Health Metrics Network

Strengthening Country
Health Information Systems

# Assessment and Monitoring Tool

Version 2.00

Contents

1. Introduction

The strengthening of health information system requires the active involvement of many stakeholders who have roles and responsibilities in different areas of health statistics. The Health Metrics Network (HMN) seeks to align all partners – at country level and in the donor community – around a coherent framework (the HMN Framework) that focuses partner actions and guides the overall direction of health information system development.

The absence of consensus on the relative strengths, usefulness and feasibility of different data-collection methods to generate the range of health indicators needed by programme managers and decision-makers is a major constraint to health information system strengthening. In such circumstances, the HMN Framework is needed to link. various data needs with data-generation methods, and helps to define country and global systems, standards, capacities and processes. It combines the normative framework for measurement in health with inclusive and participatory assessment, planning and implementation tools. The Framework also focuses the inputs of donors and technical agencies around a country-owned plan for health information, thus reducing overlap and duplication and enabling the efforts of donors and development partners to converge. At both country and global levels, the HMN Framework should enable access to and use of health information, thus serving the needs of individual countries while contributing to the global public goods.

The HMN Framework comprises two components: a normative part (components and standards) and an implementation part (a roadmap) (*Fig. 1*).

Fig. 1 The HMN Framework
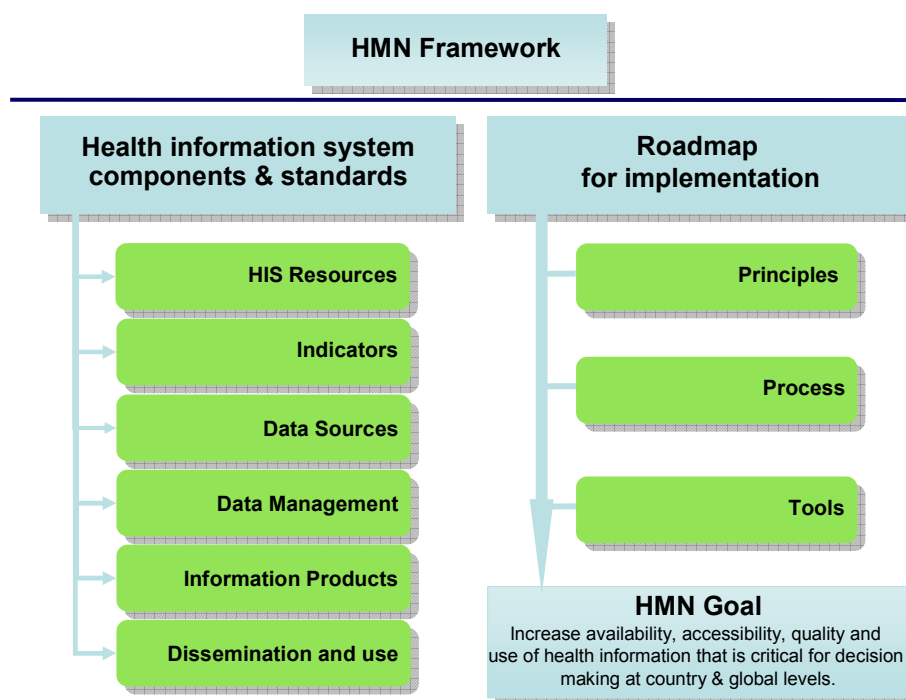
The normative component describes the standards and assessment criteria relating to the inputs, processes, outputs and outcomes of the health information system. It consists of six sections:

1   *HIS resources*. The policy, legislative, regulatory, management and financial environment that should be in place; and the infrastructure and resources required to ensure a fully functional health information system.
2   *Indicators*. Core health indicators covering the various domains of health information.
3   *Data sources*. Key data sources, standards for their use, their role in generating health information and potential linkages between them, namely: census, vital events monitoring, health facilities statistics, public health surveillance, population-based surveys and resource-tracking, including health infrastructure and human resources.
4   *Data management*. Optimal processes for collecting, sharing and storing data, data flows and feedback loops.
5   *Information products*. Criteria for assessing the quality of available data.
6   *Dissemination and use*. Norms for presenting, disseminating data, and sharing information among stakeholders; creation of incentives for evidence-based decision-making.

The implementation component outlines a roadmap for strengthening health information systems, including a tool to guide assessment of the country health information system, thus enabling countries to establish a baseline and monitor progress of health information system development. This is linked to a set of principles, processes and benchmarks for the implementation of the HMN Framework at the country level. HMN principles include country leadership and ownership; consensus-building; focus on country needs; and health information system development as a gradual and incremental process. Stages and benchmarks in the process are clearly defined, and the specific role of HMN as a catalyst and technical resource is described.

2. Assessment of the national health information systems

2.1 What are the objectives of the assessment?

The health information system (HIS) should be assessed in order to accomplish several objectives:

– *Provide for objective baseline and follow-up evaluation.* Assessment findings should thus be comparable over time.
– *Inform* certain stakeholders about aspects of the HIS with which they may not be familiar.
– *Build a consensus.*
– *Mobilize joint technical and financial support for implementation of a strategic plan* that identifies priority investments during the short (1-2 years), medium (3-5 years) and long term (10 years).

It is envisaged that the assessment exercise would be repeated at appropriate intervals, preferably involving similar stakeholders, thus providing a tool to monitor progress and inform future plans to improve the country's health information system. This should create an iterative cycle that provides information on the improvements of a country's health information system over time.

2.2 Who should assess?

A first step in the planning of an assessment of the national HIS is to identify who should be involved. It is a basic principle of the HMN approach that all major stakeholders should participate in assessing and planning for the strengthening of the HIS.

Who has a stake in the HIS? Stakeholders include producers, users and financiers at different levels (national or subnational) of health information and other social statistics.

As shown by Fig. 2, it is also important to keep in mind that essential health information is generated from a range of data sources and that a wide array of stakeholders is involved in different ways with each

Fig. 2 Data sources in a comprehensive health information system
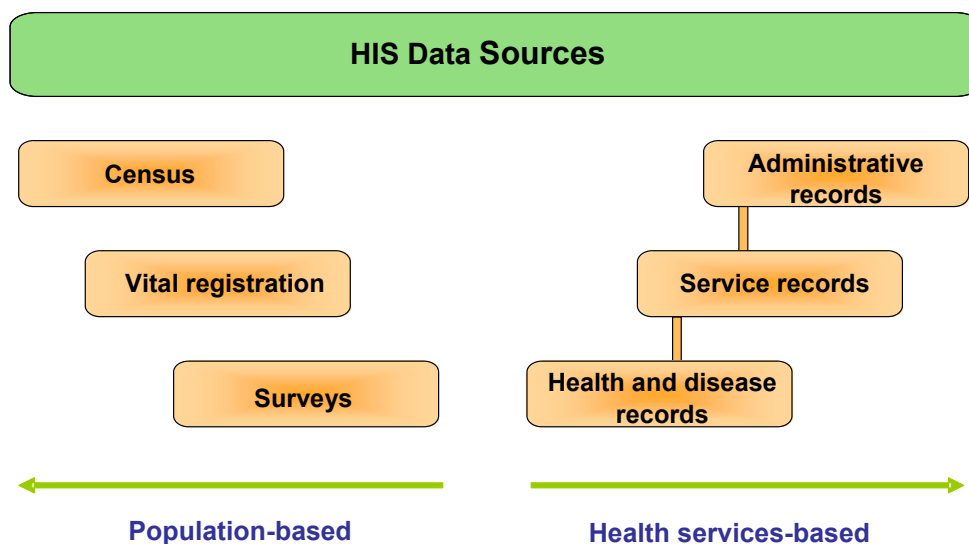
of these sources. For example, ministries of health are usually responsible for data derived from health service records. National statistics offices are usually responsible for the conduct of censuses and household surveys. Responsibility for vital statistics including births and deaths may be shared between the national statistics office, the ministry of home affairs/local government and the ministry of health.

An illustrative list of appropriate representatives of relevant stakeholders follows:

(1) Central statistics office
   (a) officials and analysts responsible for the national population census;
   (b) officials and analysts responsible for household surveys such as the Demographic and Health Survey (DHS), Living Standard Measurement Study (LSMS) household surveys and Multiple Indicator Cluster Surveys (MICS);
   (c) other leading demographers and statisticians.

(2) Ministry of health: senior advisors as well as members of the ministry cabinet and those within the ministry responsible for or coordinating:
   (a) the planning unit;
   (b) annual monitoring and evaluation/performance reviews;
   (c) the HIS section/unit of the ministry of health;
   (d) acute disease surveillance and response;
   (e) disease control, immunization and maternal and child/family planning programmes;
   (f) noncommunicable disease control programmes;
   (g) the units responsible for management of human resources, drugs/logistics, finances.

(3) Other ministries and governmental agencies responsible for planning, monitoring and evaluation of social programmes:
   (a) whichever ministry or government agencies responsible for civil registration - ministry of interior or home affairs or local government;
   (b) planning commission;
   (c) ministry of finance;
   (d) population commission;
   (e) commissions developing master plans for social statistics.

(4) Researchers/directors of Demographic Surveillance System (DSS), institutes of public health and universities.

(5) Major donors to the health sector – bilateral and multilateral as well as global health partnerships such as the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM) and donors who finance specific activities of relevance:
   (a) national population census;
   (b) large-scale national population-based surveys (DHS, MICS, LSMS);
   (c) sample vital registration system;
   (d) Demographic Surveillance System (DSS);
   (e) strengthening of surveillance/ Integrated Disease Surveillance and Response (IDSR);
   (f) strengthening of health management information system (HMIS);

(g) health accounts;
(h) mapping of health risks and health services;
(i) health facility surveys (e.g. Service Provision Assessment (SPA));
(j) annual performance reviews of the health sector;
(k) systems for monitoring and evaluation of major disease control programmes (HIV/AIDS, malaria, tuberculosis, vaccine-preventable diseases).

(6) Organizations of the United Nations system active in development and in monitoring progress towards the Millennium Development Goals (MDGs) such as UNICEF, UNDP, UNFPA, the World Bank

(7) Representatives of key nongovernmental organizations and civil society:
(a) private health professional associations;
(b) associations of faith-based health providers and other NGOs;
(c) health advocacy groups.

The HIS should be strengthened by a country-led process involving input and close coordination of these stakeholders. To mobilize these stakeholders it is very useful to have a "champion". This might be someone in the ministry of health but could also be from the national statistics office or from a major programme area involved in health systems. The champion can help ensure that stakeholders understand fully the objectives of the assessment and how it fits into the overall process of health information system development. In particular, stakeholders should be aware that the assessment will very soon be followed by a comprehensive strategic planning process to which they will also be asked to contribute.

2.3 How to organize and facilitate assessment

The stakeholder group may wish to form a steering committee that provides ongoing oversight, direction and coordination of HIS strengthening activities including the planning and implementation of an HIS assessment. Not all stakeholders need to be active on the steering committee. For example, a group of bilateral donors, each of whom finances a different aspect of HIS strengthening, may wish to designate a single representative, possibly on a rotating basis. The stakeholder group and its steering committee should designate an existing agency such as the HIS section/unit of the ministry of health to carry out certain administrative tasks (e.g. communications, procurement) required to conduct an assessment.

The assessment may be carried out in the setting of a large national workshop or during smaller meetings of several groups or with individual interviews of key informants. In general, a combination of all these approaches is most effective and time-efficient for obtaining inputs from all key stakeholders. Many participants may not be familiar with particular aspects of the HIS and it would take quite a long time for anyone to participate in discussions about all 243 items included on the assessment tool. Hence, it is usually best if participants are divided into small groups that can work either sequentially or simultaneously (e.g. at a national workshop) to reach a consensus on a subset of items. When some assessment items are completed by only a subset of participants, care needs to be taken with feedback and discussion of the findings with all the key stakeholders in order to meet the objectives of informing and building consensus among all stakeholders.

HMN's *Group Builder* tool helps those organizing the assessment to form several groups of informants and divide the assessment items among those groups. Each group should be composed of the key informants that are most qualified to assess each item. The number of items for any one group to assess should not greatly exceed 100.

Proposed groups are as follows:

(1) The HIS section/unit of the ministry of health – even without adding any further members to this group, these are key informants to assess almost 100 items.

(2) Senior planner/policy-maker with the ministry of health – even without combining such senior officials with other key informants, they are important for assessing about 75 items.

(3) Central statistics office together with other available demographers – to assess about 100 items.

(4) Programme managers (coordinators of public health programmes such as maternal and child health, immunization, tuberculosis, HIV/AIDS, disease surveillance, etc.) – to assess almost 100 items.

(5) Subnational informants (managers and HIS staff from provincial, district and hospital levels) – to assess 60 items and thus complete a subnational assessment.

(6) Finance monitoring – a specialized group to assess about 28 items.

(7) Administrative statistics – a specialized group composed of those who manage the databases that track human resources, supplies and infrastructure, to assess 22 items.

