

Toward Collective Action in Health Information

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Globally, 9 percent of total gross national income is spent in the health sector. Donor agencies transfer US\$16 billion for health programs in developing countries each year.¹ These figures represent an unprecedented increase in funding for health, and as a result, the global health landscape is unrecognizable from a decade ago. The Millennium Development Goals (MDGs) have revitalized interest in global health issues, and the influx of new money and multiple stakeholders has opened the way to innovative structures, networks, partnerships, and alliances beyond traditional health and development models.

This attention is accompanied by greater demand for more and better information to track performance and ensure accountability. There is growing global interest in health information, particularly in metrics and evaluation, as exemplified by the MDGs and such major global health initiatives as performance-based financing. This unprecedented interest has increased the pressure on countries and agencies to generate high-quality and timely data.²

As one of the most influential entities in the global health arena, the G8 has an important role in tackling the deficiencies in the systems that are expected to generate this information. At the Toyako G8 Summit, the *Report of the G8 Health Experts Group* recognized the need for action to create appropriate

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monitoring and assessment of health systems so that policymakers could base their decisions on accurate health information.³

This chapter briefly reviews the current status of health metrics and evaluation in the context of health system strengthening and describes the role of the G8. We identify key challenges in this field and propose the development of a standard set of health metrics, accompanied by a measurement strategy, to monitor, evaluate, and facilitate the effective use of resources in global health. We conclude that collective action is required to promote the generation and use of sound health information, particularly at the country level, and to realize the G8's commitment to more accountability for the resources that are being invested in improving national health systems.

THE CASE FOR BETTER HEALTH INFORMATION

During the past decade, health systems have become a prominent agenda item in global health, reflected in the World Health Organization's (WHO) *World Health Report 2000*; initiatives such as the International Health Partnership (UK), Women and Children First (Norway), the Catalytic Initiative to Save a Million Lives (Canada); efforts to advance social protection for health (Germany and France); and the Toyako G8 Summit and follow-up activities (Japan).⁴

However, without sound measurements to benchmark achievements and efficiency of resource use, debates on priorities for health and what does or does not work tend to be based more on ideology than on evidence.⁵ The higher profile of health systems and the rapidly escalating demand for more progress and accountability in global health have exposed major gaps in the supply and use of health statistics for developing countries.

Health is one of the fundamental components of human security and development.⁶ Effective health governance—the ability of national governments and the international development community to meet the health needs of the peoples of the world—requires laws, development, partnerships, and evidence.⁷

Health information contributes to all four of these functions at the global and national levels. The evidence function of health governance relies on the capacity to count, and account for, births, deaths, and causes of death. Counting everyone can also safeguard individual rights related to survival, livelihood, and dignity. While strengthening health information is essentially a national matter, the provision and accuracy of this information also has global implications insofar as it contributes to human security and development. Development

efforts in health and human security converge around the critical need for better information.

Health information can also serve other purposes: first, to sustain interest in, and funding for, global health by demonstrating positive results; second, to enhance efficiency by building a solid knowledge base of what works, thus generating a process of shared learning among countries; third, to improve the quality of decision making by providing sound evidence; fourth, to foster interdisciplinary dialogue by bringing together various areas of enquiry; and fifth, to promote the values of transparency and accountability as essential ingredients of democratic governance both nationally and globally.⁸

Health agencies and countries are actually generating increasing amounts of data.⁹ Such data, however, do not necessarily provide comprehensive information for users, nor do they answer critical questions posed by the global health community. The lack of effective and efficient health monitoring and evaluation can be attributed to the following six factors.

