

Country Health Systems Surveillance (CHeSS)

Improving data availability, quality and use for better performance

STRATEGIC WORKPLAN

Background

Recent substantial increases in international funding for health have been accompanied by demands for statistics that accurately track health progress and performance, evaluate its impact, and ensure accountability at country and global levels. The use of results-based financing mechanisms by major global donors has created further demand for timely and reliable data for decision-making. In addition, there is increasing in-country demand for data in the context of annual health sector reviews, including in countries that have established IHP+ compacts. Responding to this demand is constrained by limited data availability and quality. Few developing countries are able to produce data of sufficient quality to permit the regular tracking of the progress made in results of scaling-up and strengthening health systems. Data gaps span across the range of input, output, outcome and impact indicators.

An increasing number of stakeholders, including global health partnerships, bilateral donors, UN agencies, and academic institutions are engaged in health information, including the development of standards, tools and methods, investments in data collection, compilation and analysis, monitoring progress towards targets, results-based funding, and evaluation of large-scale programmes. This occurs both in the context of disease-specific programmes and as part of health systems strengthening. For instance, the Global Fund has invested considerably in measuring progress in countries as part of its five-year evaluation and has started to address major data gaps. GAVI relies on immunization coverage to monitor progress and disburse funds and is focusing on strengthening the monitoring systems in conjunction with other health interventions. The US Government is continuing to invest in data generation through major efforts such as Demographic and Health Surveys, HIV and malaria indicator surveys, and improving clinical information systems such as ART and TB control monitoring. UNICEF is stepping up its support to household surveys on maternal, neonatal and child health surveys (MICS). Various forms of results-based funding related to for instance the global health partnerships or World Bank grants is increasingly common with immediate needs for high quality data.

There is a need for a well-coordinated approach to improving health information systems, in line with the general Health Metrics Network framework, building upon country national health sector plans and monitoring practices, as outlined in the IHP+ common accountability and results framework. The framework translates the Paris declaration tenets to the field of health information, including issues related to alignment with country processes, collective action, harmonization and capacity building.¹ The H8 outlined four global health information goals to improve monitoring of results and accountability at country and global levels: increase the level and efficiency of international investments; enhance access to data and statistics; support the

¹ Monitoring performance and evaluating progress in the context of the scale-up for better health. A proposed common evaluation framework. Prepared by the M&E working group of the IHP+ led by WHO and the World Bank. 2008. Evaluating the scale-up for maternal and child survival. Catalytic Initiative to Save One Million Lives. Prepared by Institute for International Programmes consortium based at Johns Hopkins University. 2008.

development of a common data architecture and strengthen performance monitoring and evaluation practices, including minimizing country reporting requirements.² The global goals are aiming to strengthen country health information systems, with a focus on results and use for decision-making. The Country Health Systems Surveillance (CHeSS) platform aims to guide and facilitate the implementation of the H8 global goals at the country level.

Main goal and approach

The main goal of CHeSS is to improve the availability, quality and use of the data needed to inform country health sector reviews and planning processes, and to monitor health progress and system performance. Such improvements should be supported in such a way that global monitoring, including reporting in the context of global goals or major global health investments, is also strengthened while minimizing the reporting burden for countries.³

The improvement of the capacity of countries to monitor health-system strengthening will need to strike the right balance between standardization and country specificity, building on existing approaches and introducing appropriate tools and methods. A Bellagio meeting in 2008 formed the basis for a plan of action for the CHeSS platform which consists of three main work streams:

1. Improving access and analysis
2. Addressing data gaps
3. Building institutional capacity.

A core CHeSS principle is to build upon country experience and strengthen in-country processes. A rapid country assessment of current practices is a useful starting point and should take stock of current demand and use of health information in major planning and evaluation cycles, the supply of data and statistics and the institutional capacity (see Box).

Main areas of focus of a rapid situation analysis

Demand and use of information:

- Existence of processes for annual reviews and evidence-based planning
- Use of indicators, data and analyses to inform such processes: use of core indicators with targets and trends, analysis of equity and subnational performance, and benchmarking of country performance

Supply of data and statistics:

- Strength of data sources and data gaps
- Existence of quality control mechanisms and transparency
- Levels of access to data and analysis
- Methods and effectiveness of dissemination and communication of results

Institutional capacity

- Planning and data collection
- Data quality assessment and adjustment
- Analysis and synthesis
- Dissemination and communication.