(8) Non-project donors (including the World Bank and those contributing to a common basket for funding of a Sector-Wide Approaches) – 55 items are identified for these partners to assess if they are not already doing so through one of the other groups. Donors supporting public health programmes (immunization, surveillance, etc.) or the population census or national household surveys should be invited to join the group that includes the respective programme manager.

Group Builder enables those organizing the assessment to customize the membership of each group, adding or removing members based upon local circumstances and preferences. It is best not to add too many optional members as this may also increase the number of items that the group must assess. Once the group members are identified, the spreadsheet for each group indicates the best items for the group to assess. A separate spreadsheet (titled "ungrouped") lists the key informants that have not been included in any of the groups and the items for which key informants are still lacking. These ungrouped informants may be invited to join one of the groups. Or separate interviews may be scheduled to receive their assessment input.

Certain informants (e.g. senior policy makers and planners within the ministry of health, the central statistics office, the ministry of finance, the vital registration authorities) may not be available to attend throughout an assessment workshop. If this is the case, those organizing the assessment may wish to form a team to schedule special appointments and obtain the input of these key informants.

It is essential for one or more facilitators or resource persons to support workshops or meetings where the assessment tool is being used. The facilitators should be thoroughly familiar with the complete assessment tool and the HMN Framework on which it is based. In addition to helping to lead the plenary sessions, the facilitator should circulate among small groups, helping to clarify the meaning of particular items and answering questions. The facilitator may also explain to those who are writing the assessment report how to compile composite scores for each aspect of the HIS and how to summarize the findings.

The major advantage of a self-assessment approach is that it engages all partners in a shared learning experience. Facilitators may help to speed up the assessment and make the findings more comparable. However, it is important that the facilitator should not interfere with the process of self-discovery among country stakeholders. Self-assessment can result in a felt need for improving the country health information system.

A large number of items should be assessed by leading staff of the HIS section/unit of the ministry of health. These same persons may play a key role in organizing and facilitating assessment workshops, meetings and interviews. Hence, it may work best if these key participants meet in advance of the workshops and other meetings to assess this large number of items. Groups that meet subsequently may then be provided with a record of the scores generated by staff of the HIS section/unit of the ministry of health.

Groups or individual informants participating in the assessment should be provided with copies of certain documents. In addition to a print-out of the assessment tool for each participant, these include a copy of several background documents for each relevant group: the HMN Framework, the UN *Fundamental principles of official statistics,*[1] PARIS21 *National strategy for the development of statistics,*[2] OECD *Guidelines for data protection,*[3] and the IMF *Guidelines for data quality assessment framework.*[4]

Assessments of certain items may be supported by external findings such as statistics figuring in global databases. For example, vital statistics practices may in part be assessed on the basis of statistics compiled by the UN Statistics Division or available in WHO's global mortality database.[5]

2.4 How to reach final consensus and disseminate the findings

Irrespective of the approach used for conducting the initial assessment (interviews with key informants, discussions in small groups of subsets of items, etc.) efforts should be made to involve relevant stakeholders in the analysis of findings and the identification of next steps. The complete assessment tool should be presented in plenary and persons not able to participate in a given break-out group should not only understand all the items but have a chance to comment upon and shape the consensus on how the item is assessed. This makes it possible for stakeholders to be informed comprehensively about the strengths and weaknesses of the HIS. These discussions in plenary enable the stakeholder group to reach a broader consensus.

The assessment tool may be used as a checklist to generate a list of gaps in the health information system: Is there a legal framework (item I.A.1)? Is there an adequate mechanism for coordination of the national statistics office and the ministry of health (item I.A.5)? Do regular meetings take place at facility, district and other levels to review the quality of and interpret health information (item I.A.8)? Is there adequate capacity in epidemiology, demography and statistics (item I.B.10)? Are there designated, full-time health information officers in most districts (item I.B.3)? etc. The group interpreting the assessment findings should review the complete set of items and note the gaps identified. The immediate challenge is then to

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[1] http://unstats.un.org/unsd/goodprac/bpabout.asp
[2] http://www.paris21.org/pages/designing-nsds/NSDS-reference-paper/
[3] http://www.oecd.org/document/18/0,2340,en_2649_34255_1815186_1_1_1_1,00.html
[4] http://dsbb.imf.org/Applications/web/dqrs/dqrsdqaf/
[5] http://www.who.int/healthinfo/morttables/en/index.html

synthesize and summarize these gaps in a concise and coherent way that can best be presented to and discussed with other stakeholders. Findings go beyond the scores recorded on individual items to include the comments recorded on each of these items and the important points that are made during subsequent plenary discussions. These discussions should help considerably to identify next steps and provide a bridge between assessment and strategic planning (see next section).

A special task force should be established to draft the consensus report on the assessment. The draft report should be distributed for review and comment by a broad range of stakeholders. It is worthwhile to budget not only for a national consensus workshop but for an editor and printing costs for dissemination of the final report.

2.5 How to build on assessment findings

The assessment findings should provide information for the development of a comprehensive strategic plan for HIS strengthening. Such a strategic plan should have the following characteristics:

(a) The plan specifies what is to be done over the coming decade to increase the availability, quality, value and use of timely and accurate health information.
(b) The plan is based upon consultation with all key constituencies including those supporting the population census, vital statistics, household health surveys, disease surveillance, health service statistics (including those from the private sector), health administrative records and health accounts.
(c) The plan is also based upon the assessment and additional findings regarding the resources (human resources, financing) currently available and likely to be required for the achievement of priorities.
(d) The various constituencies (those producing, using and financing such health information) should be asked to identify investment priorities and strategies for HIS strengthening.
(e) Priority investments during the short (1-2 years), medium (3-5 years) and long term (10 years) are identified, sequenced and costed.
(f) The plan discusses how these investments will be financed and identifies appropriate funding sources at country level including ministry budgets, HIPC debt relief, concessional loans, bilateral and multilateral development agencies and global health partners.
(g) Consensus on the plan is reached at a national workshop. The plan is subsequently endorsed by the HIS coordinating committee.

HMN is currently developing guidelines to support the development of strategic plans for HIS strengthening. A few general principles to be kept in mind when preparing for this process follow.

A task force may be established to review findings from the assessment, conduct or commission additional studies and draft a strategic plan. As when selecting persons to organize and facilitate the assessment meetings themselves, when establishing the task force to draft the strategic plan it is essential to involve appropriate technical resources and stakeholders. For better coordination and partnership, the following points should be considered:

– a range of views and expertise may be essential to reach a consensus that will ultimately be endorsed by a broad range of stakeholders including those in the ministry of health, the national statistics office and financing partners;

–   too large a group may make it difficult to reach consensus. Those organizing the group that is interpreting the assessment findings should identify essential participants.

Decisions on the timing of activities included in the work plan depend on several factors: perceived urgency, extent of the gap (i.e. assessment items scored as a 0 or a 1), ease of implementation considering existing human resources and health system, availability of financing, etc. The assessment tool may identify some data sources for which the country has good capacity but has problems with the content of the information produced (for example, a good-quality census is regularly conducted every 10 years but questions on mortality have not been included in the census questionnaire). This may suggest areas where important advances can be made in the short term or with modest effort.

It is essential that the strategic plan not be limited, however, to those activities that may or should be launched and advanced in the short term. More ambitious or longer-term objectives may be met by mobilizing financial, organizational and technical commitment around a compelling strategic vision. Hence, it is also possible to address problems of weak capacity over the longer term.

Achievement of some of the more ambitious objectives (e.g. development of human resources for the HIS; strengthening of civil registration) depend on the broader policies, plans and budgets of the ministry of health, the national statistics office or the national government in general. Thus it is essential that the HIS strategic plan be consistent with these broader policies and plans. It is also important for champions of HIS strengthening to engage in discussions about reform or development of these broader policies and plans. Hence implementation of important components of the HIS strategic plan depends on continued advocacy, lobbying and negotiation, and participation in related policy formulation and planning processes.

3. Scoring and interpretation of results

For each item included in the assessment tool, a range of anticipated scenarios is provided to permit an objective and numbered rating. The highest score (3) is given for a scenario considered "highly adequate" compared to the gold standard defined by the HMN Framework. The lowest score (0) is given when the situation is regarded as "not functional" in terms of the ability to meet the HMN standard. The total score for each category is aggregated and compared to a maximum score to yield a percentage rating. Each question may be rated by multiple respondents and the replies aggregated to obtain an overall score. The more varied the (informed) respondents involved, the lower the risks of bias in the results. In some cases a particular item is judged to be not applicable. In such instances the item should be omitted from the scoring and the reasons for omitting the item should be recorded.

Scores are converted to quintiles for the overall report. Thus, answers with scores falling into the lowest quintile (less than 20th percentile) are classified as *Not functional*. Scores falling into the next lowest quintile are classified as *Not adequate*, followed by *Present but not adequate*, *Adequate*, and *Highly adequate* for the third, fourth, and fifth quintiles, respectively.

Scores may be awarded by individual informants or by groups. On the spreadsheet version of the assessment tool, there are spaces for recording the scores awarded by up to 14 individual informants and there is an adjacent space for recording detailed comments provided by informants about major gaps, constraints, possible solutions and intervention priorities. Early experience with use of the HMN assessment tool suggests that it is important to capture these detailed qualitative remarks. If responses are recorded on a paper copy of the assessment tool rather than the spreadsheet version, it is best to insert blank rows after each item or a couple of blank pages after each table so that important qualitative remarks may be captured.

On the spreadsheet version of the assessment tool, rows are provided for additional assessment items. Insertion and deletion of rows from the spreadsheet are not recommended as this may lead to errors in the formulae that are used to sum up scores and colour-code the results. Instead of deleting an item, it should be skipped, so that the item in question does not affect the final scores. New items may be added in the blank rows that are provided for each section of the assessment tool. Assessment scores entered into the cells to the right of these additional items are averaged and summed up, and the results are displayed along with the results for the standard items. If such an approach does not meet the needs for adaptation of the tool, those organizing the assessment are encouraged to contact the Health Metrics Network (healthmetrics@who.int) for assistance. The number of questions is shown below.

Number of questions in the Assessment Tool

Categories	Number of questions	Total possible score
I. Resources	**23**	**69**
A. Policy and planning	8	24
B. HIS institutions, human resources and financing	9	27
C. HIS infrastructure	6	18
II. Indicators	**5**	**15**
III. Data sources	**83**	**249**
A. Census	9	27
B. Vital statistics	13	39
C. Population-based surveys	11	33
D. Health and disease records (incl. surveillance)	12	36
E. Health service records	12	36
F. Administrative records	25	75
i. infrastructure and health services	*6*	*18*
ii. human resources	*4*	*12*
iii. financing and expenditure for health service	*8*	*24*
iv. equipment, supplies and commodities	*7*	*21*
IV. Data management	**5**	**15**
V. Information products	**108**	**324**
A. Health status indicators	33	99
Mortality	*21*	*63*
Morbidity	*12*	*36*
B. Health system indicators	57	171
C. Risk factor indicators	18	54
VI. Dissemination and use	**20**	**60**
A. Analysis and use of information	6	18
B. Information use for policy and advocacy	4	12
C. Information use for planning and priority setting	3	9
D. Information use for resource allocation	4	12
E. Information use for implementation and action	3	9
Total	**244**	**732**

4. Assessing HIS resources

Policy and planning

The legal, regulatory and planning context within which health information is generated and used is key. It enables the establishment of mechanisms to ensure data availability, exchange, quality and sharing. Legal and policy guidance is needed, for example, to elaborate specifications for electronic access and to protect confidentiality. Legislation and regulation are of particular significance in relation to the ability of the health information system to draw upon information from both the private and public health services and from non-health sectors. Furthermore, the existence of a legal and policy framework consistent with international standards such as the *Fundamental principles of official statistics*[6] enhances confidence in the integrity of the results. The legal framework also defines the ethical parameters for data collection, information dissemination and use. The policy framework for health information should identify main actors and coordinating mechanisms, ensure links to programme monitoring, and identify accountability mechanisms. A national HIS strategic plan is essential for coordination. This is a roadmap to guide HIS investments, with indications of the timeline and anticipated budget of activities to be completed in the short (1-2 years), medium (3-5 years) and long term (10 years and beyond). The document provides for maintenance/strengthening and coordination of each of the key components of the HIS: census, vital statistics, population-based surveys, health and disease records, health service records and administrative records. The strategic plan should emphasize integration of data sources at the national and subnational levels.

Institutions, human resources and financing

Improvements in health information system cannot be achieved unless attention is paid to the training, deployment, remuneration and career development of human resources at all levels. At the national level, skilled epidemiologists, statisticians and demographers are needed to oversee data quality and standards for collection, and ensure appropriate analysis and utilization of information. At peripheral levels, health information staff are accountable for data collection, reporting and analysis. Deploying health information officers within larger facilities and at districts (as well as at higher levels of the health-care system) results in significant improvements in the quality of data reported and in the understanding of its importance by health-care workers. Development of the HIS also depends on the functioning of key units and institutions such as the central HIS unit of the ministry of health and the central statistics office, which have responsibility for designing, strengthening or supporting data collection, transmission, analysis, reporting and other dissemination. It may be useful to undertake some form of institutional analysis to identify constraints (for example, those related to reporting hierarchies or relationships between different units with responsibility for monitoring and evaluation) that undermine policy and the implementation of monitoring and evaluation programmes. Investments from domestic and international sources are required to strengthen data collection, analysis and utilization.