First, the quantity and quality of data relevant for monitoring progress and assessing health systems is poor and has suffered from considerable underinvestment in the past decade.¹⁰ Second, the efforts for correcting the scarcity of data have led to proliferation of indicators, inconsistent frameworks, and fragmented activities among stakeholders.¹¹ Third, work is duplicated across agencies, and these agencies compete to fill the same gaps rather than maximizing their comparative advantages.¹² Fourth, progress toward making data openly accessible remains slow.¹³ As an example, at the midpoint of the efforts toward achieving the MDGs, there is no publicly accessible complete database with primary data on child mortality, the indicator for MDG 4.¹⁴ Fifth, there is an obvious trade-off between country ownership, which was a core component of the Paris Declaration,¹⁵ and independent evaluations. In particular, despite a growing trend toward performance-based disbursement, agencies are still vulnerable to political pressure from recipient countries.¹⁶ Finally, many countries lack both the incentives and capacity to collect, share, analyze, and interpret better quality data.¹⁷

HEALTH SYSTEM STRENGTHENING AND HEALTH INFORMATION

Global efforts to improve health conditions in poor countries have employed two distinct strategies in recent decades, one focusing on health systems and the other on specific diseases. The first strategy has emphasized

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principle-based approaches to health improvement. In the late 1970s, the world embarked on a major effort to strengthen health systems, through the primary healthcare movement. The second strategy has emphasized disease-specific approaches, exemplified by the formation of disease control programs and funding mechanisms such as the Global Alliance for Vaccines and Immunization (GAVI) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund).

Currently, a consensus is emerging that the health problems of low- and middle-income countries can only be addressed with a more balanced approach between disease-specific and system-based solutions. While the government of Japan supported a strong vertical approach for three major communicable diseases in 2000 at the Kyusyu-Okinawa G8 Summit,¹⁸ eight years later, the Toyako G8 Summit statement on health includes commitments to both achieving MDGs 4, 5, and 6 and strengthening health systems.¹⁹

The Health 8 (H8), an informal group of eight major health-related organizations (the WHO, UNICEF, the UN Population Fund, UNAIDS, the Global Fund, GAVI, the Bill & Melinda Gates Foundation, and the World Bank), is now advocating for scaling up of high-impact interventions needed to reach these goals. The International Health Partnership and Related Initiatives (IHP+), brings the H8, the African Development Bank, the Organisation for Economic Co-operation and Development, the European Commission, 14 countries, and 12 donor agencies together to advocate for strong donor coordination and country ownership, with an emphasis on meeting the health-related MDGs and on general health system strengthening.

But tension persists between the disease-specific programs and health system strengthening. In particular, there is limited evidence that disease-specific programs have contributed to strengthening health systems. Previous attempts to achieve strong donor coordination (e.g., poverty reduction strategies and sector-wide approaches) have not been shown to help improve health system performance.²⁰

The challenge with such coordinated efforts for strengthening health systems is carefully monitoring how the country's plan is developed since no metrics have been developed to assess the impact of donor coordination. Efforts must be made to measure the extent to which donor coordination truly leads to improved health system performance.

Health information underpins the health system

Among the six core pillars of health systems proposed by the WHO,²¹ health information underpins the entire health system, including health system inputs (workforce, financing), process, outputs (effective coverage), and impacts (health outcomes) (table 1). Health information also strengthens stewardship functions.²²

Table 1: Indicators for assessing health system performance²³

- A. Health system inputs and process measures:** These refer to resources invested in the health system and activities introduced to achieve program goals. Indicators in this category track the following:
1. Human resources, such as measures of health personnel per 1,000 people, number of personnel completing training per year, new recruits, attrition rates, etc.
 2. Infrastructure and equipment, such as complete inventories of buildings and available technological and laboratory equipment
 3. Drug supply, including the types and quantities of drugs available in the area of intervention and broken down by district/sub-area (where relevant)
 4. Operational measures, including how many hours per day and how many days per week the facilities are providing services, measures of the management of the referral system, etc.
 5. Program activities, such as number and type of community outreach programs, educational materials and workshops for the population, etc.
- B. Program output measures:** These are measures of the direct output of the health system; they can change in a very short period of time, and any change in them can be directly attributed to the health system. Therefore, they can be used for monitoring progress throughout the implementation of the program, identifying areas of weakness in the program, and evaluating the impact of the program.
1. Coverage: For the set of interventions that are being delivered through a program, coverage is defined as the proportion of the population receiving an intervention out of all those in need of the intervention. In other words, it measures the number of people who received an intervention (the numerator) out of the universe in need of the intervention (denominator). Coverage is measured separately for each intervention and then aggregated into a composite measure of health system coverage.
 2. Effective coverage: Effective coverage takes into consideration the quality of the intervention being delivered. Quality ranges from zero to one; if the individual receiving the intervention gets the maximum health gain from it then quality equals one. If an intervention is being delivered but it results in no health gain to an individual, then quality equals zero. Measures of

