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Report of the World Health Organization on health statistics: strengthening statistical systems to track the health-related Sustainable Development Goals

Note by the Secretary-General

In accordance with Economic and Social Council decision 2021/224 and past practices, the Secretary-General has the honour to transmit the report of the World Health Organization (WHO), in which current work on health statistics in relation to global monitoring of the health and health-related Sustainable Development Goals is outlined. The Statistical Commission is invited to express its views and provide guidance on the approaches being taken by WHO in developing its health data and statistical expertise and towards the achievement of health and health-related targets of the Goals, in partnership with national statistical offices, ministries of health, other relevant United Nations agencies and technical experts.

The present report provides updates on some of the important developments under way at WHO with regard to data and statistics, most notably the establishment of a new Geographic Information System Centre, Health Information Systems Unit and Health Equity Monitoring Unit; the development of a new, global, modular health survey; a revised and updated composite index of universal health coverage; the new World Health Data Hub; and the roll-out of the eleventh revision of the International Classification of Diseases. Furthermore, WHO highlights the groundbreaking work carried out in collaboration with the Department of Economic and Social Affairs of the Secretariat on modelling estimates for excess mortality for each member State in relation to the coronavirus disease (COVID-19), disaggregated by sex and age. It also provides information on the statement issued at the Health Data Governance Summit and on data-sharing principles. Finally, WHO informs the Commission of its intention to inaugurate a new international conference on health statistics.

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Report of the World Health Organization on health statistics: strengthening statistical systems to track the health-related Sustainable Development Goals

I. Introduction and background

1. At its fifty-first session, the Statistical Commission took note of the report of the World Health Organization (WHO) outlining current work on health statistics (E/CN.3/2020/16).

2. Since the issuance of the previous report, the coronavirus disease (COVID-19) pandemic has thrown the world into turmoil, highlighting in the most graphic terms imaginable the importance of good health and good health statistics. By the end of June 2021, 18 months into the pandemic, more than 181 million people had contracted the disease and some 3.9 million deaths were directly attributable to it. Importantly, an additional 6 million deaths are estimated to be indirectly attributable. At the time of writing, in mid-November 2021, cumulative cases had risen to 255 million and the death toll directly attributable to COVID-19 stood at over 5 million. It is likely that these are gross underestimations of the real impact of the virus.

3. The pandemic has reinforced the message that timely and reliable statistics are central to monitoring the health-related Sustainable Development Goals, informing policy decisions, anticipating and preparing for future health scenarios and tracking the impact of interventions. Health systems, like most statistical systems, were not prepared for such a crisis. The pandemic has challenged the most modern statistical and health information systems but has, in particular, presented major challenges to low- and middle-income countries.

4. A new Division of Data, Analytics and Delivery for Impact was established in 2019 as part of the WHO transformation agenda to help to strengthen WHO data and statistics, as well as to provide greater and more coordinated support to countries. The new Division has been actively working on improving data governance and data-sharing mechanisms across WHO, including hosting a two-part Health Data Governance Summit in 2021.[1] Recent reports, such as *World Health Statistics 2021*,[2] *Tracking Universal Health Coverage: 2021 Global Monitoring Report*[3] (produced jointly with the World Bank and the Organisation for Economic Co-operation and Development) and *State of Inequality: HIV, Tuberculosis and Malaria*,[4] all highlight the tremendous gains made in health between 2000 and 2019. Importantly, improvements in life expectancy and healthy life expectancy at birth were especially notable in low-income countries, reflecting the remarkable progress that those countries have made in reducing child mortality and major communicable diseases. Steady declines in suicides, homicides, unintentional poisoning and road traffic fatalities were also notable. However, the reports also highlight the risks posed by COVID-19 that may undermine or reverse such progress and underscore the detrimental barriers to progress of persistent inequalities in health within and between countries. In particular, the lack of registrations of critical life events, notably births and deaths, persists in many parts of the world, undermining human rights, attempts to formalize economies and health statistics. In November 2021, WHO hosted a two-day seminar to highlight the importance of civil registration and vital statistics systems and the need to reprioritize efforts to improve the registration of vital events.

