

HEALTH SYSTEM METRICS

**REPORT OF A TECHNICAL MEETING
Glion, Switzerland,
28-29 September 2006**

Health Metrics Network

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Action points: summary

Area	Implications	
	Dashboard	Investments
Governance	Consider to include a general governance index as a contextual variable on dashboard	Further discussion on the need to invest in developmental work on a health governance metric
Financing	<p>Include the health funding availability indicators for annual trends and develop a target for THE per capita</p> <p>Aim to include a measure of financial protection, initially with OOP estimates</p>	Promote investments in regular collection of data on health funding (National Health Account) and health expenditure (household surveys).
Human resources	Health worker density (health worker total - doctors, nurses, midwives - and broken down; possibly other cadres); worker generation ratio (key types of health workers)	<p>Develop a methodology to provide regular best estimates of health workforce by reconciling data from different sources and promote the method at international and country levels, e.g. in the context of HRH observatories</p> <p>Promote the investment in essential data collection and analysis efforts needed for monitoring the health workforce, including computerization and linkage of various administrative data including capacity building, population census, and facility census and survey.</p>
Information	List the main recent data collection efforts and provide the HIS index score level and trend	Methodological work: refine the HIS index score, apply it to a large number of countries with a small team of raters at the international level and evaluate the results
Service provision	<p>No comparable data for service provision except hospital beds.</p> <p>Need to reach agreement on small set of service capacity measures to obtain comparable data, including general and disease-specific metrics and include these in facility censuses, surveys and facility recording and reporting systems.</p>	Need to invest in obtaining better hospital statistics to evaluate the provision of care (which will also provide better cause of death statistics)

Coverage	<p>Compute co-coverage for childhood interventions for all countries with DHS and other surveys to assess trends</p> <p>Further develop composite coverage index from available aggregate data but do not neglect the lack of data on non-communicable disease interventions.</p>	<p>Promote effective coverage studies in countries as part of health systems performance assessment</p> <p>Promote investment in coverage surveys and improved health facility recording and reporting systems</p>
Subnational assessments	<p>No specific measures.</p>	<p>Investments are needed develop comprehensible tools and methods for country use.</p> <p>Household surveys are the core source of information and investments need to be made to better coordinate international investments and country health survey programmes.</p>
Equity	<p>In the absence of a perfect measure it would still be important to present measures on the distribution of health inputs (e.g. health workers) and outputs (e.g. service coverage) for a country. These measures are useful for within country trend monitoring and can be replaced with other equity metrics once they become available.</p>	<p>Comparative measures of inequality are hampered by analytical problems for e.g. human resource distribution. Further methodological work is needed.</p>

Background

There is considerable demand for health system metrics from countries, international organizations, donors and global health partnerships to guide resource allocation, enhance accountability, and monitor progress. The goal of the health system metrics is to meet the needs of all users with the same approach.

GAVI is now encouraging countries to develop proposals on health system strengthening, as long as it can be demonstrated how this is linked with improving immunization coverage¹. GAVI's work has several links with the health information system in countries: use of general health information (e.g. births, mortality, morbidity) in planning and monitoring and investment in monitoring and evaluation of immunization programmes (e.g. the Data Quality Assessment tool and process). Health systems strengthening provides an opportunity to better integrate immunization monitoring and evaluation into the health information system, along the lines of the Health Metrics Network framework. The health system metrics work is needed to help GAVI develop health systems performance indicators, data collection strategies and tools for monitoring at country and global levels.

The Global Fund to fight AIDS, TB and Malaria (GFATM) interacts with health information systems at several levels including monitoring programme implementation for performance-based disbursements; creating opportunities for investment in strengthening health information (5 to 10% of the grant could be spent on monitoring and evaluation), and developing a basis for evaluation of the impact of the scale-up on the three diseases². Hitherto, the Global Fund has invested little in the area of health information and ways are sought to enhance grant use by countries in either programme related funding (through a Global Fund M&E checklist) and health information system building in general (through the Health Metrics Network assessment tool). The Global Fund M&E toolkit has identified monitoring health systems as a key area in addition to the three diseases.

The health system metrics work includes (a) a clear measurement strategy including data collection, synthesis of data from different sources and estimation, (b) a parsimonious set of core indicators that resonate with the target audiences, (c) integration of monitoring of health systems and their performance into health information systems. While building upon existing data collection and reporting mechanisms is a core principle, there are major gaps in health system metrics that need to be addressed in a systematic way. The emphasis should be on the ability to detect change and to show progress in health system strengthening. Both level and distribution of inputs and outputs should be addressed. The focus is on low and middle income countries, but inputs from high income countries will be used to develop the best system and guidelines.

Building upon a WHO/World Bank meeting held in 2004 and existing health system frameworks several health system components have been identified as relevant for health system metrics, including financing, human resources, information, governance and policy, / stewardship, service delivery (infrastructure, procurement, logistics and supply and quality), and coverage of services.

¹ Based on a presentation by Abdallah Bchir, GAVI, at the meeting. The presentation is available on www.healthmetricsnetwork.org.

² Based on a presentation by Daniel Low-Beer, Global Fund, at the meeting. The presentation is available on www.healthmetricsnetwork.org

During the six-month period preceding this meeting several meetings were held to prepare for this meeting. This included meetings of a steering committee which includes global health partnerships and bilateral donors, a working group on monitoring human resources for health and a working group on facility level data collection.³

Meeting objectives

- 1 *Develop dashboard to monitor health systems*
 - Reach agreement on the contents of a 'dashboard' that is used for country, regional and global level monitoring of health systems
 - Agree on a reporting mechanism for the health systems dashboard
- 2 *Take stock of current progress in health system performance assessment*
 - Discuss new methods in and practical aspects of health systems performance assessment
 - Discuss priority areas for further work and how health systems performance monitoring can be linked to the dash board for monitoring health systems
- 3 *Identify priority areas for data collection and analysis investment at the country level*
 - Reach agreement on a list of priority areas for investment in health system related data collection and analysis in countries in the context of the global health partnerships driven scale up of interventions.

The results of the meeting will be presented at a meeting of global health partnerships, bilateral donors, multilateral agencies and others brought together by HMN. The meeting results will also be used to guide further investments by HMN and its partners in this area.