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effective coverage are important to monitor as they track both the population receiving interventions and the quality of the interventions being delivered.

C. Health outcome (impact) measures: This refers to the three main goals of a health system, namely improved health, fairness in financial contribution, and responsiveness, but the primary focus is the population health outcomes.

1. Population health outcomes: Improving the health of the target population is the defining goal of a healthcare program. Metrics for measuring population health include the following:
 - a. Child mortality: Under-1 and under-5 mortality
 - b. Adult mortality: Age- and sex-specific mortality rates, as well as a summary measure of adult mortality such as $45q15$, i.e. the probability of dying between the ages of 15 and 59.
 - c. Causes of death: Numbers of deaths attributable to the major causes. The list of major causes might vary slightly across countries but will likely have significant overlap. The composition of the leading causes of death for children and adults should be monitored as useful input into the epidemiologic profile of the population.
 - d. Disease-specific health outcomes and risk factors: These should be decided on separately for each program, depending on the composition of the package of services being delivered.
2. Health expenditure: This is measured in terms of catastrophic health spending and out-of-pocket expenditure. Indicators include total amount of health expenditure from all sources, amount of out-of-pocket health expenditure, and the proportion of households that spend more than 30 percent of their disposable income on health.
3. Responsiveness: Responsiveness captures the non-medical aspects of the interaction between a patient and the health system. Indicators of the responsiveness of health systems are critical to measure during the implementation of a new system of delivering health care.
 - a. Quality of care, including the cleanliness of the facilities, the quality and cleanliness of the patient beds, the availability of food during inpatient stay, patient satisfaction, etc.
 - b. Promptness of care/waiting time, such as average waiting times in facilities and average waiting times to get specialized care, when needed.
 - c. Access to social networks (mostly for inpatient care), such as whether patients are able to have their family members and other members of their social network visit during their hospital stay.
 - d. Communication between providers and patients, such as whether diagnoses are effectively communicated to the patient and whether the patient understands what they are supposed to do upon leaving the facility in terms of taking medication, follow-up visits, etc.

Thus, any global health actions, whether vertical or horizontal, need to be matched by an increase in quality and quantity of health information

and guided by a standard set of health metrics and evaluation methods if they are to have an appreciable (and measurable) effect on health system performance. **Generating this information is a great challenge for the horizontal approach** as metrics for assessing health system performance require a range of health information, including the dimensions of health worker training, basic health infrastructure, procurement and distribution of reliable supplies of essential medicines, and sustainable in-country health financing and risk-pooling mechanisms.

Information on the entire health system is required to evaluate the impact of health workforce retention and task-shifting policies in sub-Saharan Africa and to test whether performance-based financing, long-term predictable funding, or a mixture of the two would have more impact on health.²⁴ Without timely and high-quality information, the global community cannot tell whether any health policies are having the intended impact. For example, without adjusted estimates from household surveys, we will not know when or if the MDG 4 target is achieved at country, regional, or global levels.²⁵

The political and financial attention now being paid to global health has not been matched by improved information on the performance of health systems and new health programs. This shortfall in knowledge is hampering efforts to create a favorable environment for investments in health. Worst of all, the evidence gap is harming work to improve the health of the most vulnerable populations in the world, who are often identified as the intended beneficiaries of disease-specific initiatives such as GAVI and the Global Fund.²⁶

Major functions in health information

Key functions in health information are performed by various stakeholders.²⁷ Such functions—at global, national, and subnational levels, involving government, academic, and civil society actors—include 1) data collection and compilation, 2) monitoring and evaluation processes, and 3) systematic assessment of evidence on health systems and meta-analysis of health interventions (fig. 1). The latter two steps produce necessary—but not necessarily sufficient—inputs to policy formulation.