Infrastructure

Information and communications technology has the potential to radically improve the availability,

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[6] *Fundamental Principles of Official Statistics*. New York, United Nations Statistics Division, 1994. These principles include impartiality, scientific soundness, professional ethics, transparency, consistency and efficiency, coordination and collaboration.

dissemination and use of health-related data. Ideally, at national and subnational levels, health managers should have access to an information infrastructure that includes computers, e-mail and Internet access. All facilities should have such connectivity, but this is a long-term objective in many countries. Similarly, national and regional statistics offices should be equipped with transport and communications equipment to enable the timely collection and compilation of data at the subnational level.

I. Resources

A. Policy and planning

Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
	3	2	1	0	
I.A.1 The country has up-to-date legislation providing the framework for health information covering the following specific components: vital registration; notifiable diseases; private sector data including social insurance; confidentiality; and fundamental principles of official statistics	Legislation covering all aspects exists and is enforced	Legislation covering some aspects exists and is enforced	Legislation exists but is not enforced	There is no such legislation	
I.A.2 There is a written HIS strategic plan in active use addressing all HIS components as in the HMN Framework, and it is implemented at the national level	Yes, it exists and is implemented	The strategic plan exists, but the resources to implement it are not available	The strategic plan exists, but it is not used or does not emphasize integration	There is no written HIS strategic plan	
I.A.3 There is a written HIS strategic plan addressing all HIS components as in the HMN Framework, and it is implemented at subnational level	Yes, it exists and is implemented at subnational level	The strategic plan exists, but the resources to implement it at subnational level are not available	The strategic plan exists, but it is not used or does not emphasize integration	There is no written HIS strategic plan	
I.A.4 There is a representative national committee in charge of coordination of HIS	Yes, a functional committee exists	There is a functional national HIS committee, but without resources	There is a national HIS committee, but it is not functional	There is no national HIS committee	
I.A.5 National statistics office and ministry of health have established coordination mechanisms (e.g. task force on health statistics; this mechanism may be multisectoral)	Yes, fully operational, meets regularly and meets needs for coordination	Yes, but meets only occasionally on an ad hoc basis or agenda is too full	Yes in theory, but these mechanisms are not operational	No	
I.A.6 There is a regular system in place for monitoring the performance of the HIS and its various subsystems	Yes, it exists and is used regularly	Yes, but it is seldom applied	Yes, but never used	No	
I.A.7 There is a written policy (part of the HIS strategic plan) to promote a culture of information use throughout the health system. Senior managers act as role models for use of information	Yes, both the HIS strategic plan and senior management promote an information culture	Yes, the HIS strategic plan promotes information culture but it is not implemented	No policy exists on promoting culture but discussion is ongoing	There is no policy or discussion on promoting culture of information	

| I.A.8 | It is an official policy to conduct regular meetings at facility, district and other levels to review HIS information and take action based upon such information | Yes, the policy exists and is being implemented | The policy exists, but meetings are not regular | The policy exits, but is not implemented | There is no policy | |

B. HIS institutions, human resources and financing

Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
	3	2	1	0	
I.B.1 There is national capacity in core health information sciences to meet health information needs (epidemiology, demography, statistics, health planning), including outside the ministry of health	Highly adequate	Adequate	Partially adequate	Not adequate	
I.B.2 There is a functional central HIS administrative unit in the ministry of health to design, develop and support health information collection, management, analysis, dissemination and use for planning and management	HIS central unit is functional with adequate resources	HIS central unit is functional but lacks adequate resources	HIS unit has very limited functional capacity and undertakes few HIS strengthening activities	There is no functioning central HIS administrative unit in the ministry of health	
I.B.3 At subnational levels (e.g. regions/provinces, districts) there are designated full-time health information officer positions and they are filled	Yes, 100% of health offices at subnational level have a designated, filled full-time health information officer position	Yes, more than 50% of health offices at subnational level have a filled designated full-time health information officer position	Less than 50% of health offices at subnational level have a designated full-time health information officer position	No positions	
I.B.4 HIS capacity-building activities have taken place over the past year for HIS staff (statistics, software and database maintenance, and/or epidemiology) at national and subnational levels	Sufficient capacity building has taken place as part of a long-term government-driven human resources development plan	Sufficient capacity building, but largely depending on external (e.g. donor) support and input	Limited capacity building	No	
I.B.5 HIS capacity-building activities have taken place over the past year for health facility staff (data collection, self-assessment, analysis, presentation)	Significant capacity building has taken place as part of a long-term government-driven human resources development plan	Significant capacity building, but largely depending on external (e.g. donor) support and input	Limited capacity building	No	

I.B.6	Availability of information and communications technology and database support to health and HIS staff at national and subnational levels	Excellent	Adequate, usually available for occasional assistance and back-up	Limited, does not meet needs of staff for assistance and support	Not available	
I.B.7	There are written guidelines for the processes of HIS data collection, management and analysis	Yes, written guidelines exist and are observed	Written guidelines exist and are used, but not integrated into overall service supervision	Written guidelines exist but are not implemented/used	No guidelines exist	
I.B.8	Acceptable rate of health information staff turnover at national level (at ministry of health and national statistics office)	Low turnover, not a problem	Moderate turnover but manageable	Turnover rate is problematic	Turnover rate is unacceptably high	
I.B.9	There are specific budget-line items within the national budget for various sectors to provide adequately for a functioning HIS for all data sources (the HMN HIS subsystems)	Yes, there are specific budget-line items within the national budget to provide adequately for a functioning HIS for all data sources	National HIS budget-line items are limited but allow for adequate functioning of all data sources	National HIS budget-line items are limited and do not allow for adequate function of all data sources	There are no national HIS budget-line items and the function of most data sources is inadequate	

C. HIS infrastructure

	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
I.C.1	A complete list of public-sector health facilities exists and is updated every year	Yes, at least 90% of public-sector health facilities are listed. The list is updated annually	The listing covers 50%-89% of public-sector health facilities and the listing is up to date	Listing is out of date or covers less than 50% of facilities	Not available	
I.C.2	A complete list of private-sector health facilities exists, and is updated every year	Yes, at least 80% of private-sector health facilities are listed. The list is updated annually	The listing covers 50%-79% of private-sector health facilities and the listing is up to date	Listing is out of date or covers less than 50% of facilities	Not available	

I.C.3	Recording forms, paper, pencils and supplies that are needed for recording of health information are available	Yes, recording forms, paper, pencils and supplies are always available for recording required health information	There are occasional "stock-outs" of recording forms, paper, pencils and supplies but it does not affect ability to record required information	There are "stock-outs" of recording forms, paper, pencils and supplies and it affects ability to record required information	Health service is not able to meet reporting requirements due to lack of recording forms, paper, pencils and supplies
I.C.4	Computers are available at the relevant offices at national, regional/provincial, and district levels to permit rapid compilation of subnational data	Yes, all managers at district, regional/provincial and national levels have access to computers	Some managers at district level and nearly all managers at regional/provincial and national levels have access to computers	Some managers at regional/provincial level and majority of managers at national level have access to computers	No, only managers at national level have access to computers
I.C.5	Basic communications technology infrastructure (telephones, internet access, e-mail) is in place at national, regional/provincial and district levels to ensure rapid compilation of subnational data	Yes, basic communications technology infrastructure is in place at national, regional/provincial and district levels to ensure rapid compilation of subnational data	Basic communications technology is not in place at all levels but national and subnational data is compiled as needed	Basic communications technology is not in place at the national and all subnational levels and it affects ability to compile national and subnational data as needed	Basic communications technology is not in place at national and subnational levels and data cannot be compiled as needed
I.C.6	Information and communications technology (ICT) equipment maintenance support is available at national and subnational levels to ensure that data and information reporting requirements are met and on time	Yes, there is ICT equipment maintenance support at national and subnational levels so that data and information reporting requirements can be met	There is not always ICT equipment maintenance support available but data and information reporting requirements can be met	There is not always ICT equipment maintenance support available and data and information reporting requirements cannot be met	There is no ICT equipment maintenance support and it affects meeting data and information reporting requirements

5. Assessing indicators

Health information systems should cover many information areas, ranging from data for the management and administration of health services, to health system outputs such as coverage and quality of care, and outcomes such as mortality and morbidity. The domains to be tracked by the health information system may be grouped into three main types (*Fig. 3*):

Determinants of health. These include socioeconomic, environmental, behavioural and genetic determinants or risk factors. Such indicators also characterize the contextual environments within which the health system operates.

Health system. This includes inputs to the health system and related processes such as policy, organization, human resources, financial resources, health infrastructure, equipment and supplies; outputs including health service availability and quality, information availability and quality; and immediate health system outcomes including coverage of the population with key health services.

Health status. These include mortality, morbidity, disability and well-being. Health status variables depend on the coverage and efficacy of interventions and the determinants of health that may have an influence on health outcomes, independent of health services coverage.

Fig. 3 Domains of interest of health information systems
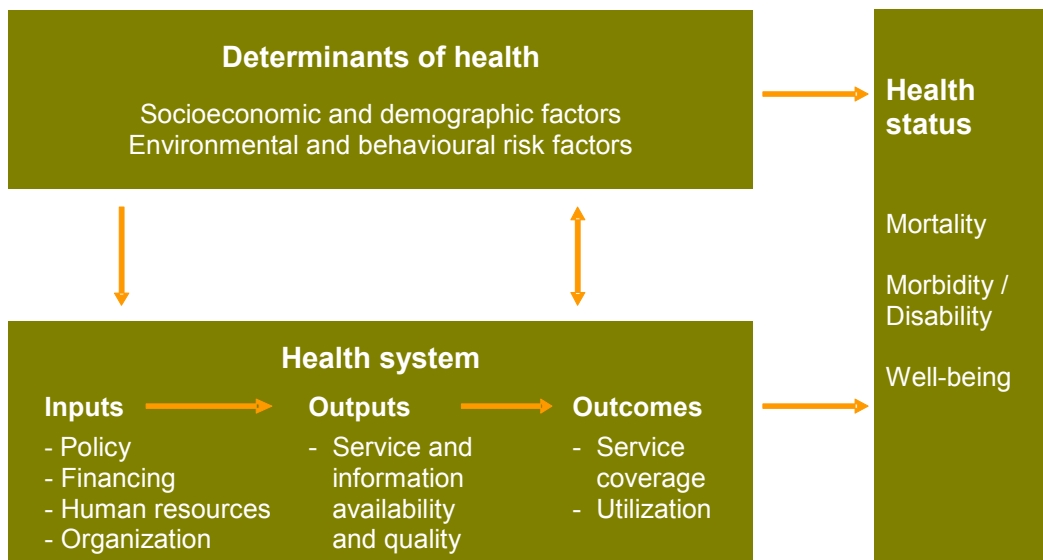
Identifying key indicators

Each country should identify core indicators on which the health information system is able to report regularly. The methods for measuring these indicators should also be specified. Core indicators may include, but would not be limited to, those related to the Millennium Development Goals (MDGs).[7] The precise list of indicators will vary according to the epidemiological profile and development needs of each country. The standard is for health indicators to monitor local and national priorities. However, indicator *definitions* should meet international technical standards. Moreover, there should be a consistent link and harmonization of national indicators with key indicators used in major international and global initiatives such as the MDGs, GFATM, and the Global Alliance for Vaccines and Immunization (GAVI). The selection of indicators should take into account: the level at which the information is needed (individual, district, national, global); the key users of the information and the ways the information is used; and existing capacity to generate the information. Statistics that are stratified by sex, age, socioeconomic status, geographical location and ethnicity permit analysis of inequities in health.

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[7] Health indicators related to the Millennium Development Goals (MDGs) include:
(1) Prevalence of underweight children under five years of age; (2) Proportion of population below minimum level of dietary energy consumption; (3) Under-five mortality rate; (4) Infant mortality rate; (5) Proportion of one-year-old children immunized against measles; (6) Maternal mortality ratio; (7) Proportion of births attended by skilled health personnel; (8) HIV prevalence among pregnant women aged 15-24 years; (9) Condom use rate of the contraceptive prevalence rate; (10) Prevalence and death rates associated with malaria; (11) Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures; (12) Prevalence and death rates associated with tuberculosis; (13) Proportion of tuberculosis cases detected and cured under DOTS (directly observed treatment short-course) ; (14) Proportion of population with sustainable access to an improved water source, urban and rural; (15) Proportion of population with sustainable access to improved sanitation, urban and rural; (16) Proportion of population with access to affordable essential drugs on a sustainable basis (http://www.who.int/mdg/publications/MDG_Report_revised.pdf).