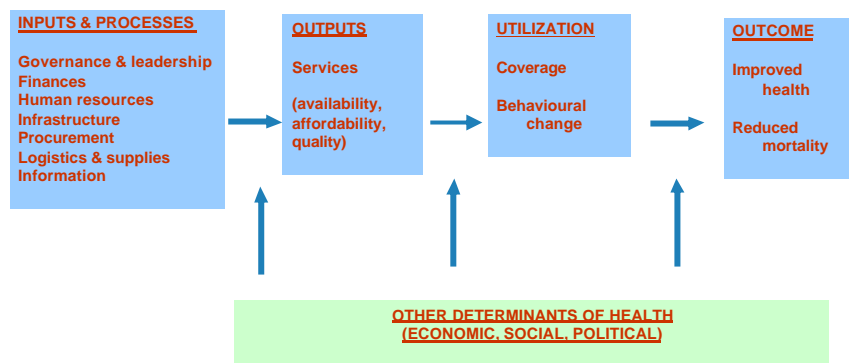
Framework

Basic health system monitoring focuses on the inputs, processes and outputs of the health system⁴. These inputs and processes include human resources, finances, governance and leadership, information, infrastructure, procurement, logistics and supplies, which influence the outputs: service delivery, including availability and quality of services. These outputs affect the utilization of the services by those who need it (coverage) which, if the interventions are effective, should lead to improvements in health outcomes.

³ Boerma T. Health system metrics: introduction of the meeting. Presented at the meeting. Available from www.healthmetricsnetwork.org

⁴ The health system is concerned with personal and non-personal health services.

Figure 1
Health systems monitoring: basic framework



The proposed dashboard aims to capture trends in health system inputs and outputs, supported by coverage data with a parsimonious set of indicators. Where appropriate percentile scores can be used to describe the relative position of the country compared to other countries. In addition, the dashboard should provide contextual information such as the country health situation in relation to its level of economic development or per capita total health expenditure.

The development of indicators and measurement strategies in the context of health system metrics focuses on the following areas:

- Governance and leadership
- Financing, including financial protection
- Human resources
- Information
- Service provision: availability and quality
- Coverage of services

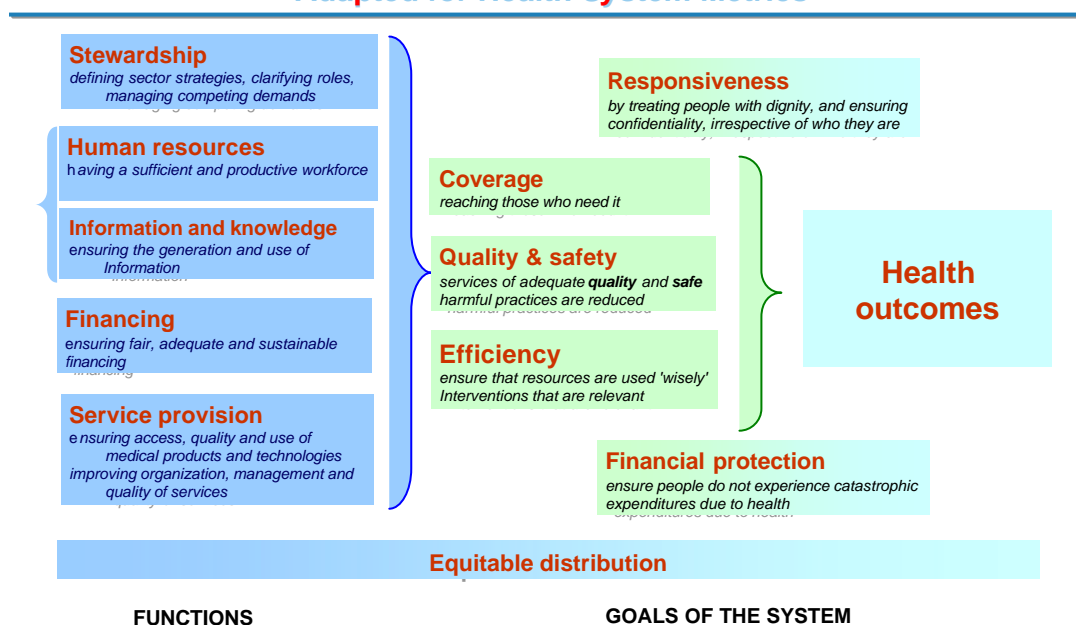
For many public health areas extensive efforts have been made to develop large sets of indicators for monitoring and evaluation purposes which, if accurate data can be provided, allow an assessment of programme performance. This is not the primary purpose of health system metrics. The aim is to develop a minimal set of core indicators, that are comparable between populations and over time, and identify the key measurement issues and strategies required to report regularly on the status of the health system.

Conceptually, monitoring the health system inputs and processes also needs to pay attention to a number of cross-cutting concerns. The WHO Health System Strengthening Strategy draft paper⁵ presents five universal concerns: equitable improvements in health, being responsive to users, financial protection, health service quality and safety and efficiency. Only some of these elements are presented in a basic monitoring framework.

⁵ WHO. Health systems strengthening strategy. Draft paper. Version September 26 2006. Geneva.

The Health System Performance Framework 2000 lists the functions and goals of health systems and can be adapted to meet the specific needs of health system metrics (Figure 2). The health system functions comprise the inputs and processes identified above. Five functions⁶ are identified for which monitoring strategies need to be in place. In addition, there is a set of health system goals that need to be monitored including coverage, efficiency and quality & safety, responsiveness and financial protection, and health outcomes. Furthermore, monitoring the distribution of the functions and the goals (equity), needs to part of the monitoring system at all levels. To monitor health system performance is clearly a much larger task - the dashboard can contribute to this effort but will -at least initially - not be able to fulfil all these tasks.

Figure 2
WHO Health System Performance Framework
Adapted for Health System Metrics



Towards a monitoring system (the "dashboard")

With the increased attention and anticipation of a higher level of investments in health systems monitoring progress and system performance will be critical. Such a monitoring system should:

- Provide statistics for a minimum set of health system performance indicators on a regular basis for countries
- Provide comparable data over time (for the same country) and between countries
- Include targets when possible

⁶ The original HSPA 2000 framework has four functions. The function resource development has been split into human resources and information as subfunctions, while infrastructure and technology are put under service delivery.

- Cover the major functions (adequacy of inputs such as human resources, finances and drugs) and measurable goals of health systems
- Have a national focus but include statistics on the distribution within the country
- Have linkages with disease specific programmes for some indicators

This requires that strengthening health systems is accompanied by key investments in improving measurement within countries, as current data collection and analysis strategies are inadequate.

A possible mechanism for such a monitoring system could be something like the "Countdown 2015 for Child Survival" which produces biannual analyses and reporting of progress in coverage of child health services for 60 countries.