At the global level, UN technical agencies have a key role in setting norms and standards for data collection and compilation in countries. For example, the WHO produces the *International Statistical Classification of Diseases and Related Health Problems* and the *International Form of Medical Certificate of Cause of Death*.²⁸

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At national and subnational levels, health information derives from data sources that are either population based, such as censuses, surveys, and civil registration, or facility based, such as facility censuses, health service records, and administrative records.²⁹ In many countries, a tension exists between the need to obtain valid and reliable data, often at high cost, and the need for timely local information. In practice, periodic surveys are often used to provide national measurements, whereas local decision makers have to rely on periodic or continuous collection of administrative records.

New methods are needed to improve the validity and reliability of timely local measurements at a reasonable cost, including the use of lower-cost sampling methods with larger design effects, record links between surveys and administrative systems allowing estimation of selection bias in administrative systems, and Bayesian methods for local-area estimation.³⁰

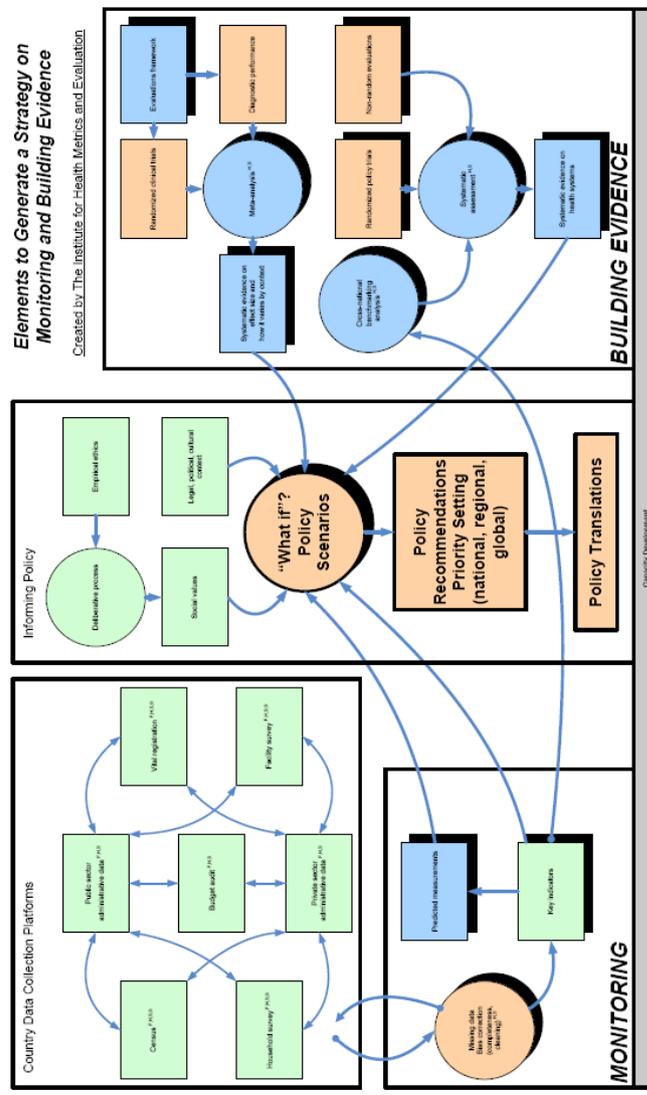
Biased data are of limited use in planning and strategic decision making, program implementation, monitoring of progress toward targets, and assessment of what works and what does not. One of the major functions in country and global health information activities is therefore to derive statistics that are corrected for known sources of bias so that figures are comparable over time and across sites or countries.³¹

The systematic evaluation of health systems and interventions is particularly important to health policy at the national level. Such evaluations can be done by randomized assignment of intervention and control areas or through various non-randomized study designs.³² Multi-country studies of health system performance are critical to understanding why a certain policy works in one country but not in another.