II. Indicators

Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
	3	2	1	0	
II.A.1 National minimum core indicators have been identified for national and subnational levels covering all categories of health indicators (determinants of health; health system inputs, outputs, outcomes; health status)	Yes, minimum core indicators are identified at national and subnational levels and cover all categories	Minimum core indicators are identified at national and subnational levels but they do not cover all categories	Discussions under way to identify essential indicators	No minimum indicators nor data set identified	
II.A.2 There is a clear and explicit official strategy for measuring each of the health-related MDG indicators relevant to the country	Yes, all the appropriate health-related MDG indicators are included in the minimum core indicator set	Not all, but at least 50% of the health-related MDG indicators are included in the minimum core indicator set	At least one but less than 50% of the appropriate MDG indicators are included in the minimum core indicator set	None of the MDG health-related indicators are included in the minimum core indicator set	
II.A.3 Core indicators are defined in collaboration with all key stakeholders, e.g. ministry of health (MoH), national statistics office (NSO), other relevant ministries, professional organizations, subnational experts, major disease-focused programmes	Yes, all the relevant stakeholders collaborated in the selection of the core indicators	Relevant ministries and the NSO are involved but more external participation would be desirable	Collaboration across the MoH, subnational, some disease programmes but no involvement of the NSO	No, each programme requests data according to own requirements	
II.A.4 Core indicators have been selected according to explicit criteria including usefulness, scientific soundness, reliability, representativeness, feasibility, accessibility	Yes, the core indicators have been selected according to explicit criteria including usefulness, scientific soundness, reliability representativeness, feasibility, accessibility	Mostly, but not all criteria for selection were clear and explicit	There are guidelines but they do not include explicit criteria for selection of indicators	There are no guidelines or explicit criteria for selection of indicators	
II.A.5 Reporting on the minimum set of core indicators occurs on a regular basis	Regular reporting (e.g. annual, biannual)		Reporting is irregular and incomplete	Reporting is very limited	

6. Assessing data sources

All country health information systems should draw on a set of core data sources. The role and contribution of each source to the health information system varies, as there is overlap between the kinds of information each source is best able to collect. In many cases, measurement of the same indicators with data from multiple sources may contribute to better-quality information while maintaining efficiency. In other cases, it is more efficient to avoid duplication. The optimal choice depends on a range of factors including epidemiology, specific characteristics of the measurement instrument, cost and capacity considerations, and programme needs (e.g. in terms of evaluation). In addition, each source may generate data on a range of indicators. The frequency and mode of data collection depend on the likelihood of change and the ability of the indicator to detect change (measurement error). Health information system development aims to ensure that an appropriate combination of data sources is available to provide for the priority information required.

The selection of data sources should be based on an assessment of feasibility, periodicity, cost-effectiveness and sustainability. Periodicity of measurement depends on the likely speed of change of the indicator and the costs of generating it. Determining which items of information may most appropriately be generated through routine health information systems, and which require special surveys, is a central feature of the reform plan.

Sources of health data can be divided into two broad groups: those that generate data relative to populations as a whole, and those that generate data about the operations of the health services (*Fig. 2*). Population-based health information sources include the census, vital events monitoring, and population-based surveys. Health service-based sources generate data as an outcome of health-related administrative and operational activities. There are a wide variety of health service-based data: facility-based data on morbidity and mortality among those using services; types of services delivered, drugs and commodities provided; information on the availability and quality of services; financial and management (e.g. human resource, logistics) information. The HMN Framework classifies these data as: health and disease records; health-service records; and administrative records.

The following sections describe the key features and desirable standards for these 6 leading data sources.

6.1 Census
A census is carried out at least once every 10 years, and the results by enumeration area are made available within 2 years after the data are collected. The census provides essential information on population numbers and distribution by age and sex, and other characteristics. The census may also be used to supplement information on mortality. The nature of the census allows for small-area estimation and for disaggregations by key stratifiers such as socioeconomic status. Unfortunately, only a small number of questions may be included on a census questionnaire, and the data are often of variable quality. To assess census-data quality, it is standard practice to conduct a post-enumeration survey during which the census questionnaire is readministered to a small sample of the population.

If vital registration captures less than 90% of deaths, questions about recent deaths in the household by age and sex are to be added to the census questionnaire. In addition, health authorities may opt to use the

census to assess maternal mortality by revisiting households that have reported the death of a woman of reproductive age.

6.2 Vital statistics

Vital statistics system refers to a system of comprehensive ongoing monitoring of births and deaths by age and sex, and with attribution of the cause of death. The gold standard is a system that provides a complete record of all births and deaths (100% coverage) and that includes a medically-certified cause of death.

Achieving the gold standard may not be attainable in many developing countries for the foreseeable future. However, there are possibilities for improvement in the relatively short term. For example, countries such as China and India have introduced Sample Registration Systems (SRS) that have been shown to work fairly effectively. In the near future, packages such as Sample Vital Registration with Verbal Autopsy (SAVVY) could considerably improve knowledge about basic health statistics in a population. Demographic Surveillance Systems (DSS) may offer another data source for continuous surveillance of births and cause-specific mortality. Novel approaches use a hybrid set of consolidated methods based on demographic surveillance, sample registration and the periodic use of sample cause-of-death modules using verbal autopsy within household surveys in countries with low levels of medical certification of the cause of death.

6.3 Population-based surveys

The gold standard is a well-integrated demand-driven household survey programme that is part of national health information and statistical systems, and generates essential high-quality information on population, health and socioeconomic status on a regular basis. As such, national surveys become a major national planning and evaluation instruments. Whether the surveys are part of international survey programmes or are national surveys, it is important that international standards and norms are adhered to.

More recently, population-based surveys have also been the vehicle for biological and clinical data collection (health examination surveys), providing much more accurate and reliable data on health outcomes than self-reports. A substantial number of countries, especially in Latin America and Asia, conduct national household surveys on health or include health questions in economic and demographic surveys. By linking surveys focused on health with those directed to other issues such as living standards, education or employment, it is possible to generate important information on the links between health and socioeconomic determinants.

Standards for consent and confidentiality are provided by the OECD *Guidelines on the protection of privacy and transborder flows of personal data.*[8] These apply to data collected from all sources (e.g. from censuses, civil registration, surveys, health services and research). Standards are provided for limiting the collection of data to which is relevant, specifying the purpose of the data at the time that data are collected, limiting the use to those specified at the time of collection, assuring the security of personal data, disclosure of the existence of personal data to those concerned, access to personal data by those concerned, and accountability of a data controller for compliance with these principles.

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[8] http://www.oecd.org/document/18/0,2340,en_2649_34255_1815186_1_1_1_1,00.html

6.4 Health and disease records

Health and disease records include individual health records (e.g. growth monitoring, antenatal, delivery outcome) and disease records (consultation, discharge) routinely produced by health workers as well as by special disease registries (e.g. for cancer). One of the most important functions of these records is to support the quality and continuity of care of individual patients. Essential information recorded on a patient chart or patient-retained "health passport" informs decision-making and delivery of services on subsequent visits.

Health and disease records also include reports of notifiable conditionș diseases or health events of such priority and public health significance that they require enhanced reporting through surveillance systems and an immediate public health response. The 2005 revision of the International Health Regulations (IHR) called for all WHO Member countries to report to WHO any cases of poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype and severe acute respiratory syndrome (SARS). In addition, countries should report any cases of cholera, pneumonic plague, yellow fever, viral haemorrhagic fevers (Ebola, Lassa, Marburg), West Nile fever and other diseases that are of special national or regional concern (e.g. dengue fever, Rift Valley fever, and meningococcal disease) if these cases have a serious impact on public health and there is a significant risk of international spread. The full list of diseases warranting prompt notification varies from one country to another depending on the epidemiological setting and the resources available. Integrated Disease Surveillance and Response (IDSR) is a strategy of the WHO Regional Office for Africa that has encouraged and supported Member countries to strengthen surveillance for:
– epidemic-prone diseases (including cholera, dysentery, measles, meningitis, plague, rabies/animal bite, relapsing fever, typhoid fever and yellow fever); and
– diseases targeted for eradication/elimination (poliomyelitis, neonatal tetanus, dracunculiasis and leprosy)

as well as other diseases of public health importance. Integration of reporting for disease surveillance and monitoring of focused public health programmes reduces the burden on those completing as well as those reviewing reports and increases the likelihood that general-purpose health staff will act on the information.

For acute communicable diseases, a sound surveillance system is able to rapidly detect events, manage outbreaks, support response and document outcomes. It requires practical and widely-known case definitions, timely and complete reporting, adequate communication capability, quality-assured laboratory services, qualified and motivated personnel (for reporting, data management, laboratory confirmation, analysis and outbreak response). Public health monitoring and response is aided by mapping of health risks, populations at risk and health services.

6.5 Health service records

Service records capture information on the number of clients provided with various services and the drugs and commodities consumed. To the extent possible, the health information system should capture service statistics from the private sector as well as communities and civil society organizations.

6.6 Health administrative records

A related component of health service information concerns the quality, availability and logistics of health service inputs and key health services. This includes information on the density and distribution of health facilities, human resources for health, drugs and other core commodities and key services.

The minimum requirement is a database of health facilities and the key services they are providing. The next level of development of this aspect of the health information system involves the mapping of facilities, human resources, core commodities and key services at national and district levels. Mapping the availability of specific interventions can provide important information from an equity perspective, and can help promote efforts to ensure that needed interventions reach peripheral areas and do not remain concentrated in urban centres.

Another component of health service information concerns financing. For the purposes of policy development and strategic planning, financial information is compiled using the National Health Accounts (NHA) methodology. NHA provides information on the amount of financial resources for health, and the flow of these resources across the health system. Breakdown by private vs. public sector is important. Disaggregation by major disease or health programme area is desirable but may not be possible. At the subnational levels, budget information is needed as a minimum; information on actual expenditure is the next step.

6.7 Criteria for assessment of data sources

The following section describes the assessment criteria and standards for each data source. A set of common principles applies: core procedures to ensure data quality need to be implemented, such as standard definitions, appropriate data collection methods, metadata and data audit trail, use of routine procedures to correct bias and confounding, primary data available. Each data-collection method should be assessed against core dimensions of data-collection platforms, i.e. contents, capacity, practices, dissemination and integration.

Contents
 − Events or measures of public health importance identified explicitly and captured by the data source.
 − Data elements defined (e.g., case definitions of notifiable conditions), and definitions consistent with global standards (e.g., HMN standards).
 − Appropriate data-collection method used.
 − Cost-efficiency and effectiveness issues considered.

Capacity and practices
 − Country capacity exists to collect the data and manage and analyse the results.
 − Standards applied for data collection.
 − Documentation available, accessible and of high quality.

Dissemination
 − Analysis of results available and disseminated.
 − Microdata available for public access.
 − Metadata available.

Integration and use
 − The number of reports required and surveys conducted is kept to an optimal level through agreements on indicators and harmonized design of formats and questionnaires.

− Results from different data-collection methods are compared.
− Appropriate data-collection methods are used for demographic, health and socioeconomic data collection (poverty monitoring) and to provide denominators for estimating need and coverage.