For health systems monitoring, regular statistical updates could be produced for key countries (e.g. all countries in which health system strengthening has been identified as a priority to reach the MDGs). The core indicators for updating will be identified by a broad-based Health System Metrics enterprise. In addition, it should be considered whether a brief health system description, a qualitative description of the key features of the country's health system, should become part of such a monitoring system.

Governance and leadership

Background

Governance and leadership are widely recognized as essential for development, including the health sector.⁷ The assessment of governance in general is challenging. First, there are few objective indicators, and subjective criteria form the basis of most assessments. Second, governance is a sensitive issue making it difficult to collect data and prompting heavy reliance on external consultants or sometimes public surveys. New systematic approaches to generating comprehensive governance assessments are being developed largely relying on panels of experts familiar with each country.

Measurement issues

WHO EMRO has developed a framework with 10 principles to assess health governance: strategic vision, participation and consensus orientation, rule of law, transparency, responsiveness, equity and inclusiveness, effectiveness and efficiency, accountability, intelligence and information, and ethics⁸. A study on health governance in Pakistan was completed, studies in Egypt and Lebanon are nearing completion. A total of about 100 questions are used to assess the performance. The results are qualitative and will not be easily comparable between countries. The work however illustrates the breadth of the topic and the measurement challenges.

⁷ The original HSPA 2000 framework uses the term stewardship. Stewardship has different domains or subfunctions: generation of intelligence, formulation of a set of strategic options and policy direction, ensuring formal mechanisms exist to steer the health system, coalition building and effective communication, seeking a fit between strategy and structure, and accountability. The intelligence / information domain of stewardship is dealt with separately in the health system metrics.

⁸ Siddiqi S, Masud TI, Nishtar S, Sabri B. Framework for Assessing Health Governance in Developing Countries: Gateway to Good Governance. Paper presented at the meeting.

The World Bank uses a policy scorecard known as the Country Policy and Institutional Assessment (CPIA).⁹ The CPIA is an index that provides a rating of a country's policies and institutional framework for fostering sustainable, poverty-reducing growth and the effective use of development assistance. The index is based on a set of 16 criteria grouped in four clusters: economic management; structural policies; policies for social inclusion and equity; and public sector management. The results are presented in quintiles (A-D, F(ailure)). Some criticize the CPIA as methodologically weak and not conducted in a transparent manner. CPIA is used to guide the allocation of IDA funds to the poorest countries.

How useful is the CPIA for the health sector?¹⁰ The CPIA indicator provides a comprehensive assessment of the overall policy and institutional context within which health systems operate. Other than the components of the "Building Human Resources" criterion, health systems performance or characteristics are not reflected. The CPIA criterion "Building Human Resources" consists for 2/3 of health ratings (overall health, and communicable diseases), and 1/3 of a rating of education policies and institutions. The correlation between the overall CPIA score and "Building Human Resources" is about 0.76.

Therefore, the use of the CPIA as part of health systems metrics would be similar to the use of GNI per capita: providing background information that helps in interpreting other aspects of health systems, in particular a country's ability to absorb additional financing in a way that contributes to sustained growth.

The World Bank produces another measure of governance on an annual basis. Kaufmann and colleagues recently published time series 1996-2005 for all countries¹¹. The aggregate governance indicators are available on the web and have six dimensions: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. As with the CPIA there is little health-specific contents, but the indicators provide a general picture of the environment in which the health system is operating.

Currently, most work in disease-specific programmes is limited to monitoring the presence of specific national policies. For instance, country profiles for the Countdown 2015 for child survival¹² assess the adoption of five national health policies (yes / no /partial): international code of marketing breastmilk substitutes, new ORS formula, use of zinc for treatment of diarrhoea, HiB vaccine in schedule as of end 2004, community treatment of pneumonia with antibiotics. UNAIDS is using a national composite policy index that includes 20 elements related to strategic plan, prevention, human rights and care & support.¹³

⁹ Court J. Governance, development and aid effectiveness: a quick guide to complex relationships. ODI Briefing paper. March 2006.

¹⁰ Bos E. Health system metrics: the country performance and institutions assessment index (CPIA) as a contextual indicator. Paper presented at the meeting.

¹¹ Kaufmann D, Kraay A, Mastruzzi M. Aggregate and individual governance indicators 1996-2005. World Bank. 2006.

¹² For instance, Bryce J, Victora C et al. Child survival countdown to 2015. *Lancet* 2005, 365: 2153-4.

¹³ UNAIDS. Monitoring the declaration of commitment on HIV/AIDS. Guidelines on construction of core indicators. 2002: Geneva, Switzerland.

Conclusions

- The quantitative assessment of governance is complicated because of the multiple dimensions
- The CPIA is a useful measure of overall governance but provides only limited information on health governance. A health-specific CPIA was not considered feasible. The same applies to the Kaufmann governance indicator.
- A health-specific governance index will require considerable development and validation work and would also require a major financial commitment to maintain on a regular basis. At this point, no such work is ongoing.
- Implications:
 - Dashboard: consider to include a general governance index as a contextual variable
 - Further discussion on the need to invest in developmental work on a health governance metric.

Financing

Background

The health financing function can be divided into three interrelated *sub-functions*: revenue collection, pooling and purchasing. *Revenue collection* is the process by which the health system receives money from households, enterprises, government and other organizations including donors. *Pooling* is the accumulation and management of these revenues in order to spread the risk of payment for health care amongst all members of the pool - individuals no longer bear the entire financial risk of ill health. *Purchasing* is the process by which these pooled contributions are used to pay providers to deliver a set of specified or unspecified health interventions. Purchasing can be either passive or strategic, with passive purchasing simply following predetermined budgets or paying bills when presented. Strategic purchasing is generally preferred, where there is a continuous search for purchasing the best health services, from whom, and with consideration given to the incentives inherent in how they are purchased.

At the 2004 meeting on health system metrics essential indicators were proposed:¹⁴

- To monitor the availability of funds
 - Expenditure on health from all sources (Total Health Expenditure) per capita in US\$, international \$, per capita and as a percentage of GDP;
 - General government expenditure on health in US\$, international \$ and as % of total general government expenditure.
- To monitor financial protection
 - Proportion of households incurring financial catastrophe as a result of health expenditures or out-of-pocket payments (OOPs) and proportion of households impoverished as a result of health spending or out-of-pocket payments.
 - Share of Total Health Expenditure (THE) that is prepaid, or the share of OOP in THE.

¹⁴ Carrin G, Evans D. Monitoring health financing changes: key indicators. Paper presented at a WHO/World Bank meeting on Health system metrics: monitoring the health system in developing countries. October 6-7 2004, Glion. Health system metrics: monitoring the health system in developing countries. Workshop report. October 6-7 2004, Glion.