² The H8 is an informal meeting arrangement for health leaders of Bill and Melinda Gates Foundation, GAVI, Global Fund, UNAIDS, UNFPA, UNICEF, WHO, World Bank. A health information background paper was prepared by the heads of statistics of the H8 (URL).

³ Monitoring country health systems and their performance. An outline plan of action. Outcome of a WHO technical meeting held at the Rockefeller Centre, Bellagio, Italy, 28-30 October 2008.

Workstream 1 Improving access and analyses

Rationale

Five areas for improvement can be identified. These include availability and quality of databases of statistics, communication of main results on key indicators, access to health data and analyses documents, linkages between global estimates for key health indicators and country use, and access to standards for health information.

Global agencies compile data from countries and maintain *databases* which may be publicly accessible. These include disease specific databases and cross-cutting databases that are kept by WHO, UNICEF, World Bank and others. Countries may also have health indicator databases, kept mostly by the Ministry of Health, and multi-sectoral databases at National Statistical Offices. There is considerable scope for improvement of the quality and public access to these databases.

Effective *communication* of data is likely to enhance information use for decision-making. Global actors and countries have developed various ways of disseminating and communicating health data and results from analysis. Country health profiles, fact sheets, dashboards, interactive graphics and mapping techniques all aim to summarize information about levels, trends and differentials for key health indicators. Examples are country profiles produced by international organizations for health and disease programmes or the Maternal, Neonatal and Child Survival Countdown 2015 country profiles, interactive maps of disease outbreaks, HIV/AIDS Epi Fact sheets and Gapminder time trend graphs. An easy way to produce such effective ways to communicate results is not easily available for most countries.

Countries and partners produce a significant number of *documents* related to health data and statistics. These include health statistical abstracts, survey reports, facility assessment reports, health sector reviews, disease specific reports and in-depth analysis. The reports of data collection efforts and analytical work ought to be easily accessible and many countries have websites that allow downloading pdf files with full reports. In general, however, access and sharing of the health statistical and analytical documents from countries is often limited and many documents rapidly become irretrievable.

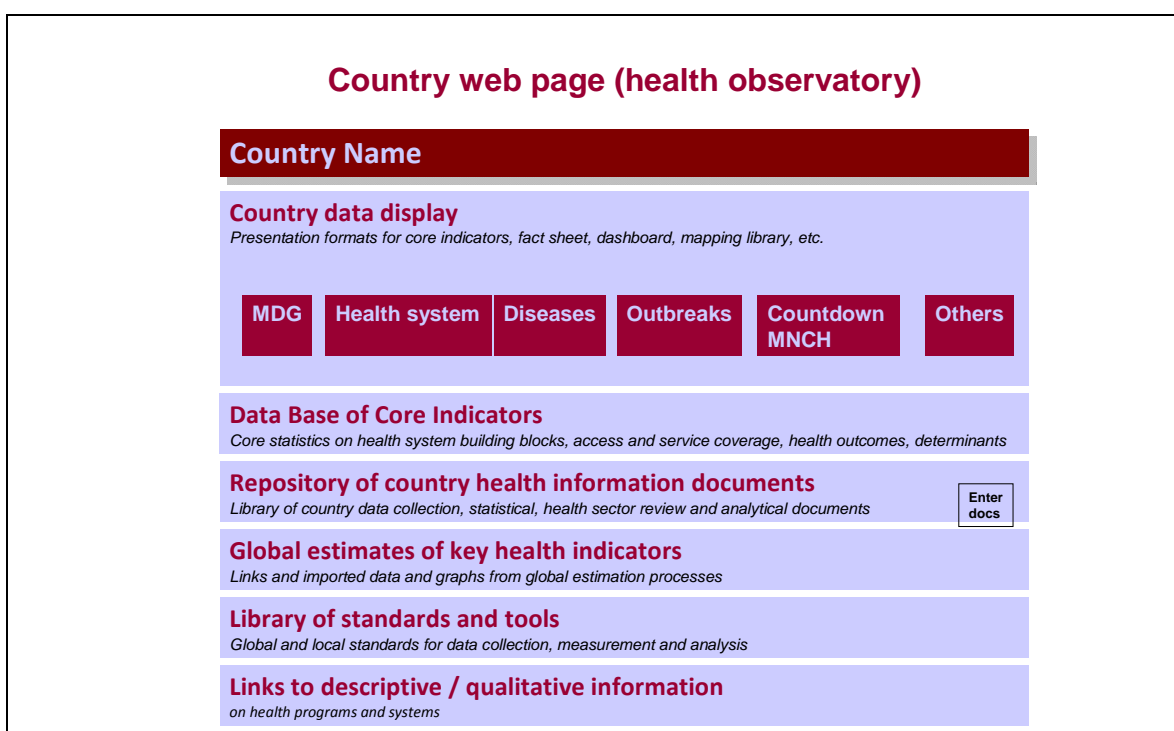
WHO, UNICEF and other international organizations produce *comparable estimates* for key health indicators based on available data and methods to correct for data deficiencies and predict in time and space. The results are available in global databases and for some health indicators, such as HIV prevalence and child mortality, it is possible to obtain further insights from web sites and use tools to make or reproduce the global estimate. In general, however, access to methods, tools and results is piecemeal, countries use is limited and there is a need to facilitate country access. This needs to be combined with capacity building.