III. Data sources

A. Census

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
III.A.1 Contents	1.1 Mortality questions were included in the last census, by asking recent household deaths and questions for indirect estimation for child and adult mortality **Note**: This question is not applicable if civil registration covers at least 90% of deaths	Questions on recent household deaths as well as questions for indirectly estimating both child mortality and adult mortality	Questions on recent household deaths as well as questions for indirectly estimating either child mortality or adult mortality	Questions on recent household death or questions for indirectly estimating either child mortality or adult mortality	No recent mortality questions	
III.A.2 Capacity & practices	2.1 The country has adequate capacity to (1) implement data collection; (2) process the data; and (3) analyse the data	Adequate capacity for all 3	Adequate capacity for 2 of the 3	Adequate capacity for only 1 of the 3	Adequate capacity for none of the 3	
	2.2 A census was carried out in the past 10 years and results have been published or are likely to be published within the next 5 years	Yes			No	
	2.3 Census sample reinterview has been completed and a written report is available and widely distributed	Reinterview undertaken and report is available on the web	Reinterview undertaken and printed report is available	Reinterview undertaken but no report available	No reinterview undertaken	
III.A.3 Dissemination	3.1 Report including descriptive statistics (age, sex, residence by smallest administrative level) from the most recent census are available and widely distributed (online or with paper copy)	All districts have immediate access	All regions/provinces have immediate access	Central/national health officials have immediate access	Not available	
	3.2 Lag between the time that descriptive statistics (age, sex, residence by enumeration area) were last published and the time that the data were collected	Less than 2 years	2 or 3 years	4 or 5 years	No census results available for at least 10 years	
	3.3 Accurate population projections by age and sex are available for small areas (districts or below) for the current year **Note**: Skip this question if no census results available more than 10 years	Accurate projections are available for the smallest administrative level	Accurate projections are available for districts	Accurate projections are available for regions/provinces	No projections for current year, or projections are not considered to be accurate	

	3.4 Microdata are available for public access **Note**: Skip this question if no census results available for more than 10 years	Available on request	Available on request with restrictions		Not available	
III.A.4 Integration & use	4.1 Census projections are used for the estimation of coverage and planning of health services **Note**: Skip this question if no census results available for more than 10 years	Projections used by most subdistricts	Projections used by most districts	Projections used at national +/- regional/provincial levels	Population projections are not used for health	

B.   Vital statistics

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	**2**	**1**	**0**	
III.B.1 Contents	1.1 There is a reliable source of nationwide vital statistics: civil registration vs. Sample Registration System (SRS) vs. Demographic Surveillance Systems (DSS)	Civil registration	Sample Registration System	Demographic Surveillance Systems	There is no reliable source	
	1.2 Coverage of civil registration of deaths (%) if civil registration is in place **Note:** Skip this item if civil registration is not in place	90% or more	70% - 89%	50% - 69%	<50%	
	1.3 Cause-of-death information is recorded on the death registration form if civil registration is in place **Note**: Skip this item if civil registration is not in place	Always - compulsory by law		Sometimes	Never	
III.B.2 Capacity & practices	2.1 The country has adequate capacity to: (1) implement data collection; (2) process the data; and (3) analyse the data from civil registration or SRS or DSS	Adequate capacity for all 3	Adequate capacity for 2 of the 3	Adequate capacity for only 1 of the 3	Adequate capacity for none of the 3	
	2.2 Frequency of the assessment of completeness of civil registration	Each time census is conducted (every 5 to 10 years)	Each time census is conducted	Less periodically than census	Never conducted or do not know	
	2.3 International Statistical Classification of Diseases and Related Health Problems (ICD) is currently in use for cause-of-death registration **Note**: Score 0 if there is no cause-of-death registration	ICD-10 detailed	Tabulation List ICD-10	ICD-9	No ICD used or ICD-8 or earlier or there is no cause-of-death registration	
	2.4 Proportion of all deaths coded to ill-defined causes (%) (garbage codes) **Note**: Skip this item if there is no cause-of-death registration	<5%	5% - 10%	11% - 19%	20% or more	

Core dimensions	Items				
	2.5 Published statistics from civil registration or SRS are disaggregated by (1) sex, (2) age, and (3) geographical or administrative region (or urban/rural) **Note**: Score 0 if there is no civil registration or SRS	All 3	2 of 3	1 of 3	None of 3, or there is no civil registration and no SRS
	2.6 Sample Registration System (SRS) developed and generating timely and accurate data **Note**: Skip this item if there is no SRS	Nationally representative		Partially representative	None
	2.7 Demographic Surveillance System (DSS) sites developed and generating timely and accurate data **Note**: Skip this item if there is no DSS		Partially representative (at least 1 urban and 2 rural sites)	Non-representative	None
	2.8 Verbal autopsy (VA) tool **Note**: Skip this item if there is no DSS or SRS	VA tool validated; questionnaire publicly available and consistent with international standards	VA tool validated	VA not validated	No verbal autopsy used by SRS and/or DSS
III.B.3 Dissemination	3.1 Lag between the time that statistics from civil registration/SRS/DSS were last published and the time that the data were collected **Note**: Score 0 if there is no civil registration or SRS or DSS	Less than 3 years	3 years	4 or 5 years	More than 5 years or statistics not published or there is no vital statistics system (civil registration, SRS, DSS) exists
III.B.4 Integration & Use	4.1 Information from civil registration/SRS/DSS on (1) mortality rates and (2) causes of death is used for national and subnational analysis **Note**: Score 0 if there is no civil registration or SRS or DSS	Both mortality rates and cause-of-death information are used	1 of 2 used		Not used or there is no vital statistics system (civil registration, SRS, DSS) exists

C. Population-based surveys

Core dimensions	Items	Highly adequate	Adequate	present but not adequate	not adequate at all	Score
		3	2	1	0	
III.C.1 Contents	1.1 In the past 5 years, a nationally-representative survey has measured the percentage of the relevant population receiving key maternal and child health services (family planning, antenatal care, professionally attended deliveries, immunization)	Yes			No	

	1.2 In the past 5 years, a nationally-representative survey has provided sufficiently precise and accurate estimates of infant and under-5 mortality	Yes			No
	1.3 In the past 5 years, nationally-representative population-based survey(s) have measured the prevalence of some priority noncommunicable diseases/health problems (e.g. disability, mental illness, hypertension, diabetes, accidents, violence) and leading risk factors (e.g. smoking, drug use, diet, physical inactivity)	Yes, nationally-representative surveys have measured biomarkers and at least 3 priority noncommunicable diseases/health conditions or risk factors	Surveys have not measured any additional biomarkers but have measured the prevalence of at least 1 priority noncommunicable disease/health problem or risk factor	In the past 5 years, population-based surveys have not measured the prevalence of any priority noncommunicable disease/health problem or risk factor	No population-based surveys have been organized in the past 5 years
III.C.2 Capacity & practices	2.1 The country has adequate capacity to: (1) conduct household surveys (including sample design and field work); (2) process the data; and (3) analyse the data	Adequate capacity for all 3	Adequate capacity for 2 of the 3	Adequate capacity for only 1 of the 3	Adequate capacity for none of the 3
	2.2 Surveys follow international standards for consent, confidentiality and access to personal data (see OECD *Guidelines on the Protection of Privacy*)	Yes			No
	2.3 The data allow disaggregation by age, sex and geographical or administrative region (or urban/rural)	All 3	2	1	None
	2.4 The data allow disaggregation by socioeconomic status: (a) income and (b) education	Yes, both		Only by education	No
III.C.3 Dissemination	3.1 Metadata (design, sample implementation, questionnaires) are available from recent surveys	Publicly available			Not available
	3.2 Microdata are available from recent surveys	Available on request	Available on request with restrictions		Not available
III.C.4 Integration & use	4.1 There are meetings and a multiyear plan to coordinate the timing, key variables measured and funding of nationally-representative population-based surveys that measure health indicators	Yes, coordination mechanism and plan coordinates all nationally-representative surveys	Coordination group and long-term plan coordinate >75% of nationally-representative household surveys	Plan exists but is incomplete and/or coordination group is unable to effectively coordinate surveys	Neither a coordination group nor a long-term plan exist
	4.2 The health and statistical constituencies in the country work together closely on survey design, implementation and data analysis and use	Highly adequate	Adequate	Present, but not adequate	Not adequate at all

D. Health and disease records (including disease surveillance systems)

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
III.D.1 Contents	1.1 For each of the key epidemic-prone diseases and diseases targeted for eradication/elimination appropriate case definitions have been established and cases can be reported on the current reporting format	True for all key epidemic-prone diseases and diseases targeted for eradication/ elimination	True for all except 1 or 2 key epidemic-prone diseases and diseases targeted for eradication/ elimination	There are 3 or more key diseases for which case definitions remain to be established or for which the reporting form is not adequate	No system for notification or a system that does not report on most of the key diseases	
	1.2 For health conditions of substantial importance other than in 1.1 above (i.e. leading causes of morbidity, mortality and disability), a measurement/assessment strategy exists and is reflected in appropriate plans, tools, supporting structures, and assignments of responsibility	True for all leading causes of morbidity, mortality, and disability	True for several major conditions of public health importance; plans exist for extending coverage	True for one to several prototypes, and plans exist to discuss how to extend to at least one more public health problem	No good prototype currently exists	
	1.3 Mapping of public health risks and populations at risk	Maps are up to date and comprehensive and there is capacity to promptly add new features	Maps are up to date and reasonably comprehensive	Mapping of only a few public health risks	No mapping of public health risks	
III.D.2 Capacity & practices	2.1 The country has adequate capacity to: (1) diagnose and record cases of notifiable diseases; (2) report and transmit timely and complete data on these diseases; (3) analyse and act upon the data for outbreak response and planning of public health interventions	Adequate capacity for all 3	Adequate capacity for 2 of the 3	Adequate capacity for only 1 of the 3	Adequate capacity for none of the 3	
	2.2 Percentage of health workers making primary diagnoses who can correctly cite the case definitions of the majority of notifiable diseases	90% or more	75% - 89%	25% - 74%	<25%	
	2.3 Percentage of health facilities submitting weekly or monthly surveillance reports on time to the district level	90% or more	75% - 89%	25% - 74%	<25%	
	2.4 Percentage of districts submitting weekly or monthly surveillance reports on time to the next-higher level	90% or more	75% - 89%	25% - 74%	<25%	
	2.5 Proportion of investigated outbreaks with laboratory results	90% or more	75% - 89%	25% - 74%	<25%	

	2.6 Individual patient records (patient charts or patient-retained "health passports") support quality and continuity of care	Patient records are almost always completed adequately and can be retrieved for almost all patients	Records are usually completed adequately and can be retrieved for the majority of patients in time to promptly inform clinical decision-making	Essential patient information is often not recorded and/or records cannot be retrieved for most patients	No system of patient charts or health passports in most health facilities	
	2.7 International Statistical Classification of Diseases and Related Health Problems (ICD) is currently used for reporting hospital discharge diagnoses **Note**: Not applicable if no ICD coding of discharge diagnoses	ICD-10 detailed	Tabulation list ICD-10	ICD-9	No ICD used or ICD-8 or earlier	
III.D.3 Dissemination	3.1 Surveillance data are disseminated and fed back through regularly-published weekly, monthly or quarterly bulletins	Bulletin produced regularly during past year and available at all district health offices		Bulletin not produced regularly during past year or not distributed to districts	No bulletin produced	
III.D.4 Integration & use	4.1 Integration of reporting for disease surveillance and other focused public health programmes (e.g. maternal care, family planning, growth monitoring)	A single form is used for notification of key diseases. Reporting of other public health programmes is also well integrated	Although there are a number of reporting forms, there is good coordination and efforts to integrate the reporting requirements of public health programmes		Health workers and managers face a heavy burden completing and reviewing separate reports for numerous public health programmes	
	4.2 Proportion of epidemics detected at regional/provincial or national level through analysis of surveillance data from districts and that were missed by the district level	At least 90% of epidemics noted at regional/provincial or national levels are first detected at district level	At least 75% of epidemics noted at regional/provincial or national levels are first detected at district level		More than 25%	

E. Health service records

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
III.E.1 Contents	1.1 There is a health-service-based information system that brings together data from all public and private facilities	Yes, it covers both public and private facilities	Integrated but covers few private facilities (e.g. for-profit and non-for-profit)	Covers few private facilities (e.g. only not-for-profit)	No data from private facilities	
	1.2 There is a systematic approach to evaluating the quality of services provided by health facilities. This includes both: (a) systematic standardized supervision with reporting of findings to district and national levels; and (b) a health facility survey of all facilities or of a nationally-representative sample at least once every 5 years	There is both systematic standardized supervision with reporting and a nationally-representative health facility survey	There has been at least 1 nationally representative health facility survey in the past 5 years	There is information on quality of services but only from a convenience sample of health facilities	Records of findings from structured supervision or health facility surveys are not available	
III.E.2 Capacity & practices	2.1 The health information system has a cadre of trained health information specialists who have at least 2 years of training and are placed at the district level	At least 75% of districts	10% - 74% of districts	1% - 9% of districts	Not in any district	
	2.2 Health workers in clinics receive regular training in health information that is either integrated into continuing education or through special workshops	Most health workers received training in the past 5 years	25% - 49% of health workers trained in the past 5 years	5% - 24% of health workers trained in the past 5 year	Less than 5% of health workers trained	
	2.3 There are mechanisms in place at national and subnational levels for supervision and feedback on information practices	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	2.4 There is a mechanism in place from district up through national level to verify completeness and consistency of data from facilities	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	2.5 Population projections based upon census statistics are used to calculate coverage rates (e.g. for immunization) at district level	At least 90% of districts	50% - 89% of districts	25% - 49% of districts	Less than 25% of districts	
III.E.3 Dissemination	3.1 The last time that an annual summary of health service statistics was published with statistics disaggregated by major geographical or administrative region	Less than 2 years ago	2-3 years ago	4-5 years ago	6 years ago or more	

		Highly adequate	Adequate	Present, but not adequate	Not adequate at all	Score
	3.2 Districts or similar administrative units compile their own monthly/quarterly and annual summary reports, disaggregated by health facility	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
III.E.4 Integration & use	4.1 Vertical reporting systems such as those for tuberculosis and vaccination communicate well with the general health service reporting system	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	4.2 Managers and analysts at national and subnational levels frequently use findings from surveys, civil registration or DSS to assess the validity of clinic-based data	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	4.3 The data derived from health service records are used to estimate coverage with key services such as antenatal care, delivery with a skilled attendant and immunization	Yes, always	Yes, sometimes	Occasionally	Never	