*Measurement issues*¹⁵

Annual updates of estimates on health spending are provided by WHO in the World Health Report and World Health Statistics, but the uncertainty around some of these estimates is relatively high because of limited data availability. The primary method of data collection on health expenditure is through national health accounts (NHA). Only 70 countries have ever undertaken a full National Health Account exercise, and only the OECD countries routinely do so. Intermittent household surveys with expenditure questions can improve the estimates from NHA. Too few countries are conducting regular NHA and data from other sources such as public expenditure reviews to make annual estimates.

Interpretation of the statistics is a challenge. In high income countries the major concern is overspending on health, while in low income countries the primary issue is often under-spending on health. Setting a target for THE per capita may be feasible for lower income countries. Such as target could be of the order of US \$50 per person per year, which would pay for a package of basic health interventions, even though actual costs often vary between countries. A target that specifies a minimum desired proportion of GDP (or of general government expenditure) for health spending is not very useful on scientific grounds.

In terms of financial protection, statistics on catastrophic expenditure and impoverishment due to out of pocket expenses are not regularly available for most countries. Household surveys with a health expenditure module are required, and at least one survey every five years is desirable. The statistics for these indicators are easy to interpret, as lower figures are better. The share of OOP in THE has the advantage that it is reported on an annual basis by WHO and could be used as a proxy. The disadvantage is that there is no clear target. Very high levels in the proportion OOPs/THE is associated with higher levels of households incurring financial catastrophe, but one cannot say that 0% should be the target. Furthermore, good estimates of change in OOPs require household surveys.

In addition, there are two key areas of financing for which no good indicators are available. The first is the extent to which financial constraints prevent people from using health services. The second is the overall equity, efficiency and effectiveness of resource use, which relates to the purchasing/provision function of financing. Effective coverage - the probability that a person will receive a health gain from an intervention if they need it - may be a useful approach but requires substantial country-specific investments in measurement. Efficiency could be monitored using frontier production functions or something similar. Both issues are addressed later in this report.

Conclusions

- There is a small set of indicators to monitor the availability of funding for health on an annual basis, which can be used for monitoring health systems.

¹⁵ Based on a presentation by Evans D, WHO at the meeting. See www.healthmetricsnetwork.org. Health financing measurement practices in selected countries was also discussed by Balabanova D et al. Monitoring health systems performance. Synthesis of some experiences from low-income countries. Presented at the meeting. Available at www.healthmetricsnetwork.org.

- It would be useful to set a target for total health expenditure per capita for the low and lower middle income countries, of the order of \$50 for a basic health intervention package.
- More investments are needed to allow countries to regularly conduct a National Health Account, e.g. at least twice in a five-year period.
- Household surveys with expenditure (for health) modules are required to improve estimates of financial protection and out-of-pocket expenditure. At least one survey every five years is required.
- Implications:
 - Dashboard: include the health funding availability indicators for annual trends and develop a target for THE per capita
 - Dashboard: aim to include a measure of financial protection, initially with OOP estimates
 - Promote investments in regular collection of data on health funding (National Health Account) and health expenditure (household surveys).

Human resources

Background

There is considerable demand to develop a monitoring system for the health workforce, with clear indicators, guidance on data collection and analysis strategies and comparable statistics. The latter implies that classification issues need to be addressed. The World Health Report 2005 on health workforce was a vivid illustration of the weaknesses in monitoring human resources for health in many countries¹⁶.

Top priorities, for supporting local management as well as national and international strategic decision making are to have reliable and up-to-date statistics for each country on (1) the active workforce -- stocks and age, sex and geographic distribution of various types of health professionals whether they work in the public or private sectors; (2) entry -- annual numbers graduating from training institutions; (3) exit -- the number of health workers who depart from service each year due either to movement to private sector positions, emigration, change of career, retirement or death; (4) performance -- measurements of the outputs of health workers; and (5) costs -- expenditures on remuneration (including benefits) as well as on pre-service training of health professionals.

A WHO/HMN informal technical working group was established to assess the current issues in monitoring human resources for health in countries. A comprehensive overview of the situation was based on the working group report and further analysis of the availability and quality of health workforce statistics¹⁷.

Measurement issues

Data for monitoring the health workforce are generated by a variety of sources: national population censuses, labour force surveys, health facility censuses, professional registration

¹⁶ World Health Organization: Working together for health. World Health Report. 2006. Geneva.

¹⁷ Pond B. Health system metrics: monitoring the health workforce. Presented at the meeting. Paper and presentation available at www.healthmetricsnetwork.org

databases, civil service payroll databases and the staffing reports submitted each month or quarter by each health facility or district. Each of these data sources has its particular strengths and limitations. This variety of data sources should increase the options for measuring and validating core health workforce statistics. No source is optimal but combining the data from the different sources to obtain best estimates is feasible and likely to lead to substantial improvements in international workforce statistics.

This requires investments in computerization and linking of various administrative data on human resources (on enrolment, graduation, registration/licensing, hiring, pay, deployment, transfer, promotion), which all have the potential to permit tracking of key dimensions of the health workforce: entry, active work and exit as well as levels of remuneration.

For many countries for the short to intermediate term there is likely to remain a need to invest in sources of health workforce statistics that validate administrative data sources. This is particularly true of statistics on health workers employed in the private sector or outside of the health sector or who are unemployed. In this respect, it is worth recognizing the potential of population census data to generate statistics on almost all components of the health workforce.

The potential of health facility censuses should also be recognized. Such a measurement strategy can generate quality data on not only the full range of facility-based staff but also validated statistics on skills, productivity (volume of services provided), absenteeism, availability of other inputs (drugs, supplies, infrastructure) and quality of services.

Improving health workforce statistics is almost certain to require investments to build sustainable capacity of the Ministry of Health, regulatory bodies/professional councils and training institutions to collect and manage human resource data, analyse them and communicate findings to key decision makers. Institutional capacity of registration authorities and professional councils may also require strengthening.

There are also methodological challenges to confront. First, it is essential to strengthen the metadata that accompany databases. Second, further progress is needed in the standardization of the classification of health workers. The key steps involve further revision of the International Labour Organization's International Standard Classification of Occupations (ISCO) and complementary movements by Ministries of Health and other health organizations towards harmonizing their own classifications of health professions. Third, international standards are needed to permit the reporting of statistics that are comparably disaggregated by other key variables such as geographic location.