Standards and tools for health information are essential to obtain comparable information over time. This ranges from basic terminologies and classification (such as ICD) to indicators definitions, data collection instruments and analytical methods. The introduction of health information technologies further corroborates the need for standardization and interoperability of data. In spite of global efforts there is still considerable variation in the extent to which countries apply appropriate standards to guide health data collection, compilation and analysis.

Approach

A country-focused, web-based platform will be established and aim to improve access to all available data on key health indicators and on systems performance. The platform will build upon existing national and international efforts to bring together health and health systems data.⁴ It will be established to address the five challenges identified above and provide easy access to country health data and statistics documents, country health statistics, estimation tools and results, communication tools and results, and international standards.

The web platform will be maintained by WHO with remote entry facilities by programmes, country offices, countries and international partners. It will be an essential part of the Global Health Observatory which will be under development. The web platform is not intended to replace existing or planned country websites which often cover multiple purposes. Ministries of Health and National Statistical Offices maintained websites however should be able to draw freely and easily from the health observatory country pages.



1 Database

The global WHOSIS data base pulls together data from WHO programmes, UN and other databases and provides a series of functionalities to display the data in tabular, graphic or mapping format. In some cases, this may include both global estimates and country reported data. The statistical data will highlight the data for the specific country in comparison with other countries.

⁴ For instance, WHO's Global Health Observatory, UNICEF's DevInfo, USAID-supported Health Systems 2020, UNSDs UNData, OECD data and statistics, Gapminder.

2 Customized data displays

The country pages will have a set of customized user interfaces. Some of those use the WHOSIS database as the basis, others will be pulled off directly from efforts by other organizations and initiatives. The WHOSIS database derived displays include dynamic pdf files with multiple data and statistics, dynamic dashboards with core indicators, interactive maps, combined tabulations and graphs (e.g. using Instant Atlas), and interactive figures (such as those developed by Gapminder).

The contents covers priority health topics including the MDGs (maternal and child health, nutrition, HIV, TB and malaria), outbreak diseases, health systems surveillance, burden of disease and non-communicable diseases, etc. Examples of links to existing profiles include the Countdown for maternal, neonatal and child survival 2015 and country profiles/fact sheets for specific diseases published by TB, HIV, malaria, EPI, other health and regional programmes.

Others still need to be developed in close collaboration with countries. For instance, a country health systems surveillance dashboard will pull together the different data and analyses to monitor health systems performance through the assessment of trends in key health indicators (towards targets if appropriate), subnational analyses and benchmarking country performance against other countries. The consistency of data presented in the different profiles will have to be assured.

3 Repository of country health data documents

A central repository at WHO will ensure easy access to country documents. The documents primarily cover documents that provide results of data collection efforts (surveys, facility assessments, census, surveillance, health statistical abstracts) and analytical work (disease reviews, systems performance assessments, annual health sector reviews etc.). The web platform will be open source, aligned with the WHO global information repository and allow uploading of documents by all users (with a short list of characteristics of the document). WHO will maintain the responsibility over the system, but will seek close collaboration with partners. This will be done by HQ and regional offices.

4 Estimates of key health indicators

The country health observatory pages will be a one-stop-shop for access to all publicly accessible estimates for key health indicators that are done by UN agencies and their partners. The links will directly lead to the country estimates for the health indicator with underlying data and associated methods. This will include child mortality, HIV prevalence, immunization coverage and others. There will also be an entry point for providing comments and queries on the estimates, directed to those responsible for the estimates, to promote greater country use.