F. Administrative records
1. Infrastructure and health services

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
III.F.1 Contents	1.1 There is a national roster of public and private-sector health facilities. Each health facility has been assigned a unique identifier code that permits data on facilities to be merged	Yes	There is a database of *public* health facilities with a coding system that permits integrated data management		No	
	1.2 Global Positioning Satellite (GPS) coordinates are included in the facility database for the majority of facilities	True for 90% or more of public and private facilities	True for 90% or more of public facilities	True for <90% of public facilities	Not adequate at all	
III.F.2 Capacity & practices	2.1 There are human resources and equipment for maintaining and updating the database and maps	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	2.2 The national database of facilities was updated no less than:	Less than 2 years ago	2-3 years ago	More than 3 years ago	There is no national database	
III.F.3 Dissemination	3.1 Maps are available in most districts showing the location of health infrastructure, health staff and key health services	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	

| III.F.4 Integration & use | 4.1 Managers and analysts at national and district levels commonly evaluate physical access to services by linking information about the location of health facilities and health services to the distribution of the population | Highly adequate | Adequate | Present, but not adequate | Not adequate at all | |

2. Human resources

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	**2**	**1**	**0**	
III.F.1 Contents (continued)	1.3 There is a national human resources (HR) database that tracks the number of health professionals by major professional category working in either the public or the private sector	Yes, the national HR database tracks numbers of health professionals by professional category in both the public and private sectors	The national HR database tracks numbers by professional category but only those working in the public sector	The national HR database does not provide statistics disaggregated by professional category	No national HR database	
	1.4 There is a national database that tracks the annual numbers graduating from all health-training institutions	Yes		Numbers graduating from certain health training institutions (e.g. nursing; private institutions) are not tracked	No	
III.F.2 Capacity & practices (continued)	2.3 There are human resources for maintaining and updating the national HR database	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	2.4 The national HR database statistics on the number of public-sector health professionals was last updated no more than:	0-1 year ago	2-3 years ago	4-5 years ago	6 years ago or more	

3. Financing and expenditure for health services

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	**2**	**1**	**0**	
III.F.1 Contents (continued)	1.5 Financial records are available on general government expenditure on health, private expenditure on health (and its components) and external expenditure on health	All components, public and private	Only public and external expenditure	Only public expenditure	No system or incomplete	

	1.6 There is a system for tracking budgets and expenditure from all sources of finance (general government including social security and local government, donors, health insurance, out-of-pocket) disaggregated by subnational/district level	All sources of finance are disaggregated by subnational/district level	Sources other than out-of-pocket (government including social security and local government, donors, health insurance) by subnational level	Government budget/expenditure plus at least 1 more source such as donors but only at national level	No tracking or only tracking of national government expenditure	
III.F.2 Capacity & practices (continued)	2.5 Adequate numbers of qualified, long-term staff are regularly devoted to work on National Health Accounts (NHA) (whether or not employed by the ministry of health) **Note**: Not applicable if no NHA conducted	Yes	Adequate numbers and skills but staff are not employed long-term by any in-country agency or are not regularly devoted to work on NHA	Adequate numbers but in need of external technical support	Ad hoc staff chosen when activity takes place	
	2.6 Periodicity and timeliness of routine National Health Accounts (NHA) **Note**: Not applicable if no NHA conducted	Estimates every year with 1-year lag	Estimates every year with 2-year lag	Erratic	No	
	2.7 NHA routinely provides information on the following 4 classifications: sources, agents, providers, functions **Note**: Not applicable if no NHA conducted	All 4	Any 3	Any 2	1 only	
	2.8 NHA provides information on health expenditure by major diseases, health programme areas, geographical or administrative region and/or target populations (according to major policy concerns) **Note**: Not applicable if no NHA conducted	Health expenditure information is available for at least 2 major disease programmes and another area of policy concern	Health expenditure information is available for at least 1 major disease programmes and another area of policy concern	Estimates are available of expenditure on some areas of policy concern but they exclude some important sources of finance (e.g. out-of-pocket)	None	
III.F.3 Dissemination (continued)	3.2 NHA findings are widely and easily accessible **Note**: Not applicable if no NHA conducted	NHA findings have been widely disseminated and are cited in a document that is accessible on a web site	NHA findings have been disseminated to the public	NHA findings are available within the agency but have not been widely disseminated	Written report on NHA findings not available	

| III.F.4 Integration & use (continued) | 4.2 NHA has been used for policy formulation and resource allocation
Note: Not applicable if no NHA conducted | There is at least one major policy document that has been substantially influenced by or cites prominently NHA findings | At least some findings from NHA have been used in budgeting and planning | Policy-makers and other stakeholders are aware of the NHA findings but there is no evidence that these findings have shaped policy and planning | There is no evidence that policy-makers are aware of NHA findings | |

4. Equipment, supplies and commodities

Core dimensions	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
III.F.1 Contents (continued)	1.7 Each facility is required to report at least annually on the inventory and status of equipment and physical infrastructure	Yes			No	
	1.8 Each facility is required to report at least quarterly on its stock of health commodities (drugs, vaccines, contraceptives, other supplies)	Yes			No	
III.F.2 Capacity & practices (continued)	2.9 There are sufficient numbers of adequately skilled human resources for managing the logistics of equipment, supplies and commodities	Highly adequate	Adequate	Present, but not adequate	Not adequate at all	
	2.10 Periodicity and completeness of reporting on equipment and physical infrastructure	Complete quarterly reporting	Complete annual reporting	Incomplete reporting	None	
	2.11 Periodicity and completeness of reporting on health commodities	Complete, monthly reporting	Complete, quarterly reporting	Incomplete reporting	None	
III.F.4 Integration & use (continued)	4.3 Reporting systems for different commodities are integrated	Fully	Partially	Somewhat	All commodities separately reported	
	4.4 Managers at national and subnational levels routinely attempt to reconcile data on consumption of commodities with data on cases of disease reported	Routine reconciliation, monthly	Occasionally	Rarely	Never	

7. Assessing data management

Data management is a set of procedures for the collection, storage, analysis and distribution of data. Countries should have a centralized data depository (preferably in electronic format) that brings together information for all parts of the health information system and that is available to all, ideally via the Internet and the World Wide Web. The availability of such a depository facilitates cross-referencing of data among programmes, promotes adherence to standard definitions and methods, and helps reduce redundant and overlapping data collection. It also provides a forum to examine and understand data inconsistencies and to generate reconciliation between data reported through different systems.

IV. Data management

Items		Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
IV.A.1	There is a written set of procedures for data management including data collection, storage, cleaning, quality control, analysis and presentation for target audiences, and these are implemented throughout the country	Yes, a written set of procedures exists including all the steps in data management and these are implemented throughout the country	Yes, a written set of data-management procedures exists, but these are only partially implemented	Yes, a written set of data-management procedures exists, but these are not implemented	No written procedures exist	
IV.A.2	The HIS unit at national level is running an integrated data warehouse containing data from all data sources (both population-based and facility-based sources including all key health programmes), and has a user-friendly reporting utility accessible to various user audiences	Yes, there is a data warehouse at national level with a user-friendly reporting utility accessible to all relevant government and international agencies	Yes, there is a data warehouse at national level but it has a limited reporting utility	Yes, there is a data warehouse at national level but it has no reporting utility	No national data warehouse exists	
IV.A.3	Subnational levels have a data warehouse equivalent to the national one and have a reporting utility accessible to various audiences	Yes, there is a data warehouse at subnational levels with a user-friendly reporting utility accessible to subnational levels including the district level	Yes, there is a data warehouse at subnational levels but it has a limited reporting utility	Yes, there is a data warehouse at subnational level but it has no reporting utility	No subnational data warehouse exists	
IV.A.4	A metadata dictionary exists which provides data-variable definitions as well as their use in indicators, specification of data-collection method, periodicity, geographical designations, analysis techniques used and possible biases	Yes, there is a metadata dictionary which provides common data element definitions as well as specification of other essential information about the data	Yes, there is a metadata dictionary but with a slightly incomplete set of definitions and specifications	Yes, there is a metadata dictionary but with a very incomplete set of definitions and specifications	No metadata dictionary exists	

| IV.A.5 | Identifier codes are available for health facilities and administrative geographical units (e.g. province, district, municipality, etc.) to facilitate merging of multiple databases from different sources | The same Identifier codes are used in different databases or a complete relational table is available to merge them | Similar identifier codes are used in different databases but some work should be done to merge them | Identifier codes are available but do not match between different databases | Not available | |

8. Assessing information products

The health information system should aim to have accurate and reliable data available for the key domains (e.g. health status, health system, determinants of health. *Fig. 3*) and for a select set of core indicators within each domain. Most indicators are estimated on the basis of empirical data sources. Therefore, it is important to assess the strength of the source data and the statistical techniques and estimation methods used to generate the indicator. Building upon the Data Quality Assessment Framework (DQAF) of the IMF, the following elements are assessed:

Quality assessment criteria
  – *Data-collection*. The appropriateness of data-collection method. Sometimes there is only one gold-standard data-collection method for a given indicator. More often, however, different sources can be used.
  – *Timeliness*. The gap between when data are collected and when they become available to a higher level or are published. Data should be made available shortly after completion of data collection or within agreed time frame.
  – *Periodicity*. The frequency with which an indicator is measured. Internationally-accepted standards concerning intervals between data-collection efforts should be followed.
  – *Consistency*. Internal consistency of data within a dataset as well as consistency between datasets and over time, and with other datasets; extent to which revisions follow a regular, well-established and transparent schedule and process.
  – *Representativeness*. The extent to which data adequately represent the population and relevant subpopulations.
  – *Disaggregation*. The availability of statistics stratified by demographic characteristics (e.g., sex, age, ethnicity), socioeconomic status (e.g. income, occupation, education), locality (e.g. urban/rural area, major geographical or administrative region), as appropriate.
  – *Estimation methods*. The extent to which the estimation methods, including adjustments, data transformation and analytical methods follows sound statistical procedures and is transparent.

Note. This assessment tool examines 16 selected indicators covering the three domains of health information (see *Fig. 3*) and largely reflects MDG indicators. However, countries may add to or replace these with indicators more relevant to their situation, then apply the same set of criteria to assess such indicators.

V. Information products

A. Health status indicators
Mortality

Indicators	Quality assessment criteria	Results	Highly adequate 3	Adequate 2	Present but not adequate 1	Not adequate at all 0	Score
1. Under-5 mortality (all causes)	V.A.1.1 Data-collection method	Data-collection method used for most recent data	Vital registration of at least 90% of under-5 deaths	Birth history from household survey or Sample Registration System	Other methods (such as indirect ones, recent deaths) from household survey or census	No data	
	V.A.1.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-2 years	3-5 years	6-9 years	10 years or more	
	V.A.1.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	None	
	V.A.1.4 Consistency	Revisions consistent over time, and datasets between major sources during past 10 years	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.A.1.5 Representativeness	Coverage of data upon which the most recently reported estimate is based	All deaths (>90%)	Sample of deaths	Local studies	Not applicable	
	V.A.1.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age) socioeconomic status (e.g. income, occupation, education of their parent) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	
	V.A.1.7 Estimation methods	In-country estimates use transparent, well-established methods	Yes			No	

2. Adult mortality (all causes)	V.A.2.1 Data-collection method	Data-collection method used for most recent data	Vital registration of at least 90% of deaths	Sample vital registration	Direct methods from household survey or censuses (such as sibling history, recent deaths)	No data	
	V.A.2.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-2 years	3-5 years	6-9 years	10 years or more	
	V.A.2.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	No data	
	V.A.2.4 Consistency	Revisions consistent during past 10 years	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.A.2.5 Representativeness	Coverage of data upon which the most recently reported estimate is based	All (>90%) deaths	Sample of deaths	Local studies	No data	
	V.A.2.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	
	V.A.2.7 Estimation methods	In-country estimates use transparent, well-established methods	Yes			None	

3. Maternal mortality	V.A.3.1 Data-collection method	Data-collection method used for most recent data	Vital registration of at least 90% of deaths and with good medical certification of cause of death	Sample Vital Registration with Verbal Autopsy	Direct methods from household survey or censuses (such as sibling history, recent deaths with verbal autopsy)	No data	
	V.A.3.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-2 years	3-5 years	6-9 years	10 years or more	
	V.A.3.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	No data	

	V.A.3.4 Consistency	Revisions consistent during past 10 years	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.A.3.5 Representativeness	Coverage of data upon which the most recently reported estimate is based	All deaths	Sample of deaths	Local studies	No data	
	V.A.3.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	
	V.A.3.7 Estimation methods	In-country estimates use transparent, well-established methods	Yes			No	

Morbidity

4. HIV prevalence	V.A.4.1 Data-collection method	Data-collection method used for most recent data 1. If generalized epidemic 2. If concentrated epidemic	 1. General population survey + ANC surveillance 2. High-risk population surveillance with random sampling	 1. ANC surveillance 2. High-risk population surveillance with purposive sampling	 HIV case-reporting HIV case-reporting	 Otherwise Otherwise	
	V.A.4.2 Timeliness	For the most recently published estimate, number of years since the data were collected	<2 years	2 years	3-4 years	5 or more years	
	V.A.4.3 Periodicity	Number of times measured in past 5 years	5	3-4	2	1 or none	
	V.A.4.4 Consistency	Revisions consistent during past 5 years	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	

