	None
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and regional ministries of health</li> <li>• Professional chambers</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Ministry of Labour</li> <li>• National Statistical Office</li> </ul>
<b>Further information and related links</b>	(WHO 2015b, WHO 2015c, WHO 2008a)

Abbreviated name  
**HRHIS for reporting on outputs from  
 education and training institutions**

**10**-04

Dimension: HRHIS to track HWF

<b>Indicator name</b>	Ability of HRHIS to generate information for reporting on outputs from education and training institutions (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator will help assess whether the HRHIS has the capacity to report on outputs from education and training institutions, and submit core indicators to the WHO Secretariat annually, for example on indicator 02_07.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a master list of accredited education and training institutions at national level?</li> <li>2. If yes, is this master list geocoded?</li> <li>3. Is this master list updated on a regular basis?</li> <li>4. Do education and training institutions record the number of graduates by health workforce education and training, and by sex?</li> <li>5. Is information on the number of graduates provided to the relevant national body on an annual basis?</li> </ol>
<b>Glossary</b>	Education
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and regional ministries of health</li> <li>• Professional chambers</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Ministry of Labour</li> <li>• National Statistical Office</li> </ul>
<b>Further information and related links</b>	(WHO 2005b, WHO 2015c, WHO 2008a)
<b>Additional references</b>	(EU Joint Action on Health Workforce Planning and Forecasting 2015)

<b>Indicator name</b>	Ability of HRHIS to generate information to track entrants to the labour market (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is related to the collection of flow data for labour market entry indicators in Module 05 – Health Labour Market Flows.</p> <p>This indicator supports the GSHRH Global Milestone 4.1: By 2020, all countries will have made progress to establish registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a system that provides information about the health workforce?</li> <li>2. If yes, does this system provide information on the inflows of the health labour market?</li> </ol>
<b>Glossary</b>	Subnational level
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and subnational ministries of health</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Institutions collecting data on health workforce</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2015c, WHO 2010d)

# HRHIS for tracking the number of active stock on the labour market

Abbreviated name

10-06

Dimension: HRHIS to track HWF

<b>Indicator name</b>	Ability of HRHIS to generate information to track active stock on the labour market (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is related to the collection of stock data for labour market entry indicators in Module 01 - Active Health Workforce Stock.</p> <p>This indicator supports the GSHRH Global Milestone 4.1: By 2020, all countries will have made progress to establish registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a health workforce information system that provides information about the health workforce</li> <li>2. If yes, does this system provide information on the stock of the health labour market?</li> </ol>
<b>Glossary</b>	Subnational level
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and subnational ministries of health</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Institutions collecting data on health workforce</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2015c, WHO 2010d)

<b>Indicator name</b>	Ability of HRHIS to generate information to track exits from the labour market (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is related to the collection of flow data for labour market entry indicators in Module 05 – Health Labour Market Flows.</p> <p>This indicator supports the GSHRH Global Milestone 4.1: By 2020, all countries will have made progress to establish registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration.</p> <p>The following questions should guide a response to this indicator:</p> <ol style="list-style-type: none"> <li>1. Is there a health workforce information system that provides information about the health workforce?</li> <li>2. If yes, does this system provide information on the inflows of the health labour market?</li> </ol>
<b>Glossary</b>	Subnational level
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and subnational ministries of health</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Institutions collecting data on health workforce</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2015c, WHO 2010d)



## HRHIS for producing the geocoded location of health facilities

Abbreviated name

10-08

Dimension: HRHIS to track HWF

<b>Indicator name</b>	Ability of HRHIS to generate geocoded information on the location of health facilities (Yes/No/Partly)
<b>Numerator</b>	Not applicable
<b>Denominator</b>	Not applicable
<b>Disaggregation</b>	Not applicable
<b>Definition</b>	<p>This indicator is related to the collection of distribution data for labour market stock indicators in Module 01 – Active Health Workforce Stock.</p> <p>This indicator supports the GSHRH Global Milestone 4.1: By 2020, all countries will have made progress to establish registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration. It also supports the achievement of health emergency preparedness under SDG 3.D.1.</p> <p>The following question should guide a response to this indicator: Is there a health workforce information system that provides information about the health workforce with geocoded information on its place of activity?</p>
<b>Glossary</b>	Subnational level
<b>Data reporting frequency</b>	Annual
<b>Potential data sources</b>	<ul style="list-style-type: none"> <li>• Ministry of Health and subnational ministries of health</li> <li>• Institutions or units responsible for monitoring, or for policies on health workforce</li> <li>• Institutions collecting data on health workforce</li> </ul>
<b>Further information and related links</b>	(WHO 2016c, WHO 2015c, WHO 2010d)





# References



- Alli, B. O. (2008) Fundamental Principles of Occupational Health and Safety, International Labour Organization [online], available: [http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms\\_093550.pdf](http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_093550.pdf) [accessed 05/09/2017].
- Berman, P. (2000) 'Organization of ambulatory care provision: a critical determinant of health system performance in developing countries', *Bull World Health Organ*, 78(6), 791-802.
- Bjegovic-Mikanovic, V., Czabanowska, K., Flahault, A., Otok, R., Shortell, S., Wisbaum, W. and Laaser, U. (2014) 'Addressing needs in the public health workforce in Europe.', available: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0003/248304/Addressing-needs-in-the-public-health-workforce-in-Europe.pdf](http://www.euro.who.int/__data/assets/pdf_file/0003/248304/Addressing-needs-in-the-public-health-workforce-in-Europe.pdf) [accessed 24/08/2017].
- Boelen, C. and Heck, J. E. (1995) 'Defining and measuring the social accountability of medical schools', available: [http://apps.who.int/iris/bitstream/10665/59441/1/WHO\\_HRH\\_95.7.pdf](http://apps.who.int/iris/bitstream/10665/59441/1/WHO_HRH_95.7.pdf) [accessed 24/08/2017].
- Buchan, J. and Calman, L. (2004) 'Skill-Mix and Policy Change in the Health Workforce: Nurses in Advanced Roles', *OECD Health Working Papers*, (17) available: <https://www.oecd.org/els/health-systems/33857785.pdf> [accessed 23/08/2017].
- Buchan, J. and O'May, F. (2000) 'Determining Skill Mix: Practical Guidelines for Managers and Health Professionals.', *Human Resources Development Journal*, 4(2).
- Buchan, J., Wismar, M., Glinos, I. A. and Bremner, J. (2014) Health professional mobility in a changing Europe, [online], available: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/248343/Health-Professional-Mobility-in-a-Changing-Europe.pdf](http://www.euro.who.int/__data/assets/pdf_file/0006/248343/Health-Professional-Mobility-in-a-Changing-Europe.pdf) [accessed 05/09/2017].
- Commission on Collegiate Nursing Education (2013) Standards for accreditation of baccalaureate and graduate nursing programs.
- Delamaire, M.-L. and Lafortune, G. (2010) 'Nurses in Advanced Roles: a description and evaluation of experiences in 12 developed countries.', *OECD Health Working Papers*, (54) available: <http://www.oecd-ilibrary.org/docserver/download/5kmbrcfms5g7-en>.
- EU Joint Action on Health Workforce Planning and Forecasting (2015) Handbook on health workforce planning methodologies across EU countries, [online], available: [http://healthworkforce.eu/wp-content/uploads/2015/11/150306\\_WP5\\_D052-Handbook-on-HWF-Planning-Methodologies-across-EU-Countries\\_Release-1\\_Final-version.pdf](http://healthworkforce.eu/wp-content/uploads/2015/11/150306_WP5_D052-Handbook-on-HWF-Planning-Methodologies-across-EU-Countries_Release-1_Final-version.pdf) [accessed 23/08/2017].

EU Joint Action on Health Workforce Planning and Forecasting (2016a) D042 Report on mobility data, [online], available: [http://healthworkforce.eu/wp-content/uploads/2016/03/160127\\_WP4\\_D042-Report-on-Mobility-Data-Final.pdf](http://healthworkforce.eu/wp-content/uploads/2016/03/160127_WP4_D042-Report-on-Mobility-Data-Final.pdf) [accessed 23/08/2017].

EU Joint Action on Health Workforce Planning and Forecasting (2016b) Report on health workforce planning data, [online], available: [http://healthworkforce.eu/wp-content/uploads/2016/06/160524\\_WP4\\_D043\\_Report-on-HWF-planning-data.pdf](http://healthworkforce.eu/wp-content/uploads/2016/06/160524_WP4_D043_Report-on-HWF-planning-data.pdf) [accessed 23/08/2017].

European Communities, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations and World Bank (2008) System of National Accounts.

European Union (2013) 'Directive 2013/55/EU of the European Parliament and of the Council amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation.', [online], available: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:32013L0055>].

Eurostat (2010) 1st and 2nd International Workshops on Methodologies for Job Vacancy Statistics - Proceedings, [online], available: <http://ec.europa.eu/eurostat/documents/3888793/5847769/KS-RA-10-027-EN.PDF/87d9c80c-f774-4659-87b4-ca76fcd5884d> [accessed 23/08/2017].

Eurostat (2017a) 'EU labour force survey - methodology', [online], available: [http://ec.europa.eu/eurostat/statistics-explained/index.php/EU\\_labour\\_force\\_survey\\_-\\_methodology](http://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey_-_methodology) [accessed 23/08/2017].

Eurostat (2017b) 'Job vacancies', [online], available: <http://ec.europa.eu/eurostat/web/labour-market/job-vacancies> [accessed 05/09/2017].

Ferrinho, P., Van Lerberghe, W., Fronteira, I., Hipolito, F. and Biscaia, A. (2004) 'Dual practice in the health sector: review of the evidence', *Hum Resour Health*, 2(1), 14.

Frehywot, S., Mullan, F., Payne, P. W. and Ross, H. (2010) 'Compulsory service programmes for recruiting health workers in remote and rural areas: do they work?', *Bull World Health Organ*, 88(5), 364-70.

High-Level Commission on Health Employment and Economic (2016) Working for health and growth: investing in the health workforce, World Health Organization, [online], available: <http://apps.who.int/iris/bitstream/10665/250047/1/9789241511308-eng.pdf?ua=1> [accessed 24/08/2017].

ICN (2017) 'Nurse Practitioner and Advanced Practice Roles - ICN Nurse Practitioner / Advanced Practice Nursing Network. Definition and Characteristics of the Role.', [online], available: <https://international.aanp.org/Practice/APNRoles>].

International Conference of Labour Statisticians (2013) 19th ICLS Resolution I concerning statistics of work, employment and labour underutilization., International Labour Organization [online], available: [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_230304.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf) [accessed 05/09/2017].

International Labour Office, International Council of Nurses, World Health Organization and Public Services International (2002) Framework guidelines for addressing workplace violence in the health sector., [online], available: [http://who.int/violence\\_injury\\_prevention/violence/interpersonal/en/WVguidelinesEN.pdf?ua=1&ua=1](http://who.int/violence_injury_prevention/violence/interpersonal/en/WVguidelinesEN.pdf?ua=1&ua=1) [accessed 23/08/2017].

