SCORE

for **Health Data**
Technical Package

Essential Interventions

World Health Organization

SCORE for Health Data Technical Package

Essential Interventions

Made possible by funding from
Bloomberg Philanthropies

World Health Organization

SCORE for Health Data Technical Package: Essential Interventions
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Foreword

More than at any time in human history, we live in a data-driven world. Digital technologies offer unprecedented opportunities to collect, analyse and use data to drive progress in many areas of life, including health.

Robust health data are vital to the work of WHO and the entire global health community – for monitoring national and subnational health priorities, for tracking progress towards the Sustainable Development Goals (SDGs) and the "triple billion" targets in WHO's Thirteenth General Programme of Work, and for preventing, preparing for, responding to and recovering from pandemics such as COVID-19.

In all these areas, countries must be able to measure progress to make progress. But understanding how to harness the power of data for health - and the abundance of tools for collecting, analysing and processing it - can present a challenge for countries.

Countries require accurate information to make real-time decisions, yet even the most advanced health systems still experience shortfalls in human and technical resources – a challenge highlighted as never before by the demand for data during the COVID-19 pandemic.

That's why WHO has developed the *SCORE for Health Data Technical Package*. It presents five strategies to help countries meet the challenges of data availability, collection, analysis, dissemination and use. The tools and standards in this resource are the most effective in addressing critical health data gaps and strengthening country health data as the foundation for evidence-based policies.

SCORE presents – for the first time in one resource – all the key elements required by governments and stakeholders to create an optimized health information system and allocate resources based on priority interventions that can have the greatest impact. It aims to help countries to develop a modern, data-driven, results-oriented health information and policy culture to help meet this inevitably growing demand.

Improvements in the way data is collected and optimized using this package will also enable countries to address inequality, and guide countries to act by consolidating best practices using universally accepted data standards and tools.

Urgently addressing the challenges of obtaining timely, reliable and actionable data is paramount for strong health information systems today and for sustainable solutions in the future. It is our hope that countries can use this package to achieve this aim.

We would like to express our sincere gratitude to Bloomberg Philanthropies for funding this truly collaborative work and to everyone who played a role in bringing SCORE to fruition.

SCORE is just one dimension of WHO's commitment to strengthening health data. As part of our organization-wide transformation, WHO has created a new division of Data, Analytics and Delivery for Impact to harmonize and streamline our data work as we continue in our mission to promote health, keep the world safe, and serve the vulnerable.

Dr Tedros Adhanom Ghebreyesus
Director-General
World Health Organization

[1] Available at https://www.who.int/about/what-we-do/thirteenth-general-programme-of-work-2019---2023

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Technical Experts

Carla Abouzahr, Ties Boerma, David Boone, Fern Greenwell, Robert Pond, Kavitha Viswanathan

Country Representatives

Shams El Arifeen, Ann Chao, Candy Day, Khalid Abdelmutalab Elmardi, Anton Fric, Churnrurtai Kanchanachitra, Alhassan Fouard Kanu, Ardeshir Khosravi, Safi Malik, Alvin V. Marcelo, Emmanuel Chukwuemeka Meribole, Frank Kwadjo Nyonator

Bloomberg Philanthropies

Jennifer Ellis, Kelly Henning, Adrienne Pizatella

Centre for Health Sciences Training, Research and Development (CHESTRAD)

Lola Dare

Centers for Disease Control and Prevention (CDC)

Deutsche Gesellschaft für Internationale Zusammenarbeit/German Development Agency (GIZ)

Alina Brendsen, Binod Mahanty, Simon Ndira, Hendrik Schmitz Guinote

Gavi, the Vaccine Alliance (GAVI)

Lee Chung-Won, Heidi Reynolds

The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)

Peter Hansen, Osamu Kunii, Michelle Monroe, Nathalie Zorzi

Johns Hopkins School of Public Health

Joint United Nations Programme on HIV/AIDS (UNAIDS)

Mary Mahy, Peter Ghys

MEASURE Evaluation

Tariq Azim, Manish Kumar, Jason Smith

Norwegian Agency for Development Cooperation (NORAD)

Austen Davis

United Nations Children's Fund (UNICEF)

Debra Jackson

United States Agency for International Development (USAID)

Lindabeth Doby, Kathleen Handley, Irene Koek, Kelly Saldana, Ana Scholl

United States Department of Health and Human Services (DHHS)

Aisha Hasan, Vindell Washington

University of Melourne

University of Oslo

Kristin Braa, Jorn Braa

Vital Strategies

Adam Karpati, Philip Setel

The World Bank Group

Laure Mercereau

World Health Organization

Adewale Akinjeji, Seun Aladesanmi, Samira Asma, Serge Bataliack, Douglas Bettcher, Lara Brearley, Somnath Chatterji, Anh Chu, Adrienne Cox, Geraldo De Cosio, Khassoum Diallo, Theresa Diaz, Henry Doctor, Shana Dorr, Benson Droti, Gabriela Flores, Katherine Floyd, Jun Gao, Vilma Gawryszewski, Hebe Gouda, Stephane Hugonnet, Robert Jakob, Hyppolite Kalambay, Humphrey Karamagi, Nenad Kostanjsek, Mark Landry, Daniel Lins Menucci, Daniel Low-Beer, Doris Ma Fat, Vinayak Prasad Mohan, Allisyn Moran, Irene Mwoga, Marjolaine Nicod, David Novillo Ortiz, Kathryn O'Neill, Alyssa Palmquist, Tina Purnat, Arash Rashidian, Rakesh Rastogi, Leanne Riley, Aurora Saares, Kerstin Schotte, Andrew Siroka, Amani Siyam, Chelsea Taylor, Tamitza Toroyan, Wendy Venter, Xu Hongyi, Xu Ke.

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Acronyms

ART	Antiretroviral therapy
BP	Bloomberg Philanthropies
CDC	Centers for Disease Control and Prevention
CRVS	Civil registration and vital statistics
D4H	Data for Health
DHIS	District Health Information System
DHS	Demographic and Health Survey
GAVI	Gavi, the Vaccine Alliance
GHO	Global Health Observatory
HDSS	Health and demographic surveillance system
HFA	Health facility assessments
HMIS	Health management information system
HIS	Health information system
HRH	Human Resources for Health
ICD	International Classification of Diseases
ICF	International Classification of Functioning, Disability and Health
ICHI	ICHI - International Classification of Health Interventions
IHME	Institute for Health Metrics and Evaluation
IHR	International Health Regulations
ILO	International Labour Organization
INSERM	Institut national de la Santé et de la Recherche Médicale
ISGWHS	Inter-Secretariat Working Group on Household Surveys
ISQUA	International Society for Quality in Health Care
ITU	International Telecommunication Union

JHU	Johns Hopkins University
JSI	John Snow, Inc.
MDSR	Maternal death surveillance and response
ME	MEASURE Evaluation
MOH	Ministry of Health
M&E	Monitoring and Evaluation
NHA	National Health Accounts
NHO	National health observatories
NHSP	National health sector strategic plan/policy
NHWA	National Health Workforce Accounts
OECD	Organisation for Economic Co-operation and Development
PEPFAR	President's Emergency Plan for AIDS Relief
SCORE	Survey, Count, Optimize, Review, Enable
SDG	Sustainable Development Goal
SRS	Sample registration system
TB	Tuberculosis
TGF	The Global Fund to Fight AIDS, Tuberculosis and Malaria
UOM	University of Melbourne
UHC	Universal Health Coverage
UNDESA	United Nations Department of Economic and Social Affairs
UNICEF	United Nations Children's Fund
UNSD	United National Statistical Division
USAID	United States Agency for International Development
VA	Verbal autopsy
WBG	World Bank Group
WHODAS	WHO Disability Assessment Schedule

Introduction

01

The new *SCORE for Health Data Technical Package* forms the cornerstone of WHO's efforts to strengthen health information systems worldwide, and countries' capacity to generate, analyse and use health data (i.e. health status and health intervention). The package is published during one of the most data-strained public health crisis responses ever – that of the COVID-19 pandemic[2] – which is placing a huge burden on already overstretched health and health-related data systems worldwide. The *SCORE for Health Data Technical Package* can guide countries to take action by providing a one-stop shop for best technical practices that strengthen health information systems, using universally accepted standards and tools.

To meet the increasingly complex demands on countries for health information, the *SCORE for Health Data Technical Package* brings together for the first time a set of the most effective interventions and tools for addressing critical data gaps and strengthening country health data for planning and monitoring health priorities (see "*SCORE for Health Data Technical Package* and the COVID-19 response" section for details on how the package can be used to help meet COVID-19 data needs in particular).

Reliable data on the health of a country's population are essential to help governments prioritize health challenges, develop health policies, direct resources and measure the success of their investments. Accurate health data and information are also essential for Member States to monitor progress towards achieving the Sustainable Development Goals (SDGs), universal health coverage (UHC), health emergencies protection and healthier populations, and their own goals and national and subnational health priorities (see Box 1). The WHO *World Health Statistics report*[3] outlines both the challenges and opportunities we have to strengthen health information systems for more accurate and timely health data. This covers multiple dimensions of measuring progress towards the 'Triple Billion targets': one billion more people benefiting from UHC, one billion more people better protected from health emergencies, and one billion people enjoying better health and well-being. SCORE is a vital tool to advance towards these targets through a country-led approach to identifying and addressing core data gaps.

Equity is a key consideration in this drive for better data, and the SDGs' commitment to "leave no one behind" means that countries must significantly increase their efforts to disaggregate health data by equity dimensions – including gender, age, geographic distribution, and population subgroups. It is only by addressing all of these priorities that everyone – including marginalized populations – will benefit from equitable health outcomes.

[2] Developed by WHO in close collaboration with key partners, the new SCORE for health technical package addresses WHO's commitment in its 13th Global Programme of Work to support Member States in the effective collection, analysis, reporting and use of data.

[3] Available at https://www.who.int/gho/publications/world_health_statistics/2020/en/

There is much to do to reach this point: health data around the world today are often non-existent or fragmented. More than two-thirds of the world's population live in countries that do not produce reliable statistics on deaths by age, sex and cause of death, and many countries lack data on critical areas such as access to primary health care services, the health workforce, and on the quality of care provided. Where health data are scarce or fragmented, countries' ability to prioritize action and to effectively monitor progress towards the SDGs or other health priorities is hindered. The following are examples of major data deficiencies related to SDG and UHC monitoring:

- The births of tens of millions of children remain unregistered every year.[4]
- Just over half of all deaths (55%) are never registered and are thus absent from vital statistics systems.[5]
- Among the deaths registered, information on age, sex and cause of death is lacking at national and subnational levels.
- Almost 20% of countries are lacking recent primary or direct data for over half of the indicators included in the 2020 *World Health Statistics report*.[6]
- The recording and reporting systems of many health facilities lack the capacity to measure the quality and outcomes of the services provided. Facility assessments and population-based surveys may provide insights, but they are not conducted routinely. Furthermore, absence of reporting from private sector facilities means that coverage of certain services cannot be accurately reflected at population level.
- Duplication in data collection efforts result in data systems and workers being overburdened by requirements to collect and report on an excessive number of data elements and indicators.
- Integration and use of data from other sectors are often piecemeal, especially those concerning risks to health (for example, environmental risks and road traffic crashes).
- Ministries of health, national public health institutions, national statistics offices, and offices of the registrar general may lack the technological and analytical capacity to meet the increased demand for SDG-related data.
- Interoperability of data from different sources is compromised by lack of use of agreed data standards.

[4] According to UNICEF, 27% of children under the age of 5 years have not had their births registered. (https://data.unicef.org/topic/child-protection/birth-registration/).

[5] See for example WHO *World Health Statistics report* 2017 (https://apps.who.int/iris/bitstream/handle/10665/255336/9789241565486-eng.pdf?sequence=1); and Global, regional, and national under-5 mortality, adult mortality, age-specific mortality, and life expectancy, 1970–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet. 480 390(10100):1084–150.

[6] World Health Statistics 2020: Monitoring health for the SDGs (https://www.who.int/gho/publications/world_health_statistics/2020/en/)

BOX 1: WHY WE NEED BETTER DATA

Data to monitor progress towards national and subnational health priorities

Countries need data to inform national-level planning and management at programme, subnational and facility levels. Health ministry officials, district and facility managers, as well as individual providers, legislative bodies, communities, citizens and the media need accessible, high-quality health information to:

- better target health programming to reach all people;
- increase the monitoring of populations at greatest risk;
- provide early warning on potential public health threats;
- efficiently adjust programming to meet evolving needs;
- improve the quality and efficiency of health care;
- support global monitoring;
- effectively plan and advocate for resources both within and beyond the health sector;
- hold health institutions and government authorities to account for resource use and health outcomes.