[1] See www.who.int/data/events/health-data-governance-summit/introduction.
[2] Available at http://www.who.int/data/gho/publications/world-health-statistics.
[3] Available at www.who.int/publications/i/item/9789240040618.
[4] Available at www.who.int/publications/i/item/9789240039445.

5. A report of the first global assessment, known as SCORE (survey, count, optimize, review, enable),[5] of the status and capacity of data and health information systems in 133 countries (covering 87 per cent of the world's population) was issued in 2020. In the report, gaps and guidance for investment were identified in areas that will have the greatest impact on the quality, availability, analysis, accessibility and use of data. More broadly, the support needed to help countries to strengthen their routine health information systems was also identified.[6] The report highlighted clearly that, in many countries around the world, administrative data from health information systems are not captured or utilized, owing largely to poor data architecture, low usage of common identifiers and a lack of digitization. Following a global consultation in early September 2021, WHO, in collaboration with Health Data Collaborative partners,[7] developed a global strategy for optimizing routine health information systems in countries on achieving primary health care and universal health coverage. The strategy outlines a process that can be adapted to individual country circumstances and identifies available technical resources to strengthen routine health information systems. It also guides how WHO, at the global, regional and country levels, will work together and engage with partners to support countries in developing and strengthening the capacity of national routine health information systems. The aim of the strategy is to help countries to develop their own strategies to improve the capacity of their routine health information systems for the next global SCORE assessment in 2025 and beyond. WHO is currently holding discussions with member States to identify the first cohort of countries in which the strategy will be implemented.

II. Establishment of new units

6. In late 2021, the Department of Data and Analytics was restructured. The focus of some units was clarified, and crucially three new specialist units were created. The rationale is detailed below.

A. Geographic Information System Centre

7. WHO established a new Geographic Information System Centre for health to serve various programmes within WHO and its member States in the area of geographic information systems and mapping. By connecting maps, applications, data and people, the Centre will be dedicated to supporting countries in making informed public health decisions. By integrating geographic information systems and statistics, the aim is to bring forward more innovative approaches and data sets, helping to inform decisions both in routine practice and during health emergencies – for example, by mapping cases and vaccine delivery, collecting samples, integrating health mapping with local geography and exploring spatial patterns in areas of case reporting.

8. In its strategy, the Centre envisages the following eight outcomes: (a) adoption of modern and fit-for-purpose technical approaches and skills to best meet its mission; (b) improved clarity and collaboration on key decisions, supported by geo-intelligence; (c) increased capacity across WHO regions and member States to take advantage of proven geospatial methods and resources for health outcomes; (d) minimization of transaction costs for WHO regions and member States looking to engage with geospatial technologies; (e) establishment of meaningful technical

[5] See www.who.int/data/data-collection-tools/score.
[6] World Health Organization, document A74/8.
[7] See www.healthdatacollaborative.org.

partnerships and plans to execute against those shared commitments; (f) development of a leading voice on geospatial technologies for global health, ensuring intentional approaches that leave no one behind; (g) optimization of operations and acceleration of the targeted deployment of resources; and (h) improvement in geospatial data governance and risk mitigation as well as compliance.

9. Proposed research topics for the Centre include: big data, artificial intelligence/machine learning and crowd sourcing. Working with big data and crowd sourcing (in particular regarding satellite imagery) will help the Centre to better address issues such as mapping spatial populations as well as monitoring global security incidents and conflicts and their impact on health infrastructure and affected populations. The Centre will also pioneer the use of satellite imagery and geospatial intelligence; drones for delivery of vaccines and other emergency supplies and for returning collected samples to laboratories for testing; remote sensing techniques for burial counts to validate mortality; and the development, testing and implementation of new knowledge management and training tools for the Centre. WHO country offices, in partnership with ministries of health, are constantly asking for guidance, documents and training by the Centre, which will better address these requests. Evaluating research and coordinating with United Nations agencies will allow WHO to assess the latest tools for mobile devices and survey software and expand knowledge in emerging technologies. It will also improve capacity with regard to research synthesis and meta-analysis of primary research in the field of geographic information systems for health and development.