An often-neglected step in the health information cycle is translating the evidence into policy dialogue and specifying the actions needed to make an impact. The health information products need to be easy to use and designed to meet the immediate and strategic needs of decision makers. This in turn will enhance the awareness of decision makers at all levels of the importance of using reliable health information in their policymaking.

The current flow of health information is often in one direction, from communities to central governments or from countries to international agencies, and there is some concern that there will be further distancing of capacities from local data producers when data gathering and compilation happen at a higher level. In fact, quite a few developing countries are using estimates generated by international agencies to track progress on the MDGs without knowing where such figures come from,³³ and there is a risk that they may not develop their capacities to collect and analyze better quality data. The health

Figure 1



(Source: Institute for Health Metrics and Evaluation, unpublished)

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information cycle, therefore, needs to bring the information back to countries and data collectors. The ultimate goal of the global health metrics community is to develop local capacity to collect high-quality data, monitor and evaluate health programs and systems, and inform policy.

THE G8'S UNIQUE ROLE IN GLOBAL HEALTH

The G8 countries account for 48 percent of the global economy and provide roughly 75 percent of the world's development assistance. Although the G8 lacks a constitutive intergovernmental agreement and a secretariat, since 1996 the G8's annual summit and periodic ministerial meetings have emerged as an important forum for global health policy.³⁴ The G8 is unique in the global health arena: it is a small, collective decision-making forum, with a relatively new interest in population health in developing countries and a substantive influence on the directions and policies of international agencies.

The G8 initially made commitments to support the WHO and the broader UN system in raising the money these agencies needed but were unable to attract on their own.³⁵ The G8 then found it necessary to launch its own initiatives and started in 2001 by agreeing on the establishment of the Global Fund, followed by the Africa Action Plan (2001–2002), the Health Action Plan (2003), a focus on HIV/AIDS (2006), and most recently the Toyako Framework for Action on Global Health (2008). The Toyako Framework was the first attempt to promote the health-related MDGs through health system strengthening,³⁶ consistent with the recent directions proposed by the IHP+ and other global campaigns.

Until recently, the G8 has been silent about the need for accountability in the field of global health.³⁷ At the Toyako Summit, however, the *Report of the G8 Health Experts Group* explicitly stated the need for “appropriate monitoring and evaluation of health systems” and pointed out that policymakers need to be able “to base their decisions on accurate health information.”³⁸

G8 leaders have demonstrated their capacity to deliver an alternative to existing multilateral organizations through such initiatives as the establishment of the Global Fund.³⁹ In addition to the policy and resource commitments the G8 leaders make, their annual summits create value by establishing new principles in normative work, by highlighting new issues, and by altering public discourse on these issues.⁴⁰ The G8 also has an unparalleled capacity to link health with broader development and security issues. The G8 can also facilitate dialogue between public and private sectors, mobilizing intellectual, human, and financial

resources from government, business, and civil society active in global health at both the global and country levels.⁴¹

What should the G8 do in global health information?

In the health information arena, the G8 has the capacity to effectively catalyze action on a set of issues that the existing entities—including the H8, academics, civil society, individual donors, and bilateral aid agencies—cannot tackle effectively in isolation. The G8 should not replicate what a single country or agency can do but focus on the issues for which collective action works most effectively. It should define effective and efficient functions for the global health information architecture.

