SDG Goal 3	**Good health and well-being**
SDG Target 3.c	**Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States**
SDG Indicator 3.c.1	**Health worker density and distribution**
Time series	**Health workers with direct patient contact (practising concept)**

1. General information on the time series

- Date of national metadata: 11 August 2021
- National data: http://sdg-indikatoren.de/en/3-c-1/
- Definition: The time series is defined as the number of persons working in health services per 10,000 inhabitants.
- Disaggregation: profession

2. Comparison with global metadata

- Date of global metadata: March 2021
- Global metadata: https://unstats.un.org/sdgs/metadata/files/Metadata-03-0C-01.pdf
- The time series is compliant with the global metadata. Traditionally, the time series has been estimated using two measurements: density of physicians, and density of nursing and midwifery personnel. In the context of the SDG agenda, the dataset has been expanded to physicians, nursing personnel, midwifery personnel, dentistry personnel and pharmaceutical personnel. The dataset is planned to progressively expand to cover all health cadres.

3. Data description

• The data on health workers by occupation have been retrieved from the health personnel accounts of the Federal Statistical Office. The health personnel accounts is a secondary statistical calculation system that combines different data sources on employment in health services, such as administrative data, sample surveys or annual reports. About 30 statistics are included in the health personnel accounts, like the hospital statistics and the Microcensus of the Federal Statistical Office as well as the employment statistics of the Federal Employment Agency and other statistics of various professional associations (e.g. German Medical Association, German Dental Association). Data gaps are closed by estimations and mathematical-statistical forecasting methods. In addition, consistency checks with results of the employment accounts (part of the National Accounts) are carried out. With reference year 2015 the updated classification of the occupations, the KldB-2010, was implemented. The existing data were calculated backwards until 2012 (only some occupations further back).

Data on population are the results of the latest population census (currently: 2011 Census) rolled forward in a breakdown by sex, age, marital status and citizenship, using both statistics of population change (migration, births, deaths, entering into marriages or registered same-sex partnerships) and information on changes in citizenship and the dissolution of marriages or registered same-sex partnerships. Before 2011, updated census data from 1987 (Federal Republic of Germany) and the population register of October 1990 (German Democratic Republic) were used. For the years before 2011 the results for population were calculated backwards using the census 2011 and migration, birth and death statistics.

The time series is defined as the number of persons working in health services per 10,000 inhabitants. The data have been provided according to the "practising concept ", which comprises only health workers who work in direct contact with patients. The time series is disaggregated by occupations into medical doctors (221, 2211 and 2212 of ISCO-08), nursing and midwifery personnel (2221, 2222, 3221 and 3222 of ISCO-08), dentists (2261 of ISCO-08), and pharmacists (2262 of ISCO-08). The disaggregations are defined as the number of persons working in a specific sector according to the particular definition of the Joint Questionnaire between OECD, Eurostat and WHO-Europe on non-monetary health care statistics.
The codes of the KldB-2010 listed above are comparable with the codes mentioned in the International Standard Classification of Occupations, the ISCO-08. According to the classification of occupations 2010 (KldB-2010) the following codes are relevant for:

•medical doctors
- 81214 Technical laboratory occupations in medicine – highly complex tasks,
- 81234 Technical occupations in radiology – highly complex tasks,
- 81404 Medical doctors (without specialisation) – highly complex tasks,
- 81414 Medical doctors specialised in paediatrics and adolescent medicine – highly complex tasks,
- 81424 Medical doctors specialised in internal medicine – highly complex tasks,
- 81434 Medical doctors specialised in surgery – highly complex tasks,
- 81444 Medical doctors specialised in dermatology, otorhinolaryngology, ophthalmology, gynaecology, andrology and related medical fields – highly complex tasks,
- 81454 Medical doctors specialised in anaesthesiology – highly complex tasks,
- 81464 Medical doctors specialised in neurology, psychiatry, psychotherapy and psychosomatic medicine – highly complex tasks,
- 81484 Medical doctors (with specialisation, not elsewhere classified) – highly complex tasks,
- 81494 Managers in human medicine and dentistry, as well as
- 81814 Medical doctors specialised in pharmacology – highly complex tasks.

•nursing and midwifery personnel
- 81302 Occupations in nursing (without specialisation) – skilled tasks,
- 81313 Occupations in nursing specialized in a particular branch of nursing – complex tasks,
- 81323 Occupations in nursing specialised in paediatrics – complex tasks,

- 81352 Occupations in obstetrics and maternity care – skilled tasks
- 81353 Occupations in obstetrics and maternity care – complex tasks
- 81382 Occupations in nursing (with specialisation, not elsewhere classified) – skilled tasks
- 81383 Occupations nursing (with specialisation, not elsewhere classified) – complex tasks
- 81393 Supervisors in nursing, emergency medical services, obstetrics,
- 82102 Occupations in geriatric care (without specialisation) – skilled tasks,
- 82103 Occupations in geriatric care (without specialisation) – complex tasks,
- 82182 Occupations in geriatric care (with specialisation, not elsewhere classified) – skilled tasks, as well as
- 82183 Occupations in geriatric care (with specialisation, not elsewhere classified) – complex tasks.

•dentists
- 81474 Dentists and orthodontists – highly complex tasks, as well as
- 81494 Managers in human medicine and dentistry.

•pharmacists
- 81804 Pharmacists – highly complex tasks and
- 81884 Occupations in pharmacy (with specialisation, not elsewhere classified) – highly complex tasks

4. Accessibility of source data

• Health personnel by occupations in healthcare:GENESIS online 23621-0002: Health personnel - Germany, years, facilities, sex, occupations in healthcare:
https://www-genesis.destatis.de/genesis//online/data?operation=table&code=23621-0002&bypass=true&language=en

• Population – GENESIS online, table 12411-0003:
https://www-genesis.destatis.de/genesis//online/data?operation=table&code=12411-0003&bypass=true&language=en

• Population 2010 calculated backwards to Census 2011 (only available in German):
https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsstand/_inhalt.htm

5. Metadata on source data

• Quality report of health personnel accounts (only available in German):"Gesundheitspersonalrechnung":
https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Gesundheit/einfuehrung.html

• Quality report of intercensal population updates:
https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Bevoelkerung/einfuehrung.htm

6. Timeliness and frequency

• Timeliness: t + 12 months

• Frequency: Annual

7. Calculation method

- Unit of measurement: Per 10,000 inhabitants
- Calculation method:

$$\textbf{Health workers}_i = \frac{\text{Health personnel by occupation}_i\,[\text{number}]}{\text{Population}\,[\text{number}]} \cdot 10{,}000$$

$i \in \{\text{medical doctors; nursing and midwifery personnel; dentists; pharmacists}\}$