International Labour Office, International Council of Nurses, World Health Organization and Public Services International (2003) Workplace violence in the health sector: Country Case Studies Research Instruments. Survey questionnaire, [online], available: [http://who.int/violence\\_injury\\_prevention/violence/interpersonal/en/WVquestionnaire.pdf?ua=1&ua=1](http://who.int/violence_injury_prevention/violence/interpersonal/en/WVquestionnaire.pdf?ua=1&ua=1) [accessed 23/08/2017].

International Labour Organization (2008) 'Measurement of decent work based on guidance received at the Tripartite Meeting of Experts on the Measurement of Decent Work', available: [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/meetingdocument/wcms\\_115402.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/meetingdocument/wcms_115402.pdf) [accessed 23/08/2017].

International Labour Organization (2012) International Standard Classification of Occupations Structure, group definitions and correspondence tables, [online], available: [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_172572.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf) [accessed 23/08/2017].

International Labour Organization (2013) Resolution concerning statistics of work, employment and labour underutilization, [online], available: [http://ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms\\_230304.pdf](http://ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf) [accessed 23/08/2017].

International Labour Organization (2016) Key indicators of the labour market - ninth edition, [online], available: [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms\\_498929.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_498929.pdf) [accessed 05/09/2017].

International Labour Organization, Organisation for Economic Co-operation and Development and World Health Organization (2016) Health Employment and Economic Growth: A Five-Year Action Plan (2017-21) Version for consultation., [online], available: [http://www.who.int/hrh/com-heeg/com-heeg\\_actionplan2016.pdf?ua=1](http://www.who.int/hrh/com-heeg/com-heeg_actionplan2016.pdf?ua=1) [accessed 23/08/2017].

International Monetary Fund (2003) External Debt Statistics: Guide for Compilers and Users, [online], available: <http://www.imf.org/external/pubs/ft/eds/Eng/Guide/index.htm> [accessed 05/09/2017].

International Pharmaceutical Federation (2014) Quality assurance of pharmacy education: The FIP global framework, [online], available: [http://fip.org/files/fip/PharmacyEducation/Quality\\_Assurance/QA\\_Framework\\_2nd\\_Edition\\_online\\_version.pdf](http://fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf) [accessed 23/08/2017].

Lee, S.-H., McCann, D. M. and Messenger, J. C. (2007) Working time around the world, Geneva: International Labour Organization.

McPake, B., Russo, G., Hipgrave, D., Hort, K. and Campbell, J. (2016) 'Implications of dual practice for universal health coverage', *Bull World Health Organ*, 94(2), 142-6.

McPake, B., Scott, A. and Edoka, I. (2014) Analyzing Markets for Health Workers : Insights from Labor and Health Economics. *Directions in Development--Human Development*, World Bank [online], available: <https://openknowledge.worldbank.org/handle/10986/18780> [accessed 23/08/2017].

OECD (2011a) Education at a Glance 2011: OECD indicators, OECD Publishing [online], available: <https://www.oecd.org/education/skills-beyond-school/48631582.pdf> [accessed 23/08/2017].

OECD (2011b) 'Employment in the health and social sectors', *Health at a Glance 2011: OECD Indicators*,

OECD (2011c) *Health at a Glance 2011: OECD Indicators*, OECD Publishing [online], available: [http://dx.doi.org/10.1787/health\\_glance-2011-en](http://dx.doi.org/10.1787/health_glance-2011-en) [accessed 23/08/2017].

OECD (2015a) *Health at a Glance 2015: OECD Indicators*, OECD Publishing [online], available: [http://dx.doi.org/10.1787/health\\_glance-2015-en](http://dx.doi.org/10.1787/health_glance-2015-en) [accessed 23/08/2017].

OECD (2015b) *OECD Health Statistics 2015 Definitions, Sources and Methods*, OECD Publishing [online], available: <http://www.oecd.org/els/health-systems/Table-of-Content-Metadata-OECD-Health-Statistics-2015.pdf> [accessed 23/08/2017].

OECD (2016) Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places, OECD Publishing [online], available: <http://dx.doi.org/10.1787/9789264239517-en> [accessed 23/08/2017].

OECD (2017a) 'Annual Labour Force Statistics, Employment by activities and status, for all countries except the United States.', [online], available: [http://stats.oecd.org/Index.aspx?DataSetCode=ALFS\\_EMP#](http://stats.oecd.org/Index.aspx?DataSetCode=ALFS_EMP#) [accessed 23/08/2017].

OECD (2017b) 'Gender wage gap (indicator)', [online], available: <https://data.oecd.org/earnwage/gender-wage-gap.htm> [accessed 23/08/2017].

OECD (2017c) 'Gross domestic product (GDP)', [online], available: [http://www.oecd-ilibrary.org/economics/gross-domestic-product-gdp/indicator/english\\_dc2f7aec-en](http://www.oecd-ilibrary.org/economics/gross-domestic-product-gdp/indicator/english_dc2f7aec-en) [accessed 05/09/2017].

OECD (2017d) 'List of variables in OECD Health Statistics 2017', [online], available: <https://www.oecd.org/els/health-systems/List-of-variables-OECD-Health-Statistics-2017.pdf> [accessed 23/08/2017].

OECD (2017e) 'OECD Family Database', [online], available: <http://www.oecd.org/els/family/database.htm> [accessed 23/08/2017].

OECD (2017f) 'OECD Statistics', [online], available: <http://stats.oecd.org/Index.aspx> [accessed 23/08/2017].

OECD (2017g) 'Part-time employment rate (indicator)', [online], available: <https://data.oecd.org/emp/part-time-employment-rate.htm> [accessed 23/08/2017].

OECD, Eurostat and Europe, W. R. O. f. (2016) 'Joint questionnaire on non-monetary health care statistics, Guidelines for completing the OECD/Eurostat/WHO-Europe questionnaire 2017', [online], available: <https://www.oecd.org/statistics/data-collection/Health%20Data%20-%20Guidelines%202.pdf> [accessed 23/08/2017].

OECD, Eurostat and WHO (2011) A system of health accounts, OECD Publishing [online], available: <http://www.who.int/health-accounts/methodology/sha2011.pdf> [accessed 23/08/2017].



- Ono, T., Lafortune, G. and Schoenstein, M. (2013) 'Health Workforce Planning in OECD Countries. A review of 26 projection models from 18 countries.', OECD Health Working Paper, (62) available: [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DELSA/HEA/WD/HWP\(2013\)3&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DELSA/HEA/WD/HWP(2013)3&docLanguage=En) [accessed 23/08/2017].
- Pan American Health Organization (2011) Handbook for Measurement and Monitoring Indicators of the Regional Goals for Human Resources for Health: A Shared Commitment, PAHO [online], available: [http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&gid=10910&Itemid=270](http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=10910&Itemid=270) [accessed 23/08/2017].
- Scott, A., Araujo, E., Menkulasi, G. and Cohen, R. (2016) 'Chapter 2: Data requirements for the economic analysis of health workers labor markets.' in Scheffler, R., Herbst, C., Lemiere, C. and Campbell, J., eds., Health Labor Market Analyses in Low- and Middle-Income Countries. An Evidence-Based Approach, The World Bank.
- Sousa, A., Scheffler, R. M., Nyoni, J. and Boerma, T. (2013) 'A comprehensive health labour market framework for universal health coverage', Bull World Health Organ, 91(11), 892-4.
- The World Bank (2015) The economics of health professional education and careers : insights from a literature review., The World Bank [online], available: <http://documents.worldbank.org/curated/en/570681468190783192/pdf/99535-PUB-Box393201B-PUBLIC-PUBDATE-9-16-15-DOI-10-1596-978-1-4648-0616-2-EPI-210616-SERIES-World-Bank-Studies.pdf> [accessed 24/08/2017].
- The World Bank (2017a) 'Labor Market Regulation Methodology.', [online], available: <http://www.doingbusiness.org/methodology/labor-market-regulation> [accessed 24/08/2017].
- The World Bank (2017b) 'Specialist surgical workforce (per 100,000 population)', [online], available: <http://data.worldbank.org/indicator/SH.MED.SAOP.P5> [accessed 23/08/2017].
- Touré, B., Avocksouma, D. A., Nyoni, J. and Ahmat, A. (2013) 'Road map for scaling up human resources for health for improved health service delivery in the African Region 2012–2025', African Health Monitor, available: <https://www.aho.afro.who.int/sites/default/files/ahm/reports/756/ahm-18-05-road-map-scaling-human-resources-health-2012-2025.pdf> [accessed 24/08/2017].
- UNESCO (1998) 'World declaration on higher education for the twenty-first century: vision and action', [online], available: [http://www.unesco.org/education/educprog/wche/declaration\\_eng.htm](http://www.unesco.org/education/educprog/wche/declaration_eng.htm) [accessed 05/09/2017].

UNESCO (2009) Education Indicators Technical guidelines, United Nations Educational, Scientific and Cultural Organization [online], available: [http://uis.unesco.org/sites/default/files/documents/education-indicators-technical-guidelines-en\\_0.pdf](http://uis.unesco.org/sites/default/files/documents/education-indicators-technical-guidelines-en_0.pdf) [accessed 24/08/2017].

UNESCO (2012a) International Standard Classification of Education - ISCED 2011, UNESCO Institute for Statistics [online], available: <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf> [accessed 05/09/2017].

UNESCO (2012b) UNESCO Guidelines for the recognition, validation and accreditation of the outcomes of non-formal and informal learning., UNESCO [online], available: <http://unesdoc.unesco.org/images/0021/002163/216360e.pdf> [accessed 05/09/2017].

UNESCO (2014) International Standard Classification of Education Fields of Education and Training 2013 (ISCED-F 2013), UNESCO Institute for Statistics [online], available: <http://unesdoc.unesco.org/images/0022/002280/228085e.pdf> [accessed 05/09/2017].

UNESCO (2015a) Education 2030. Incheon Declaration and framework for action towards inclusive and equitable quality education and lifelong learning for all, United Nations Educational, Scientific and Cultural Organization [online], available: [http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/ED/ED/pdf/FFA\\_Complet\\_Web-ENG.pdf](http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/ED/ED/pdf/FFA_Complet_Web-ENG.pdf) [accessed 24/08/2017].

UNESCO (2015b) Thematic Indicators to Monitor the Education 2030 Agenda, United Nations Educational, Scientific and Cultural Organization [online], available: <http://unesdoc.unesco.org/images/0023/002351/235172e.pdf> [accessed 24/08/2017].

UNESCO (2015c) Unleashing the Potential- Transforming Technical and Vocational Education and Training, [online], available: <http://unesdoc.unesco.org/images/0023/002330/233030e.pdf> [accessed 05/09/2017].

UNESCO (2016) Methodology of national education accounts, United Nations Educational, Scientific and Cultural Organization [online], available: <http://unesdoc.unesco.org/images/0024/002457/245781e.pdf> [accessed 24/08/2017].