	V.A.4.5 Representativeness	Coverage of data upon which the most recently reported estimate is based				
		1. If generalized epidemic	1. Nationally representative survey + both urban and rural ANC clinics	1. Both urban and rural ANC clinics	1. Inadequate sample of clinics	Otherwise
		2. If concentrated epidemic	2. All major high-risk populations with random sampling	2. At least one major high-risk population in multiple locations	2. One high-risk population in one location	Otherwise
	V.A.4.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3 - specifically, prevalence among 15-24 year olds is estimated with an adequate sample size	2	1	None

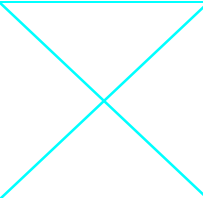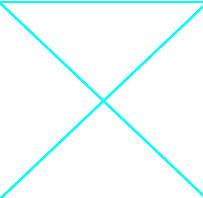|						
5. Underweight in children (<59 months or <36 months)	V.A.5.1 Data-collection method	Data-collection method used for most recent data	Population-based survey with anthropometry	✕	✕	None
	V.A.5.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-2 years	3-5 years	6-9 years	10 years or more
	V.A.5.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	None
	V.A.5.4 Consistency	Revisions consistent during past 10 years	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable
	V.A.5.5 Representativeness	Coverage of data upon which the most recently reported estimate is based	Nationally representative sample	✕	Local studies	Otherwise
	V.A.5.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education of their parents) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None

B. Health system indicators

Indicators	Quality assessment criteria	Results	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
			3	2	1	0	
6. Outpatient attendance	V.B.6.1 Data-collection method	Method used to collect and validate the information	Clinic reports are validated by reviewing records at a representative sample of health facilities	Clinic reports are reviewed at each level for completeness and consistency; inconsistencies are investigated ad hoc	Clinic reports not validated. There is limited or no evaluation of completeness or reporting bias	None	
	V.B.6.2 Timeliness	For the most recently published data, number of months since the data were collected (typically from December of the year being reported)	0-11 months	12-17 months	18-29 months	30 months or more	
	V.B.6.3 Periodicity	Number of times measured in past 5 years	5 or more times	3 or 4 times	Once or twice	None	
	V.B.6.4 Consistency	Revisions consistent over time, and datasets consistent between clinic reports and sample clinic records	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.B.6.5 Representativeness	Most recent statistics include data from (i) teaching hospitals; (ii) more than 90% of public- and private-sector health facilities	Yes	Based upon data from (i) teaching hospitals; and (ii) more than 90% of other public-sector health facilities	Data exclude teaching hospitals and/or more than 10% of other public-sector facilities (or completeness unknown)	Data exclude more than 25% of public-sector facilities	
	V.B.6.6 Disaggregation - 1	Distinguishes curative consultations from visits solely for preventive services and initial visits from follow-up visits for the same illness	Distinguishes curative from preventive and initial from follow-up		Distinguishes curative from preventive but does not distinguish initial from follow-up	Does not distinguish	
	V.B.6.7 Disaggregation - 2	Statistics on curative consultations are disaggregated by disease	Yes			No	

	V.B.6.8 Disaggregation - 3	Most recent dataset disaggregated by sex, age and major geographical or administrative region for relevant indicators	All 3	2	1	No	
7. Measles coverage by 12 months of age	V.B.7.1 Data-collection method - administrative statistics	Measles coverage can be estimated from routine administrative statistics submitted by at least 90% of immunizing health facilities. These statistics are systematically reviewed at each level for completeness and consistency and inconsistencies are investigated and corrected. To calculate coverage, reliable estimates of population are available	Yes. Administrative statistics are complete (>90%) and quality control is good; population denominators are based upon full (>90%) birth registration	Administrative statistics are evaluated for completeness and consistency; population denominators are based upon population projections	There is little evaluation of the completeness or consistency of administrative statistics or they are submitted by less than 90% of relevant facilities or no population projections are available	Measles coverage cannot be estimated from administrative statistics	
	V.B.7.2 Data-collection method - household survey statistics	Measles coverage has been measured by at least 2 nationally-representative household surveys in past 5 years and immunization cards were shown during each survey for at least 2/3 of children	Yes, in past 5 years there has been at least 2 nationally-representative household surveys measuring measles coverage and for which cards were shown for at least 2/3 of children	In past 5 years there has been 1 nationally-representative household survey measuring measles coverage and for which cards were shown for at least 2/3 of children	During the household survey, immunization cards were shown for less than 2/3 of children	No coverage estimate or estimate based on a household survey from more than 5 years ago	
	V.B.7.3 Timeliness	For the most recently published estimate, number of months since the data were collected	0-11 months	12-17 months	18-29 months	30 months or more	
	V.B.7.4 Periodicity	Number of times in past 5 years that an annual estimate was published based on administrative statistics	5 or more times	3 or 4 times	Once or twice	None	
	V.B.7.5 Consistency	Datasets consistent between recent surveys and reports	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	

	V.B.7.6 Representativeness	Coverage of data upon which the most recent estimate is based	(i) Data from at least 90% of health facilities and outreach sites that immunize children including all major hospitals and both public and private sector; or (ii) nationally-representative household sample	Data from at least 80% of health facilities and outreach sites that immunize children	Data from less than 80% of health facilities and outreach sites that immunize children	Otherwise	
	V.B.7.7 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education of their parents) and locality (e.g. urban/rural, major geographical or administrative region)	All 3 (demographic, socioeconomic and geographical characteristics)	2 of 3	1 of 3	None	

8. Deliveries attended by skilled health professionals	V.B.8.1 Data-collection method - administrative statistics	The percentage of deliveries attended by a skilled health professional can be estimated from routine administrative statistics submitted by at least 90% of relevant health facilities. These statistics are systematically reviewed at each level for completeness and consistency and inconsistencies are investigated and corrected. To calculate coverage, reliable estimates of population are available	Yes. Administrative statistics are complete (>90%) and quality control is good; population denominators are based upon full (>90%) birth registration	Administrative statistics are evaluated for completeness and consistency; population denominators are based upon population projections	There is little evaluation of the completeness or consistency of administrative statistics or they are submitted by less than 90% of relevant facilities or no population projections are available	The percentage of deliveries attended by a skilled health professional cannot be estimated from administrative statistics	
	V.B.8.2 Data collection method - household survey statistics	The percentage of deliveries attended by a skilled health professional has been measured by at least 2 nationally-representative household surveys in past 5 years	Yes. In past 5 years there have been at least 2 nationally-representative household surveys measuring coverage	In past 5 years there has been 1 nationally-representative household survey measuring coverage		No coverage estimate or estimate based on a household survey from more than 5 years ago	
	V.B.8.3 Timeliness	For the most recently published estimate, number of months since the data were collected	0-11 months	12-17 months	18-59 months	60 months or more	

	V.B.8.4 Periodicity	Number of times measured in past 10 years	3 or more	2	1	None	
	V.B.8.5 Consistency	Datasets consistent between recent surveys and reports	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.B.8.6 Representativeness	Coverage of data upon which the most recent estimate is based	Data from at least 90% of professionally-supervised deliveries and from complete (>90%) registration of births	Nationally-representative household sample	Local studies; incomplete reporting on professionally-supervised deliveries with limited or no evaluation of completeness	None	
	V.B.8.7 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3 (demographic, socio-economic and geographical characteristics)	2 of 3	1 of 3	None	

9. Tuberculosis (TB) treatment success rate under DOTS	V.B.9.1 Data-collection method	Data-collection method used for most recent data	Clinic reports with evaluation of reporting rate	District reports with evaluation of reporting rate	National reports with limited evaluation of reporting bias	None	
	V.B.9.2 Timeliness	For the most recently published estimate, number of years since the data were collected	1 year	2 years	3-4 years	5 years or more	
	V.B.9.3 Periodicity	Number of times measured in the past year (should be quarterly)	4		<4	None	
	V.B.9.4 Consistency	Trend in treatment success rate consistent since 1995	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.B.9.5 Representativeness	Coverage of data upon which the most recent estimate is based -- % of subnational DOTS quarterly reports received by national TB programme in most recent year	Over 90%	75% - 89%	50% - 75%	Less than 50%	

	V.B.9.6 Disaggregation - 1	Most recent estimate disaggregated by demographic characteristics (e.g. age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3 (demographic, socioeconomic and geographical characteristics)	Any 2 of 3	Any 1 of 3	None	
	V.B.9.7 Disaggregation - 2	Most recent data point disaggregated by HIV status and by drug resistance	Disaggregated by both	Disaggregated by 1 of these	✕	Neither	
10. Proportion of children (<59 months or <36 months) sleeping under insecticide-treated bednets	V.B.10.1 Data-collection method	Data-collection method used for most recent data	Household survey	✕	✕	None	
	V.B.10.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-1 years	2-3 years	4-5 years	None or more than 5 years	
	V.B.10.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	None	
	V.B.10.4 Consistency	Revisions consistent over time	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.B.10.5 Representativeness	Coverage of data upon which the most recent estimate is based	Nationally-representative sample of households	Locally representative	Local studies	Otherwise	
	V.B.10.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education of their parents) and locality (e.g. urban/rural, major geographical or administrative region)	All 3 (demographic, socioeconomic and geographical characteristics)	2	1	None	

Indicators	Quality assessment criteria	Results	Highly adequate	Adequate	present but not adequate	not adequate at all	Score
			3	2	1	0	
11. General government expenditure on health (GGHE) per capita (ministry of health, other ministries and social security, regional and local governments, extra budgetary entities)	V.B.11.1 Data-collection method	Data-collection method used for most recent data	Data compiled using National Health Accounts (NHA) methodology	Data compiled from administrative sources	Data imputed from secondary sources	No data	
	V.B.11.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-1 years	2 years	3 years or more	None	
	V.B.11.3 Periodicity	Periodicity	Yearly	Every 1-2 years	More than every 2 years	No data	
	V.B.11.4 Consistency	Consistent across components of the indicator and over time	Single source with no break in series	Various sources that are harmonized	Various sources that are not harmonized	None	
	V.B.11.5 Representativeness	Components represented	All components: ministry of health, other ministries and social security, regional and local governments, extra budgetary entities	Ministry of health, subnational governments and social security	Ministry of health as well as social security	Only ministry of health (or none)	
	V.B.11.6 Disaggregation - 1	General government expenditure available by subnational or district level	All components: ministry of health, other ministries and social security, regional and local governments, extra budgetary entities	Ministry of health, subnational governments and social security	Ministry of health as well as social security	Only ministry of health (or none)	

	V.B.11.7 Disaggregation - 2	Share of general government expenditure funded through external resources	Disbursed external resources from multilateral, bilateral, private foundations, NGOs, others	Disbursed external resources from multilateral and bilateral	Committed external resources from multilateral and bilateral	None	
	V.B.11.8 Estimation methods	Availability of detailed information on sources and statistical methodologies, and recording of any departures from international guidelines, for all estimates produced	Data audit trail available	Replicable at 75%	Replicable at 50%	Not replicable	
12. Private expenditure on health per capita (households' out-of-pocket, private health insurance, NGOs, corporations)	V.B.12.1 Data-collection method	Data-collection method used for most recent data	Data compiled using National Health Accounts (NHA) methodology	Data compiled using 1 household survey for out-of-pocket, a survey for at least 1 other component, and imputations for remaining components	Data compiled using 1 household survey for out-of-pocket and imputations for the other components	No data	
	V.B.12.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-1 years	2 years	3- 4 years	None	
	V.B.12.3 Periodicity	Periodicity	Data for all components available yearly	All components surveyed at least once in past 5 years	Households surveyed at least once in past 5 years	No data	
	V.B.12.4 Consistency	Consistent across components of the indicator and over time	Single source with no break in series	Various sources that are harmonized	Various sources that are not harmonized	No data	
	V.B.12.5 Representativeness	Coverage of population	Nationally-representative including all components: households' out-of-pocket, private insurance, NGOs, corporations	Nationally-representative only for households' out-of-pocket plus 1 other sector	Nationally-representative only for the households' out-of-pocket	Local studies or otherwise	

	V.B.12.6 Disaggregation - 1	Private expenditure available by subnational or district level	All components: households' out-of-pocket, private insurance, NGOs, corporations	Households' out-of-pocket and 1 other component	Households' out-of-pocket only	No disaggregated data	
	V.B.12.7 Disaggregation - 2	Tracking of private expenditure funded through external resources	Disbursed external resources from multilateral, bilateral, private foundations, NGOs, others	Disbursed external resources from multilateral and bilateral	Committed external resources from multilateral and bilateral	No data	
	V.B12.8 Estimation methods	Availability of detailed information on sources and statistical methodologies, and recording of any departures from international guidelines, for all estimates produced	Complete data audit trail available	Replicable at 75%	Replicable at 50%	Not replicable	