At country-level, most ministries of health maintain geographically disaggregated statistics from which can be calculated health worker densities by first (province/ region/ state) or second administrative unit (districts, municipalities). Such statistics could be compiled into a global database to track the ratio of health worker densities in most advantaged versus least advantaged provinces, but there is currently no consensus method on how to obtain comparable estimates of distribution of health workers within countries (see also Equity section). But interest remains in more sophisticated ways of analyzing the geographic distribution (for example, urban vs. rural) and until there is a stronger consensus it will not be possible to use the international database to monitor geographic disparities within countries.

For many countries counts of private sector workers are likely to remain significantly less accurate than the counts of public sector health workers. For this reason, and because private sector health workers are often less accessible to low income populations and because they may

offer services of a different quality than public sector workers, it is best for national and global databases to report health worker statistics by public / private.

Conclusions

- Major investment needed to improve the availability and quality of statistics on health workforce
- Multiple data sources need to be used to obtain a comprehensive picture of the situation in public and private sector in a country; reconciliation of data from different sources should be the basic analytical approach at country and international level
- For purposes of selecting a parsimonious set of health system metrics for comparison between countries and over time, key indicators should include health worker density (stocks per 1,000 population of various types of active health workers) and worker regeneration ratio (the number of various types of health workers graduating each year per member of the active workforce). Some measure of geographic distribution of health workers is essential. Migration statistics on health workers may be useful in some countries.
- Implications:
 - Dashboard: health worker density (health worker total - doctors, nurses, midwives - and broken down; possibly other cadres - public private split if possible); worker generation ratio (key types of health workers)
 - Develop a methodology to provide regular best estimates of health workforce by reconciling data from different sources and promote the method at international and country levels, e.g. in the context of health workforce observatories. In the meantime, suboptimal measures of distribution of health workers should be used to monitor country trends.
 - Promote the investment in essential data collection and analysis efforts needed for monitoring the health workforce, including computerization and linkage of various administrative data including capacity building, population census, and facility census and survey.

Information

Background

The health information system, has four subfunctions, namely data generation, data management (storing, processing, dissemination, communicating and sharing), data analysis and reporting, and data use. In fulfilling its functions, the health information system (HIS) draws upon a number of sub-systems- population-based sources (vital registration system, household surveys and census) and service-based sources (health status records, service provision record and administrative record systems).

Health Metrics Network has developed an assessment tool, linked to the HMN framework, that measures the performance in six components of the health information system: resources, indicators, data sources, data management, information products (statistics) and dissemination &

use.¹⁸ The summary score can be used to monitor the strength and performance of HIS. The emphasis is on self-administration of the standardized assessment tool which may limit the cross country comparability of results. The results are primarily intended to diagnose the strengths and limitations of the health information system and highlight the priority investments that need to be made to strengthen the system and its outputs.

Based on the premise that every death should be counted an assessment of the coverage and quality of the civil registration system can be used to monitor the strength of the health information system. Currently, the World Health Statistics present such data as the sole indicator of HIS, based on the outcome of a WHO/World Bank meeting on health system metrics early 2004. In the World Health Statistics 2006, data could be produced for the majority of countries, assuming that the majority of countries that do not report to WHO do not have a civil registration system that produces vital statistics. Deaths may be registered, especially in urban areas, but without a systematic reporting system and a regular assessment of the quality and adjustment for biases, such data of little value to mortality statistics. A comprehensive assessment of the availability of vital statistics was conducted by WHO a few years ago and not only includes completeness of registration but also an assessment of the quality of cause of death reporting¹⁹. A serious disadvantage of this indicator is that short term changes are not likely. Furthermore, it only captures one source of health information.

There is a need to explore if consensus can be reached on one or two indexes that assess a broader array of information sources but more objectively than the HMN assessment tool, providing measurements that are comparable over time and between countries Two of the six HMN framework components of health information systems are more suitable than others, because they can be measured more objectively: data sources and health statistics (information products). Such an index will not capture the full range of issues related to HIS, although the correlation between the different components of HIS is likely to be high and positive.

Measurement issues

It is proposed to focus on monitoring the implementation of the range of data collection methods that determine the country's ability to produce quality health statistics for key health indicators such as the Millennium Development Goals²⁰. A simple HIS score can be developed and applied to selected countries over time.

In terms of monitoring it would be feasible to simply consider outputs of the HIS: accurate and complete statistics on key indicators such as the MDG health indicators. The availability of empirical data on child mortality, maternal mortality, nutritional status, HIV prevalence, TB control, immunization coverage within the last 3-5 years could form the basis of such an indicator. The availability and quality of the statistics can be assessed using the IMF Data Quality Assessment Framework (DQAF) which has been adapted for health statistics in the HMN assessment tool. Initial application of this method for a range of countries by independent raters

¹⁸ Health Metrics Network. Strengthening country health information systems: Assessment and monitoring tool. Version 1.75. April 23 2006.

¹⁹ Mathers C et al. Bulletin of the WHO.

²⁰ Abou-Zahr C, Stanfield S, Pond B, Boerma T. Monitoring the performance of country health information systems. Paper presented at the meeting. Available from www.healthmetricsnetwork.org.

shows that it is possible, although there is still some room for subjective interpretation of the rating items.

A more objective and preferred approach is based on rating data collection efforts, provided a clear and simple standard is developed to rate against. A HIS summary index score compares the recent implementation of the data sources for the last five years to a standard. The scoring system includes and weights different data sources such as surveys, registration of vital events, census, service records and administrative records. The population-based sources dominate the score, as primary sources of health statistics in the overwhelming majority of low and middle income countries.

Conclusions

- The HMN assessment tool is suitable for comprehensive assessment of the national health information system, serves to initiate a process of HIS strengthening, and provides a basis for a specific ten year plan. It is less suitable for cross-country comparisons.
- To obtain internationally comparable data, a country HIS index score has been developed based on data sources, compared with internationally agreed standards. Such a score can be used for monitoring changes over time. The next step is to fine tune the HIS index score and implement it for a large number of countries, including a 2000 and 2005 score.
- Implications:
 - Dashboard: list the main recent data collection efforts and provide the HIS index score level and trend
 - Methodological work: refine the HIS index score, apply it to a large number of countries with a small team of raters at the international level and evaluate the results.

Service provision

Background

The WHO Health System Strengthening Strategy draft paper (version April 2006) distinguishes between technology and infrastructure ("ensuring access, quality and use of medical products and technologies") and service delivery ("improving organization, management and quality of services"). From the overall health system monitoring perspective it is desirable to combine the two into one, with a focus on service delivery. Inputs such as technology and infrastructure are intended to translate into service availability which can be monitored more accurately. If the purpose of monitoring is to identify gaps and weaknesses in the system, more extensive sets of indicators and data collection efforts are required.