Data to monitor progress towards the SDGs

The overarching health goal – SDG3 – is associated with 13 health targets and 27 indicators that countries need to consider and monitor in national health strategies and policies. In addition, there are 32 additional health-related SDGS what fall within other SDGs.[7] Health is closely linked to other SDGs such as those relating to nutrition, water and sanitation. Thus, there are several other health-related targets and indicators that rely on non-health sector data sources such as civil registration and vital statistics systems (CRVS), satellite data, air-quality monitors for air pollution, and police data for suicide, homicide and road traffic mortality. Countries have the primary responsibility for follow-up and review of the progress made in implementing the SDGs, which will require high-quality, accessible and timely data collection and analysis to ensure that no one is excluded.

Data to monitor progress towards UHC, health emergencies protection and healthier populations

Underpinning SDG3 is a pledge by countries to provide universal health coverage (UHC) – a commitment to everyone receiving the high-quality health interventions they need without incurring financial hardship. Monitoring UHC requires information about both financial protection and effective coverage of interventions. Effective coverage requires both measurement of people's coverage with needed services and their outcomes or, by proxy, the quality of services.

Meeting the health-related SDGs also requires health emergencies protection and healthier populations based on indicators such as sanitation, nutrition and environment. Emergency protection requires preparedness, prevention and the ability to detect and respond quickly to public health threats. Each of these depends on effective early warning systems based on reliable data. No single data source can meet all information needs, therefore we must use a multisectoral approach to monitor overall progress towards the SDGs

Appropriate and effective guidance is essential

A concerted and coherent approach to accelerate improvements in country health data systems and capacities is therefore urgently needed – especially in light of COVID-19, which has seen demand for health data from frontline workers, policy-makers and researchers reach unprecedented levels as countries take action to break chains of transmission, trace contacts, and test and treat cases while maintaining all other essential services.

No single data source can meet the statistical needs of the broad array of health-related indicators that need to be monitored, so country health information systems need to draw upon multiple data sources such as population-based surveys, civil registration and vital statistics, censuses, public health surveillance, health facility and community systems, population-based disease registries, administrative data sources and non-health sector data sources. Strong country systems need to be led by competent country institutions for data collection, compilation and sharing, analysis and synthesis, communication and use of results.

The current political momentum around data as part of the 2030 Agenda for Sustainable Development is a step in the right direction, as are advances afforded by the digital and data revolution and opportunities created by the Health Data Collaborative[i] for more efficient, coordinated, and sustainable investments in health information systems.

But the pace of progress is too slow. Working collaboratively with Member States to scale up implementation of the five key interventions featured in the ***SCORE for Health Data Technical Package*** provides WHO and partners with the opportunity to accelerate progress towards more reliable health data that equip governments to address key health challenges with evidence-based, data-driven policies.

[7] For more, visitt https://www.who.int/data/stories/health-data-a-critical-element-to-meet-the-sdgs

WHO's *SCORE for Health Data Technical Package*

Improving country health information systems and their capacity to generate, analyse and use data is a core component of WHO's support to Member States. The new ***SCORE for Health Data Technical Package***, developed by WHO in close collaboration with key partners, addresses WHO's commitment to support Member States in the effective collection, analysis, reporting and use of data.

A technical package[ii] is a collection of proven strategies and interventions required for effective implementation of public health programmes. The interventions selected are known to be the most effective, feasible, sustainable and scalable, and, like other technical packages – such as MPOWER[iii] for tobacco control, HEARTS[iv] for cardiovascular disease management in primary health care and SHAKE[v] for salt reduction to name a few – the aim is to be able to communicate in a way that resonates with policy-makers and health leaders globally.

The development of the ***SCORE for Health Data Technical Package*** builds on and advances the work of previous frameworks in measurement and accountability, particularly that of the Health Metrics Network (HMN) framework 2008.[vi] It also draws on the health care monitoring work of the Organisation for Economic Co-operation and Development (OECD),[vii] the International Health Partnership (IHP) monitoring and evaluation framework[viii] and the Measurement for Health Five-Point Call to Action.[ix] It has been developed by WHO with extensive input from partners and experts working at country, regional and global levels, including partners of the Health Data Collaborative.[x]

This package is not intended to replace existing detailed guidance on implementing various components of a health information system. Instead, it provides a coherent framework for countries to focus on priority interventions and elements, and points countries towards good and best practice actions and to existing and new universally accepted standards and tools. It is intended that the ***SCORE for Health Data Technical Package*** will evolve over time to incorporate new and innovative tools, approaches and country experiences, and will help:

- **Countries meet their own health data priorities:** Since countries have health information systems that are at different stages of development, prioritizing different interventions must be based on individual country needs. The approach to implementing the five SCORE interventions should be linked to and integrated into country-owned plans and priorities. Many countries have existing monitoring and evaluation plans as part of national health sector strategies or national health information system (HIS) strategies that detail ways to address data gaps and weaknesses in the various data systems and capacities. The SCORE framework is meant to be used in support of existing plans and strategies by providing (i) recommendations on the most important interventions required to improve data systems and capacities; (ii) good/best practice actions and global public goods and standards for addressing various critical data gaps and challenges; and (iii) a benchmark for monitoring progress in performance of a country's HIS over time.

- **Provide access to best practice actions, standards and tools:** The *SCORE for Health Data Technical Package* also provides guidance on best practice, measurement methods, recommended standards, tools and resource material for each intervention and key element. These relate, for example, to birth and death registration (including ICD-based reporting of deaths and causes), hospital and clinic reporting systems, patient monitoring systems, chronic disease registers, facility and population-based health surveys, real-time surveillance of public health threats, and finance and health workforce data. Guidance is also provided on best practice approaches and resources for strengthening national institutional capacity for data synthesis, analysis and dissemination and use of data to drive policy and planning. It also outlines the key elements of strong, country-led data governance.
- **Guide the monitoring of countries' health information systems**: Regular, systematic monitoring of how SCORE interventions are monitored will be critical to targeting actions and tracking progress. The ***SCORE for Health Data Technical Package*** provides a set of core indicators and a monitoring instrument that allow countries, regions and the global community to identify gaps in data systems, target investments and to track improvements over time. Monitoring and addressing gaps in health information systems over time will also allow countries to better track their progress towards meeting SDG targets.

The ***SCORE for Health Data Technical Package*** comprises five key interventions. These five interventions are represented by the acronym SCORE. Interventions S, C and O focus on improving critical data sources and the availability and quality, while interventions R and E aim to enhance the synthesis, analysis, access and use of health data for action. Indicators and actions are included for each intervention.

SURVEY

POPULATIONS AND HEALTH RISKS

- System of regular population-based health surveys
- Surveillance of public health threats
- Regular population census

COUNT

BIRTHS, DEATHS AND CAUSES OF DEATH

- Full birth and death registration
- Certification and reporting of causes of death

OPTIMIZE

HEALTH SERVICE DATA

- Routine facility reporting system with patient and community monitoring
- Regular system to monitor service availability, quality and effectiveness
- Health service resources: health financing and health workforce

REVIEW

PROGRESS AND PERFORMANCE

- Regular analytical reviews of progress and performance, with equity
- Institutional capacity for analysis and learning

ENABLE

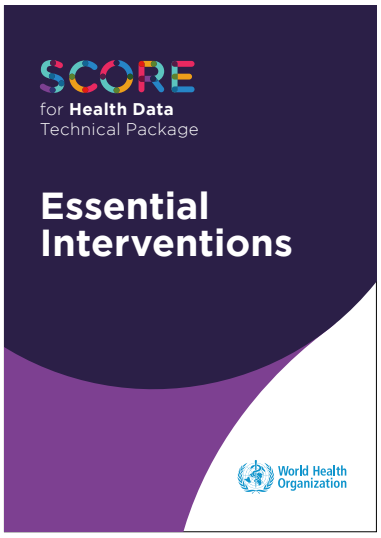
DATA USE FOR POLICY AND ACTION

- Data and evidence drive policy and planning
- Data access and sharing
- Strong country-led governance of data

What the *SCORE for Health Data Technical Package* includes

The *SCORE for Health Data Technical Package* includes the following components and will be accompanied by the first *Global status report on the status of health data systems* (and accompanying regional and country profiles).

SCORE FOR HEALTH DATA TECHNICAL PACKAGE

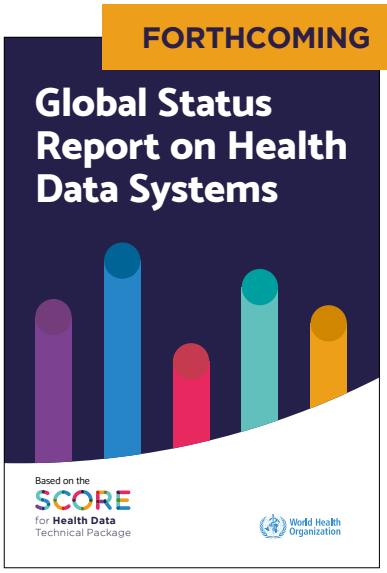


SCORE Essential Interventions: An overview to health information systems. For each of the interventions, the document provides the underlying key elements, the indicators used to assess and monitor, and examples of actions to be taken.

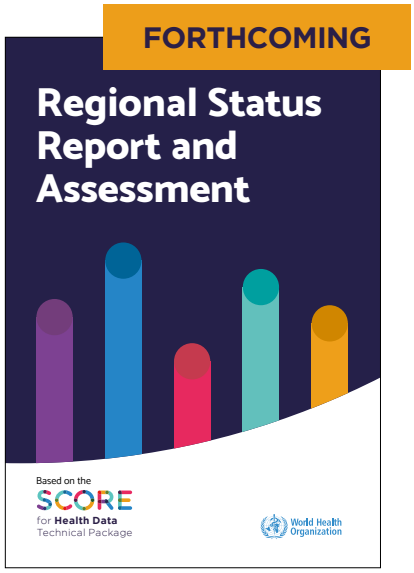
SCORE Tools and Standards: A list of up-to-date resources for each intervention.

SCORE Assessment Instrument: A data collection instrument (and accompanying user guide) to assess a country's health information system and identify gaps.

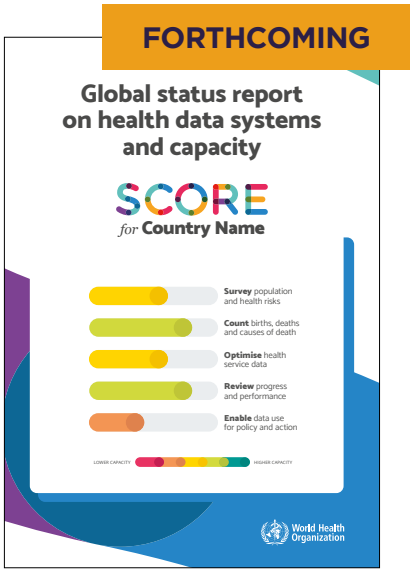
SCORE GLOBAL STATUS REPORT AND COUNTRY PROFILES



SCORE Global Status Report on Health Data Systems: Presents results of the global assessment using the SCORE Assessment Instrument.



SCORE Regional Status Report and Assessment: Regional summary reports and/or profiles that focus on interventions particularly relevant to specific regions.



SCORE Country Assessment: PDFs showing country-specific results.

***Note: SCORE Global Status Report on Health Data Systems*:** Between 2019 and 2020, a global assessment was conducted using the *SCORE Assessment Instrument* to provide a baseline diagnosis of key aspects of countries' health information systems. The results of these assessments will feed into the *Global status report on health data systems*, describing (through comparative analysis) the state of the world's health data systems, and providing individual country profiles generated by a defined set of indicators that assess the maturity of a country's health information system (due to be published in late 2020).