UNESCO (2017) Metadata for the global and thematic indicators for the follow-up and review of SDG 4 and Education 2030, United Nations Educational, Scientific and Cultural Organization [online], available: <http://uis.unesco.org/sites/default/files/documents/sdg4-metadata-global-thematic-indicators.pdf> [accessed 24/08/2017].

- UNESCO-IIEP (2015) 'Education sector financial simulation model', [online], available: [https://poledakar.iiep.unesco.org/sites/default/files/ckeditor\\_files/efsm.pdf](https://poledakar.iiep.unesco.org/sites/default/files/ckeditor_files/efsm.pdf) [accessed 24/08/2017].
- United Nations (2008) International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4, United Nations [online], available: [https://unstats.un.org/unsd/publication/seriesM/seriesm\\_4rev4e.pdf](https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf) [accessed 24/08/2017].
- USAID (2015) Leadership and Governance Indicators, [online], available: [https://www.hfgproject.org/wp-content/uploads/2015/01/Governance-Indicators-Ref-Sheets-Final\\_2015.pdf](https://www.hfgproject.org/wp-content/uploads/2015/01/Governance-Indicators-Ref-Sheets-Final_2015.pdf) [accessed 24/08/2017].
- USAID and CapacityPlus (2015) Human resources for health indicator compendium, [online], available: [https://www.capacityplus.org/files/resources/HRH\\_Indicator\\_Compendium.pdf](https://www.capacityplus.org/files/resources/HRH_Indicator_Compendium.pdf) [accessed 24/08/2017].
- WFME (2015) Basic Medical Education - WFME Global Standards for Quality Improvement: The 2015 Revision, World Federation for Medical Education [online], available: <http://wfme.org/standards/bme/78-new-version-2012-quality-improvement-in-basic-medical-education-english/file> [accessed 24/08/2017].
- WHO (1998) Workload indicators on staffing needs (WISN). A manual for implementation, World Health Organization [online], available: [http://www.who.int/hrh/documents/en/workload\\_indicators.pdf](http://www.who.int/hrh/documents/en/workload_indicators.pdf) [accessed 24/08/2017].
- WHO (2005a) International Health Regulations (2005) - Third edition, World Health Organization [online], available: <http://apps.who.int/iris/bitstream/10665/246107/1/9789241580496-eng.pdf?ua=1> [accessed 05/09/2017].
- WHO (2005b) Joint external evaluation tool: International Health Regulations, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/204368/1/9789241510172\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/204368/1/9789241510172_eng.pdf) [accessed 24/08/2017].
- WHO (2006) World Health Report – Working together for health, World Health Organization [online], available: [http://www.who.int/whr/2006/whr06\\_en.pdf](http://www.who.int/whr/2006/whr06_en.pdf) [accessed 24/08/2017].
- WHO (2007) Assessing financing, education, management and policy context for strategic planning of human resources for health, World Health Organization [online], available: [http://www.who.int/hrh/tools/assessing\\_financing.pdf](http://www.who.int/hrh/tools/assessing_financing.pdf) [accessed 24/08/2017].

WHO (2008a) Human Resources for Health Minimum Data Set, World Health Organization [online], available: [http://www.who.int/hrh/documents/hrh\\_minimum\\_data\\_set.pdf](http://www.who.int/hrh/documents/hrh_minimum_data_set.pdf) [accessed 24/08/2017].

WHO (2008b) WHO Commission of the Social Determinants of Health and its report Closing the Gap in a Generation, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/43943/1/9789241563703\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/43943/1/9789241563703_eng.pdf) [accessed 24/08/2017].

WHO (2010a) Framework for action on interprofessional education and collaborative practice, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/70185/1/WHO\\_HRH\\_HPN\\_10.3\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf) [accessed 24/08/2017].

WHO (2010b) 'Leadership and governance', Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies, 6),

WHO (2010c) Models and tools for health workforce planning and projections, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/44263/1/9789241599016\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44263/1/9789241599016_eng.pdf) [accessed 23/08/2017].

WHO (2010d) Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies, World Health Organization [online], available: [http://www.who.int/healthinfo/systems/WHO\\_MBHSS\\_2010\\_full\\_web.pdf](http://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf) [accessed 24/08/2017].

WHO (2010e) Policies and practices of countries that are experiencing a crisis in human resources for health: tracking survey. Human Resources for Health Observer. Issue No 6, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/44480/1/9789241500821\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44480/1/9789241500821_eng.pdf) [accessed 24/08/2017].

WHO (2010f) The WHO Global Code of Practice on the International Recruitment of Health Personnel, World Health Organization [online], available: [http://www.who.int/hrh/migration/code/code\\_en.pdf](http://www.who.int/hrh/migration/code/code_en.pdf) [accessed 24/08/2017].

WHO (2013a) 'Global Action plan on the Prevention and Control of Non Communicable Diseases', [online], available: [http://www.who.int/nmh/events/ncd\\_action\\_plan/en/](http://www.who.int/nmh/events/ncd_action_plan/en/) [accessed 24/08/2017].

WHO (2013b) Guidelines for transforming and scaling up health professionals education and training. Policy brief on regulation of health professionals education, World Health Organization [online], available: [http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines\\_PolicyBrief\\_Regulation.pdf](http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines_PolicyBrief_Regulation.pdf) [accessed 24/08/2017].

- WHO (2013c) Transforming and scaling up health professional education and training. Policy brief on accreditation of institutions for health professional education., World Health Organization [online], available: [http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines\\_PolicyBrief\\_Accreditation.pdf](http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines_PolicyBrief_Accreditation.pdf) [accessed 24/08/2017].
- WHO (2013d) Transforming and scaling up health professional education and training. Policy brief on faculty development., World Health Organization [online], available: [http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines\\_PolicyBrief\\_FacultyDevelopment.pdf](http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines_PolicyBrief_FacultyDevelopment.pdf) [accessed 24/08/2017].
- WHO (2013e) Transforming and scaling up health professionals education and training. Policy brief on monitoring and evaluation the education of health professionals., World Health Organization [online], available: [http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines\\_PolicyBrief\\_MnE.pdf](http://whoeducationguidelines.org/sites/default/files/uploads/whoeduguidelines_PolicyBrief_MnE.pdf) [accessed 24/08/2017].
- WHO (2013f) Transforming and scaling up health professionals' education and training - World Health Organization Guidelines 2013, World Health Organization [online], available: [http://whoeducationguidelines.org/sites/default/files/uploads/WHO\\_EduGuidelines\\_20131202\\_web.pdf](http://whoeducationguidelines.org/sites/default/files/uploads/WHO_EduGuidelines_20131202_web.pdf) [accessed 24/08/2017].
- WHO (2014) Twelfth General Programme of Work Not merely the absence of disease, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/112792/1/GPW\\_2014-2019\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/112792/1/GPW_2014-2019_eng.pdf) [accessed 24/08/2017].
- WHO (2015a) Global reference list of 100 core health indicators, World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/173589/1/WHO\\_HIS\\_HSI\\_2015.3\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf) [accessed 24/08/2017].
- WHO (2015b) Global Strategy for Women's, Children's and Adolescents' Health, 2016-2030, World Health Organization [online], available: <http://www.who.int/life-course/partners/global-strategy/ewec-globalstrategyreport-200915.pdf> [accessed 24/08/2017].
- WHO (2015c) Human resources for health information system: minimum data set for health workforce registry., World Health Organization [online], available: [http://www.who.int/hrh/statistics/minimun\\_data\\_set.pdf](http://www.who.int/hrh/statistics/minimun_data_set.pdf) [accessed 24/08/2017].
- WHO (2015d) Workload indicators on staffing needs (WISN). User's manual., World Health Organization [online], available: [http://www.who.int/hrh/resources/WISN\\_Eng\\_UsersManual.pdf](http://www.who.int/hrh/resources/WISN_Eng_UsersManual.pdf) [accessed 24/08/2017].

- WHO (2016a) 'Framework on integrated, people-centred health services', available: [http://apps.who.int/gb/ebwha/pdf\\_files/WHA69/A69\\_39-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_39-en.pdf) [accessed 24/08/2017].
- WHO (2016b) Global monitoring of action on the social determinants of health: a proposed framework and basket of core indicators, World Health Organization [online], available: [http://www.who.int/social\\_determinants/consultation-paper-SDH-Action-Monitoring.pdf?ua=1](http://www.who.int/social_determinants/consultation-paper-SDH-Action-Monitoring.pdf?ua=1) [accessed 24/08/2017].
- WHO (2016c) Global strategy on human resources for health: Workforce 2030, World Health Organization [online], available: <http://apps.who.int/iris/bitstream/10665/250368/1/9789241511131-eng.pdf> [accessed 24/08/2017].
- WHO (2016d) Strategizing national health in the 21st century: a handbook, World Health Organization [online], available: <http://apps.who.int/iris/bitstream/10665/250221/41/9789241549745-eng.pdf> [accessed 24/08/2017].
- WHO (2017a) 'Attacks on Health Care', [online], available: <http://www.who.int/emergencies/attacks-on-health-care/en/> [accessed 24/08/2017].
- WHO (2017b) 'Glossary of intervention terms', [online], available: <http://whoeducationguidelines.org/content/4-glossary-intervention-terms> [accessed 05/09/2017].
- WHO (2017c) 'Universal Health Coverage', [online], available: [http://www.who.int/healthsystems/universal\\_health\\_coverage/en/](http://www.who.int/healthsystems/universal_health_coverage/en/) [accessed 24/08/2017].
- WHO (2017d) 'WHO Emergency and essential surgical care Global Database', [online], available: [http://www.who.int/surgery/eesc\\_database/en/](http://www.who.int/surgery/eesc_database/en/) [accessed 24/08/2017].
- WHO, The World Bank and USAID (2009) Handbook on monitoring and evaluation of human resources for health with special applications for low- and middle-income countries., World Health Organization [online], available: [http://apps.who.int/iris/bitstream/10665/44097/1/9789241547703\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44097/1/9789241547703_eng.pdf) [accessed 24/08/2017].
- WHO and WFME (2004) Task Force on Accreditation. Accreditation of medical institutions, World Health Organization [online], available: [http://www.who.int/hrh/documents/WFME\\_report.pdf](http://www.who.int/hrh/documents/WFME_report.pdf) [accessed 24/08/2017].