The aim of service provision is to achieve effective coverage (see next section)²¹. The different components of service provision - accessibility, quality, and efficiency - often form a major part of a health systems performance assessment. For instance, a health systems performance assessment in the USA used a score card with five domains that included the domains of access,

²¹ Shengelia B. Monitoring provision and quality of services. Presented at the meeting. Available at www.healthmetricsnetwork.org. See also Shengelia B, Tandon A, Adams O, Murray CJL. Access, utilization, quality and effective coverage: an integrated conceptual framework and measurement strategy. Soc Sci Med 2005, 61: 97-109.

quality and efficiency of services²². The OECD health care quality indicators project focuses on the dimension of quality and three of its components: effectiveness, safety, and responsiveness²³.

Score cards are used to summarize statistics for the different domains of a health systems performance assessment. In Afghanistan, 29 indicators and indexes in six domains (patients and community, staff, capacity for service provision, service provision, financial systems, overall vision) form a score card²⁴. Capacity for service provision included equipment functionality, drug availability, family planning availability, lab functionality, staffing index etc. The domain of service provision itself was mainly focused on monitoring provider-client interaction. Extensive data collection in 2004 and 2005 - facility visits, health worker and community health worker interviews, exit interviews and observation in over 600 health facilities in 30 provinces - was used to show change by province over time, and single out top and bottom performers.

A GIS-based facility census with a focus on the district level (Service Availability Mapping) can be used to monitor the level and distribution of health infrastructure, health workforce, equipment and essential drugs, and key services²⁵. Regular censuses or censuses combined with facility surveys can be used to monitor trends. Facility surveys such as the ORC Macro supported national surveys of 400+ health facilities provide data on quality of care through health inventory, health worker interviews, exit interviews and provider- client observation. A meeting of a working group on facility level data collection was held and agreed upon the basic elements of five indexes to monitor facility capacity: infrastructure, basic equipment, drugs and commodities, infection control, and laboratory capacity.

Measurement issues

The multiple dimensions of service provision require various data collection instruments. Furthermore, analysis is not straightforward. For instance, to obtain an idea of physical access of health facilities one needs the GPS coordinates of the health facilities, recent data on the population distribution by small geographic area as a minimum, and for more precise estimation geographic and logistical characteristics. To accurately estimate travel time to facilities, household surveys may be preferable.

In low income settings an approach that measures the capacity of facilities to provide services is useful as it also provides data to improve services. The capacity indicators are a better indicator of what is not provided than of what is provided, as the availability of infrastructure, human resources, basic equipment, drugs, diagnostics aids and infection control are a necessary condition for the provision of care, but do not guarantee it is being provided. Further work is needed to agree on a core set of items that make up the various indexes.

Further methodological work is also needed to assess what set of indicators can be used best to monitor aspects of quality and efficiency. The majority require sound health facility based statistics. The simplest are hospital beds (or acute care beds) or presence of key medical

²² Ref to website

²³ Kelley E, Hurst J. Health care quality indicators project: conceptual framework paper. OECD Health Working Papers 23. March 2006.

²⁴ Peters D. Measuring and managing health services: the balanced score card. Presented at the meeting. Available at www.healthmetricsnetwork.org.

²⁵ Noriega S, Rubona J. Facility censuses and surveys. Presented at the meeting. Available at www.healthmetricsnetwork.org.

equipment (X-ray machine, MRI etc.). Most indicators require however detailed data related to utilization of hospitals and health facilities, such as bed occupancy rates, length of stay by major diagnostic categories, hospital mortality rates, or after contact with health services, such as medical error rate, or rate of unsafe medical practices, or long-term follow up, such a 5 year survival rates.

Conclusions

- Further work is needed to try to develop a small set of indicators that can be used to monitor service provision in low income countries. In upper middle and high income countries a wide range of measures is used to monitor the various dimensions of service provision, and work on standardization is ongoing.
- A proposed set of summary measures of tracer drug availability, basic equipment, infection control, infrastructure, and minimum standards for specific services (human resources and training, guidelines, drugs, commodities and equipment) needs finalization. The core of these summary measures should be comparable across countries, but within country extensions are important.
- There are multiple methods of data collection to monitor service provision: administrative records, facility records, facility surveys and censuses, exit interviews, and patient provider observation .
- Coverage is an important outcome of service provision, but it cannot completely replace the service provision data as there is only limited set of coverage measures currently available. Furthermore, monitoring service provision by itself may be useful way to assess health systems performance, track progress in the scale up of services, diagnose problem areas, and link to management of services.
- Implications:
 - Dashboard: there are no comparable data for service provision except hospital beds for most low income countries.
 - Need to reach agreement on small set of service capacity summary measures to obtain comparable data, including general and disease specific measures and include these in facility censuses, surveys and facility recording and reporting systems. (building upon the facility working group report)
 - Need to invest in obtaining better hospital statistics to evaluate the provision of care (which will also provide better cause of death statistics).

Coverage of interventions

Background

Coverage can be defined as the percent of people receiving a specific intervention among those who need it. Effective coverage has been defined as the probability that an individual will receive health gain from an intervention if they need it.

The Ministry of Health in Mexico, in collaboration with Harvard, developed an overall measure of health system effective coverage²⁶. There were 13 interventions for which consistent estimates

²⁶ Lozano R. Benchmarking performance of Mexican states using effective coverage. Presented at the meeting. Available at www.healthmetricsnetwork.org. Also paper forthcoming in the Lancet.

of coverage and sometimes effective coverage could be obtained at the state level. Several aggregation options were explored. The first approach applied weights to the specific interventions according to the average health gain it delivers to the population. For instance, skilled birth attendance would get a higher weight than vaccination coverage because the burden of vaccine preventable diseases is already small in Mexico. Alternative approaches include the use of preference of arbitrary weights. A sensitivity analysis showed that it did not make much difference in how the weights are selected: with the health gain method, selecting alternative composite measures using factor analysis and an arbitrary approach by simply giving each indicator equal weight. The composite coverage score was based on data from different sources, primarily a national health examination survey. It provides insights into inequality between states and also showed to what extent increasing health expenditure is likely to improve effective coverage in Mexico and to what extent increased efficiency can lead to higher levels of coverage at the same expenditure level.