B. Health Equity Monitoring Unit

10. The principle of leaving no one behind is central to the Sustainable Development Goal agenda, and serving the vulnerable is a cornerstone of the thirteenth general programme of work of WHO.[8] The COVID-19 pandemic has not only exposed socioeconomic and geographic health inequalities but has also interrupted (or even reversed) improvements being made in countries to reduce inequalities across health areas. With this is mind, and to strengthen WHO capacity in this area, a new Health Equity Monitoring Unit has been established within the Department of Data and Analytics. The new Unit will broaden the scope of current analyses.

11. The work of WHO on health inequality monitoring is focused on developing and enhancing a package of tools and resources for countries; generating and disseminating evidence on global and national health inequalities; and building equity monitoring capacity among member States in order to inform equity-oriented health policies, programmes and practices. WHO has updated the Health Equity Monitor,[9] a large database of reproductive, maternal, newborn and child health data disaggregated by relevant characteristics, including associated country equity profiles, [10] in collaboration with the International Centre for Equity in Health. It has also launched new versions of the Health Equity Assessment Toolkit (HEAT and HEAT Plus),[11] a software application that facilitates the assessment of national health inequalities. WHO has been developing a new measure of the status of socioeconomic deprivation to monitor multidimensional health inequality, in collaboration with the Oxford Poverty and Human Development Initiative, which will be included as a new dimension of inequality in the 2022 update of the Health Equity Monitor.

[8] See www.who.int/about/what-we-do/thirteenth-general-programme-of-work-2019---2023.
[9] See www.who.int/data/gho/health-equity.
[10] See www.who.int/data/gho/health-equity/country-profiles.
[11] See www.who.int/data/gho/health-equity/assessment_toolkit.

12. In December 2021, WHO and the Global Fund to Fight AIDS, Tuberculosis and Malaria published a joint report entitled *State of Inequality: HIV, Tuberculosis and Malaria*, the first systematic global analysis of the state of inequality in the three diseases and how it has changed over the past decade, which highlighted opportunities for further action to reduce inequities. In addition, WHO has conducted several global and country-level studies on health inequalities in immunization, covering topics including subnational inequalities,[12] gender-related barriers and distance to health facilities. WHO continues to provide training workshops to member States to build capacity in equity monitoring, as well as to develop training resources. In December 2021, it published a new resource, entitled "Inequality monitoring in sexual, reproductive, maternal, newborn, child and adolescent health: a step-by-step manual", and launched e-learning courses on health inequality monitoring and health inequality monitoring in immunization.

C. Health Information Systems Unit

13. The importance of secondary data, especially administrative data, is well understood by national statisticians. A large volume of secondary health data potentially exists within routine health information systems. However, much of the data is not harnessed or utilized. The first global SCORE assessment report in 2020 illustrated the scale of the challenge and identified support to countries to strengthen routine health information systems as a priority action and need. The critical need for robust, timely, country-level data has become more evident during the COVID-19 pandemic. The Health Information Systems Unit has been established to work with member States to develop their routine health information systems so that potentially rich data can be used to support policy formation.

14. The Unit, in collaboration with Health Data Collaborative partners, has developed a global strategy for optimizing routine health information systems in countries on achieving primary health care and universal health coverage. The strategy outlines a process that can be adapted for individual countries and identifies a number of currently available technical resources to strengthen routine health information systems, with a focus on data use as the main driver. It also guides how WHO, at the global, regional and country levels, will work together and engage with partners to support countries in building the capacity of national routine health information systems. The aim is for countries to have that capacity improved by the next global SCORE assessment in 2025. WHO is holding discussions with member States to identify the first cohort of countries in which the strategy will be implemented in 2022.

III. Other developments

15. A number of important developments are summarized below that will be of interest to members of the Statistical Commission.

A. World Health Survey Plus

16. The World Health Survey Plus is a WHO-led data-generation initiative aimed at helping countries and WHO to measure progress towards the health-related

[12] Katherine Kirkby and others, "Subnational equalities in diphtheria-tetanus-pertussis immunization in 24 countries in the African region", *Bulletin of the World Health Organization*, vol. 99, No. 9 (September 2021), pp. 627–639.