- WHO Regional Office for Europe (2015) Core health indicators in the WHO European Region 2015 - Special focus: human resources for health, World Health Organization Regional Office for Europe [online], available: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0019/290440/Core-Health-Indicators-European-2015-human-resources-health.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0019/290440/Core-Health-Indicators-European-2015-human-resources-health.pdf?ua=1) [accessed 24/08/2017].
- WHO Regional Office for Europe (2017) 'Primary health care main terminology', [online], available: <http://www.euro.who.int/en/health-topics/Health-systems/primary-health-care/main-terminology> [accessed 24/08/2017].
- WHO Regional Office for the Eastern Mediterranean (2011) Regional standards for accreditation of health professions education., World Health Organization Regional Office for the Eastern Mediterranean [online], available: [http://applications.emro.who.int/docs/IC\\_Meet\\_Rep\\_2011\\_EN\\_14538.pdf](http://applications.emro.who.int/docs/IC_Meet_Rep_2011_EN_14538.pdf) [accessed 24/08/2017].
- WHO Regional Office for the Eastern Mediterranean (2015) 'Review of medical education in the Eastern Mediterranean Region: challenges, priorities and a framework for action.', available: [http://applications.emro.who.int/docs/RC\\_technical\\_papers\\_2015\\_3\\_16503\\_EN.pdf](http://applications.emro.who.int/docs/RC_technical_papers_2015_3_16503_EN.pdf) [accessed 24/08/2017].
- WHO Regional Office for the Western Pacific (2007) Regional Strategy on Human Resources for Health 2006-2015., World Health Organization Regional Office for the Western Pacific Region [online], available: <http://www.wpro.who.int/hrh/documents/docs/HRHStrategy.pdf> [accessed 24/08/2017].
- Wismar, M., Maier, C., Glinos, I., Dussault, G. and Figueras, J. (2011) Health Professional Mobility and Health Systems: Evidence from 17 European Countries., World Health Organization, European Observatory on Health systems and Policies.
- World Health Assembly (2013) 'World Health Assembly resolution 66.23: Transforming health workforce education in support of universal health coverage', available: [http://apps.who.int/gb/ebwha/pdf\\_files/WHA66/A66\\_R23-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R23-en.pdf) [accessed 24/08/2017].
- World Health Assembly (2016) Global strategy on human resources for health: workforce 2030, 69.19, Geneva: World Health Organization.
- World Health Assembly (2017) Human resources for health and implementation of the outcomes of the United Nations' High-Level Commission on Health Employment and Economic Growth, Geneva: World Health Organization.







# Annex 1

Development of  
the National Health  
Workforce Accounts

The list of National Health Workforce Accounts (NHWA) indicators was developed through a stepwise process that included several phases of consultation on preselected indicators.

In October 2015, over 450 indicators were selected from diverse sources of international and subregional literature and filtered down to a set of 255. The filtering process was executed to remove duplicates by eliminating multiple indicators that capture the same underlying concept (data), as well as to embrace all recommended data so that no underlying concepts (data) were excluded.

A global consultation (Delphi study) of this list was conducted in November 2015 with the objective of rating the indicators. The consultation comprised over 70 experts from around the world, including deans of faculty, academics, teaching instructors, information systems experts, policy planners, and health professionals. The experts were asked to evaluate the value of these indicators based on criteria of relevance, availability and current utilization in a national context. Experts of a Technical Advisory Group, representing various institutions engaged in human resources for health (HRH) data monitoring, collection and management, discussed and interpreted the results of this global consultation in a series of workshops at WHO headquarters. As a result of these discussions, the final list of indicators was defined for inclusion in the NHWA system as presented in this Handbook.

The NHWA indicators are developed using existing tools to the greatest possible extent. This approach minimizes the potential for duplication (and hence redundancy) in data collection efforts, while enabling integrated data collection and subsequent analysis and synthesis into policy options. In practice, the NHWA has been built on:

- The WHO minimum data set for health workforce registry (MDS), which is a key global tool published by WHO in 2015. The MDS serves as the basis for the indicators in Module 1 of the NHWA (WHO, 2015a).
- The Joint questionnaire on non-monetary health care statistics – the harmonized data collection by OECD, Eurostat and the WHO Regional Office for Europe – is an established annual global data collection on HRH that aims to provide internationally comparable data to monitor key HRH aspects of health-care systems. Its data categories are reflected in the indicators of the NHWA.
- The European Union Joint Action on Health Workforce Planning and Forecasting, with various reports and analyses on HRH-related indicators, also served as a basis for indicators in the NHWA system.

The National Health Workforce Accounts is an ongoing, evolving process. The system will be reviewed and updated on a regular basis as measurement methodologies improve and changing HRH trends require.



# Annex 2

Indicator metadata sheets

The indicators in the National Health Workforce Accounts (NHWA) are specified in the metadata sheets outlined in Part II of this Handbook. The indicators are mostly numeric (quantitative), i.e. representing in numbers certain ratios with a numerator and denominator related to a human resources for health (HRH) policy field. There are also capability indicators on the existence of certain regulations, processes, etc. reflecting the status of development of the HRH management system of a country. The metadata sheets aim to provide a definition with explanations for the connecting terms and methodology for the calculation. Definitions for key terms are presented in the Glossary, with an indication in the metadata sheets. External links and references are provided for further understanding, and the most relevant data sources for each indicator are also identified.

The metadata sheets follow the same structure for each indicator and include the current information in the following order:

- Indicator number: according to the standard numbering of the NHWA indicator system. It contains two numbers: the first number refers to the module, the second one to the indicator itself inside the module.
- Dimension: the thematic group to which the indicator belongs.
- Abbreviated name of the indicator: this name is for general use when referring to the indicator.
- Name of the indicator: full name of the indicator, which provides information about the definition. Some indicators are categoric, such as on the existence of a regulation; for these indicators, the possible values are provided in parenthesis (for example: Yes/No/Partly).
- Numerator: Numerator to be used for the calculation of the indicator (applicable only for numeric indicators).
- Denominator: Denominator to be used for the calculation of the indicator (applicable only for numeric indicators).
- Disaggregation of an indicator: the factors by which the value of the indicator can be disaggregated (e.g. by sex, age, facility type); for some indicators more than one disaggregation factor occurs.
- Definition: details of the content of the indicator and additional technical notes. Where capability indicators consist of questions, these and options for the answers are listed here.
- Glossary: key terms from the indicator definition for which an explanation can be found in the Glossary of the Handbook.
- Data reporting frequency: whether the data should be collected on an annual basis or every three years.
- Potential data sources: relevant data sources at national level that can provide information for the current indicator, listed in order of decreasing relevance.
- Further information and related links: these represent the key literature, governing body, resolution, or programme publication that was used as a reference, or provide further information on the context of the indicator.



# Annex 3

Examples of applications  
of the National Health  
Workforce Accounts

## Example 1: Self-sustainability of the health workforce

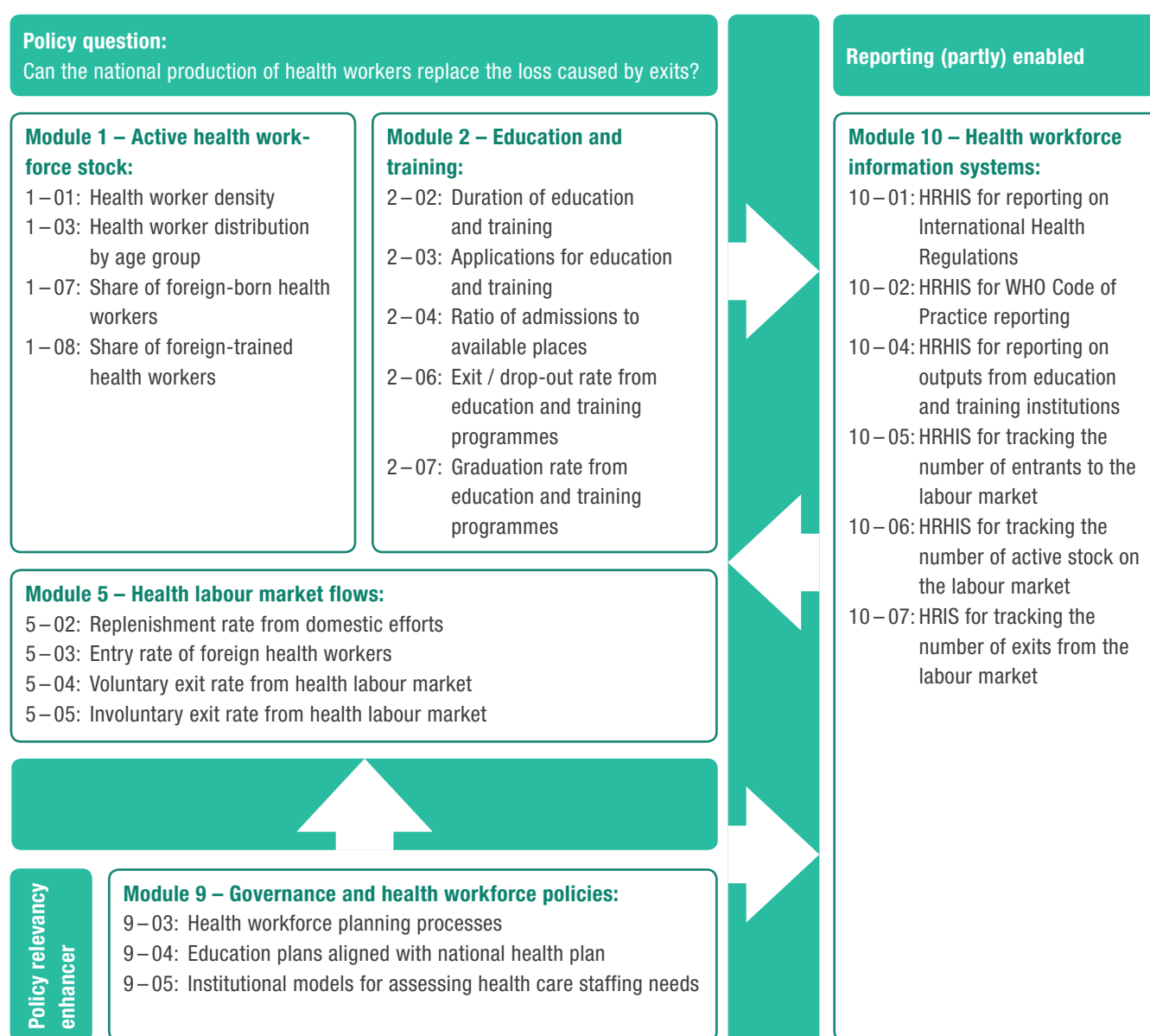
As advocated by the WHO Global Code of Practice on the International Recruitment of Health Personnel, all Member States should strive to create a self-sustainable health workforce and work towards establishing effective health workforce planning, education and training, and retention strategies that will reduce their need to actively recruit migrant health personnel. Hence, policies and strategies addressing national self-sustainability are distinguished as a 2030 milestone in the Global Strategy on Human Resources for Health: *“All countries are making progress towards halving their dependency on foreign-trained health professionals.”*

Self-sustainability occurs when national production compensates the health worker loss caused by exits and adapts to the evolution of the population needs. Still, this is affected by many influencing factors from inside and outside the national labour market. To understand the situation regarding self-sustainability and for the development of policy interventions, the following modules of the NHWA are of relevance for providing data:

- Module 1 – Active health workforce stock
- Module 2 – Education and training
- Module 5 – Health labour market flows.

Self-sustainability can be modelled through the balanced impact of newly educated health workers on the existing stock of active health workforce, now and in the future, and of outflows from the health labour market. Also, any gap between emigration and immigration puts self-sustainability in perspective (Table A3.1).