Co-coverage score can also be obtained by combining a number of interventions received by the same individual. Victora et al. (2005) developed a co-coverage score of preventive interventions for children aged 1-4 years and applied it to nine DHS surveys²⁷. The co-coverage score for children includes eight preventive interventions: immunization (BCG, DPT3, measles), tetanus toxoid to the mother (at least two doses), vitamin A supplementation (in last 6 months), antenatal care (at least 4 visits), skilled birth attendance, and access to safe water. The summary measures used are median coverage of interventions, receipt of at least three interventions, receipt of at least six interventions, Q5/Q1 ratio and concentration index. The aim is to make this analysis part of tracking country progress in the child survival countdown to 2015²⁸.

To obtain a similar co-coverage index for adults or to capture a broad array of health interventions will be difficult. A composite coverage index can be developed from aggregate health statistics, as was done in the case of Mexico. Only a limited number of health interventions have regular statistics that can be used²⁹. A small set such as immunization coverage (DPT3), skilled birth attendant, contraceptive prevalence rate, access to safe water and sanitary facilities, TB detection rate and treatment success rate was used to explore the results and the association of the coverage index with health inputs (per capita health expenditure, health worker density) and outcomes (life expectancy, child mortality).

Measurement issues

Effective coverage is the desirable measure, but requires considerable investments in data collection, especially health examination surveys and to a lesser extent good quality facility statistics, and substantial analytical expertise.

A co-coverage score for individual children is feasible for DHS and MICS surveys and should be routinely computed and reported to assess trends over time. As a health system metric however the utility of co-coverage is limited, as it does not include curative and non-child interventions.

²⁷ Victora C et al. Co-coverage of preventive interventions and implications for child survival strategies: evidence from national surveys. *Lancet* 2005, 366:1460-66.

²⁸ Bryce J et al. Tracking intervention coverage for child survival. *Lancet* 2006, 368: 1067- 76.

²⁹ Boerma T. Co-coverage of interventions: a useful index to monitor systems strength? Presented at the meeting. Available at www.healthmetricsnetwork.org.

A composite coverage measure is an attractive option, especially if it can be built on existing data collection and analysis efforts. A major limitation is that no data are available for a broader array of health interventions that a health system should deliver, notably those against chronic conditions. An alternative approach would be to rank the 20 most effective interventions and aim to obtain coverage measures for those. The actual top interventions may differ from country to country. It may also be good to include a general hospital mortality statistic (such as perinatal mortality in Mexico), if only because hospitals consume so much of the national health budget.

Investments need to be made to obtain more frequent data on coverage, especially during the scale-up. This implies more frequent coverage surveys, either national or local surveys, using new technology to improve the quality of local surveys and enhance their efficiency. The annual demand for information implies that household surveys cannot be the sole supplier of health information. Service records will be an important additional source. The key approach is a systematic approach to quality control which includes careful analysis of the quality of the data and adjustments, sentinel sites to gauge the quality of reporting by all facilities and to collect additional information, and systematic calibration of coverage data generated by the facilities with survey data.

Conclusions

- Effective coverage, co-coverage, and a composite coverage index all have potential to be useful metrics for health systems performance monitoring.
- Data availability is the main bottleneck and systematic investments in regular surveys (health examination surveys, national and local coverage surveys) are needed. In addition, improving the quality of health facility data on services provided could lead to better trend analysis, if used in combination with population-based data to calculate coverage.
- Implications:
 - Dashboard: compute co-coverage for childhood interventions for all countries with DHS and other surveys to assess trends
 - Dashboard: further develop composite coverage index from available aggregate data but do not neglect the lack of data on non-communicable disease interventions.
 - Promote effective coverage studies in countries as part of health systems performance assessment
 - Promote investment in coverage surveys and improved health facility recording and reporting systems

Subnational assessments and efficiency analysis

Background

A few countries have recently performed subnational health systems performance assessments. The Mexico effective coverage study summarized all coverage data into a single measure and plotted coverage by total health expenditure at the state level, providing insights into the efficiency of health systems at the state level.

Attainment is a function of the level of resources available and the efficiency with which resources are used. Efficiency can be defined in different ways. Economic efficiency the outputs

actually achieved compared to the maximum possible outputs for a given input. Measured inefficiency can be due to technical inefficiency (in use of technology, personnel and material resources) or allocative inefficiency (choosing the wrong mix of outputs).

Ways to measure health systems efficiency have been proposed and require the measurement of a set of inputs to the overall health system goal which are compared with the outputs (overall goal attainment)³⁰. A subnational health systems performance assessment in Indonesia used an input index consisting of permanent income, female education, nurses per 100,000 population, out-of-pocket expenditure, and access to health facilities (measured by ambulatory care utilization)³¹. An output index was constructed from immunization coverage (complete), skilled birth attendance, iodized salt content, catastrophic expenditure, and life expectancy.

A review of country experiences with health systems performance assessment indicates that several countries have implemented components of an assessment³². There are however many constraints including lack of coherence between country and external demands, data limitations, lack of analytical capacity, lack of coherence between system-wide and vertical programme assessment. Subnational assessments have been hampered by lack of data availability, while the comparisons between districts or provinces have received mixed reviews in countries.

Measurement issues

The World Health Survey is a global effort to improve data availability for health systems performance assessment, including subnational analyses³³. It includes modules on coverage of interventions for chronic diseases, responsiveness, health expenditure and health status. Malaysia implemented the World Health Survey in 2002 and is publishing a series of four volumes with results³⁴. On the positive side, the Malaysia survey succeeded in throwing light on several aspects of the health system which have drawn the attention of policy makers, e.g. related to responsiveness. On the negative side, the survey costs were considered to be high - in terms of staff time, survey complexity, and money.

Health service statistics are also used for subnational analysis. In South Africa, Health Systems Trust has developed a Health Barometer which includes a small set of indicators almost entirely derived from the District Health Information System (DHIS)³⁵. In many cases the DHIS appears to generate data of sufficient quality. In other cases investments are needed to improve the use of population-based data on e.g. coverage and health outcomes (e.g. civil registration data).

³⁰ Evans DB, Murray CJL, Tandon A. Health system efficiency: time, attribution and multiple indicators. Chapter 52 in WHO Health systems performance book: 699-703.

³¹ Soeharsono S. Indonesia subnational health system performance assessment report. Presented at the meeting. Available at www.healthmetricsnetwork.org. Tandon A. Measurement issues regarding estimation of subnational health system efficiency. Presented at the meeting. Available at www.healthmetricsnetwork.org.

³² Balabanova D et al. Monitoring health systems performance. Synthesis of some experiences from low-income countries. Presented at the meeting. Available at www.healthmetricsnetwork.org.

³³ Chatterji S. World Health Survey. Presented at the meeting. Available at www.healthmetricsnetwork.org.