Sustainable Development Goals and other topics of public health interest. Its flexible modular design – which allows it to build on existing national and multi-country household survey programmes – has been founded upon scientifically robust methods, while incorporating innovative approaches to capture and disseminate health data needed to inform policy and programmatic decisions and track progress.

17. The first expert technical consultation on the survey was hosted virtually in April 2021 and set the agenda for the new survey programme. Crucially, its success depends on ministries of health, national statistics offices, donors and other partner organizations working together with WHO. Such interaction is vital to ensure that the survey reduces unnecessary duplication, builds on existing strengths and partnerships in data collection and is an efficient process.

18. WHO will work closely with other international organizations through the Intersecretariat Working Group on Household Surveys to find the best way to help countries to integrate the survey with existing surveys, in order to minimize the burden and fill as many data gaps as possible. It is hoped to pilot the survey modules in a selection of countries in 2022 in order to assess these issues. Where ongoing household health or other surveys exist, specific core add-on modules from the survey could be considered for inclusion in those surveys with appropriate technical assistance and partnership.

B. World Health Data Hub

19. The World Health Data Hub has been developed to address requests from WHO member States to: resolve data fragmentation by consolidating WHO data repositories, portals and data sets; reduce the data collection burden on countries; support country capacity in data and health information systems; and track the triple billion targets in the thirteenth programme of work of WHO and the health-related Sustainable Development Goals by providing timely, reliable and actionable data.

20. The Data Hub is intended to seamlessly map complex relationships from dashboards and visualizations to source data. The data include indicators, data sets, metadata, microdata, collection instruments and methodologies. Users are given complete transparency regarding the journey of data from collection to visualization. They can access and browse data through a range of pathways, allowing for custom themes and dashboards. By providing a dynamic, common system, the Data Hub implements the backbone for publishing channels, WHO observatories and data portals. WHO technical programmes, regional offices, country offices and partners will be equipped with their own space to collate, curate and publish dashboards, insights and data assets.

21. The Data Hub consists of the following major components: (a) the country portal, a system that streamlines and tracks consultation and data collection processes; (b) the data lake, a collection of cloud-based services that allow WHO technical teams to acquire, share and collaborate with common data assets, tools and codes; and (c) data.who.int, a streamlined data dissemination site for all available WHO data assets that provides optimization for ease of use, accessibility and discoverability, while providing a single source of truth for data sets.

22. The first version of the complete system is slated for release in the second quarter of 2022, but the country portal is already in use for consultation processes and the data lake components are being used by selected technical teams. WHO will be switching from the implementation mode to the operational mode of the initiative during the first and second quarters of 2022 and will begin iterative needs-based feature enhancements from the third quarter of 2022.

C. Revision of the universal health coverage index

23. As part of its triple billion targets, WHO compiles an index of universal health coverage. Conceptually, it is quite a complex topic and can be approached from a variety of perspectives. The current index was constructed quickly and questions remain regarding the robustness of that measurement. Therefore, in 2022, WHO intends to hold a global consultation on the most appropriate conceptual framework for an index. Thereafter, it is intended that the index will be reconstructed with a view to bringing it to the Inter-Agency and Expert Group on Sustainable Development Goal Indicators as part of the 2025 comprehensive review for adoption. On a related note, with regard to the measure for healthy populations, the second arm of the triple billion targets, a similar process will be undertaken, namely a global consultation followed by the construction of a new composite index.

D. Classifications

24. Country health statistics and recording for clinical and administrative purposes are founded upon the International Statistical Classification of Diseases and Related Health Problems under WHO regulations on nomenclature. The eleventh revision of the International Classification of Diseases (ICD-11) comes into effect on 1 January 2022, following its adoption by the World Health Assembly in May 2019. Some 157 countries are at different stages of preparation for ICD-11. The spectrum ranges from basic knowledge to fully fleshed data production. A set of early adopter countries started data production with ICD-11, conducted a national roll-out for mortality and morbidity or ran national pilots in preparation for implementation. The ICD-11 coding tool, in conjunction with either an electronic cause of death certificate or health records, has considerably lowered the bar for coding the collection of causes of death or diseases. The experiences of early adopters provided valuable input for updates of ICD-11.