Several UN agencies have mandates and experience in assisting countries to develop their health information systems. Yet, in the case of the WHO at least, arguably little progress has been achieved in guiding the development of these systems over the past few decades,⁴² and some countries have even witnessed declining coverage and completeness of vital event registration. While the WHO has established and disseminated some crucial standards for data collection, it has not effectively supported the widespread implementation of these standards by countries. Nor have the UN and its agencies been successful in building the capacity that countries require for data analysis close to the point of capture.⁴³

The Health Metrics Network has provided small grants to 65 countries⁴⁴ for health information assessments but can only afford an in-depth focus for 6. While these decisions are a combination of explicit strategy and limited resources, the latter often determines a lack of flexibility among the institutions involved. Ensuring a more effective response to countries' needs for expertise and assistance with health information system development is a role that the G8 could play.

Jamison and colleagues propose a framework for defining essential functions of international organizations (See table 2). The first type of essential function transcends the sovereignty of any one nation-state and therefore makes up the core of international health cooperation. These functions address problems of the global commons, in which individual decisions based on property rights are made ineffective by the fact that use of resources cannot be contained within national boundaries.

This is the case with both global public goods, when use by any one country producing them does not preclude use by other countries, and negative

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externalities, when behavior in one country causes danger and financial cost to another. Since they cross national borders, problems of the global commons are shared by rich and poor countries alike. The two core functions to address these problems are the promotion of international public goods and the surveillance and control of negative externalities.

The second type of essential function deals with problems within individual countries that may warrant collective action at an international level owing to the shortcomings of national systems; because they supplement activities that are primarily the responsibility of nation states, these functions are supportive.

The emphasis given to these two essential functions needs to be balanced carefully. In the area of health information, initial collective action can concentrate on the first essential function by developing a global database and setting standards to improve comparability of data, followed by capacity building at country level.

The G8 is uniquely capable of arbitrating the functions and roles of the existing components of the global architecture in health information. Its convening power can be used to revamp existing mechanisms, consolidate fragmented activities, and leverage outputs. In particular, through the G8 follow-up process, governments and agencies need to be encouraged to 1) strengthen existing initiatives to conduct monitoring and evaluations efficiently, 2) generate and share rigorous evidence, 3) synthesize studies, 4) build capacity in developing countries, and 5) link researchers, policymakers, and project managers in an effective health information system for using evidence for policy.⁴⁶

Table 2: Essential objectives and functions of international organizations⁴⁵

Basic objectives	Core functions and examples	Rationale
Assure adequate levels of goods with benefits to all countries	Promotion of global public goods Databases Norms and standards Research and development Consensus building on health policy	Collective action is an economically rational approach to provision of public goods from which all can benefit, and international collective action responds to opportunities, benefits of which cover many nations.
Assure opportune response to global threats and control of international transfer of health risks	Intervention to deal with international externalities Threats specified under the WHO's International Health Regulations Transfer of risk factors Trade in legal and illegal harmful substances	If actions in individual countries have consequences for other countries, leaving decision making to countries will fail to include all costs or benefits.

Supplementary objectives	Supportive functions	Rationale
Support development in countries	Technical cooperation and development financing Capacity building Capacity strengthening	According to special needs, some countries require targeted investments in knowledge and financial resources to enhance conditions for sustainable development.
Protect health of vulnerable groups	Agency for dispossessed The poor Special groups	Ethical imperative to protect people when their governments fail or when their human rights are violated; in self-interest of every nation/state to prevent and resolve humanitarian crises.

KEY CHALLENGES AND STRATEGIES IN HEALTH INFORMATION

The amount of data available from agencies and countries is rapidly increasing.⁴⁷ However, such data do not yet permit reliable monitoring of the trends of both communicable and noncommunicable disease burdens, evaluation of the impact of health initiatives and investments, or a comparable assessment of the performance of health systems. We do not know whether well-intentioned programs do more good than harm until sound evidence is provided.⁴⁸

There are two major sources for this problem in the field of health information:

1. Existing data are neither accessible nor presented in a coherent way (a problem of technical inefficiency); and
2. Data, very often with limited utility, are collected and compiled in an uncoordinated fashion, hence at higher marginal costs (a problem of allocative inefficiency).