5 Library of standards and tools

This component will be the same for all countries. It includes the WHO registry of indicators and metadata, which has detailed descriptions of all relevant indicators. It will also include references to standard terminologies and classifications (e.g. ICD, ICF), standards for data

collection (e.g. survey modules). A WHO registry of indicators and metadata will aim to bring together all major indicators.

Activities

- Set up web-based platform with country-specific observatories, linked to the Global Health Observatory and regional efforts
- Develop country-specific database interface, starting with WHOSIS and expanding to programme and regional databases and adding subnational data.
- Develop customised data and analytical displays and user interfaces and link with existing partner efforts
- Link to existing work on estimates, expand and fill gaps
- Develop a library of standards and tools

Workstream 2 Improving data availability and quality for reviews and global reporting

Rationale

The first workstream primarily focuses on building upon already available data and strengthening capacities to analyse and use them most effectively. However, for a comprehensive examination of health progress and systems performance, it is necessary to deal with the substantial gaps in the availability of quality data that cannot be addressed through analytic and statistical procedures alone.

Data deficiencies are likely to be multiple and varied across countries but a common feature observed everywhere is that routine reports from health facilities and districts are often subject to bias, incompleteness, tardiness, and poor quality. The need to systematically address such problems is particularly acute in the light of the increasing use of performance-based disbursement mechanisms used by funds and donors, including annual health sector reviews. Currently, performance is often assessed on the basis of routine reporting from health facilities, yet it is clear that there are multiple problems in clinic and programme-based reporting systems. Financial incentives tend to aggravate the problems and create incentives for gaming and for data manipulation. The application of tools to assess health facilities and district performance would not only fill important data gaps, but also provide a mechanism for validating routine facility and district reports. What is needed is a standard set of tools and methods that are relevant and feasible in diverse settings.

It will be essential to fill data gaps on all components of health systems functioning along the causal chain from inputs, processes and outputs, to outcomes and impact. A comprehensive plan to improve the information available on health progress and systems performance should include relevant data sources with particular emphasis on:

1. strengthening *vital events monitoring* with causes of death, through existing civil registration systems, demographic surveillance sites, or hospital statistics;

2. harmonizing *health surveys* through a country-led national plan for population-based health surveys with a focus on service coverage, equity and population health outcomes, and using global standards;
3. improving the timeliness, completeness and quality of *facility generated data* with the help of information technology and supported by an up-to-date national health-facility database that covers all public and private health facilities with data on infrastructure, equipment and commodities, service delivery, and health workforce;
4. a system of tracking *financial resource flows* and expenditures to subnational levels;

In addition, greater use of existing data from population-based, clinical and administrative sources is required to assess progress and performance. Improved synthesis and analysis of data from multiple sources is needed to better inform annual health sector and other review processes. This includes improving data availability and quality, developing and disseminating analytical tools, and building capacity for analysis.

Approach

To improve the availability and quality of data to inform annual health sector reviews and other processes special efforts need to be made to fill data gaps in the five areas identified above. For each areas standards and tools are required to guide strengthening efforts through technical assistance and capacity building.

Area	Standards and tools	Key issues
Monitoring of vital events	<ul style="list-style-type: none"> - Manual of civil registration systems (UNSD) - ICD for coding causes of death (WHO) - Verbal autopsy tool (WHO) - Data quality assessment tool for civil registration systems (under development (UQ/WHO/HM)) - Demographic surveillance systems starter kit (INDEPTH) 	<ul style="list-style-type: none"> - Link with disease mortality surveillance investments (especially HIV) - Clear guidance for countries with no functioning civil registration systems - Strengthening hospital cause of death data
Surveys	<ul style="list-style-type: none"> - Modules for core indicators (several available; MACRO, UNICEF, World Bank, IHSN, WHO) - Guidance for national survey plan (partly, HMN) 	Both activities need more investment from partnerships, donors and international agencies
Health facility data	<ul style="list-style-type: none"> - DHIS /Open Health (partly, HISP, WHO, HMN) - Disease or intervention-specific reporting systems (e.g. outbreak diseases, TB, HIV, EPI) (UN agencies, bilateral donors) - Facility and service databases (WHO, USG) - Facility assessments (under development, WHO, IHFAN/USG, UNICEF) 	<ul style="list-style-type: none"> - IT to improve reporting systems - Quality of recording may improve with EHR and mHealth introduction - Requires national facility census and district updating systems
Financial tracking	<ul style="list-style-type: none"> - Country specific tools, including IT - Public expenditure reviews - National Health Accounts 	<ul style="list-style-type: none"> - Demand for data by programme or disease and subnational data - standard data collection tools
Data quality assessment and analysis	<ul style="list-style-type: none"> - Range of tools used to assess facility and subnational data quality (but no standard) - Range of analytical methods and tools to bring together data from different sources and develop estimates 	<ul style="list-style-type: none"> - Data quality assessment generally weak in countries - Poor availability of global tools for adjustment and estimation for most diseases - Use of global methods limited at country level