25. The current release has incorporated international non-proprietary names, the anatomical chemical therapeutic classification/daily drug dosage classification, all elements of the international classification of external causes of injury, elements of the International Classification of Diseases for oncology and some 2,000 proposals from early adopters and scientific groups. Some 20,000 synonyms were added, further facilitating the use of ICD-11. Versions in Arabic, Chinese, English and Spanish have been released, and French and Russian versions will follow by the end of 2021. Versions in 20 other languages are at various stages of translation and will be available from the same unified platform.

26. WHO will be preparing its statistical output based on ICD-11 starting in 2022. Earlier data can be converted to ICD-11 using the available transition tables. A set of ICD-11 codes serves to document COVID-19 cases, the exclusion of COVID-19, post-COVID-19 (“long COVID”) cases, COVID-19 vaccination status and vaccines. In conjunction with codes from the WHO classification for health interventions (International Classification of Health Interventions), the data set is also the reference data set for the international COVID-19 certificate. The health-related indicators of the Sustainable Development Goals have been mapped to ICD-11. ICD-11 and all accompanying materials are available at https://icd.who.int, including guides for implementation, training materials and technical instructions for integrating the application programming interface and coding tool into any digital environment, locally or online.

27. The International Classification of Health Interventions has been finalized for clinical and nursing interventions. It is already in use in some countries. The

components for functioning interventions will be finalized in 2021. Reviewers and the final input for the public health interventions are being identified, and the formal final release is planned for 2022. An updated digital version of the International Classification of Functioning, Disability and Health has been released. All of the above-mentioned WHO classifications are now maintained on the same platform, sharing extension codes (terminology) for more detail, and are using the same technology for translation, coding, proposals and the software interface.

E. Coronavirus disease-related excess mortality

28. In February 2021, in collaboration with the Department of Economic and Social Affairs, WHO convened a Technical Advisory Group on COVID-19 Mortality Assessment to advise on the development of analytical methods for estimating excess mortality in all countries.[13] The Technical Advisory Group comprises leading demographers, epidemiologists, data and social scientists and statisticians from a range of backgrounds and regions.

29. Working group 1 of the Technical Advisory Group, which deals with estimating global excess mortality, including from COVID-19, tested several statistical models and, after assessing performance, interpretability and extensibility, proposed a Poisson regression model (parameterized to account for overdispersion) to predict the total number of deaths from all causes for 2020 and the first half of 2021, conditional upon the number of expected monthly deaths over the period and a predicted relative rate parameter that is modelled using country-specific variables. The model has been used by WHO to generate estimates for countries and WHO regions for which adequate input data were available for reliable inference and to predict estimates for countries with no data available. In addition to determining levels of excess mortality attributable to COVID-19 for 2020 and 2021, the expertise of the Technical Advisory Group is also being leveraged to develop methods for disaggregating the estimated number of excess deaths by age and sex.

30. Mortality data to calculate actual deaths in real time are available in only a subset of countries in which reporting systems are functioning effectively, while historical data sets to calculate expected deaths are often incomplete. Many countries do not have the mortality surveillance capacity to generate and collect data in a timely manner, and these data gaps mean that excess mortality cannot be derived for all countries using standard methods. The work of the Technical Advisory Group has been essential to establishing a methodology to model excess deaths where data are unavailable and/or incomplete. This methodology remains under development and will continue to be revised as new data become available and the process of incorporating feedback from member States continues.

31. A country consultation was conducted from September to November 2021. Member States were invited to nominate focal points and were requested to review the results, data sources and methods used to produce the estimates; they were also asked to provide advice on primary data sources that may not previously have been reported and to share data sets not previously available. Furthermore, a series of regional webinars and individual mission briefings was conducted to present the estimates and methodology and respond to questions.

[13] The terms of reference of the five working groups of the Technical Advisory Group are presented to the Statistical Commission at its fifty-third session in paragraphs 8–12 of the report of the Secretary-General on the implementation of the United Nations Legal Identity Agenda: civil registration and vital statistics (E/CN.3/2022/9).