The correction of such inefficiencies across agencies, institutions, and countries will make global health metrics more useful and reliable and leverage the comparative advantage of each stakeholder. The biggest challenge facing the global health community is developing the local capacity needed to collect, share, and analyze the high-quality data that are required to guide the ongoing reform of health systems.

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Technical inefficiency

Data availability is the key in monitoring progress toward targets and evaluating the performance of health systems and programs. Many consumers of statistics overlook this fact because numbers—such as those representing progress toward the health-related MDGs—continue to be published annually, and the assumption is that these represent meaningful data.⁴⁹ Both governmental and academic consumers of these reports are hampered in their attempts to understand or replicate such estimates because they do not have access to the data from which these were derived.

There are three prominent factors that contribute to technical inefficiency in data collection and compilation: 1) the lack of a common database, 2) the lack of standardized metrics and data quality assurance, and 3) the lack of capacity and incentives to share data.

LACK OF A COMMON DATABASE: As a general principle, common formats, definitions, and standards should be used to collect, compile, and store health information from countries. However, not all countries have achieved—nor are they likely to in the near future—best international practice in this area. However, there can be considerable information content and value in non-standard data sets (e.g., verbal autopsy-derived data on causes of death). Provided these data are well documented and understood, they should be made more widely available for comparative analyses and included along with more standardized compilations.

At a minimum, a common database should include all currently available data and their metadata, with detailed documentation specifying whether data are crude, adjusted, or projected statistics and including a link to the original dataset.⁵⁰

For example, child mortality, the indicator for MDG 4, is one of a few health-related MDG indicators with good data available from a number of sources. These sources include complete and partial vital registration systems for some countries, Demographic and Health Surveys (DHS) and similar surveys, census questions on the number of children ever born and the number surviving, and sample registration systems. Some efforts have been made to put all data sources used for tracking child mortality in the public domain and harmonize the work of defining past trends and generating current estimates.⁵¹

Despite a major debate over the completeness of child mortality databases,⁵² each institution still maintains an independent and incomplete dataset of child mortality. Some of these are in the public domain and others are not, and

there are quite a few data sources for child mortality that are missing from international databases.⁵³

The WHO has two binding rules that ensure its legitimacy in collecting global health information. The first World Health Assembly in 1948 adopted nomenclature regulations for diseases and causes of death,⁵⁴ and the International Sanitary Regulations—adopted in 1951 and revised and consolidated as the International Health Regulations in 1969, 1973, 1981, and 2005—provide the organization with its disease surveillance mandate.⁵⁵

However, data compiled by the WHO are often dependent on official reporting from countries, and it is not uncommon that the latest national data are not forwarded to the WHO.⁵⁶ For example, although the Register General of India has annually published its reports on medically certified causes of death since 1973, the WHO Mortality Database contains no data on India since 2001. The WHO has not received data from China since 2000. In other words, the two most populous countries in the world are not sending their latest mortality data to the WHO,⁵⁷ despite reports being shared with academics and other agencies through their collaborative activities. Better data on interventions' effective coverage, risk factors, and health system variables need to rely on household surveys and administrative records implemented independently by different agencies and countries.

Therefore, the global health community has not yet been able to use all existing data to assess progress toward MDG 4. If all global policy-relevant health data—particularly those related to MDGs 4, 5, and 6, and health systems—were available in a common database, independent analysis and synthesis would be possible at both the country and global levels.

As more data become available for users outside traditional health agencies through advances and investments in information technology, strategic collective action is needed in data compilation, building upon the principles of country ownership of data. **Existing entities need to strengthen and clarify their functions,** and a common data architecture needs to be developed.

LACK OF A STANDARD SET OF METRICS AND DATA QUALITY ASSURANCE: When developing health information systems, it is essential to determine what exactly to measure and how frequently and most efficiently to do so, recognizing that countries differ in their information needs and priorities. Little progress will be made if countries are advised to report on thousands of indicators. However, the set of measures needs to be sufficiently broad to capture the key information required to manage the health system (see table 1). G8 leadership to guide efforts to fill this critical knowledge gap would be most welcome.