**Table A3.1 Possible supporting indicators for sustainability of the health workforce**



HRHIS: human resource health information system; IHR: International Health Regulations (2005).

## Example 2: Balanced geographical distribution of the health workforce

Many countries suffer from geographical imbalances in the distribution of their health workforce, with most (severe) shortages arising in rural and remote areas. Establishing an evaluation of this maldistribution is a starter to evaluate further the influence of social, financial and organizational determinants on health worker decisions to be a candidate for, stay in, or leave a job in underserved areas – and hence to increase population access to health workers in these areas. Monitoring geographical distribution supports the Global Strategy on Human Resources for Health 2030 milestone that *“All countries are making progress towards halving inequalities in access to a health worker”*.

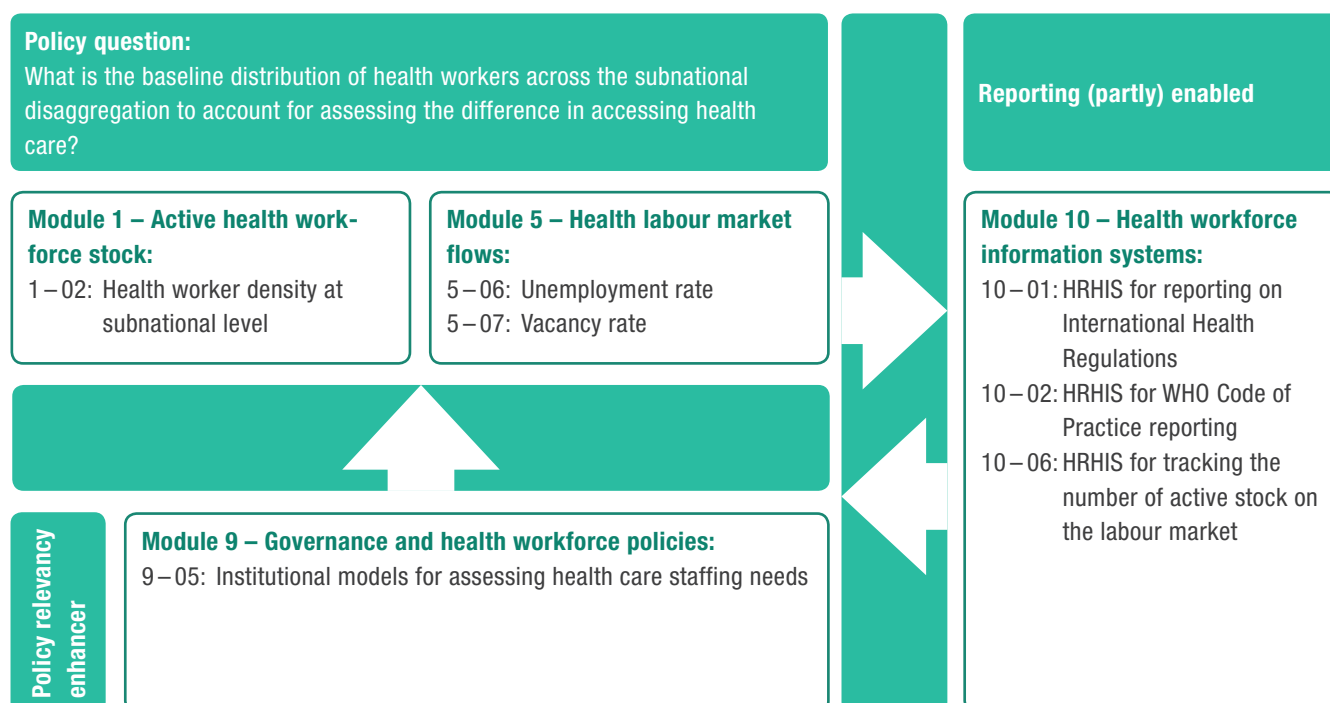
The following modules of the NHWA are of relevance to provide an initial description of the situation regarding geographical imbalances of the health workforce as a baseline for the development of policy interventions:

- Module 1 – Active health workforce stock
- Module 5 – Health labour market flows.

These allow basic monitoring of geographical distribution through measures of density and with the employment dynamic as a perspective (Table A3.2).



**Table A3.2 Possible supporting indicators for geographical distribution of the health workforce**



HRHIS: human resource health information system; IHR: International Health Regulations (2005).

### Example 3: Required health worker training performance

The national supply of new health workers to the health labour market is key to the success of any health policy. The implementation of educational plans is a determinant that requires careful monitoring, and is a key element in the Global Strategy on Human Resources for Health policies, articulated through several milestones:

- (by 2020); *“All countries have inclusive institutional mechanisms in place to coordinate an intersectoral health workforce agenda”*
- (by 2020); *“All countries have established accreditation mechanisms for health training institutions”*
- (by 2030); *“All countries are making progress towards improving the course completion rates in medical, nursing and allied health professionals training institutions”.*

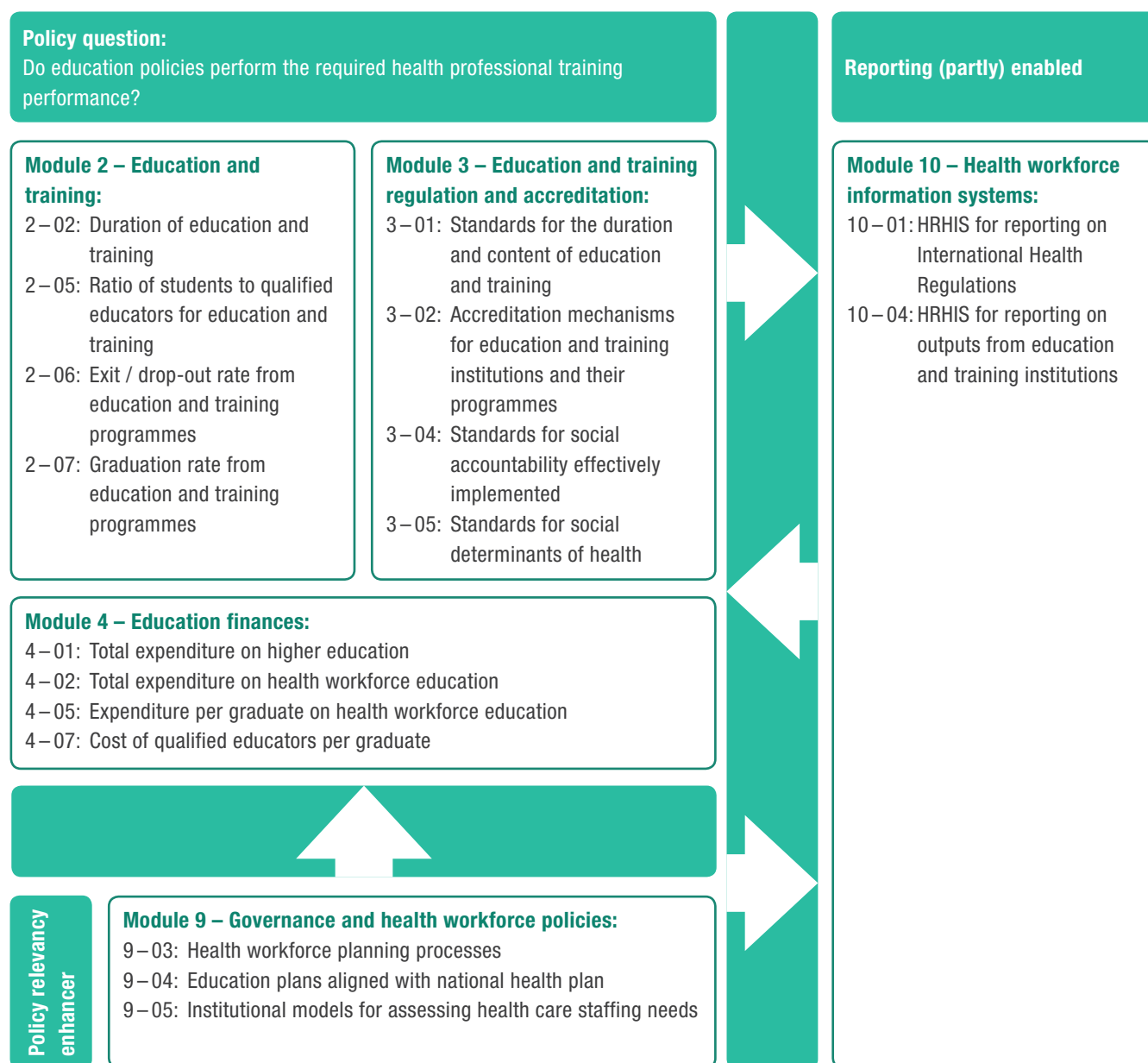
These milestones are supported by the High-Level Commission on Health Employment and Economic Growth in its 2016 report, and through its recommendation on education, training and competencies, i.e. to *“Scale up transformative, high-quality education and lifelong learning so that all health workers have skills that match the health needs of populations and can work to their full potential”.*

To understand the impact of policies on completion rates, the following modules of the NHWA are of relevance:

- Module 2 – Education and training
- Module 3 – Education and training regulation and accreditation
- Module 4 – Education finances.

Course completion crude numbers are influenced by the duration, quality and social accountability of education. Public investment and the level of tuition fees are either a catalyst or a blockade to study completion, while the cost per student and per educator could be correlated to the quality of the programmes (Table A3.3).

**Table A3.3 Possible supporting indicators for the impact of study completion**



HRHIS: human resource health information system; IHR: International Health Regulations (2005).





# Annex 4

List of occupations  
covered by the NHWA

In order to provide a comprehensive overview of the health workforce, most of the quantitative indicators in the NHTA are disaggregated by occupation. Although various classifications for occupations may exist at national level, the internationally agreed classification of the International Standard Classification of Occupations (ISCO-08) is recommended to be used where possible.

The list below provides detailed occupation titles and corresponding ISCO-08 codes useful for monitoring the health workforce. In cases where data according to the ISCO-08 classification is not complete or missing, focus should be put on the groups and occupations marked as core groups or core occupations. These core groups and occupations are indicative but represent a set of easily identifiable occupations with a high degree of comparability between countries, ensuring a harmonized monitoring of the health workforce. This list should be adapted and completed as much as possible to national priorities.