³⁴ Abu Bakr A. Contribution of survey to health systems performance assessment: experience with the World Health Survey- the Malaysian experience. Presented at the meeting. Available at www.healthmetricsnetwork.org.

³⁵ Monticelli F. South Africa's District Health Barometer. Presented at the meeting. Available at www.healthmetricsnetwork.org.

From the comparability perspective, it would be useful to reach agreement on a small set of measures that are used in efficiency analysis to measure input and output of the health system. A set of effective coverage measures, or coverage measures if there is limited information, could be the most useful output. Inputs could be limited to health system inputs, notably funds and human resources (and perhaps a meaningful measure of infrastructure).

Conclusions

- Subnational assessments are generally considered a useful in-country instrument to assess health systems performance.
- Data availability is a major challenge. Only very large household surveys will be able to provide the required estimates at the subnational level. Health service statistics may add relevant data, but have their limitations.
- Further methodological work is also still needed, including the development a tools to facilitate local use, as current methods are complex.
- Implications:
 - Dashboard: no specific measures proposed.
 - Investments are needed develop comprehensible tools and methods for country use.
 - Household surveys are the core source of information and investments need to be made to better coordinate international investments and country health survey programmes.

Equity

Background

There are several dimensions of equity that need to be monitored as part of health system performance monitoring. This includes distribution of resources, e.g. health workers with the country and between rural and urban populations, resource allocation, and service provision. Fairness in financing is an equity measure itself. Also coverage will have a distributional component. The geographic distribution of health inputs and outputs is of special interest and was the focus of the meeting's discussions on monitoring equity.

Measurement issues

Based on an analysis of the distribution of the health workforce within countries it was shown that it is challenging to develop a measure that allows comparisons over time and between populations if the number of units change³⁶. This may occur within a country if for instance the number of districts increases because of an administrative reform, as the value of most inequality measures changes if larger or smaller groupings of a population are chosen - inequalities are more accentuated when described across smaller geographical divisions. This problem is called the scale or areal aggregation problem in a spatial inequality study. An alternative approach would

³⁶ Speybroeck N., Goovaerts P., Ebener S., Sousa A., Paraje G., Evans D.B., Prasad A. Human Resources for Health Inequalities : Measurement Issues. Presented by Evans D t the meeting. Available at www.healthmetricsnetwork.org.

be to measure inequality against a benchmark (i.e. an "optimal" number of health workers per inhabitant within a country, for example).

A judgement must be made about whether policy should be concerned with inter-individual differences, or differences compared to some standard or norm. A proposed alternative method of adjustment for the number of units would be to use information on two levels of administrative units, e.g. province and districts. This needs further work.

Descriptive measures such as proportion of doctors in the country who are working in the capital city may also be used to describe inequality, although these only capture the upper end of the distribution.

Conclusions

- Comparative measures of inequality are hampered by analytical problems for e.g. human resource distribution. Further methodological work is needed.
- Dashboard: in the absence of a perfect measure it would still be important to present measures on the distribution of health inputs (e.g. health workers) and outputs (e.g. service coverage) for a country, right from the start. These measures can be replaced with other equity metrics once they become available.

List of participants

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ANNEX B - Agenda

Thursday, Sep 28

Session 1 Setting the stage

9:00	Welcome and introductions Demand for health system metrics	Sally Stansfield, HMN Abdallah Bchir, GAVI; Daniel Low -Beer, GFATM Ties Boerma, WHO
	Overview and expected outcome of the meeting (<i>Doc 1.1 and 1.2</i>)	
10:00	Coffee break	

Session 2 Core components of health system dashboard

	2.1 Financing	
10:30	Monitoring health financing changes: key indicators and measurement strategies (<i>Doc 2.1</i>) Discussion	David Evans, WHO
	2.2 Human resources	
11:00	Proposed system for monitoring human resources (<i>Doc 2.2a and 2.2b</i>) Equity measures in human resource monitoring (<i>Doc 2.2c</i>) Discussion	Bob Pond, HMN Niko Speybroeck David Evans, WHO
	2.3 Information	
12:00	An index for health information systems performance assessment (<i>Doc 2.3</i>) Discussion	Sally Stansfield, HMN
12:30	Lunch break	

Session 2 Core components of the dashboard (continued)

	2.4 Governance / leadership / stewardship	
14:00	Assessment of stewardship function in countries - country applications (<i>Doc 2.4a</i>) Extending the CPIA to health (<i>Doc 2.4b Doc 2.4c</i>) Discussion	Sameen Siddiqi, EMRO Ed Bos, World Bank and David Peters, JHU
	2.5 Service provision	
14:45	Monitoring provision and quality of services (<i>Doc 2.5a 2.5b</i>) Facility censuses and surveys (<i>Doc 2.5c</i>) Use of a score card (<i>slides</i>) Discussion	Bakhuti Shengelia, EURO Shanthi Noriega, HMN Josibert Rubona, MOH, Tanzania David Peters, JHU / WB
16:00	Coffee break	
	2.6 Coverage of interventions	
16:30	Effective coverage of the health system in Mexico Co-coverage as an index for the dashboard (<i>Doc 2.6a</i>)	Rafael Lozano, MOH, Mexico Ties Boerma, WHO
17:30	End of day 1	

Friday, Sep 29

Session 4 From dashboard to health systems performance assessment (Doc 4.0a and 4.0b)

SSi

8:30	Contribution of surveys to health systems performance monitoring: experience with the WHS (Doc 4.1)	Somnath Chatterji, WHO
8:45	The World Health Survey and health systems performance assessment in Malaysia	Azman Abu Baker, Ministry of Health
9:00	District health barometer in South Africa	Fiorenza Monticelli, Health Systems Trust
9:15	Discussion	

Session 4 From dashboard to health systems performance assessment (continued)

DE

10:00	Coffee break	
10:30	Country practices in health systems performance assessment (Doc 4.2)	Dina Balabanova, Richard Coker (LSHTM)
10:45	Efficiency analyses: the Indonesia subnational assessment (Doc 4.3 and 4.4)	Suharsono Sumoemantri, Ministry of Health, Indonesia, and Ajay Tandon, Asia Development Bank
11:00	Health systems performance assessment - issues and way forward Discussion	Chris Murray, Harvard Institute for Global Health
12:00	Lunch	

Session 3 Finalizing the dashboard components

DdS

13:30	Introduction group work	
	Group work on components: Contents for the dashboard; strategies for data collection and analysis; methodological work	All participants in five groups
15:00	Plenary	
16:00	Closure	