SCORE for Health Data Technical Package and the COVID-19 response

The *SCORE for Health Data Technical Package* can help meet the increasing demand for data resulting from the COVID-19 response in the following ways:

SCORE's "Survey" strategy demonstrates that population-based assessments and surveillance systems are universally indispensable in identifying populations at risk of COVID-19 infections in every setting. Household surveys can measure seroprevalence for COVID-19 antibodies, knowledge and practices; physical and mental health status; and other socioeconomic factors. Novel methods of data collection, such as the use of mobile phone surveys, are particularly important They are invaluable in measuring a range of inequities in health status and access to care. All countries should have the capacity for communication and systematic reporting with a dedicated team in place for data analysis, risk assessment and reporting for both indicator-based (routine) and event-based surveillance. COVID-19 has revealed gaps in the surveillance systems of many countries; the tools and standards presented in this section can enable countries to better prepare for subsequent pandemic waves.

SCORE's "Count" strategy validates the importance of civil registration and vital statistics that can reliably and continuously track fertility rates, mortality rates, cause-of-death distribution and life expectancy. Classification of disease and mortality due to COVID-19 has been improved by the emergency coding for ICD-10. This emergency coding has a dual purpose: disease diagnosis and mortality coding as a cause of death by COVID-19. However, to date, strategic investments in – and momentum for – strengthening CRVS are likely to be affected to varying degrees by the COVID-19 pandemic. Measured lockdowns restrict citizens' movements, and registration of births and deaths – where not classified as essential by national governments – will likely result in incomplete vital statistics.

Countries impacted by the pandemic have been making periodical revision to their COVID-19 cause-of-death figures as a result of late registration of deaths outside hospitals and treatment centres. Understandably, every health sector is actively responding to the COVID-19 pandemic. However, it is critical to continue notifying Civil Registrars of every birth and death event, even when registration at requires in-person attendance at the registry. During and after the COVID-19 pandemic there should be coordinated efforts between the health sector and civil registration bodies to ensure all births and deaths are properly counted, notified and registered.

SCORE's "Optimize" strategy bolsters the significant importance of regular health facility data, health expenditures and health workforce skill mix and distributions as the triple axes to measure health sector capacity to deliver quality services, and to produce accurate and reliable multiple-purpose health service data. Facility data comes in different forms across levels of care, serving clinical management of patients, to disease monitoring, to health sector planning (public and private), to monitoring performance and service coverage.

It is indisputable that data gathered from the clinical management of COVID-patients will be purposed to different uses from vaccine and therapeutics development, to patient registries, to collection of additional clinical variables on treatment and survival. In the wake of COVID-19, financing and staffing the health sector is bound to take a new turn in terms of assessing the impact of health-workforce mortalities due to COVID-19, ensuring better preparedness and training as well rapid resource allocation to maintain essential services and response.

SCORE's "Review" strategy harnesses population- and institution-based data (i.e. data generated inside and outside the health sector) for the benefit of the health sector strategic plan and priorities. This intervention underscores the need for – and capacity of – countries to conduct data-driven analytical reviews using the highest possible quality data; and to make informed decisions and take corrective action when allocating resources, thereby reducing inequity and creating more effective access to (and use of) health-care services. This intervention puts clear markers on the importance of national capacity for health data and statistics generation, synthesis, and analysis. The in-country collaboration and response post-COVID-19 will be the quintessential knowledge-base for curating plans and policies, specifically in bridging the gap between all public sector services.

SCORE's "Enable" strategy enables the translation of data into effective, well-governed and accessible use by multiple stakeholders. Regardless of governance structures, governments demonstrate their accountability for health system performance by monitoring the priorities laid out in their national health strategies and plans (NHSP). Accordingly, every country must ensure their health information system adequately defines, measures and compiles data required for monitoring these priorities, usually laid out in the monitoring and evaluation (M&E) plan.

Undoubtedly, post-COVID-19, health sector plans (and their M&E plans) will be adapted with the necessary preparedness and response activities. WHO's COVID19 strategic preparedness and response plan (https://www.who.int/publications-detail/covid-19-strategy-update-13-april-2020) outlines and provides guidance for countries to ensure that the best support possible is provided to national authorities and communities. Importantly, transparency is an essential element of accountability and once data have been collected and analysed according to the highest standards, the methods for collecting and compiling the data – and the data themselves – should be made available potentially through a national health observatory or similar. Improved visualizations, made possible by advances in digital technology, will enhance data use.

SCORE interventions

02

The underpinning of the *SCORE for Health Data Technical Package* is the five interventions (S, C, O, R, E) each of which is further broken down into a number of key elements and can be assessed through a set of indicators.

The following section, provides details for each of the interventions and key elements, highlighting the aim for each key element and rationale for how strengthening it leads to a stronger overall health information system. The indicators used by the SCORE package to assess a countries strengths and weaknesses for each key element are outlined. Finally, a set of key actions that countries to take to address identified gaps are provided.


THE
JOHANNITER

Survey populations and health risks

to know what makes people sick or at risk

KEY ELEMENTS

- **S1.** System of regular population-based health surveys
- **S2.** Surveillance of public health threats
- **S3.** Regular population census

Information about health, health risks and population distribution is a cornerstone of disease and disability prevention. It enables evidence-informed planning and evaluation of health policies and preventive activities, which in turn help to keep the workforce fit while minimizing the level of health care required by an ageing population.

Population-based surveys are among the main data sources for understanding population health status and health risks. They are a means of gathering critical information on factors affecting the population, such as poverty, education, water and sanitation, living conditions, nutrition, air quality and security and are often the only source of data for indicators on behaviour and risk factors, and are the most important instrument for assessing inequality. They are also a prominent source of data for many health-related SDG indicators.

"Real-time" public health surveillance is a critical intervention for identifying emerging threats to population health. The International Health Regulations 2005 require countries to maintain an integrated, national system for public health surveillance and response, and set out the core national capabilities necessary for monitoring, surveillance and investigation of public health threats. Increasing integration of digital systems and the use of WHO data standards (e.g. ICD, ICF and ICHI) for data that are generated in different streams of work serve to ensure interoperability of the information collected.

While not a direct health data source, a population and housing census (or population registry) is nonetheless a critical data source for health and other sectors. It provides information on population size, geographical distribution, and social, demographic and economic factors that are critical inputs for resource allocation and targeting interventions. It is recommended that a population census is conducted once every 10 years. Some countries implement population registries that maintain selected information on each member of the resident population of the country, using a system of unique individual identifiers. The registry is maintained through interconnected electronic systems that enable notification of certain events, which may be recorded originally in various administrative systems and linked automatically to the population register on a real-time basis. A population registry may include basic characteristics such as date and place of birth, sex, date and place of death, date of arrival/departure in the country, citizenship(s) and marital status. Much additional information may be included in the population registry depending on the potential to link with other data sources.

S1. System of regular population-based health surveys

Aim

All countries generate regular, comprehensive, high-quality, nationally representative statistics with equity dimensions on population health status, health-related behaviours and risk factors, access to health interventions and out-of-pocket spending on health.

Rationale

Population-based health surveys are a significant source of data for many health and health-related SDG and UHC indicators. They are often the only data source for indicators of health-related behaviours and risk factors, for example breastfeeding practices or tobacco use. Population surveys also capture measures of mental health and well-being and are an important means for collecting biomarkers.

In the absence of functioning civil registration or reliable facility reporting systems, surveys can provide data for indicators of mortality, health service coverage and use. Surveys also provide critical information from other sectors (such as education, water and sanitation, housing, nutrition, and security) and are among the data sources used to determine out-of-pocket expenditure in national health accounts. Population-based surveys are also among the most important instruments for assessing equity, since they provide disaggregated data (including sex, age, wealth, education and geographic location) for almost all indicators.

Although routine health facility reporting systems (also called "health management information systems", HMIS) are an important source of data, population-based surveys include individuals who may not be accessing health care and thus provide a population-level understanding of a country's disease burden and risk factors. In some contexts, special-population surveys may also be needed to target populations that cannot be specifically identified in a population-based survey (WHO's Study on Global Ageing and Adult Health is one).

Key actions for countries to take

- **Establish a national programme of regular, population-based surveys to generate key health indicators on a regular basis.** Surveys should be integrated and demand-driven, and form part of the national health information system. The national survey programme should collect the minimum information required to monitor progress towards all relevant SDG targets and the national health strategic plan, and should be linked to strategic planning and review cycles. Population-based surveys should be nationally representative to ensure capture of data on all target populations (such as women of reproductive age, adolescents or children under 5 years of age) and all population subgroups, including potentially marginalized groups. Some countries undertake annual, comprehensive multi-topic surveys, but all countries should have multi-topic surveys at least every 3 years.

  A system of surveys using a modular approach can also be implemented. This may involve a series of successive surveys, coordinated to focus on different topics, with the comprehensive spectrum of required data obtained over time. Examples include international survey programmes such as the Demographic and Health Surveys (DHS) and the Multiple Indicator Cluster Surveys (MICS), and the WHO STEP-wise approach to noncommunicable disease risk factor surveillance (STEPS) among others. Single-topic or special-population surveys may also be needed to inform the goal of leaving no one behind but need to be balanced against the need for periodic comprehensive multiple topic surveys.

- **Follow international standards for quality and transparency.** International best practices include enforcing quality assurance, ethical practices, transparency and data sharing in accordance with stringent confidentiality protocols and international standards for measurement to ensure comparability of results between populations and over time.
- **Follow WHO data standards for interoperability.** Information collected on health status and health interventions should be coded using standardized systems such as ICD-11 for information related to diagnoses, findings signs, accidents and causes of disease and injury, cancer, devices or medicaments, ICHI for health interventions at individual and population level, ICF for functioning and disability, and WHODAS for assessing activity and participation. This ensures that data can be aggregated and compared across surveys.
- **Build national capacity for survey implementation, analysis and communication.** Involve relevant country institutions in the various stages of survey design and implementation. Ensure good coordination between the ministry of health, national statistical office and other stakeholders; invest in a sustainable infrastructure for survey implementation, analysis and communication capacity in key institutions; and make the data public, with appropriate privacy protection.
- **Engage all health programmes in the design of the survey programme in order to minimize the total number of surveys needed.** The survey programme should identify strategic priorities (with key programme areas) and determine the frequency and scope of data collection.

INDICATORS

- A system of regular and comprehensive population health surveys that meets international standards. At least one survey conducted in the last 5 years that:
  - covers major health priorities;
  - covers major dimensions of inequity;
  - is nationally representative;
  - is aligned with international standards on design, implementation and reporting;
  - is funded, partially or fully, by government.

Tool or standard	Publisher	Year	Link
Bloomberg Philanthropies Data for Health initiative - Noncommunicable Diseases (NCD) Mobile Phone Survey	D4H	2017	
World Health Survey Plus (WHS+)	WHO	2020	
International Household Survey Network (IHSN) resources	IHSN	Various	
WHO STEPwise approach to noncommunicable disease risk factor Surveillance (STEPS)	WHO	2017	
Multiple Indicator Cluster Survey 6 (MICS6)	UNICEF	2017	
Demographic and Health Surveys Program (DHS)	USAID	2014	
WHO Study on Global AGEeing and Adult Health (SAGE)	WHO	2002	
Living standards measurement study (LSMS)	WBG	2000	

Recommended tools and resources for conducting population-health surveys can be found at:
http://score.tools.who.int/tools/survey-populations-and-health-risks/

S2. Surveillance of public health threats

Aim

All countries can detect public health events requiring rapid investigation and response and ensure timely action and control through:

- A strong indicator and event-based surveillance system that can detect events of significance for public health, animal health and health security (these are the two main channels of information for public health surveillance).
- Effective communication and collaboration across sectors and between subnational, national and international authorities on surveillance of events of public health significance.
- Strong country and intermediate level/regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems, including at points of entry.

Rationale

In order to assess national capacities for the surveillance and verification of – and response to – acute public health events (and thus evaluate a country's capacity for ensuring health), all countries need a functioning public health surveillance system that detects, reports and responds swiftly to potential public health threats on a continuous ("real-time") basis. These threats include epidemic-prone communicable diseases and other notifiable conditions and events, including environmental hazards. The International Health Regulations (IHR) 2005 require countries to maintain an integrated national system for public health surveillance and response and have set out the core national capacities needed do this to do this, including at points of entry.