32. The WHO COVID-19 excess mortality estimates, published in December 2021, provide a comprehensive and comparable set of country estimates from January 2020 to June 2021. The estimates for 2020 included disaggregation by sex and age. It is envisaged that the estimates will be updated in June 2022.

F. Health Data Governance Summit

33. In 2021, WHO hosted a two-part Health Data Governance Summit.[14] The summit was prompted in part by developments arising from the COVID-19 pandemic, but more generally by the increasing volume of health and health-related data being generated worldwide, which is also accelerating the trend towards digitization in health. The increased demand for health data[15] and statistics[16] has exposed long-standing data governance issues, including issues of intellectual property rights, inequalities in data access and capacity, availability and sharing (including cross-border owing to differing data protections, regulations and interpretation), use, reuse, storage and bias in data analytics and possible misuse. Persistent data gaps and fragmented approaches to the governance of health data in different contexts are a major roadblock to the use of data as a global public good and have contributed to the lack of cross-pollination of health research and information systems data. Health data are both a strategic asset and a public good, the management of which requires cooperation and leadership at the global and national levels to address fragmentation.

34. Some of the main points in the statement issued at the summit[17] are as follows: (a) high-quality health data are crucial to inform policies, budgets and plans for improved health access and impact and to accelerate progress towards the achievement of the Sustainable Development Goals; (b) health data must be collected, shared and stored in line with internationally approved standards and used ethically and equitably; and (c) a new global consensus on health data governance, underpinned by a core set of guiding principles, is needed to secure health data as a global public good and to identify good data governance practices for better health, especially for communities left behind.

35. The summit reinforced the need for cooperation and dialogue to secure health data for and as a global public good and align support for identified good practices and principles in health data governance. Establishing health data as a global public good, adhering to international standards and being governed by good practices will help to build trust in order to maximize benefits and minimize harm. A data governance framework should support and strengthen individuals and communities so that they have control over, and benefit from, their own health data. This can be achieved by clarifying and strengthening legal protections against the misuse or abuse of health-related data and engaging with communities to co-create health data stewardship and accountability mechanisms.

36. In convening the summit, WHO acknowledged that data to improve health outcomes would come from multiple sources and that health data need to be integrated within broader multisectoral data governance practices in order to realize synergies, uncover new insights or develop new applications. It also acknowledged the power of data to change lives and transform communities. Understanding and acting on

[14] See www.who.int/data/events/health-data-governance-summit/introduction.

[15] Basic, often unprocessed, elements, characteristics or single pieces of information that make up sets of quantitative or qualitative variables.

[16] Numerical data that have been organized through mathematical operations in line with conceptual frameworks.

[17] See www.who.int/news-room/articles-detail/health-data-as-a-global-public-good-a-call-for-health-data-governance-30-september.

health data can enable better health and well-being, ensure universal health coverage and provide protection from emergencies. Therefore, WHO has committed to facilitating this common vision through the collective leadership and resources of a multisectoral and multi-stakeholder data community; has supported the need for global collaboration and dialogue on heath data across all sectors, ensuring shared learning and practices; and has called on member States and all stakeholders, including civil society and the private sector, to work together to develop and adopt a common framework and good data governance practices, underpinned by a globally unifying set of principles that build on or adapt WHO data principles. These actions should enable health data to be recognized as a global public good.

G. International conference on health statistics

37. WHO intends to inaugurate a new international conference on health statistics. The first session is tentatively scheduled for the third quarter of 2023, but a number of important steps will be required before this can be confirmed. It is envisaged that the conference will be country-driven, with member States represented by ministries of health and national statistical offices. The broad aim of the conference will be to provide a mechanism to improve coordination and communications with WHO member States and offer a forum in which international standards for health statistics can be developed and agreed upon. Given the intended role of the new conference, WHO requests that the Intersecretariat Working Group on Health Statistics be dissolved, while expressing appreciation for its work to date.

IV. Action to be taken by the Statistical Commission

38. **The Commission is invited:**

(a) **To express its views on the above activities and endorse them;**

(b) **To dissolve the Intersecretariat Working Group on Health Statistics, while expressing appreciation for its work to date.**