Activities

- Develop country guidance on monitoring progress and assessing performance in the context of annual health sector strategic plans and country compacts (if IHP+ country), based on the IHP+ common accountability and results framework
- Develop guidance with a set of standard tools and methods to address data gaps and promote the implementation, including:
 - vital events monitoring: for countries with partial registration systems and for countries with very limited data;
 - health surveys: for the development of a long term national survey plan, with standards and tools for data collection and analysis
 - facility data: for the effective transmission of data and statistics, and feedback of results from facilities and districts to national levels
 - service data: developing a comprehensive data base of facilities with GPS coordinates, services, and human resources
 - financial data
- Develop a tools and a system to assess data quality through regular health-facility and district assessments, and analyses of data from multiple sources

Workstream 3 Institutional capacity strengthening

Rationale

A major constraint faced by many countries relates to the individual and institutional capacities required across a range of issues associated with data collection, management, analysis and sharing. The many global initiatives launched to address health systems weaknesses may be jeopardized if there is no strong in-country capacity to monitor and evaluate the effects of investments. Capacity-building requires support to institutions complemented by investment in training of individuals. In the health sector, there has been relatively little attention to institutional capacity-building in support of such functions.⁵ Establishing stronger partnerships for capacity building between research institutes and ministries of health could go some way towards filling the capacity deficit. The institutional component is critical in terms of long-term sustainability.

Different organizational forms for such institutions can be envisaged, from an integral part of a Ministry of Health to an entirely separate private, non-profit organization. Governance and financing structures may also differ. However, evidence from a number of countries suggests that capacity-strengthening efforts should preferably be directed towards institutions that are independent of programme implementation so as to maximize objectivity and minimize risks associated with vested interests. In some countries, national statistics offices that have aligned

⁵ A recent review of statistical capacity-building activities by the agencies of the United Nations system, found that extensive support to statistical capacity building was directed to data collection and processing for household surveys but noted that sector statistics (including health) appear to receive little support for capacity-building.

themselves with the Fundamental Principles of Official Statistics⁶ can provide this degree of objectivity and transparency. Elsewhere, academic, research and public health institutes may be well placed to provide this function. Landscaping of the institutional context would be included in the country-based web platform described above, and would serve as the foundation for decision-making regarding capacity strengthening activities.

The specific areas in which capacity-building is required include:

- Data compilation and storage, bringing together for analytic purposes data generated by the national statistics office, ministries of health, researchers, donors, development partners, funds, NGOs, others;
- Data analysis and synthesis: bringing together data from multiple sources for the purpose of health sector reviews and planning, policy analysis, country, regional and global reporting, and evaluation;
- Data quality assessment, validation and adjustment: independent assessment of the quality of data generated from clinical and administrative sources, ad hoc surveys etc.;
- Estimation and statistical modelling: application of global standards, tools and methods to correct for bias and missing values, generate estimates and forecast for planning purposes, focusing on key statistics (child mortality, immunization coverage, HIV prevalence etc.)

Approach

The CHeSS platform will promote an institutional approach and maintain a summary of country institutional capacity on the web. It will be critical however to link with existing or new efforts to strengthen institutional capacity.

⁶ <http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>

Annex A (Workstream 2 - improving data quality)

Meeting on "The quality of health facility data: assessment and adjustment."

Rationale

Data quality issues are likely to be multiple and varied across countries and affect all data sources. A common feature observed everywhere is that routine reports from health facilities and districts are often subject to bias, incompleteness, tardiness, and poor quality. The need to systematically address such problems is particularly acute in the light of the importance of regular annual data to inform health sector review processes and of the increasing use of performance-based disbursement mechanisms used by funds and donors. In both cases, routine reporting from health facilities is the main source of data, yet it is clear that there are multiple problems in clinic and programme-based reporting systems. Financial incentives tend to aggravate the problems and create incentives for gaming and for data manipulation.