Key actions countries can take

- **Establish indicator-based surveillance (i.e. the routine reporting of cases of disease), including an early warning function to detect deviations or values exceeding the threshold in order to determine unusual disease patterns, and swift reporting from facilities, including private health facilities.** Indicator-based surveillance includes notifiable disease surveillance systems, incorporating syndromic surveillance as well as laboratory diagnosis surveillance methods. This reporting is commonly health facility-based, and done on a weekly or monthly basis. Data are collected as individual or aggregated data and originate from either exhaustive reporting systems or sentinel surveillance systems in specific populations. Data collection is done according to established case definitions, which are either disease-specific or syndromic. Case definitions for syndromic surveillance are based on clinical signs and symptoms, rather than on specific laboratory criteria for confirmation of the causative agent. Syndromic surveillance is used to detect outbreaks earlier than would otherwise be possible with laboratory diagnosis-based methods. Case-based surveillance is used for conditions requiring rapid response and involves immediate reporting and investigation of a suspected case, using laboratory methods for confirmation.
- **Establish and strengthen event-based surveillance and ensure a mechanism to capture public health events from a variety of sources.** Event-based surveillance (the organized and rapid capture of information about events that are a potential risk to public health) includes ad-hoc reports transmitted through health workers, crews, points of entry workers and officials, travellers, community leaders and nongovernmental organizations. Rapidly advancing information

and communication technologies, such as SMS, social media and the Internet, provide new opportunities for improving monitoring and alert capacities. Event-based surveillance contributes to the early warning/early detection function of a surveillance system.

- **Establish interoperable, interconnected, electronic, real-time reporting systems.** Countries should have an interoperable and interconnected electronic real-time reporting system, capable of linking to other multisectoral data sources and of using the resulting information to enhance the capacity to quickly detect and respond to developing threats, including for points of entry.
- **Ensure capacity to analyse data from different systems, including a dedicated core team for data analysis, risk assessment and reporting.** Capacity for communication and systematic reporting is essential for all countries, and ideally there should be a dedicated team in place for data analysis, risk assessment and reporting.
- **Undertake an annual IHR State Party Self-assessment Annual Report (SPAR) and complement this with a Joint External Evaluation (JEE) of the country's capacity for ensuring health security, based on IHR requirements.** To assess national capacity for the surveillance, verification of and response to acute public health events, the IHR Monitoring and Evaluation Framework requires all countries to undertake an annual State Party Self-Assessment Annual Report (SPAR) of their International Health regulations capacities. The evaluation is self-assessed, using a multidisciplinary and multisectoral approach, and evaluates 13 technical areas. SPAR assessments can be complemented by Joint External Evaluations (JEE), usually carried out every 4–5 years. A JEE is a voluntary, multisectoral process to assess country capacity to prevent, detect and rapidly respond to public health risks occurring naturally or due to accidental or deliberate events.
- **Undertake regular evaluations of the surveillance system.** The evaluation should assess both, indicator-based and event-based functions of the surveillance system. It should further consider:
  - Integration and one health approach: link between relevant sectors (human, zoonotic and environment) using a unique approach for early detection. The SPAR C3 tool can be used for this.
  - Link to preparedness and response authority: two-way linking between surveillance and its capacity for detecting public health events and risk assessment and the response authority (e.g. rapid response teams and emergency operation centres).
  - Epidemic Intelligence: better integration of "classical" IBS, EBS and community-based surveillance with other early detection functions such as media scanning.
  - Lab capacity for early detection and confirmation of diagnosis. The SPAR C5 tool can be used for this.
  - Information systems and electronic tools for rapid reporting and data analysis.

INDICATORS

Depending on the specifics of the surveillance and early warning system, evaluations need to be tailored to countries' needs. Indicators for evaluation are (amongst others):

- Completeness and timeliness of weekly reporting of notifiable conditions
- Percentage of reporting sites that submitted a weekly report in the past month: public facilities
- Percentage of reporting sites that submitted a weekly report in the past month: non-public facilities

- Indicator and event-based surveillance system(s) in place based on IHR requirements, such as those related to SPAR C6 tool for surveillance:
  - If country has done a SPAR/JEE:
    - Indicator- and event-based surveillance system
    - Interoperable, interconnected, electronic real-time reporting system
    - Integration and analysis of surveillance data
    - Syndromic surveillance systems
    - System for efficient reporting
    - Reporting network and protocols in country
    - Mechanism for event management (verification, risk assessment, analysis and investigation) SPAR indicator 6.2
  - If country has not done a SPAR/JEE, based on IHR:
    - Self-assessment score for surveillance
    - Self-assessment score for level of IHR coordination

Tool or standard	Publisher	Year	Link
World Health Organization (WHO) Health Emergency Dashboard	WHO	2020	
Early Warning, Alert and Response System (EWARS)	WHO	2019	
State Party self-assessment Annual Reporting (SPAR) tool – International Health Regulations (2005)	WHO	2018	
Joint External Evaluation tool: International Health Regulations as part of the IHR (2005) monitoring and evaluation framework	WHO	2018	
Go.Data Managing complex data in outbreaks	WHO/ GOARN	2015	
Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance	WHO	2014	
Outbreak surveillance and response in humanitarian emergencies	WHO	2012	

Recommended tools and resources for surveillance of public health threats can be found at:
http://score.tools.who.int/tools/survey-populations-and-health-risks/

S3. Regular population census

Aim

All countries should have regular censuses every 10 years, or equivalent population registries that provide information on population and socioeconomic characteristics by small geographical area, conducted in line with United Nations Department of Economic and Social Affairs (UNDESA) standards.[8]

Rationale

Information generated by a census or population registry includes numbers of people and the distribution of their characteristics such as age, sex, socioeconomic status, race or ethnicity, living conditions and geographic location. This represents critical demographic data that are used to determine denominators for the computation of vital statistics and many health indicators, especially in the absence of reliable data from civil registration and vital statistics systems (***see "Count births, deaths and causes of death"*** section, page 30).

Key actions countries can take

- **Implement a census every 10 years that provides comprehensive demographic data, including consideration of migrant populations where relevant.** A population consists of an individual enumeration of the entire population, with the objective of providing an accurate count of the population at a fixed point in time. Some countries have replaced traditional enumeration with an "administrative census", which is a count of the population based on a national population registry (see page 19 for more).[9]
- **A post-enumeration survey (PES), which is a complete re-enumeration of a sample of enumeration areas, should be carried out typically within a month of the census.** A PES is used to assess the degree of coverage error in certain areas or among certain groups, and to assess errors in content for specific questionnaire items. The results help to correct the census data for potential undercounts or other coverage errors.
- **Disaggregated population projections, and population projections for subnational units** for each year should be derived from the census data – they are among the most important analytical outputs from the census and are used in computing many health-related indicators).
- **Ensure that the census includes small-area identifiers to facilitate subnational analyses.** A population register contains selected information on each member of the resident population of the country, using a system of unique individual identifiers. The register is maintained through interconnected electronic systems that enable notification of individual vital events, such as births, deaths and marriage, which may be initially recorded in various administrative systems and linked automatically to the population register on a real-time basis. A population register includes basic characteristics of the resident such as date and place of birth, sex, date and place of death, date of arrival/departure, citizenship(s) and marital status. Much additional information may be included in the population registry, depending on the extent of its links with other data sources.

[8] The Statistics Division of the United Nations Department of Economic and Statistical Affairs has developed principles, recommendations and manuals for population and housing censuses. These publications are widely used by national statistical offices and census officials in countries worldwide in planning and organizing their censuses and other related data-collection activities, particularly demographic and socioeconomic surveys.

[9] Valente P. 2010. Census taking in Europe: how are populations counted in 2010? Population and Societies, No. 467, May 2010. https://www.ined.fr/fichier/s_rubrique/19135/pesa467.en.pdf

- **Ensure national capacity to produce small-area population projections based on census data.** Small-area identifiers in the census database, including geographic codes and geographic information system (GIS) coordinates, permit analysis of population structures (number of people by age and sex) and dynamics (growth rates by age and sex) at the district, subdistrict, and census enumeration area levels. The list of enumeration areas in the census, with their corresponding population count, serves as the baseline for intercensal population estimates and projections. Decision-makers need updated information on population counts between census years to plan service delivery and resource allocation, especially as ageing populations cause health system priorities to shift. Population estimates are also used in the denominators of many health-related and demographic indicators to monitor trends over time.

INDICATORS

- Census conducted in past 10 years in line with international standards:
  - Post-enumeration survey (PES) conducted
  - Population projections with all disaggregations
  - Population projections for subnational units each year

Tool or standard	Publisher	Year	Link
United Nations principles and recommendations for population and housing censuses, Revision 3	UNSD	2017	
United Nations handbook on the management of population and housing censuses, Revision 2	UNSD	2016	

Recommended tools and resources for conducting population censuses can be found at:
http://score.tools.who.int/tools/survey-populations-and-health-risks/


WHO
OMS

Count births, deaths and causes of death to know who is born and what people die from

KEY ELEMENTS

C1 Full birth and death registration

C2 Certification and reporting of causes of death

An effective civil registration and vital statistics (CRVS) system is critical for tracking public health trends, planning interventions to improve population health and evaluating policy effectiveness. CRVS is the optimal system for producing fertility and mortality statistics. In addition, birth registration is the foundation of individual identity management systems that in many countries provide the proof of legal identity required to access health and other services.

Civil registration is the continuous recording of vital events in an individual's life (such as birth, marriage, death and cause of death). A civil registration office (often based in the ministry of the interior or local government) typically has the responsibility to register births and deaths and to issue birth and death certificates. The national statistics agency (or civil registration agency) is responsible for producing vital statistics from the civil registration records. However, the health sector also has a pivotal role in the overall CRVS system including:

- reporting to registration authorities all vital events occurring in health facilities and/or identified in the community; and
- determining causes of death (occurring both within and beyond health facilities) using the WHO International Standard Form of Medical Certification of Cause of Death (IMCCD), according to the standards of the International Statistical Classification of Diseases (ICD).

In contexts where a significant proportion of deaths occur outside health facilities, a health sector representative should assign a probable cause of death in at least a representative sample of such deaths.

Several health and health-related SDGs require either all-cause or cause-specific reporting of deaths, for example: the maternal mortality ratio; the mortality rate of children aged under 5 years; the neonatal mortality rate; the mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease; the suicide mortality rate; the mortality rate attributed to household and ambient air pollution; the mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene; and the mortality rate attributed to unintentional poisoning.

It is important to note that although many countries have made significant strides towards improving birth and death data, in 2017 cause of death information was lacking for about half of all deaths worldwide.[xi] Development of a CRVS system is a fundamental responsibility of government and requires collaboration among multiple stakeholders across multiple sectors. The course of action required to develop an effective health sector role in CRVS systems will depend on existing national conditions and the availability of national expertise, capacity and resources. In all cases, progress relies on a structured assessment of the current legal framework and business processes; the quality of cause-specific mortality data; and the coverage, completeness and performance of the overall CRVS system.

C1. Full birth and death registration

Aim

All countries should have a well-functioning civil registration and vital statistics (CRVS) system that registers all births and deaths, issues birth and death certificates, and compiles and disseminates vital statistics, including cause-of-death data. It may also record marriages, divorces and adoptions.

Rationale

CRVS systems generate administrative data that serve as the basis for other databases or population registers and can be used to produce vital statistics. Countries with a strong CRVS can reliably and continuously track fertility rates, mortality rates, cause-of-death distribution and life expectancy. Depending on the coverage and completeness of the CRVS system and the data available in the population register, vital statistics can also be produced for subnational populations and groups of interest, such as marginalized groups and those living in extreme poverty. If a strong CRVS system exists, it can provide data that can be more highly disaggregated than data from household surveys.

Key actions countries can take

- **Establish or strengthen a high-level national CRVS coordination committee or mortality committee.** This should involve registration authorities, the health and statistical sectors, the national identification agency and other key stakeholder groups, including academia.
- **Conduct a CRVS system review.** Performed by key stakeholders, this review should include legal and regulatory frameworks, business processes, and quality and completeness of cause-of-death data.
- **Develop a prioritized national improvement and resource mobilization plan.**
- **Ensure robust processes for reporting all births and deaths in health facilities or detected by the health sector to civil registration authorities.** Consider a special system to track maternal and child deaths.
- **Produce and disseminate an annual national statistics report containing vital statistics, including causes of death.** The report should be produced even if the vital statistics are incomplete. Placing CRVS data into the public domain can stimulate action to strengthen CRVS and improve the quality of data.