**Table A4.1 List of health-related occupations according to ISCO-08**

Group code			Occupational title	Core occupational group	Core occupation
Sub-major group	Minor group	Unit group			
22			Health professionals		
	221		Medical doctors	0	
		2211	Generalist medical practitioners		x
		2212	Specialist medical practitioners		x
	222		Nursing and midwifery professionals	0	
		2221	Nursing professionals		x
		2222	Midwifery professionals		x
	223		Traditional and complementary medicine professionals	0	
		2230	Traditional and complementary medicine professionals		x
	224		Paramedical practitioners	0	
		2240	Paramedical practitioners		x
	226		Other health professionals	0	
		2261	Dentists		x
		2262	Pharmacists		x

Group code			Occupational title	Core occupational group	Core occupation
Sub-major group	Minor group	Unit group			
		2263	Environmental and occupational health and hygiene professionals		x
		2264	Physiotherapists		x
		2265	Dieticians and nutritionists		x
		2266	Audiologists and speech therapists		
		2267	Optometrists and ophthalmic opticians		
		2269	Health professionals not elsewhere classified		x
32			Health associate professionals		
	321		Medical and pharmaceutical technicians	0	x
		3211	Medical imaging and therapeutic equipment technicians		
		3212	Medical and pathology laboratory technicians		
		3213	Pharmaceutical technicians and assistants		
		3214	Medical and dental prosthetic and related technicians		
	322		Nursing and midwifery associate professionals	0	
		3221	Nursing associate professionals		x
		3222	Midwifery associate professionals		x
	323		Traditional and complementary medicine associate professionals	0	
		3230	Traditional and complementary medicine associate professionals		x
	325		Other health associate professionals	0	
		3251	Dental assistants and therapists		
		3252	Medical records and health information technicians		
		3253	Community health workers		x
		3254	Dispensing opticians		
		3255	Physiotherapy technicians and assistants		
		3256	Medical assistants		

Group code			Occupational title	Core occupational group	Core occupation
Sub-major group	Minor group	Unit group			
		3257	Environmental and occupational health inspectors and associates		
		3258	Ambulance workers		
		3259	Health associate professionals not elsewhere classified		x
53			Personal care workers		
	532		Personal care workers in health services	o	
		5321	Health care assistants		x
		5322	Home-based personal care workers		x
		5329	Personal care workers in health services not elsewhere classified		x
			Additional health-related unit groups	o	
		1342	Health service managers		x
		1343	Aged care service managers		
		2634	Psychologists		
		2635	Social work and counselling professionals		
		3412	Social work associate professionals		
		3344	Medical secretaries		
		2149	Biomedical engineers		

o : Core occupational groups; x : Core occupations

International Labour Organization (2012). International Standard Classification of Occupations: ISCO 08, [www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_172572.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf).

WHO, World Bank, USAID (2009). Handbook on monitoring and evaluation of human resources for health, with special applications for low- and middle-income countries, [http://apps.who.int/iris/bitstream/10665/44097/1/9789241547703\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44097/1/9789241547703_eng.pdf).





# Annex 5

## Glossary

<b>Accreditation</b>	<p>A process by which an officially approved body, on the basis of assessment of learning outcomes and/or competences according to different purposes and methods, awards qualifications (certificates, diplomas or titles), or grants equivalences, credit units or exemptions, or issues documents such as portfolios of competences. The term accreditation applies to the evaluation of the quality of an institution or a programme as a whole. (UNESCO 2012b)</p> <p><b>Accreditation mechanisms</b> Mechanisms and procedures for implementation of an accreditation process. (WHO 2013c)</p> <p><b>Accreditation standards</b> Standards that guide health workforce education programme development and evaluation, facilitate diagnosis of strengths and weaknesses relating to the education programme, and stimulate quality improvement. (WFME 2015)</p> <p><b>Accreditation systems</b> A system that is: based on standards; supported by a legislative or legal instrument; independent; transparent; non-profit-making; accountable; representative of, but independent from all major stakeholders; and efficiently administered. (WHO and WFME 2004)</p>
<b>Active health worker</b>	<p>One who provides services to patients and communities (practising health worker) or whose medical education is a prerequisite for the execution of the job (e.g. education, research, public administration) even if the health worker is not directly providing services (professionally active health worker). If data are not available for practising or professionally active health workers, data with the closest definition can be used, such as “health worker licensed to practice”. Categories of level are based on the definitions of OECD/Eurostat/WHO-Europe Joint questionnaire on non-monetary health care statistics. (OECD et al. 2016)</p>
<b>Admission</b>	<p>University or college admission is the process through which students enter tertiary education at universities and colleges. The admissions process assesses whether the applicant has achieved the course entry requirements for admission into a health workforce education and training programme in a given country. Admissions policies and the minimum entry requirements for each programme can fall under the institution or local or national body.</p>
<b>Advanced practice nurse</b>	<p>A registered or other professional nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which the nurse has credentials to practise. A master’s degree is recommended for entry level. (ICN 2017)</p>
<b>Age group</b>	<p>Subgroup of a population, disaggregated by age; the following categories are recommended: &lt; 25, 25–34, 35–44, 45–54, 55–64, ≥ 65. (OECD 2017d)</p>
<b>Ambulatory care</b>	<p>Personal health-care services delivered by individuals and organizations on an outpatient basis. (Berman 2000)</p>
<b>Applicant</b>	<p>A person who applies for or requests entry into an educational programme. Oxford English Dictionary (2015). (WHO 2006)</p>
<b>Associate professional nurse</b>	<p>An associate professional nurse or nursing associate professional (ISCO–2008 code 3221) generally works under the supervision of, and in support of implementation of health care, treatment and referral plans established by medical, nursing and other health professionals. (OECD 2017d)</p>
<b>Childcare support</b>	<p>Financial support to parents to pay fees to childcare institutions (e.g. day-care centres, family day care) for the services they provide to them and their children. (OECD 2017e)</p>
<b>Collaborative practice</b>	<p>Multiple health workers from different professional backgrounds who work together to deliver comprehensive services of the highest quality to patients, their families, carers and communities across settings. Practice includes both clinical and non-clinical health-related work, such as diagnosis, treatment, surveillance, health communication, management and sanitation engineering. (WHO 2010a)</p>

<b>Community health worker</b>	Health workers who provide health education, referral and follow up, case management, basic preventive health care and home visiting services to specific communities. They provide support and assistance to individuals and families in navigating the health and social services system. (International Labour Organization 2012)
<b>Compensated absence rate</b>	The number of workdays lost per health worker per year due to illness (excluding maternity leave). (OECD 2017d)
<b>Compensation of employees</b>	The total remuneration, in cash or in kind, paid by an enterprise to an employee in return for work performed by the latter during the accounting period. It includes wages, salaries, and all forms of social benefits, payments for overtime or night work, bonuses, allowances, as well as the value of in-kind payments such as the provision of uniforms for medical staff. (OECD et al. 2011)
<b>Continuing professional development</b>	<p>Training that is beyond clinical update and includes wide-ranging competences like research and scientific writing; multidisciplinary context of patient care; professionalism and ethical practice; communication, leadership, management and behavioural skills; team building; information technology; auditing; and appropriate attitudinal change to ensure improved patient service, research outcomes, and attainment of the highest degree of satisfaction by stakeholders.</p> <p>The form of continuing professional development (CPD) may include: courses and lectures; training days; peer review; clinical audit; reading journals; attending conferences; e-learning activity. CPD may be included in national standards of conduct, performance and ethics that govern health workers. (WHO 2017b)</p> <p><b>Continuing professional development (mandatory)</b></p> <p>National systems for continuing CPD may be voluntary or mandatory. Mandatory systems may include the requirement for both verifiable, and general and non-verifiable CPD. Verifiable CPD is activity that meets an agreed definition of CPD and for which there is documentary evidence that the health worker has undertaken CPD with concise educational aims and objectives; clear anticipated outcomes; and quality controls. (WFME 2015)</p>
<b>Cost category</b>	Categories of expenditure on health workforce: Wages and salaries; Social contributions; All other costs related to employees; Self-employed professional remuneration. (OECD et al. 2011)
<b>Domestic trained health worker</b>	A health worker who obtained his/her first qualification in the country where s/he is entitled to practise. (WHO 2010f)
<b>Drop-out rate</b>	Students from a cohort leaving health workforce education and training without completion. (UNESCO 2009)
<b>Dual practice</b>	Multiple health-related practices by a health worker in the same or different sites. Dual practice in this sense may be public on public, public on private, or private on private. (Ferrinho et al. 2004)
<b>Economic activity classification</b>	<p>A process, i.e. the combination of actions, that results in a certain set of products or services.</p> <p>The United Nations International Standard Industrial Classification of All Economic Activities is the international standard for the classification of productive economic activities. The main purpose is to provide a standard set of economic activities so that entities can be classified according to the activity they carry out. Human health and social work activities are classified with the following codes: 86 for human health activities, 87 for residential care activities, and 88 for social work activities without accommodation. (United Nations 2008)</p>

<b>Education</b>	<p>“The processes by which societies deliberately transmit their accumulated information, knowledge, understanding, attitudes, values, skills, competencies and behaviours across generations. It involves communication designed to bring about learning”. (UNESCO 2012a)</p> <p><b>Education level</b></p> <p>Levels described in International Standard Classification of Education 2011 programmes:</p> <ul style="list-style-type: none"> <li>• 0 Early childhood education</li> <li>• 1 Primary education</li> <li>• 2 Lower secondary education</li> <li>• 3 Upper secondary education</li> <li>• 4 Post-secondary non-tertiary education</li> <li>• 5 Short-cycle tertiary education</li> <li>• 6 Bachelor’s or equivalent</li> <li>• 7 Master’s or equivalent</li> <li>• 8 Doctorate or equivalent.</li> </ul> <p>(UNESCO 2012a)</p> <p><b>Educational activities</b></p> <p>“Deliberate activities involving some form of communication intended to bring about learning”. Health and welfare activities are classified under the broad field code 09 in ISCED classification. (UNESCO 2014)</p>
<b>Employment</b>	<p>Defined as persons of working age who, during a short reference period, are engaged in any activity to produce goods or provide services for pay or profit. They comprise:</p> <p>(a) employed persons “at work”, i.e. who work in a job for at least one hour;</p> <p>(b) employed persons “not at work” due to temporary absence from a job, or to working-time arrangements (such as shift work, flexitime and compensatory leave for overtime.)</p> <p>(International Conference of Labour Statisticians 2013)</p>
<b>Enrolment</b>	<p>Number of new entrants in the first year of an education programme. (UNESCO 2009)</p>
<b>Facility/institution ownership type</b>	<p>Classification for ownership type:</p> <ul style="list-style-type: none"> <li>• Publicly owned: Facilities owned or controlled by a governmental unit or a public corporation (where control is defined as the ability to determine the general corporate policy) corresponding to the institutional sector “Government units” defined in the System of National Accounts 2008.</li> <li>• Not-for-profit privately owned: Facilities that are legal or social entities created for the purpose of producing goods and services, whose status does not permit them to be a source of income, profit, or other financial gain for the unit(s) that establish, control or finance them, corresponding to the institutional sector “Non-profit institutions serving households” defined in the System of National Accounts 2008.</li> <li>• For-profit privately owned: Facilities that are legal entities set up for the purpose of producing goods and services and are capable of generating a profit or other financial gain for their owners corresponding to the institutional sector “Non-financial corporations” defined in the System of National Accounts 2008.</li> </ul> <p>(European Communities et al. 2008)</p> <p><b>Facility type</b></p> <ul style="list-style-type: none"> <li>• Hospitals (HP.1)</li> <li>• Residential long-term care facilities (HP.2)</li> <li>• Providers of ambulatory health care (HP.3)</li> <li>• Ancillary services (HP.4, including transportation, emergency rescue, laboratories and others)</li> <li>• Retailers (HP.5, including pharmacies)</li> <li>• Providers of preventive care (HP.6)</li> </ul> <p>(OECD et al. 2011)</p>