13. Density of health workforce (total and by professional category) by 1,000 population	V.B.13.1 Data-collection method	Routine administrative records are validated with findings from a regularly conducted health facility survey/census, labour-force survey and the population census	Population census, labour-force surveys, health facility census/surveys and administrative records	Administrative records and either health facility census/surveys or labour-force surveys	Only administrative records without validation by any census or survey	No data	
	V.B.13.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-5 months	6-11 months	>12 months	No data	
	V.B.13.3 Periodicity	Number of times measured in past 5 years	5 or more	3-4	1-2	No data	
	V.B.13.4 Consistency	Variables and data definitions and classifications consistent over time and across sources	All sources are consistent. The variables have the same definitions/ classification in all sources	Most of the sources are consistent. The variables have the same definitions/ classification in most of the sources	Only some of the main sources are consistent	The main sources are not consistent; definitions/ classification of variables vary across sources	
	V.B.13.5 Disaggregation- 1	Categories of health workers (ISCO: International Standard Classification of Occupations)	>15 occupations or ISCO 4 digits or national equivalent	4-14 occupations or ISCO 3 digits or national equivalent	<4 or ISCO 2 digits or national equivalent	Otherwise	

| | V.B.13.6 Disaggregation -2 | Most recent estimate disaggregated by (1) gender, (2) urban/rural, (3) major geographical or administrative region and (4) public/private sector | The data allow disaggregation by all 4 variables | The data allow disaggregation by 3 variables (excluding public/private sector) | The data allow disaggregation by 2 variables (excluding public/private and urban/rural) | The data allow disaggregation only by gender or no disaggregation possible | |

C. Risk factor indicators

Indicators	Quality assessment criteria	Results	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
			3	2	1	0	
14. Smoking prevalence (15 years and older)	V.C.14.1 Data-collection method	Data-collection method used for most recent data	Population-based survey with self-report, daily smokers over previous month			No data	
	V.C.14.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-2 years	3-5 years	6 years or more	None	
	V.C.14.3 Periodicity	Number of times measured in past 10 years	3 or more	2	1	None	
	V.C.14.4 Consistency	Revisions consistent over time	No major discrepancies	A few discrepancies	Multiple discrepancies	Not applicable	
	V.C.14.5 Representativeness	Type of sample upon which most recent estimate is based	Nationally-representative sample	Purposive or other non-random national sampling	Local studies	Otherwise	
	V.C.14.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	

15. Condom use with higher-risk sex	V.C.15.1 Data-collection method	Survey with self-reports and appropriate questions 1. If generalized HIV epidemic 2. If concentrated HIV epidemic	Self-reports with appropriate questions 1. General household survey 2. High-risk populations	Self-reports with non-standard questions 1. General household survey 2. High-risk populations	1. Administrative data (condom distribution) 2. Little information on high-risk populations	No estimate available	
	V.C.15.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-1 years	2-3 years	4 years or more	No data	
	V.C.15.3 Periodicity	Number of times measured in past 5 years	3 or more	2	1	None	
	V.C.15.4 Consistency	Datasets consistent between service statistics and survey-based datasets	High	Moderate	Low	None	
	V.C.15.5 Representativeness	Type of sample upon which most recent estimate is based	Nationally-representative with random sampling	Purposive or other non-random national sampling	Local studies	Otherwise	
	V.C.15.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education of their parents) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	

16. Proportion of households using improved water supply (pipe-borne or borehole or protected well)	V.C.16.1 Data-collection method	Data-collection method used for most recent data	Household survey	Administrative report		Otherwise	
	V.C.16.2 Timeliness	For the most recently published estimate, number of years since the data were collected	0-1 years	2-3 years	4 years or more	No data	
	V.C.16.3 Periodicity	Number of times measured in past 5 years	3 or more	2	1	None	

			High	Moderate	Low	None	
	V.C.16.4 Consistency	Revisions consistent over time, and datasets consistent between sources during past 10 years	High	Moderate	Low	None	
	V.C.16.5 Representativeness	Type of sample upon which most recent estimate is based	Nationally-representative with random sampling	Purposive or other non-random national sampling	Local studies	Otherwise	
	V.C.16.6 Disaggregation	Most recent estimate disaggregated by demographic characteristics (e.g. sex, age), socioeconomic status (e.g. income, occupation, education of their parents) and locality (e.g. urban/rural, major geographical or administrative region)	All 3	2	1	None	

9. Assessing dissemination and use

Data by themselves do not always tell a straightforward story. Meaning is acquired when they are analysed and interpreted. Data should be synthesized, analysed and interpreted within the overall context of the health-systems functioning and of health-intervention delivery. A critical aspect of analysis is the synthesis of data from multiple sources, examination of inconsistencies and contradictions, identification and explanation of biases, and summarization into a consistent assessment of the health situation and trends. This includes the burden of disease, patterns of risk behaviour, health service coverage, trends in indicators and health system performance.

Following the analysis stage is the use of the data for decision-making. Capacity for data analysis is often lacking at peripheral levels where the data are generated and the results are to be used for planning and management. Bringing together a comprehensive analysis of the health situation and trends with data on health inputs, such as health expenditure and health system characteristics, is particularly important. The development of such analytic capacity requires planning and investment.

Behavioural, organizational and environmental factors influence the extent to which information is used.[9] Entry points for improving the use of data include:
–   linking data/information to actual resource allocation (budgets and expenditure);
–   enhancing indicator-driven, short- (1 year) and medium-term (3–5 years) planning;
–   creating organizational routines where managers are held accountable for performance through the use of results-based indicators at all levels of the health system;
–   addressing behavioural constraints, for example through the use of incentives for data use;
–   providing a supportive organizational environment that puts a premium on the availability and use of well-packaged and -communicated information and evidence for decision-making;
–   ensuring that data are relevant to strategic decision-making and to planning;
–   engaging all key constituencies in determining which information to collect in order to ensure wide ownership and involvement;
–   making maximum efforts to ensure confidence in the information's reliability and validity;
–   avoiding offering too much information with excessive detail, and making sure that important aggregations are provided;
–   providing essential disaggregations, such as health status by major measures of equity;
–   customizing data presentation to the needs of specific target audiences;
–   ensuring timeliness of data.

An important function of the health information system is to connect data production with data use. Users comprise those delivering care as well as those responsible for the management and planning of health programmes. More broadly, users include those financing health care programmes, both within the country (health and finance ministries) and outside (donors, development banks and technical support agencies). Users of health-related data are not confined to health-care professionals, managers or statisticians. Indeed, decision-making around country health priorities necessarily involves the wider community, including civil society as well as policy-makers at senior levels of government.

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[9] Routine Health Information Network (RHINO). *The Prism: Workshop paper. September-October 2003.*

These different users of data have varying needs in terms of the level of detail and technical specificity required. Health-care planners and managers responsible for tracking epidemiological trends and the response of the health-care system generally require more detailed data than policy-makers who need data for broader strategic decision-making and investment. Thus, the health information system should present and disseminate data in appropriate formats for different audiences.

VI. Dissemination and use
A. Analysis and use of information

Items		Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
VI.A.1	There is continual demand for good-quality and timely health information – for example for results/performance-based budgeting	Yes, health information is continually demanded	Health information is demanded on an ad hoc basis	Health information is seldom demanded	None	
VIA.2	Senior managers and policy makers demand complete, timely, accurate, relevant and validated HIS information	Yes	Yes, but they do not have the skills to judge	Demand from managers is ad-hoc, usually as a result of external pressure (e.g. questions from politicians or the media)	Negligible demand from managers	
VI.A.3	Graphs are widely used to display information at subnational/district offices/health facilities	Yes	Up-to-date graphs are displayed, but poorly understood	Some graphs, but they are not up to date	No graphs	
VI.A.4	Maps are widely used to display information at subnational/district offices/health facilities	Yes	Up-to-date maps are displayed but poorly understood	Some maps, but they are not up to date	No maps	
VI.A.5	Central HIS unit conducts in-depth data analysis that provides answers to important questions and identifies critical changes important for population health	Yes, strategic planning and policy development are regularly based on central HIS unit analytic reports	HIS unit regularly provides information but in-depth analysis from the unit does not regularly contribute to policy development and planning	HIS unit supplies information but not on a regular or timely basis. No in-depth analysis	No central HIS unit or there is a unit but it does not have this capacity	
VI.A.6	HIS data and indicators collected by any public agencies, are in principle regarded as belonging in the public domain, i.e. they should be available to all interested citizens	Public access and availability are guaranteed by law/regulations and fully implemented	Public access accepted in principle and largely implemented	Public access accepted in principle, but not implemented in practice	Access is strictly controlled	

B. Information use for policy and advocacy

Items		Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	**2**	**1**	**0**	
VI.B.1	HIS information is readily available in a written annual (or biannual) report that combines and analyses critical health information from all subsystems	Yes	Report made but analysis weak	Report out of date and/or poor quality	No report	
VI.B.2	Integrated HIS summary reports covering at least a minimum set of core indicators, including of MDGs and global health partners (GHPs) where relevant, are distributed regularly to all relevant parties	Regular integrated reports at least annually to national and local relevant partners	Regular integrated reports at least annually, but distributed only to ministry of health	Occasional reports, but not annually	No integrated reports	
VI.B.3	The national under-5 mortality rate, maternal mortality ratio, immunization rate and HIV prevalence are well known among politicians and media	Yes	Known among health-focused policy/decision-makers	Known by a few "specialists" only	No	
VI.B.4	Policy- and decision-makers regularly use health information to evaluate performance and set health policies	Systematic use of HIS information, with most accepting the HIS information as reliable and valid	HIS information used frequently, but with reservations or disagreements owing to concerns about validity	HIS information used occasionally, but with clear reservations owing to concerns about validity	No	

C. Information use for planning and priority setting

Items		Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
VI.C.1	Health information (population health status, health system, risk factors) is demonstrably used in the planning process, e.g. for annual integrated development plans, medium-term expenditure frameworks, long-term strategic plans, and annual health sector reviews	Yes, systematically used with methods and targets aligned between different planning frameworks	Commonly used for diagnostic purposes to describe health problems/ challenges, but no synchronised use of health information between different planning frameworks	Health information is used occasionally	Never used	
VI.C.2	District health workers analyse all health statistics in their province/district, compare them with national benchmarks and act accordingly	Yes	Most health information is analysed by district health workers and any discordant activities are adjusted accordingly	Health statistics are analysed and reported	No	
VI.C.3	All indicators in the national minimum core indicator set are linked to the relevant short- (1 year), medium- (3-5 years), and long-term (10-15 years) targets	All indicators have relevant targets	40%-80% of indicators have targets	Under 40% of indicators have targets	No targets	

D. Information use for resource allocation

	Items	Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
VI.D.1	HIS information is widely used to set national resource allocation	The majority of targets/budget proposals are backed up by HIS information	Some targets/budget proposals are backed up by HIS information	Few targets/budget proposals are backed up by HIS information	None of the targets/budget proposals are backed up by HIS information	
VI.D.2	HIS information is widely used by district and subnational management teams to set resource allocation in the annual budget processes	The majority of targets/budget proposals are backed up by HIS information	Some targets/budget proposals are backed up by HIS information	Few targets/budget proposals are backed up by HIS information	None of the targets/budget proposals are backed up by HIS information	
VI.D.3	HIS information is used to advocate for equity and increased resources to disadvantaged groups and communities by e.g. documenting their disease burden and poor access to services	HIS information is systematically used to pursue equity	HIS information is regularly used to promote equity	HIS information is used for equity purposes on an ad hoc basis	Not used for equity purposes	
VI.D.4	During the past 5 years, HIS information has resulted in significant changes in annual budgets and/or general resource allocation	All resource allocation (budgets, staff allocations) are based on HIS information, resulting in major shifts	Information-driven resource allocation adopted in principle, but not yet fully implemented	Some shifts, but links to information not clear	Budgets are not information-driven	

E. Information use for implementation and action

Items		Highly adequate	Adequate	Present but not adequate	Not adequate at all	Score
		3	2	1	0	
VI.E.1	Managers at all levels use health information for local health service delivery management, planning and monitoring	Health information is used by managers at all levels for health service delivery management, planning and monitoring		Health Information is rarely used for management and monitoring, but no real planning done	All key decisions are centralized or HIS information is never used	
VI.E.2	Care-providers at all levels use health information for local service delivery, planning and monitoring	Health information is used by care-providers at all levels for health service delivery, planning and monitoring		Health information is rarely used for service delivery and monitoring, but no real planning done	Care-providers other than at central level do not use health information for service delivery, planning and monitoring	
VI.E.3	Information on health risk factors is systematically used to advocate less-risk behaviour in the general public as well as in targeted vulnerable groups	Such indicators are systematically used and tailored to fit the risk profile and situation facing each vulnerable group	Such indicators are regularly used, but generally not tailored to each vulnerable group	Only used on an ad hoc basis	Not used	