INDICATORS

- Completeness of birth registration (%)
- Completeness of death registration (%)
- Core attributes of a functional CRVS in place to generate vital statistics:
  - Legal framework for CRVS
  - Easy access to registration offices
  - Adequate training for registrars
  - Formal CRVS interagency collaboration
  - All data are exchanged electronically
  - Data quality assessment, adjustment, and analysis using international standards
  - System performance monitoring
  - Vital statistics report published in the past 5 years

Tool or standard	Publisher	Year	Link
The 'Ten CRVS Milestones' framework for understanding civil registration and vital statistics systems	UoM/D4H	2018	
Handbook on civil registration and vital statistics systems: management, operations, maintenance, Revision 1	UNSD	2018	
CRVS Knowledge Gateway Learning Centre	UoM/D4H	2018	
CRVS eLearning course	WBG	2017	
Civil registration and vital statistics legal and regulatory review: tool and methodology	VS	2017	
Training course on civil registration and vital statistics systems	CDC	2016	
United Nations principles and recommendations for a vital statistics system, Revision 3	UNDESA	2014	
Improving mortality statistics through civil registration and vital statistics systems: strategies for country and partner support	WHO	2014	
Strengthening civil registration and vital statistics for births, deaths and causes of death: resource kit	UoQ	2013	
Rapid assessment of national civil registration and vital statistics systems	WHO/UoQ	2010	
Improving the quality and use of birth, death and cause-of-death information: guidance for a standards-based review of country practices	WHO/UoQ	2010	

Recommended tools and resources on birth and death registration can be found at: http://score.tools.who.int/tools/count-births-deaths-and-causes-of-death/

C2. Certification and reporting of causes of death

Aim

All countries should have the capacity to generate good quality, recent mortality statistics to describe levels and trends of mortality, and identify and track changes in the burden of disease in different population groups.

Rationale

Information on causes of death is critical, as it is indicative of the overall health status or quality of life of a population. In settings where most deaths occur in the health sector and where population denominators are known or can be estimated, hospital-based reporting can be used to generate proxy population mortality rates by age, sex and cause. Even in countries where most deaths occur outside hospitals, routine hospital data are an important source of mortality data. Hospitals are generally the only source of medically certified cause of death. Important facility-based indicators that can be derived from aggregate hospital data include: all-cause hospital mortality rates by age group and sex, per 1000 admissions; distribution of causes of death by sex and age group; cause-specific case fatality rates per 1000 admissions for major causes by sex and age group; and institutional maternal mortality ratio (facility maternal deaths per 100 000 facility deliveries).

Key actions countries can take

- **Establish a technical group including experts from health, statistics, registration and academia, to improve hospital (and community-based) cause-of-death data.** Statistics on causes of death are legally mandated and best generated from the medical certification of cause of death according to the standards set out in the International Statistical Classification of Diseases (ICD). Where this is not possible, verbal autopsy (VA) can be used to estimate cause-of-death distributions in the population. Implement or strengthen ICD Coding (including ICD11) through increasing modern training opportunities and tools for coders (e.g. ICDfit and the ICD-11 course at the WHO Academy), introducing digital mortality-coding tools (e.g. ICD-11 coding tool) and centralizing mortality coding where feasible.
- **Consider introducing VA techniques** where a large proportion of deaths occur outside health facilities through representative population samples to estimate population-based cause-specific mortality fractions.
- **Introduce (if not currently in use) the International Form of the Medical Certificate of Cause of Death 2016 (IMCCD) and train physicians and medical officers in its use.** Establish a national quality-assurance procedure to periodically review medical certification of cause of death and coding.
- **Ensure high-quality coding of cause of death:** To facilitate cause-of-death coding based on ICD standards, WHO has developed the ICD-11 Coding Tool - an index and rule based "smart search" functionality of ICD-11 coding tool which allows easy, fast and accurate coding of CoD with minimal training. The coding process can be greatly facilitated by using available this and other available digital tools.
- **Use verbal VAA where the civil registration system is weak, as an intermediate measure to estimate mortality and cause-specific mortality.** VA using a recognized instrument such as the WHO 2016 VA questionnaire can be used to determine probable causes of deaths occurring outside

health facilities. When properly implemented in representative population samples, VA can provide population-level estimates of fertility and cause-specific mortality. However, the accuracy of this method is limited for some important causes of death (such as tuberculosis and malaria). Health and demographic surveillance sites (HDSS) and sample registration systems (SRS) use VA techniques to ascertain causes of death in their surveillance populations.

Such systems should be integrated into the CRVS system, rather than implemented as stand-alone activities. Censuses and household surveys may use VA to assign causes to deaths that have occurred outside health facilities. However, sample size limitations, along with unavailability of subnational data, render these methods inadequate for the generation of detailed national and local estimates of cause-specific mortality.

INDICATORS

- Completeness of deaths with cause of death reported to national authorities and/or international institutions (%)
- Quality of cause-of-death data (% of cause of death with ill-defined or unknown causes of mortality)
- Core attributes of a functional system to generate cause-of-death statistics
  - Legislation for Medical Certificate for Cause of Death (MCCD) is line with international standards
    - ICD-compliant MCCD are used
    - Medical students trained in correct death certification practices
    - Statistical clerks trained in mortality coding
    - Verbal autopsy (if applicable) is applied
    - Data quality assurance and dissemination
    - Cause of death statistics available

Tool or standard	Publisher	Year	Link
Global COVID-19 weekly mortality data entry platform	WHO	2020	
Revealing the toll of COVID-19: A technical package for rapid mortality surveillance and epidemic response	Vital Strategies and WHO	2020	
CRVS Gateway – Resources for responding to COVID-19	CRVS Gateway	2020	

Tool or standard	Publisher	Year	Link
EuroMOMO: European mortality monitoring activity	Statens Serum Institut Denmark/ ECDC/WHO	2020	
ICD-11 Coding Tool	WHO	2019	
ICD-11 Reference guide, and ICD-10 Volume 2	WHO	2019	
ICD-11 Application Programming Interface (APIs) and Embedded Coding Tool (ECT) based cause-of-death app in DHIS-2	WHO	2020	
ICD-11 based automated UCoD tool	WHO	2020	
ICD-FIT coding training and self-evaluation tool – Mortality module	WHO	2019	
ICD-11 Training Tool and WHO Academy Course	WHO	2020	
WHO Application of ICD-10 for low-resource set-tings initial cause-of-death collection: the Start-up Mortality List (ICD-10-SMoL)	WHO	2014	
Analysing mortality levels and causes of death (ANACoD)	WHO	2020	
Analysing mortality levels and causes of death (ANACONDA)	UoM	2020	
Integrating community-based verbal autopsy into civil registration and vital statistics	BMJ Global Health	2018	
IRIS automated coding system for causes of death	INSERM	2017	
SmartVA-Analyze Application	IHME	2017	
Verbal autopsy standards: the 2016 WHO verbal autopsy instrument	WHO	2016	
Performing basic checks on cause-of-death data (CoDEdit)	WHO	2014	
Maternal death surveillance and response technical guidance: information for action to prevent maternal death	WHO	2013	
INDEPTH resource kit for demographic surveillance systems	IN-DEPTH/ Rockefeller	2008	

Recommended tools and resources on certification and reporting on cause of death can be found at: http://score.tools.who.int/tools/count-births-deaths-and-causes-of-death/

Optimize health service data to ensure equitable, quality services for all

KEY ELEMENTS

01 Routine facility reporting system with patient and community monitoring

02 Regular system to monitor service availability, quality and effectiveness

03 Comprehensive databases on health financing and health workforce data

Health service data are generated through several data subsystems including routine facility and community reporting systems; health facility surveys or accreditation systems for monitoring service availability, quality and effectiveness; and various health resource data systems such as health workforce information systems, health financing information system, and logistics management information systems (LMIS). Data need to be collected from all levels of facilities, including primary care facilities. Primary health care is critical for achieving UHC and primary care facilities remain the most cost-effective ways to address comprehensive health needs close to people's homes and communities.

The various subsystems should ideally be integrated or interoperable to facilitate comprehensive analysis of health services to support patient management, facility management, disease surveillance, sector planning, monitoring and management at all levels.

Data generated in health facilities contribute to a number of health SDG and UHC monitoring indicators, including, for example, the incidence of tuberculosis (TB) and malaria; the percentage of TB cases that are detected and successfully treated; the percentage of people living with HIV currently receiving antiretroviral therapy; coverage of essential health services (UHC tracer indicators[10] with facility data component); and hospital beds per capita.

Routine facility and community reporting systems: As part of their routine activities, health facilities generate data on the provision of clinical services and health status at the time of clinical encounters. This includes data collected within health facilities, for example from individual client records (patient file/card) and service delivery records (such as registers and tally sheets); data from home-based (client-held) records (e.g. immunization cards); and community health reports submitted to health facilities (for example, by community health workers) or disease-specific registries (e.g. for HIV, cancer, diabetes.

Also included are data collected from other health-related service delivery sites such as prisons, schools, workplaces and communities. As facility data are, by definition, limited to information about people who use health facilities or related community-based services, they are not necessarily representative of the whole population in any given catchment area. Facility data should therefore be compared with data from other sources, notably household surveys, which may provide information on the utilization of health services not included in the routine reporting system.

[10] There are 16 "tracer indicators" in the UHC service coverage index (published by WHO every 2 years).

Regular system to monitor service availability, quality and effectiveness: External reviews of health services through health facility surveys or accreditation/certification systems assess whether facilities provide the required standards of care. Such reviews complement routine reporting systems by periodically capturing information not routinely reported, such as the availability of services, essential equipment, medicines and supplies, and human resources; compliance with clinical guidelines; quality of care; client experience; and aspects of facility management and finance. Facility assessments are also used to provide external validation of data reported through the routine facility and community reporting systems.

Health service resources – health financing and health workforce: All countries should have comprehensive databases and electronic tracking systems on health financing and human resources for health and medicines and supplies. Systems of national health accounts (NHA) and national health workforce accounts (NHWA) should be institutionalized and maintained according to international standards. An established, adequately sized and skilled health workforce is essential for countries to be able to deliver the high-quality and equitable services that are critical to the attainment of both national and international health goals. Well-functioning LMIS are critical to ensuring continuous availability and quality of essential medicines and supplies.[11]

[11] LMIS are not addressed in this version of the SCORE framework and assessment.

01. Routine facility and community reporting systems with patient monitoring

Aim

All countries should be able to continuously monitor health service use and coverage, disease patterns, individual client care and health care resources; and to produce and use timely and reliable, individual-level and aggregate statistics from all health facility levels, including community outreach programmes.

Rationale

Facilities generate data on a continuous, routine basis that can be used to produce regular (e.g. monthly, quarterly or annual) summary statistics on service availability, utilization and performance; health care resources; and individual client care. These data can be used at local, district and national levels for client management, facility management, disease surveillance, sector planning, and monitoring and management at all levels.

Key actions for countries to take

- **Establish and maintain a master list of health facilities:** this should include both public and private sector facilities.
- **Develop guidelines and procedures (tailored for each level of the health system) to standardize:**
  - the collection of aggregate and patient-level data;
  - the way in which data are transmitted;
  - the analysis and use of data.
- **Address ethical considerations, including data privacy and confidentiality, by independent review boards:** Confidentiality is of concern when information collected can identify specific patients through name, age, gender and locality (and/or patient residence). Such information may be necessary in the health facility for good patient management, but confidentiality should be safeguarded in analyses and reports.
- **Promote unique identifiers for patient-level data to ensure that each person can be correctly and repeatedly identified when accessing health care services:** Individual-level data are used mainly to ensure quality care for individual patients but can also help evaluate long-term outcomes such as compliance and treatment failure. A system of unique individual identifiers enables continuity of care as well as interconnection of disease-specific patient records for comprehensive, safe patient care. It also means records can be matched across health facilities. This ability to track patients across different facilities and even regions enables assessment of treatment compliance and outcomes; and improves monitoring and evaluation efforts by minimizing the double-counting of services and clients.