<b>Family medicine practitioner</b>	Part of generalist medical practitioners classified in ISCO-08 code 2212. Also referred to as general practitioners and in some countries considered as a specialization, they provide person-centred continuous and comprehensive medical care to individuals and families in their communities. This group does not include resident medical officers, medical interns or other generalist medical practitioners not in general practice activities.
<b>Field epidemiology training programme (FETP)</b>	<p>A health training programme with field investigations to develop experience and specialist skills based on practical application of epidemiological methods. FETP training levels are defined as:</p> <ul style="list-style-type: none"> <li>• basic level: for local health staff, comprising limited classroom hours interspersed throughout 3–5 month on-the-job field assignments to build capacity to conduct timely outbreak detection, public health response, and public health surveillance.</li> <li>• intermediate level: for district/regional epidemiologists, comprising limited classroom hours interspersed throughout 6–9 month on-the-job mentored field assignments to build capacity to conduct outbreak investigations, planned epidemiologic studies, and public health surveillance analyses and evaluations.</li> <li>• advanced level: using a national focus for advanced epidemiologists, it consists of limited classroom hours interspersed throughout 24-month mentored field assignments to build capacity in outbreak investigations, planned epidemiologic studies, public health surveillance analyses and evaluations, scientific communication and evidence-based decision-making for development of effective public health programming.</li> </ul> <p>(WHO 2005b)</p>
<b>Foreign-born health worker</b>	A health worker born in a country other than the one in which s/he performs health-related activities. (Wismar et al. 2011)
<b>Foreign-trained health worker</b>	A domestic health worker who obtained his/her qualification (degree) in another country and is entitled to practise in the receiving country. (OECD 2015b)
<b>Full-time equivalent (FTE)</b>	<p>Employment defined as the total hours worked divided by the average annual hours worked in a full-time job. Depending on data availability on working hours, FTE level may also be calculated in the following ways:</p> <ul style="list-style-type: none"> <li>• A worker with a full-time employment contract should be counted as 1 FTE. Concerning workers who do not have a full-time employment contract, FTE should be measured by the number of hours of work mentioned in each contract divided by the normal number of hours worked in a full-time job.</li> <li>• A worker with a full-time employment contract should be counted as 1 FTE. Concerning workers with part-time contracts, the practice in many countries is simply to consider that 2 part-time workers = 1 FTE.</li> </ul> <p>(OECD et al. 2016) An alternative definition can be found in: (European Communities et al. 2008)</p>
<b>Graduate</b>	An individual who has successfully completed an education programme, according to the International Standard Classification of Education 2011. (UNESCO 2012a)
<b>Gross domestic product</b>	Final consumption expenditures + gross capital formation + net exports. (OECD 2017c)
<b>Gynaecologist</b>	A specialist medical practitioner (ISCO-08 code 2212) concerned with the functions and diseases specific to women and girls, especially those affecting the reproductive system. (International Labour Organization 2012)

**Health-care financing scheme**

This is a structural component of health-care financing systems, and the main types of financing arrangement through which people obtain health services. Health-care financing schemes include direct payments by households for services and goods and third-party financing arrangements. Third-party financing schemes are distinct bodies of rules that govern the mode of participation in the scheme, the basis for entitlement to health services and the rules on raising and then pooling the revenues of the given scheme. Four broad categories of health-care financing schemes can be considered:

1. Government schemes and compulsory contributory health-care financing schemes
2. Voluntary health-care payment schemes (other than out-of-pocket)
3. Household out-of-pocket payment
4. Rest of the world financing schemes.

(OECD et al. 2011)

**Health information system**

The health information system provides the underpinnings for decision-making and has four key functions: (i) data generation, (ii) compilation, (iii) analysis and synthesis, and (iv) communication and use. The health information system collects data from health and other relevant sectors, analyses the data, ensures their overall quality, relevance and timeliness, and converts the data into information for health-related decision-making. (WHO 2010d)

**Health professional mobility**

Any movement across a border by a health professional after graduation with the intention to work, that is, deliver health-related services in the destination country, including during training periods. (Buchan et al. 2014)

**Health workforce education and training institution**

An established institution that provides education as its main purpose, such as a school, college, university or training centre. Such institutions are normally accredited or sanctioned by the relevant national education authorities or equivalent to award qualifications. Educational institutions may also be operated by private organizations, such as religious bodies, special interest groups or private educational and training enterprises, both for profit and non-profit. (UNESCO 2012a)

Types of health workforce education and training institutions are:

- Public: Public educational institutions provide core educational services such as teaching activities and ancillary services. They include schools, colleges, universities, and training centres. They are controlled and managed directly by a public education authority or governing body (council, committee, etc.), the majority of whose members are appointed by a public authority.
- Private: Private educational institutions provide core educational products such as teaching activities and ancillary services. They include schools, colleges, universities, and training centres, which are controlled and directly managed either by a private organization such as a church, trade union, or business enterprise, or by a governing board whose members have mostly not been selected by a public authority. Whether or not an institution is private is therefore a matter of management, not funding. A school, for example could in theory be entirely publicly funded but still be considered private because it is not managed by the government. In practice, for international comparability, any educational institution not managed by a government institution is classified as private.

(UNESCO 2016)

**Health workforce education and training place**

A place may be offered, by a health workforce education and training institution, to an applicant who meets the published minimum admission requirements for a particular programme. The number of places denotes the capacity of an education and training institution and its programmes.

**Health workforce education and training programme**

A “coherent set or sequence of educational activities or communication designed and organized to achieve pre-determined learning objectives or accomplish a specific set of educational tasks over a sustained period” with the objective to improve health knowledge, skills and competencies applied to health and enable the training of new health workers. Health workforce education and training programmes will often have a numerus clausus that restricts the number of places for a given programme. (UNESCO 2012a)

<b>Health workforce planning</b>	Strategies that address the adequacy of the supply and distribution of the health workforce according to policy objectives and the consequential demand for health labour. (EU Joint Action on Health Workforce Planning and Forecasting 2015)
<b>Higher education</b>	Includes “all types of studies, training or training for research at the post-secondary level, provided by universities or other educational establishments that are approved as institutions of higher education by the competent State authorities”. (UNESCO 1998)
<b>Hospital patient bed-days</b>	When a patient is confined to a bed in which the patient stays overnight in a hospital. Day cases (patients admitted for a medical procedure or surgery in the morning and released before the evening) should be excluded. (OECD 2015b)
<b>Human resources for health</b>	<p>All persons engaged in actions whose primary intent is to enhance health (WHO definition). Three categories of workers relevant for health workforce analysis can be distinguished:</p> <ul style="list-style-type: none"> <li>• those with health vocational education and training working in the health services industry</li> <li>• those with training in a non-health field (or with no formal training) working in the health services industry, and</li> <li>• those with health training who are either working in a non-healthcare related industry, or who are currently unemployed or not active in the labour market.</li> </ul> <p>(WHO et al. 2009)</p>
<b>Inpatient visits</b>	Visits to, or consultations in a hospital for treatment and/or care that lasts for a minimum of one night. (OECD 2015b)
<b>In-service training</b>	<p>Training received while one is employed in the health sector. (WHO 2017b)</p> <p>Training aimed at maintaining core competences and developing new competences in response to consumer demand and evolving public health needs. (WHO 2013b)</p>
<b>Institutional sector</b>	Relevant sectors based on the System of National Accounts, 2008: government units; non-profit institutions serving households; non-financial corporations; and households. (European Communities et al. 2008)
<b>International Health Regulations (2005)</b>	An international legal instrument that is binding on 196 countries across the globe, including all Member States of WHO. Its aim is to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide. (WHO 2005a)
<b>Interprofessional education</b>	When two or more health professionals learn about, from and with each other to enable effective collaboration and improve health outcomes. “Professional” is an all-encompassing term that includes individuals with the knowledge and/or skills to contribute to the physical, mental and social well-being of a community. (WHO 2010a)
<b>Job vacancy</b>	A paid post that is newly created, unoccupied, or about to become vacant: (a) for which the employer is taking active steps and is prepared to take further steps to find a suitable candidate from outside the enterprise concerned; and (b) which the employer intends to fill either immediately or within a specific period of time. (Eurostat 2017b)
<b>Leave entitlements to care for sick family members</b>	Entitlements to leave, sometimes paid, for employees with a child, partner, parent or other family member who is in need of care because of illness. (OECD 2017e)
<b>Licensure</b>	The granting of a permit (licence) or mandatory certification to practise in the appropriate field of health, issued by a legitimate regulatory body within the profession. (WHO 2015c)



## Lifelong learning

All general education, vocational education and training, non-formal education and informal learning undertaken throughout life, at all levels and all settings, resulting in an improvement in knowledge, skills and competences, which may include professional ethics. (European Union 2013)

### Lifelong learning systems

Schools, colleges, universities and other tertiary education institutions, community-based learning facilities, and health workplaces that gradually become integrated learning centres and, together as learning networks, would become mutually reinforcing. Technical and vocational education and training (TVET) could also be a strategic modality for addressing inequalities and promoting equality of opportunity in learning and the world of work, thereby promoting gender equality, social inclusion and social cohesion.

TVET within a lifelong learning framework could help to establish diverse learning pathways with multiple entry and exit points, supporting learning and career progression. Learning pathways could enable learners to navigate between different locations or levels and to gain recognized skills and qualifications throughout the life course. Together, such learning networks and learning pathways could form more flexible and responsive lifelong learning systems. (UNESCO 2015c)

## Maternity leave (or pregnancy leave)

Employment-protected leave of absence for employed women at around the time of childbirth, or adoption in some countries. The ILO convention on maternity leave stipulates the period of leave to be at least 14 weeks. (OECD 2017e)

## Medical doctor or physician: generalist

Generalist medical practitioners (ISCO 2008 code 2211) including family and primary care doctors, who diagnose, treat and prevent illness, disease, injury, and other physical and mental impairments and maintain general health in humans through application of the principles and procedures of modern medicine. They plan, supervise and evaluate the implementation of care and treatment plans by other health-care providers. They do not limit their practice to certain disease categories or methods of treatment, and may assume responsibility for the provision of continuing and comprehensive medical care to individuals, families and communities. (International Labour Organization 2012)

## Medical doctor: specialist

Specialist medical doctors (ISCO 2008 code 2212) diagnose, treat and prevent illness, disease, injury and other physical and mental impairments using specialized testing, diagnostic, medical, surgical, physical and psychiatric techniques, through application of the principles and procedures of modern medicine. They plan, supervise and evaluate the implementation of care and treatment plans by other health-care providers. They specialize in certain disease categories, types of patient or methods of treatment, and may conduct medical education and research activities in their chosen areas of specialization.

**Gynaecologist:** Specialist medical doctor concerned with the functions and diseases specific to women and girls, especially those affecting the reproductive system.