There are two main issues that affect the quality of data generated from health facilities. First, recording of events may be incomplete or inaccurate. Incompleteness may stem from poor recording practices, and may lead to both under- and overrecording of the event. For instance, a vaccination tally sheet may have more or less vaccinations than were actually given. An outpatient register may show more or less patients than actually were seen. The health worker may make errors deliberately or not. Incomplete recording may also originate from lack of knowledge of the outcome of the event. For instance, a maternity register may not record a maternal death which occurs following re-admission for post partum sepsis.

Inaccurate recording generally occurs when the health worker lacks the right knowledge. This may lead to omission or misclassification of events. For instance, a poor diagnosis of for instance malaria or incorrect use of ICD coding rules leads to a faulty recording of the event. A death of a person on TB treatment or ARV therapy can be recorded as loss to follow up.

The second set of issues is related to reporting of the recorded data. There are two types. Aggregation errors may occur during different stages: aggregating the individual data at the facility level, aggregating the facility summaries at the district level, summarizing the district data at provincial and at national levels. Incomplete reporting occurs within facilities (e.g. specific time periods are missed), at district (missing facilities), province and national levels (missing districts). This also includes poor inclusion or poor reporting by private facilities, but may also include poor reporting by hospitals which sometimes have a separate reporting system.

Representativeness of facility data is affected because the data are only related to those that make use of health facilities. This is not strictly a data quality issue but will need to be taken into account when making population inferences from facility data.

Approach

The assessment of data quality has different components. First, a general picture of data quality can be obtained by analyzing data from multiple sources. This may include comparison of results, on for instance intervention coverage, from population based household surveys with facility

reports. While population-based surveys may also have measurement error and data quality issues that need to be taken into account, they are usually considered the gold standard.

To assess the completeness and accuracy of recording of events observational and follow-up studies are required. One may also assess data quality by comparison of commodity and drug distribution figures with service provision data, since the former number has to be larger than the latter.

The accuracy and completeness of recording is difficult to assess. For some indicators the results may indicate data quality problems, e.g. a highly unusual cause of hospital death distribution or an exceptionally low mortality rate among patients on TB or ARV. For other indicators unusually high numbers of events may suggest over-recording, e.g. for vaccinations. This assessment often depends on accurate knowledge of the denominator, i.e. the target population. At local levels this often presents a problem, due to the long time interval between the last census and the year of interest, migration, or poor definition of catch population. The consistency over time in of numbers of events may be an indicator of complete recording, although recording problems can easily be "concealed" by adjustments made at the facility, district or higher level by adjusting the data without proper documentation.

The most visible reporting problem is non-reporting of facilities, districts or provinces. Errors in aggregating data are much harder to detect. Comparisons of individual data at the facility level (registers, tally sheets) with aggregate reports from the facilities and at the district level may provide insights into such errors.

The assessment of data quality should form the basis for adjustments of the statistics. Missing facilities and districts should be taken into account using standardized methods for adjustment. Limited reporting by the private sector should be taken into account, and can benefit from population-based surveys. In addition, IT based reporting systems have great potential to improve such systems, not only in terms of timeliness but also in terms of quality.

Meeting

A range of disease programmes and studies have developed data quality assessment and adjustment methods and tools. For instance, GAVI uses a data quality audit to assess reporting problems. The Global Fund has developed a set of tools to assess data quality. Disease programmes, such as TB and HIV, are using a range of analytical methods and tools to adjust for recording and reporting problems. Also several countries have developed ways to adjust for data quality problems.

Data quality assessment needs to look at different levels of the system of data collection and aggregation, from facility to district, provincial and national level.

- Develop a core set of analytical tools to ascertain data quality and make adjustment as appropriate
- Design a tool to assess the quality of data and statistics through a review recording and reporting practices at the facility and district levels

Districts are often the main administrative unit of country health systems that provide key information on progress towards health goals. District assessments aim to provide regular information on the quality of data generated by districts, especially facilities (HMIS), and provide additional information on the state of health services and system through facility assessments (including public and private sector) and expenditure reviews. The overall picture provided by a sample of health facilities or a sample of districts aims to provide information on the national situation.

Participants

- GAVI DQA;
- GF evaluation study DQA tools
- Country DQA tools (e.g. South Africa, Zambia, Tanzania)
- Disease programmes (TB, HIV, immunization, other)
- Analytical methods to assess quality by using data from different sources: local and national level
- Analytical methods to assess quality by using international methods and tools
- HMN synthesis from Seattle meeting on local surveys and other data collection: tools, sampling, data analysis