- **Institutionalize a regular system of data quality assurance, based on recommended international standards:** Data quality can be a challenge because health care workers do not always have the time or the required forms or computers to record individual patient information. Assessment of the quality of health records and service reports is necessary to ensure the reliability of information for its intended use.
- **Establish a unified digital system that facilitates interoperability between different systems:** Integration and interoperability of disease- and programme-specific information systems can improve patient care, efficiency, data quality and the use of data for informed decision-making. If possible, data collection systems and forms for client data (e.g. clinical episodes) should be standardized across all implementing partners and donors. Ideally, health facility information systems should use electronic recording and reporting systems, but paper-based systems remain in use in many countries. The transition to electronic reporting systems should be guided by a unified, integrated and flexible framework.
- **Develop a costed workforce training and development plan and build skills and infrastructure for electronic recording and reporting systems, based on international standards:** High-quality data collection, management, analysis and interpretation require skilled health information personnel. Timely, complete recording and transfer of data can be achieved only if personnel are adequately trained. Data managers at facilities should receive in-service refresher training at regular intervals to ensure adequate capacity for evolving data needs. The synthesis and analysis of data from multiple sources and reconciliation of indicator values is essential to maximize the value of all sources of data. Feedback mechanisms to data producers should be implemented at all levels.
- **Ensure community-based programmes are integrated into an overall facility reporting system.**
- **Publicly share aggregate health-facility level data for key indicators on a regular basis to enable further analysis by local institutions and partners.**

INDICATORS

- Annual statistics for 11 selected indicators derived from facility data, including key disaggregations:
  - OPD visits (new / revisits)
  - Hospital admission/discharge rates
  - Hospital deaths by major diagnostic category (ICD)
  - DTP/Penta3 (<1year)
  - Institutional maternal mortality ratio
  - TB treatment success rates
  - Low birthweight prevalence among institutional births
  - Antiretroviral therapy (ART) coverage
  - Surgery rate by type
  - Severe mental health disorders
  - Cancer diagnoses by type
- Coverage levels of reporting from facilities:
  - Completeness of reporting by public, primary care facilities
  - Completeness of reporting by public hospitals
  - Completeness of reporting by private health facilities
- Functional facility/community/patient reporting system in place, based on key criteria:
  - Coverage levels of reporting from facilities:
    - National unique patient identifier system
    - Cancer registries for all types of cancer
    - Up-to-date master facility list
    - Institutional system of data quality assurance
    - Standards of practice for routine facility reporting systems describe all parts of process, are fully implemented and revised periodically
    - System of electronic data entry – aggregate at district level
    - System of electronic capture – patient-level primary health care facilities
    - System of electronic capture – patient-level in hospitals
    - Interoperability is ensured
    - There is a standards-based mechanism allowing integration/exchange of data between health data systems for management purposes (including aggregate service data and patient-level data; and status of selected commodities/stocks such as vaccines for Extended Programmes on Immunization, medicines for malaria, HIV, TB etc)

Tool or standard	Publisher	Year	Link
International Classification of Health Interventions (ICHI)	WHO	2020	
ICHI Training Course	WHO	2020	
ICD-FIT coding training and self-evaluation tool – Morbidity module	WHO	2019	
Analysis and use of health facility data	WHO/UoO	2019	
Master facility list (MFL) resource package: guidance for countries wanting to strengthen their MFL	WHO/ USAID/ PEPFAR	2019	
Digital Health Package for DHIS2	WHO/UoO	2019	
DHIS2 – a Digital Tool for WHO RHIS standards	WHO/ University of Oslo	2020	
Routine Health Information Systems (RHIS) rapid assessment tool	ME/USAID/ WHO/D4H	2014	
Performance of Routine Information System Management (PRISM)	ME/USAID	2011	
Routine health information systems: a curriculum on basic concepts and practice	USAID/ME/ WHO	2017	
Data Quality Review (DQR): a toolkit for facility data quality assessment	WHO	2017	
Guidance on unique identifiers for patient monitoring	WHO	2017	
Planning and developing population-based cancer registries in low- and middle-income settings	IARC	2014	
International Classification of Functioning, Disability and Health (ICF)	WHO	2001	
ICF eLearning Tool	WHO	2014	
ICD-11 Functioning section incl. WHO Disability Assessment Schedule (WHO DAS 2.0)	WHO	2018	

Recommended tools and resources on optimizing routine facility data can be found at:
http://score.tools.who.int/tools/optimize-health-service-data/

O2. Regular system to monitor service availability, quality and effectiveness

Aim

All countries have in place an independent, objective, comprehensive system of external review, through health facility surveys or accreditation systems, to regularly monitor health service availability, readiness, quality and effectiveness.

Rationale

A system of external review through facility surveys or accreditation systems provides assurances that healthcare facilities have quality systems in place and the data to demonstrate the required level of service provision. Depending on the comprehensiveness of the standards against which health service performance is being measured, external reviews can contribute to quality improvement, risk mitigation, patient safety, improved efficiency and accountability and can contribute to the sustainability of the health-care system. In countries that have not yet developed full accreditation and certification systems, regular facility surveys can be used to assess aspects of facility performance and service quality. External review systems can provide information on how well health services are being delivered, identify gaps, and assist the decision-making of funders, regulators, health care professionals and the public.

A comprehensive approach to an external review via a survey or accreditation should cover the following areas:[12]

- **Availability** of basic resources and services (e.g. staff, beds, medicines, diagnostics, services offered and building structure).
- **Readiness** to provide specific services to defined minimum standards (e.g. guidelines, trained staff, equipment, commodities, systems to support quality and safety, and provider knowledge).
- **Quality of care and safety** (e.g. adherence to standards in the patient care process, patient outcomes, and patient experience).
- **Management and finance** practices to support continuous service availability and quality (e.g. management practices, finance systems, utilization and efficiency, quality assurance, health worker absenteeism).
- **Data verification** to validate routine service statistics and self-reports on facility infrastructure, resources and service activities.

Key actions for countries to take

- **Develop a single harmonized programme for health facility surveys or accreditation, based on international standards and adapted to country context and needs.** The programme should be part of the monitoring and evaluation plan of the national health sector and should reduce duplication and include details on content, funding and implementation.
- **Ensure that accreditation or facility survey results and findings are accessible to decision-makers and public through:**
  - user-friendly reports to inform critical health sector reviews and planning processes.
  - the ministry of health website, or a central data repository or national observatory.

[12] While various international health facility assessment tools have been developed (e.g. the Service Availability and Readiness Assessment (SARA); the Service Delivery Indicators survey (SDI); and the Service Provision Assessment –(SPA)), most efforts have been piecemeal, focusing on quality of care in a specific service area, such as obstetric care, newborn care or HIV care. The recent multi-stakeholder initiative to develop the Harmonized Health Facility Assessment (HHFA) modules aim to achieve a comprehensive and harmonized approach to health facility surveys.

- **Address financial issues and coordination between national institutions and partners as part of the accreditation or facility survey plan.**
- **Engage national institutions with relevant experience to build capacity to ensure technical quality and effective implementation of external review systems.**

INDICATORS

- Well-established system to independently monitor health services:
  - Regular independent assessments of the quality of care in hospitals and other health facilities
  - System of accreditation of health facilities based on data
  - System of adverse event reporting following medical interventions

Tool or standard	Publisher	Year	Link
Standardized health facility survey modules – modular approach to health facility assessments	WHO/HDC	2018	
Service Availability and Readiness Assessment (SARA)	WHO	2015	
Service Provision Assessment (SPA) survey	USAID	2012	
Service Delivery Indicators (SDI) survey	WBG	2012	
Health Resources Availability Monitoring System (HeRAMS)	WHO	2016	
Guidance on designing health care external evaluation programmes, including accreditation	ISQua	2015	

Recommended tools and resources on monitoring service availability, quality and effectiveness can be found at: http://score.tools.who.int/tools/optimize-health-service-data/

03. Health service resources: health financing and health workforce

Health financing data

Aim

All countries systematically measure the flow of funds in their health system using a system of national health accounts, based on international standards. An electronic system for tracking public expenses at all levels of government is desirable to enable tracking of subnational health expenditures.

Rationale

National health accounts (NHA) provide national decision-makers with essential financial information to inform policy choices, budgetary planning and resource allocation, and to monitor accountability. National health account information includes: the share of health expenditure within an economy; the financial burden of health spending on households (e.g. "catastrophic spending"); the magnitude of external financing in health expenditure; and the share of spending on different levels of care (e.g. hospitals, primary care facilities) and on different diseases or conditions.

Linking NHA with non-financial data, such as output and outcome indicators, provides the basis for powerful tools to monitor performance, link financial investments with attainments in health status and drive improvement in effectiveness, efficiency and quality of services.

NHAs are produced using the System of Health Accounts (SHA) 2011, an internationally recognized methodology that tracks the flow of expenditures in the health system. The SHA generates consistent, comprehensive data on all health spending in a country, providing a common framework for enhancing comparability of health expenditure data over time and among countries.

Key actions for countries to take

- **Develop core technical capacities in-country for production and use of NHA:** Countries need adequate human capacity and information and communications technology (ICT) infrastructure at national and subnational levels to produce NHA data and core indicators on a regular basis.
- **Undertake at least one full round of the NHA every 3 years.**
- **Integrate key aspects of NHA data collection into routine information systems and national surveys and ensure reporting of expenditure information.** Government expenditure data codes can be mapped to the NHA coding system (SHA 2011), and the data can then be automatically converted to the NHA format.
- **Establish an electronic system for tracking public expenses at all levels of government to facilitate tracking of subnational expenditures.** The result is a central NHA database that is used for production of standard NHA tables and indicators.
- **Effectively disseminate and communicate NHA findings and demonstrate their value to policy-makers through specific policy-related analyses.**
- **Establish a governance structure for NHA:** Countries need to ensure a strong governance structure to institutionalize health accounts. A strong governance structure would include predictable funding streams to conduct health accounts and ensure coordination with (and inclusion of) key stakeholders in the production and use of results of the accounts.

INDICATORS

- Availability of latest data on national health expenditure
  - Data available within last 5 years on:
    - Public health expenditure
    - Private health expenditure
    - Catastrophic health spending (defined as household out-of-pocket health spending exceed household ability to pay)

Tool or standard	Publisher	Year	Link
A System of Health Accounts (2017 revised edition)	OECD/ Eurostat/ WHO	2017	

Recommended tools and resources on improving health financing data can be found at:
http://score.tools.who.int/tools/optimize-health-service-data/

Health workforce data

Aim

All countries have a system of national health workforce accounts (NHWA) that can generate and improve the availability, quality and use of health workforce data (including health workforce distribution).

Rationale

The availability, quality, comprehensiveness and interoperability of health workforce data are often limited – with availability often restricted to a few core health occupations, to the public sector only, or to employed workers only. In many cases, information from routine administrative sources is not updated. Moreover, even when data quantity and quality are adequate, there are limitations to its effective use. NHWA can help countries address these problems by progressively improving the availability, quality and use of workforce data through using a set of core indicators. This can help standardize countries' health workforce information systems to improve interoperability and data sharing among national stakeholders; support tracking of health workforce policy performance in relation to UHC; and facilitate comparability of health workforce data nationally and globally. As the implementation of NHWA is by nature progressive, some of the benefits for countries will be immediate, while others will become available over the longer term.

Key actions for countries to take

- **Establish a multi-stakeholder working group from across government to coordinate health workforce data:** This working group should build on existing structures and mechanisms involved in the collection and reporting of human resources for health data from across sectors. Four major sources are commonly used: the national population census; labour force and employment surveys; health facility assessments; and routine administrative information systems (including reports on staffing and payroll, professional training, registration and licensure). As multiple sources and stakeholders must be consulted to acquire the necessary data on the size, characteristics and dynamics of the national health workforce, a functional multi-stakeholder working group with a clear mandate on data sharing and processes for standardization is required.
- **Conduct a baseline NHWA maturity assessment followed by periodic reviews.**
- **Define key health workforce policy questions and relevant NHWA indicators to address them:** As health systems and workforce issues vary across and within countries, different countries will have different policy questions and priorities regarding the health workforce. In addressing national priorities, it is therefore the responsibility of countries to determine the most relevant indicators for the monitoring and management of their national health workforce.
- **Map currently available sources of information in the country and plan NHWA data collection.** This requires multisectoral input to provide information on human resources, not only on the density of health workers but also information on health workforce education, finance and migration.
- **Assess the existing legal environment for data protection rules and regulations and obtain legal authorization for all data extraction, exchange and dissemination:** As data sources are generated by different sectors and stakeholders, and a clear mandate on data sharing and processes for standardization must be created (a factor often overlooked).
- **Compile, validate and analyse data and develop a set of policy recommendations based on the findings.**

- **Produce reliable and comprehensive health workforce statistics at national and subnational levels annually:** Disseminate the results and key messages for research and monitoring and planning purposes, including a report on the state of human resources for health in the country.