**Obstetrician:** Specialist medical doctor in pregnancy and childbirth.

**Paediatrician:** Specialist medical doctor who deals with the development, care, and diseases of children.

(International Labour Organization 2012)

## Midwife

Midwifery professionals (ISCO-2008 code 221) “plan, manage, provide and evaluate midwifery care services before, during and after pregnancy and childbirth. They provide delivery care for reducing health risks to women and newborn children according to the practice and standards of modern midwifery, working autonomously or in teams with other health care providers.” (International Labour Organization 2012)

## Net inflow, outflow

Net inflow is the difference between the number of health workers entered into the health labour market and the number of health workers who left the health labour market in a given year, when more health workers entered than left. If the number of workers who have left is greater than those who have entered, the concept of net outflow is used.



<b>Newly active health worker</b>	A health worker who starts activity in the given year in the given profession. (WHO 2015c)
<b>Nurse practitioner</b>	A registered nurse/advanced practice nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he has the credentials to practise. A master's degree is recommended for entry level. (ICN 2017)
<b>Nurse professional</b>	As defined by ISCO-2008 code 2221, "nursing professionals treat and provide care for people who are physically or mentally ill, the elderly, the injured or physically or mentally disabled". (International Labour Organization 2012)
<b>Occupation</b>	The concept of occupation is defined as a "set of jobs whose main tasks and duties are characterized by a high degree of similarity". A job is defined as "a set of tasks and duties performed, or meant to be performed, by one person, including for an employer or in self employment". Preferably, National Health Workforce Accounts should cover health and health-related occupations grouped according to the International Standard Classification of Occupations (ISCO-08). The list of occupations is included in Annex 4. (International Labour Organization 2012, International Conference of Labour Statisticians 2013)
<b>Occupational health and safety</b>	The science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment. (Alli 2008)
<b>Official development assistance</b>	Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25% (using a fixed 10% rate of discount). By convention, official development assistance (ODA) flows comprise contributions of donor government agencies, at all levels, to developing countries (bilateral ODA) and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions. Lending by export credit agencies – with the pure purpose of export promotion – is excluded. (International Monetary Fund 2003)
<b>Outpatient visits or consultations</b>	Consultations at the doctor's practice, in the patient's home, in outpatient departments in hospital, but excludes telephone contacts, visits for prescribed laboratory tests, visits to perform prescribed and scheduled treatment procedures, e.g. injections, physiotherapy, visits to dentists, visits to nurses. (OECD 2015b)
<b>Parental leave</b>	Employment-protected leave of absence for employed parents, often supplementary to maternity and paternity leave, and frequently, but not in all countries, follows the period of maternity leave. (OECD 2017e)
<b>Part-time employment</b>	Persons in employment (whether employees or self-employed) who usually work less than 30 hours per week in their main job. (OECD 2017g)
<b>Paternity leave</b>	Employment-protected leave of absence for employed fathers at, or in the first few months after, childbirth. (OECD 2017e)
<b>People-centred care</b>	An approach to care that consciously adopts the perspectives of individuals, carers, families and communities as participants in, and beneficiaries of, trusted health systems that respond to their needs and preferences in humane and holistic ways. People-centred care also requires that individuals have the education and support they need to make decisions and participate in their own care. It is organized around the health needs and expectations of people rather than diseases. (WHO 2016a)
<b>Pre-service education</b>	All mandatory educational activities occurring before graduates enter into service, i.e. excluding all education and training activities done in-service and continuing professional development.

<b>Primary care team</b>	Fellow professionals with complementary contributions to patient care. This is part of a broader social trend away from deference and hierarchy, towards mutual respect and shared responsibility and cooperation. (WHO Regional Office for Europe 2017)
<b>Primary object of attack</b>	<p>Persons, infrastructure, vehicles and other health-related items that have been subjected to violence, obstruction or the threat of violence. Object types are grouped as follows:</p> <ul style="list-style-type: none"> <li>• Health-care facility – hospital, clinic or health post</li> <li>• Health-care provider – physician, nurse, midwife, vaccinator, and other health-care workers including laboratory workers, health care security personnel, and maintenance or cleaning staff</li> <li>• Health-care transport – ambulances and any other health-care transport</li> <li>• Health-care recipient – patients or visitors.</li> </ul> <p>(WHO 2017a)</p>
<b>Public expenditure</b>	Expenditure from public funds. Public funds are state, regional and local government bodies and social security schemes. Public capital formation includes publicly-financed investment in facilities plus capital transfers to the private sector for construction and equipment. (OECD 2011c)
<b>Public health workforce</b>	A diverse workforce whose prime responsibility is the provision of core public health activities such as surveillance of disease, assessment of population health, identification of priority health problems and health hazards in the community. Such activities are carried out for preparedness and planning for public health emergencies, health protection operations, and evaluation of prevention activities. (Bjegovic-Mikanovic et al. 2014)
<b>Qualified educator</b>	Educators with the minimum academic qualifications required to teach a subject at the relevant level in a given country. (UNESCO 2017)
<b>Registered health worker</b>	Health workers whose data are included in a health workforce registry regardless of their activity or validity of licence. (WHO 2015c)
<b>Relicensure</b>	Recertifying a health worker as having attained the standards required to practise a particular occupation (see also Licensure). (WHO 2013c)
<b>Remuneration</b>	<p>Average gross annual income, earned by employees or those self-employed, i.e. income per year and per person, before any deductions are made for social security contributions or income tax. A person may have more than one qualifying job in any given reference period.</p> <ul style="list-style-type: none"> <li>• Income earned by employees (earnings) refers to all payments – in cash or in kind, for work done or time worked – made by their employers, and includes basic wages, overtime and other bonuses, such as for night work, work on weekends or other unsocial hours, all allowances paid by the employer, such as for working away from home or for housing, and all commissions and gratuities paid by the employer. Employers may be the government, corporations, non-profit institutions or households.</li> <li>• Income earned by self-employed workers refers to all payments, in cash or in kind, made by customers for goods or services, and includes capitation or fee-for-service reimbursement, bonuses, commissions, and gratuities. It should be net of operation costs/practice expenses.</li> </ul> <p>(OECD et al. 2011)</p>
<b>Rural–urban classification</b>	<p>Defines or delimits both urban and rural areas, or urban areas first and the latter by default. The classification may be defined on the basis of population in physical spaces with or without access to key services. In many countries, the criterion is population size or density, which are standard determinants of rurality. Rural areas are those with a low population density, i.e. a low number of inhabitants on a given area of land. Local administrative units may contain combinations of urban and rural populations.</p> <p>Several criteria may be combined (cities, municipalities, metropolitan areas) to define urban areas and define rural areas by exclusion. An initiative to address rural labour statistics in the context of national development for decent work can be found at <a href="http://ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/projectdocumentation/wcms_153119.pdf">http://ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/projectdocumentation/wcms_153119.pdf</a>.</p>

<b>Self-sufficiency in the health workforce</b>	Strategic investment in country infrastructure development to enhance its overall capacity to achieve an optimal, stable and appropriately distributed health workforce through more effective recruitment and retention policies and programmes. (Pan American Health Organization 2011)
<b>Sex</b>	Biological determination of a person's sex at birth. (WHO 2015c)
<b>Skill mix</b>	<p>A broad term that refers to the combination or grouping of different categories of staff in the workforce, or the demarcation of their roles and activities. It is also used to describe the mix of posts, grades or occupations in an organization (as in "grade mix"). Buchan and O'May offer the following definition in the context of health-care provision:</p> <ul style="list-style-type: none"> <li>• a combination of skills available at a specific time</li> <li>• a mix of posts in a given facility</li> <li>• a mix of employees in a post</li> <li>• a combination of activities that are comprised in each role</li> <li>• differences across occupational groups such as nurses and physicians or between various sectors of the health system, or</li> <li>• a mix within an occupational group such as the different types of nursing providers with different levels of training and different wage rates.</li> </ul> <p>(Buchan and O'May 2000, Buchan and Calman 2004)</p>
<b>Social accountability</b>	The obligation of an authorized body to direct its education, research, and service activities towards addressing the priority health concerns of the community, region, and/or nation it has a mandate to serve. (Boelen and Heck 1995)
<b>Social determinants of health</b>	The conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems. (WHO 2008b)
<b>Specialist surgical workforce</b>	Includes licensed, qualified physician surgeons; anaesthesiologists; and obstetricians. (WHO 2017d)
<b>Status in employment</b>	<p>One of two categories of the total employed:</p> <p><b>(a)</b> wage and salaried workers (employees): workers who hold a job defined as "paid employment", with explicit (written or oral) or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work, and</p> <p><b>(b)</b> self-employed workers: workers who, working on their own account or with one or more partners or in a cooperative, hold a "self-employment job", i.e. one in which the remuneration is directly dependent upon the profits derived from the goods and services produced.</p> <p>(International Labour Organization 2016)</p>
<b>Student</b>	A person not economically active who attends any regular educational institution, public or private, for systematic instruction at any level of education. (OECD 2017f)
<b>Subnational level</b>	To be defined according to the specific conditions, governing structures, and constitutional provisions existing in a given country. Disaggregation based on administrative boundaries down to the first or second subnational level is recommended (depending on the structure of administrative boundaries and the size of subnational territories), without overlaps between the administrative units. Examples for subnational administrative units are states, regions, provinces, counties, and districts. (WHO 2015a)

<b>Total expenditure on the health workforce</b>	<p>The sum of expenditures on compensation of employees (FP.1): wages and salaries (FP.1.1); social contributions (FP.1.2); all other costs related to employees (FP.1.3); self-employed professional remuneration (FP.2). Expenditure on mandatory continuing professional development should be included within social contributions. (OECD et al. 2011)</p> <p><b>Total public expenditure on health workforce education</b></p> <p>Current and capital expenditure expressed as a percentage of gross national income (or gross national product) in a given financial year. This indicator shows the proportion of income spent by government authorities on health workforce education over a given financial year. This can also be calculated based on gross domestic product. (UNESCO 2009)</p>
<b>Total expenditure on health care</b>	Current health expenditure plus capital investment in health-care infrastructure. (OECD et al. 2011)
<b>Total public health expenditure</b>	Current public health expenditure plus capital investment in health-care infrastructure. (OECD 2011c)
<b>Transformative (health workforce) education</b>	The sustainable expansion and reform of health workforce education and training to increase the quantity, quality and relevance of health workers, and in so doing strengthen national health systems and improve population health outcomes. (World Health Assembly 2013, UNESCO 2015c)
<b>Tuition fee</b>	Money that students pay to a health workforce education and training institution for their teaching.
<b>Unemployment</b>	All persons of working age who are qualified for a job, are not in employment, have carried out activities to seek employment during a specified recent period, and are currently available to take up employment given a job opportunity. (International Conference of Labour Statisticians 2013)
<b>Unemployment rate</b>	The number of persons unemployed as a percentage of the labour force (i.e. total number of people employed and unemployed). (Eurostat 2017a)
<b>Vacancy rate</b>	The proportion of total posts that are vacant according to the definition of the job vacancy, expressed as a percentage of total positions, both filled and unfilled. (Eurostat 2017b)









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