INDICATORS

- Information on health worker density and distribution updated annually, including availability at subnational level and major levels of disaggregations for:
  - Doctors
  - Nurses
  - Midwives
  - Dentists
  - Pharmacists
- Functional national human resources health information system (HHRIS) is in place and able to track:
  - Number of entrants to the labour market
  - Number of active stocks on the labour market
  - Number of health workers leaving the labour market
  - Demographic distribution of health workers
  - Subnational-level data on active health workers
  - Number of graduates from education and training institutions
  - Information on foreign-born and/or foreign-trained health workers

Tool or standard	Publisher	Year	Link
National Health Workforce Accounts (NHWA): a handbook	WHO	2017	
International Standard Classification of Occupations (ISCO-08)	ILO	2012	

Recommended tools and resources on health workforce data can be found at:
http://score.tools.who.int/tools/optimize-health-service-data/

Review progress and performance to make informed decisions

KEY ELEMENTS

R1 Regular analytical reviews of progress and performance, with equity

R2 Institutional capacity for analysis and learning

The use of data and information for periodic health sector progress and performance reviews is critical to understanding what is working and what has been achieved, and to discuss problems. The output of a review process (based on the highest-possible quality data and indicators) will support decision-making processes at all levels and can help generate consensus on corrective measures or action needed, including guiding resource allocation. Assessing equity dimensions, system performance, and enablers and barriers to effective access to and utilization of health care services are also key components of a review, which will enable informed decisions. Progress and performance reviews are part of national and local governance mechanisms that help ensure transparency and allow for debate between stakeholders.

Local use of data to review progress and promote action should occur at the health facility and subnational administrative levels such as districts and provinces. Data quality checks and adjustments should precede the compilation and synthesis of data on a regular basis. Scorecards or dashboards are tools that have tremendous potential for regular annual or more frequent assessment of progress. However, mechanisms should be in place to translate results shown in scorecards and dashboards into action.

Most countries have a national health sector strategy and plan (NHSP) that is regularly reviewed to assess performance against the plan's objectives and targets, monitor trends and provide information to guide improvement where necessary. In many countries, progress towards achieving targets in the national health strategy and plan is assessed through an annual health sector performance review. Mid-term and end-of-plan reviews are also common and should be more extensive. The overall assessment of progress and performance is based on the analysis of progress, including equity and efficiency analyses. The results of these analyses are interpreted in the light of national strategies, plans and policies and take into account international developments as well as contextual changes. Additionally, sound public health research, periodic surveys and the use of global health estimates can also inform the analytical review of NHSP progress and benchmark performance compared to other countries and global and national targets. Engagement of national academic, public health and research institutions will foster broader institutional capacity to improve the analysis and use of health-related statistics.

R1. Regular analytical reviews of progress and performance, with equity

Aim

Countries should assess and monitor progress and performance of their national health sector strategy or plan, including the extent to which equity in access to and availability of health care has been achieved.

Rationale

Analytical reviews are part of national and local governance mechanisms that help ensure transparency and allow for debate between stakeholders. They can demonstrate the progress and performance of the NHSP over a specific period (against set indicators) in relation to baseline values and targets. This analytical review should provide in-depth analysis and synthesis (in the form of a report) of all relevant data. They following attributes are important to address in local and national reviews:

- **Progress towards NHSP goals:** The analytical report should measure the extent to which the objectives and goals of the NHSP (core indicators and their targets) have been attained.
- **Equity monitoring**: High out-of-pocket expenditures for obtaining health services can push people into poverty. Lack of availability of, and access to, key health interventions also cause poor health outcomes. Both financial hardship and availability of health services are at the core of UHC monitoring. Data on levels of and inequities in financial protection and coverage of health service interventions are at the core of UHC monitoring and should be used to target programmes and use health resources efficiently and effectively.[xii] Health equity monitoring requires linked data on health indicators and data disaggregated by dimensions of equity across population subgroups (e.g. age, sex, place of residence, education level, income and other country or context-specific factors).
- **Efficiency:** Countries should measure the extent to which the resources used by the health system have been optimized to produce the maximum possible benefit to society.
- **Benchmarking:** Benchmarking refers to comparisons within and among countries to assess performance. There are different types of benchmarking, which may vary according to the level of comparison (international or national), level of assessment (individual service provider, facility, care organization, district/province, national), measurement focus (process, outcomes, quality, performance) and uses of data (public reporting, accountability, internal reporting only, self-learning and improvement).
- **Qualitative assessment and analyses of contextual changes:** The analytical review should take into account non-health system changes, such as socioeconomic development, that affect both implementation and the outcomes of health service provision.

Key actions countries can take

- **Establish or strengthen a regular system of reviews with broad involvement of key stakeholders, and ensure links between health sector reviews and disease and programme-specific reviews.** Reviews should include information drawn from health and other household surveys; census and CRVS systems; health facility and disease surveillance data; facility assessments; administrative data (e.g. health workforce and financing); and health systems and policy data and research studies. Data sources should include both local and global data as relevant.

- **Produce regular analytical reports that include progress against baseline and targets, equity analyses, efficiency, performance and benchmarking.** The analytical report should include NHSP key indicators and benchmarks, as well as additional programme-specific indicators, equity analyses by key dimensions, comparative analyses with peer countries, performance and efficiency analysis comparing inputs and outputs at the subnational level and computation of lives saved through interventions. Data quality assessment with supervision and possible adjustment should be carried out to maximize the report's quality and usefulness. Equity reporting should include both relative and absolute measures of equity and indicate disadvantaged or marginalized subgroups, as well as national or overall averages.
- **Establish or maintain an institutionalized partnership with a national institute that has analytical capacity to support government reviews.** The use of a national institute as the lead implementer for national health system performance reviews, as well as health systems and policy research, is particularly important for strengthening the capacity of countries to conduct and institutionalize statistical reviews.
- **Support a system of local analysis and use of data** with use of simple (yet powerful) tools such as scorecards or dashboards with clear quality criteria and links with remedial action and feedback.

INDICATORS

- A high-quality analytical report on progress and performance is produced regularly (at least every 5 years) and:
  - uses all available data sources;
  - assesses progress against targets;
  - pays attention to measures of inequity;
  - links performance to health inputs;
  - provides comparative analysis;
  - includes subnational rankings;
  - evaluates performance of hospitals and large facilities;
  - summarizes main findings for use for policy and planning.

Tool or standard	Publisher	Year	Link
Triple Billion dashboard	WHO	2020	
Leading by example: A resource for global health decision-makers	Exemplars in Global Health/ BMGF	2020	
Health inequity monitoring resources	WHO	Various	
OneHealth Tool	Avenir Health	2017	
Lives Saved Tool (LiST)	JHU	2017	
Modeling physical accessibility to health care and geographic coverage (AccessMod©)	WHO	2017	
Equitable Impact Sensitive Tool (EQUIST)	UNICEF/ CSF	2016	

Recommended tools and resources on regular analytical reviews of progress and performance can be found at: http://score.tools.who.int/tools/review-progress-and-performance/

R2. Institutional capacity for analysis and learning

Aim

All countries should have national, institutionalized capacity for health data and statistics generation, synthesis, analysis, dissemination and use.

Rationale

Capacity to improve data quality and make health data meaningful to multiple audiences (e.g. civil society, health managers, and decision-makers) is key to triggering policy dialogue, making informed decisions, taking corrective measures when needed and providing adequate feedback to support local planning and management. All countries therefore require adequate institutional capacity for health data collection, compilation and sharing; data quality assurance; analysis, synthesis and interpretation; and effective communication and use of results. Deployment of health information officers in large facilities and districts (as well as at higher levels of the health system) results in significant improvements in the quality of data reported and used at all levels of the health system and in the understanding of its importance by health workers.

Key actions for countries to take

- **Ensure analytical capacity and, if needed, direct resources to analytical capacity strengthening and professional advancement.** Investments may include institutional capacity strengthening of ministries of health, national statistics organizations, and national public health and academic institutions. Targeted capacity building is needed in areas such as health information management and use, system design and application, public health informatics and epidemiology. At national level, skilled epidemiologists, statisticians, demographers and information technology experts are needed to oversee system technology, data standardization for collection and management, data quality and appropriate analysis and utilization of the information produced; and at subnational levels, health information staff should be accountable for data collection, reporting and analysis. Investment may be needed to assess the information system workforce and develop and implement costed workforce development plans, standardized training curricula, and guidelines for supervision and mentoring.
- **Incorporate analytical capacity building in pre-service training:** Pre-service training should include, among others, courses such as basic statistics, key analytical concepts, data quality, presentation and communication of data. These should be followed by regular in-service training.
- **Set up professional development schemes (including peer-learning and mentoring), training programmes and retention plans for health information officers at all health system levels.** Improvements in the national health information system cannot be achieved without appropriate investments in training, deployment, remuneration and development of clear paths for career advancement at all levels. Appropriate remuneration is essential to ensure recruitment of high-quality staff and limit attrition. This implies, for example, that health information positions in ministries of health should be graded at levels equivalent to those of major disease programmes. Establishment of an independent or semi-independent statistics office may also improve remuneration and retention of high-level staff.

INDICATORS

- Institutional capacity in data analysis at national and subnational level:
  - Involvement of public health institutes/schools of public health
  - Subnational capacity in the ministry of health or institutions to conduct health analysis
  - Capacity at national ministry of health level to conduct health analysis
  - Capacity at national bureau of statistics to:
    - draw sample
    - implement surveys
    - conduct analysis

Tool or standard	Publisher	Year	Link
Analysis and use of health services data	WHO/UoU	2019	
Data Quality Review: a toolkit for facility data quality assessment	WHO	2017	
Routine Health Information Systems (RHIS): a curriculum on basic concepts and practice	ME/WHO	2017	

Recommended tools and resources on institutional capacity for analysis can be found at:
http://score.tools.who.int/tools/review-progress-and-performance/

Enable data use for policy and action to accelerate improvement

KEY ELEMENTS

- **E1** Data and evidence drive policy and planning
- **E2** Data access and sharing
- **E3** Strong country-led governance of data

Health data are the bedrock of sound NHSPs and decisions to accelerate improvements in health systems and health outcomes. An enabling environment is therefore critical for ensuring their effective use.

Accessible, credible data from multiple sources must be available to those who are best placed to use it to improve health system performance, including decision-makers at all levels, health service funders and implementers, academic institutions, the media and the public. It must also be accessible to those who aim to hold the government accountable. Mechanisms to promote data access and dissemination include annual statistical reports, national health observatories or portals and an open data policy in the government.

Policy-relevant data analyses, evidence synthesis and structured expert review processes are needed to translate this knowledge to inform policy-making and legislative proposals. The use of regular independent reviews can promote transparency, strengthen accountability and drive remedial action. To ensure data and evidence are effectively applied to improve health systems and health outcomes, it is important to recognize the political complexities around data release and use and to engage proactively with decision-makers.

A well-functioning country HIS is dependent on a strong policy and institutional environment. HIS governance encompasses the legal frameworks, policies and processes underpinning the national HIS architecture, which is based on the design, infrastructure and processes of various system components and their alignment at different health system levels.

Delivery for Impact interventions provide real-time progress tracking, active problem-solving, and knowledge sharing in collaboration with partners and technical teams to improve results reporting and ensure maximum impact. This empowers countries by creating a common understanding of progress towards the health-related SDGs and Triple Billion targets globally as well within regions and countries.

The country HIS should be a single, country-led platform that meets all data needs and enables monitoring of progress towards UHC and the health and health-related SDGs. Development of the HIS (including digital systems) should be based on one strong, country-led monitoring and evaluation plan that is an integral part of the NHSP.

E1. Data and evidence drive policy and planning

Aim

Countries should use data and evidence to allocate resources effectively, enhance performance and demonstrate accountability nationally and globally.

Rationale

Data are essential to inform decisions at all levels of the health system. However, there are no simple, linear relationships between data production, dissemination and use. Structured processes of data analysis, evidence synthesis and expert review are required to translate knowledge into technical guidance for policy development for health system interventions ("knowledge management").

Key actions countries can take

- **Develop a comprehensive knowledge management and data dissemination strategy for each level of the health system.** To ensure data and evidence are effectively applied to improve health systems and health outcomes, it is important to recognize the political complexities around data release and use and to engage proactively with decision-makers.
- **Ensure that results from analytical progress and performance reviews are incorporated into the decision-making process.** This includes incorporating reviews into the mechanisms used by government and partners to make resource allocation decisions and financial disbursements to programmes and subnational levels. (Mechanisms to ensure data accuracy should also be in place, to minimize potential perverse incentives).
- **Produce high-quality policy briefs and summaries with findings from analytical reviews identifying key actions needed to improve health sector performance.**
- **Convey information to diverse target audiences:** Employ a variety of dissemination techniques such as interactive analytics using dashboards and summary charts that are meaningful to diverse target audiences such as media, the public and policy-makers.
- **Engage with the media and civil society, parliamentarians and other major stakeholders to communicate and disseminate the findings.** Routine representation of civil society members in accountability mechanisms at all levels, including national health sector reviews, is important. The media, parliamentarians, professional associations and academics are also important stakeholders. Public meetings, engagement with citizens' groups and with media to disseminate findings have been used effectively to spur decision-makers to take action.

INDICATORS

- National health plan and policies are based on data and evidence:
  - National health plan/policies include review of past performance (trends)
  - National health plan/policies include burden of disease analysis
  - National health plan/policies include health system strength analysis (response strength)
  - Presence of a central unit or function in the ministry of health for data and evidence to policy translation
  - Level of output of a central unit or function in the ministry of health for data and evidence to policy translation
  - Coordination function between ministry of health and partners

Tool or standard	Publisher	Year	Link
WHO Global Observatory on Health Research and Development	WHO	2016	
Tools for data demand and use in the health sector: a quick guide	ME/USAID	2013	
Making data meaningful: four practical guides	UNECE	2009	

Recommended tools and resources on using data and evidence to drive policy and planning can be found at: http://score.tools.who.int/tools/enable-data-use-for-policy-and-action/

E2. Data access and sharing

Aim

All countries have health data that are accessible to decision-makers at all levels, including subnational decision-makers and local communities, and to all constituencies, including the public, with appropriate disaggregation for equity dimensions.

Rationale

Openly available, credible statistics encourage transparency are an essential element of accountability at all levels of a health system. Once data have been collected and analysed according to the highest standards, the methods for collecting and compiling the data – and the data themselves – should be made available to potential users.

The most commonly shared data are aggregated data. However, there is also value in sharing individual record data (microdata) with bona fide users such as researchers, as long as there are solid mechanisms to ensure data privacy, confidentiality and security. Data sharing has numerous advantages. It permits analysts and researchers to conduct in-depth analyses, study historical trends, draw out correlations and relationships and enhance the policy value of the information collected. A supportive legal and administrative framework is essential to enable sharing and use of data, in accordance with agreed standards for confidentiality and data security. Sharing of (anonymized) individual record information with the health department is a core element of public health surveillance.

Key actions countries can take

- **Develop a national open data policy.**
- **Establish a data warehouse or national health observatory (NHO) to enable sharing of aggregated data across national, subnational and district levels to support data analysis and use.** There are now over 60 observatories throughout the world, and many other platforms that perform an observatory function. In most of these countries, observatories are subnational (e.g. at district, regional or municipal levels). The main objectives of NHOs are to improve the availability and use of information and evidence on health status and trends and their social determinants for policy dialogue, and to monitor and evaluate the implementation of national strategies and plans. The portal should develop content appropriate to different stakeholder groups and use innovative visualization and analysis, including geographic information system functionality to enable spatial analysis and mapping, charts, graphs and dashboards.
- **Offer well-documented microdata and relevant metadata (with appropriate safeguards for confidentiality) to bona fide researchers.** This can contribute to evidence for policy-making and planning.

INDICATORS

- Health statistics are publicly available
- National health portal/database exists, is publicly available and meets standards based on:
  - Frequency of updating national database
  - Contents of national database
  - Ease of navigation of the national database
- National statistical report available and meets standards based on:
  - Publication frequency
  - Inclusion of disaggregations
- Bona fide users have access to HMIS data
- Bona fide users have access to health survey data
- Open data policy

Tool or standard	Publisher	Year	Link
Policy statement on data sharing by the World Health Organization in the context of public health emergencies	WHO	2016	

Recommended tools and resources on data access and sharing can be found at: http://score.tools.who.int/tools/enable-data-use-for-policy-and-action/

E3. Strong country-led governance of data

Aim

Countries' health information systems should operate according to sound governance policies and legal frameworks for data, as well as multi-stakeholder coordination mechanisms, with defined roles and responsibilities for different stakeholders.

Rationale

Successful implementation of the SCORE interventions and progress towards a well-functioning country HIS require a sound policy and institutional environment. This includes sound governance policies and legal frameworks for data as well as for multi-stakeholder coordination.

Key actions countries can take

- **Establish or update the legal framework, codified in a legal mandate.** A clear legal framework and associated regulations should underpin policy and planning for health information systems (HIS), covering the collection, management, reporting and sharing of data. This should include clearly articulated roles and responsibilities at all levels; identification of decision-making authorities; and confidentiality precautions and mechanisms for accountability to both data users and data producers. Data policies should be based on the principles of accountability, transparency and participation of multiple stakeholders at different levels, promoting the open use of data at all levels. However, policies must make explicit provision to assure ethical use of data and protection of individual privacy and confidentiality.
- **Develop/strengthen a strong monitoring and evaluation (M&E) plan.** A strong M&E plan should be comprehensive, address the goals and objectives of the NHSP, and support the selection of a balanced set of core indicators with well-defined baselines and targets based on international standards. The plan should also detail ways to address data gaps and weaknesses in the various data systems, specify analytical outputs, define communication and dissemination mechanisms and outline plans for institutional capacity building.
- **Develop and implement an HIS strategy based on the priorities of the national M&E plan.** In many countries, the M&E plan is accompanied by a comprehensive national HIS strategy and implementation plan that provides additional details for strengthening the country HIS. The M&E plan and its relationship to the NHSP provide the basis for multi-year costing and investment in the HIS by both government and partners.
- **Ensure a unified digital health data infrastructure that underpins the national HIS plan and national M&E plan.** Digitalization of health data has become an integral component of country HIS. The use of digital health data should be strategic, support national health goals and be closely linked to the national M&E and HIS plans. A national strategy for digital health data may be embedded within the HIS strategy. Within the context of the NHSP, information and communication technologies (ICT) require effective governance, investment in infrastructure and adoption of standards for information systems at all levels of care. Furthermore, national information policies and regulations should ensure security of digital data and consistent management of data protection, privacy, confidentiality and consent.

- **Encourage harmonization and alignment of donors and development partners around country strategies and action plans, including the M&E plan and the HIS strategy.**
- **Establish mechanisms/platforms for multisectoral coordination of health and health-related data, within the context of the health and health-related SDGs.** A key focus is investment in one country-led platform[xiii] that meets all country data needs and enables monitoring of progress towards UHC, and the health and health-related SDGs, with high-level commitment and aligned investments by countries and partners. This requires one strong country-led monitoring and evaluation (M&E) plan, as an integral component of the national health strategy and plan (NHSP) and related sub-sectoral plans. Countries should also ensure effective governance structures for country-led coordination mechanisms (including defined roles and responsibilities of different stakeholders) for monitoring, evaluation and review for the entire HIS policy framework, including those concerning monitoring of the many health-related SDGs.

INDICATORS

- National monitoring and evaluation (M&E) exists and:
  - Includes core indicator list with baselines and targets
  - Includes specification on data collection methods and digital architecture
  - Includes data quality assurance mechanisms
  - Includes analysis and review process specifications
  - Specifies use of data for policy and planning
  - Specifies dissemination of data
  - Specifies resource requirements to implement the strategic plan/policy
- National digital health/e-health exists and:
  - Includes discussion of health data architecture
  - Includes description of health data standards and exchange
  - Includes handling of data security issues
  - Includes specifications for data confidentiality and data storage
  - Specifies access to data
  - Specifies alignment/is integrated with national HIS strategy
- Foundational elements to promote data use and access are present.
  - Legal framework or policies exist for health information systems and are enforced

Tool or standard	Publisher	Year	Link
WHO Guideline: recommendations on digital interventions for health system strengthening	WHO	2019	
Guidance for Investing in Digital Health: ADB Sustainable Development working paper series	Asian Development Bank (ADB)	2018	
Digital Health Platform Handbook: Building a Digital Information Infrastructure (Infostructure) for Health	ITU/WHO	2017	
Global reference list of 100 core health (plus health-related SDG) indicators	WHO	2018	
Health Information Systems (HIS) Interoperability Maturity Toolkit	ME/USAID/ PEPFAR/ WHO	2017	
Strategizing national health in the 21st century: a handbook	WHO	2016	
OpenHIE	Regenstrief Institute	2013	
National eHealth Strategy Toolkit	WHO/ITU	2012	
Monitoring, evaluation and review of national health strategies: a country-led platform for information and accountability	WHO	2011	

Recommended tools and resources on data access and sharing can be found at:
http://score.tools.who.int/tools/enable-data-use-for-policy-and-action/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Conclusion

03

Conclusion

Governments need reliable health data to prioritize health challenges, use resources appropriately, and to monitor progress towards commitments in their national health sector plans. They also need reliable health data to measure progress towards global commitments such as universal health coverage, and global strategies such as the SDGs .[xiv]

However, at present, key sources of health data are in many countries very weak, deeply fragmented or non-existent, meaning that the use of resources is often inefficient. The *SCORE for Health Data Technical Package* summarizes essential interventions that governments can use to help overcome these inefficiencies and shortfalls, and improve the quality of – and access to – health care for all. Recommendations also ensure interoperability between the different data sources and analytical steps and pave the path towards usage of big data in the future. The technical package will be periodically updated in the future to ensure that the most current interventions are included.

Based on solid evidence and drawing lessons learned in improving data systems from around the world, the interventions in this resource are intended to be implemented in a complementary and synergistic way in order to have the greatest impact. That said, because countries' health information systems are at different stages of maturity, prioritization of these different interventions and the order in which they are implemented should be based on a comprehensive assessment of country needs, and integrated into existing country plans and priorities.

The recent rise in attention given to health information systems globally – in part a result of the adoption of the 2030 Agenda for Sustainable Development, but accelerated by the explosion in the demand for data as a result of COVID-19 – is a necessary development, and reflects the increasing commitment of many governments to improving health data.

However, the pace of progress is too slow. Working collaboratively with Member States to scale up implementation of the *SCORE for Health Data Technical Package* provides WHO and partners with the opportunity to hasten progress towards more reliable health data that equip governments to address key health challenges with evidence based and data driven policies.

WHO urges Member States to focus on the priority interventions in this technical package, to adopt the good and best practice actions it recommends, and to draw upon the and new universally accepted standards and tools it offers. This can help meet the "leave no one behind" ethos of the SDGs to ensure that all populations achieve equitable health outcomes.

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Annex

CORE INDICATORS TO MONITOR IMPROVEMENT IN COUNTRY HEALTH DATA

Interventions	Key elements	Indicators
Survey populations and health risks	System of regular population-based health surveys	A system of regular and comprehensive population health surveys that meets international standards
	Surveillance of public health threats	Completeness and timeliness of weekly reporting of notifiable conditions (%)
		Indicator and event-based surveillance system(s) in place based on International Health Regulations standards
	Regular population census	Census conducted in last 10 years in line with international standards with population projections for subnational units
Count births, deaths and causes of death	Full birth and death registration	Completeness of birth registration (%)
		Completeness of death registration (%)
		Core attributes of a functional CRVS in place to generate vital statistics
	Certification and reporting of causes of death	Completeness of deaths with cause of death reported to national authorities and/or international institutions (%)
		Quality of cause-of-death data (% of cause of death with ill-defined or unknown causes of mortality)
		Core attributes of a functional system to generate causeof-death statistics

Interventions	Key elements	Indicators
Optimize health service data	Routine facility reporting system with patient monitoring	Availability of annual statistics for selected indicators derived from facility data
		Functional facility/patient reporting system in place based on key criteria
	Regular system to monitor service availability, quality and effectiveness	Well established system to independently monitor health services
	Health service resources: health financing and health workforce	Availability of latest data on national health expenditure
		Availability of data on health workforce density and distribution updated annually
		National human resources health information system is in place and functional
Review progress and performance	Regular analytical progress and performance reviews, with equity	High quality analytical report on progress and performance of health sector strategy/plan are produced annually
	Institutional capacity for analysis and learning	Institutional capacity in data analysis at national and subnational level
Enable data use for policy and action	Data and evidence drive policy and planning	National health plan and policies are based on data and evidence
	Data access and sharing	Health statistics are publicly available
	Strong country-led governance of data	National monitoring and evaluation (M&E) is based on standards
		National digital health/e-health strategy is based on standards
		Foundational elements to promote data use and access are present

World Health Organization

20 Avenue Appia
CH-1211 Geneva 27
Switzerland

score@who.int
www.who.int/healthinfo/en

9789240009837