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Likewise, experience with the Global Burden of Disease project and other large comparative analyses suggest that there is limited capacity in many countries to critically appraise data.⁵⁸ A prerequisite to improving the quality of health information is to improve the capacity of country analysts—particularly those charged with data collection—to critically appraise data for biases, errors, and general plausibility. These skills are not routinely taught in schools of public health but need to be developed if any progress is to be made with improving data quality.

At the Toyako Summit, the G8 Health Experts Group recommended that the G8 should continue “to encourage further collaboration among stakeholders with the aim of standardizing health metrics to collect, analyse and evaluate health data for policy planning and evaluation” at both the global and the country level.⁵⁹ In developing a standard set of metrics, there is always an issue of defining the universe of core indicators and a trade-off between the number of indicators and their quality. The health-related MDGs provide a high-profile illustration.⁶⁰ In fact, for the health-related MDG indicators, overall availability of any type of statistics on the official UN MDG website is only 15 percent for the interval 1990–2005.⁶¹

With thousands of indicators recommended but few measured well, the global health community needs to focus its efforts on improving measurement of a small set of priority areas, including aid effectiveness and health system inputs (resource tracking), outputs (effective coverage), and impact (mortality, causes of death, and morbidity). Priority indicators should be selected on the basis of public health significance and specific dimensions of measurability.⁶²

The lack of a standard data exchange and quality assurance process for health metrics is also aggravating technical inefficiency. Setting such standards at the global level, specifically by the WHO, is necessary but not sufficient unless standards are developed to enhance the quality of data at the country level.

The introduction of information technology alone cannot solve the problem of interoperability. Applying a complex quality assurance framework can be impractical and even meaningless for a wide range of statistics. There is no compelling evidence that data quality assurance as advocated by the statistical community has contributed to the improvement of statistics. Independence and objectivity are important principles, but these need to be accompanied by incentives and capacity for compliance. Data exchange and quality assurance processes should aim to set a minimum standard while contributing to analytical capacity at the country level.

LACK OF CAPACITIES AND INCENTIVES TO SHARE DATA: In general, wider availability of datasets will result in different analyses of key public health issues. This is to be expected and encouraged. Genuine academic discourse about what can and cannot be reliably concluded from data will advance the evidence base for public policy derived from these data. Opening them up to wider use may also encourage methodological developments, which in turn may shed new light on key public health issues.

Despite technological advances, the progress toward open access and data sharing in the public domain is still slow in the area of global health,⁶³ with the exception of microdata from DHS and the Integrated Public-Use Microdata Series, both of which have sufficient technical, financial, and administrative support.

Data collected by many institutions and countries are still restricted to a limited number of investigators and collaborators for an indefinite period. Access is restricted for the following reasons: 1) to protect the ownership and intellectual property rights of the investigators, 2) to help offset the costs of maintaining data collection, 3) to retain confidentiality of individual participants, and 4) to minimize the risk of misinterpretation of data.⁶⁴

These reasons may not be sufficient to restrict access to invaluable sources of data indefinitely, particularly when such obstacles can be overcome by appropriate and time-limited use of restrictions.

Precedents and protocols exist for addressing concerns around data access. For example, provision of wider access to data from clinical trials and DHS, after a certain period of exclusive rights to the investigators, can be adapted to other contexts. Data sharing may not be guaranteed through principles or codes alone but should be promoted by giving incentives, building capacity, and ensuring sustainability of data collection activities at the country level.⁶⁵

Allocative inefficiency

On the one hand, the amount of data being collected in global health is rapidly increasing.⁶⁶ On the other, the political and financial attention now being paid to global health has not been matched by improved sources of information on the performance of health systems and new health programs.⁶⁷ This is partly due to the duplication and fragmentation of activities and partly due to the lack of sustainable investment in data collection at the country level.

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DUPLICATION AMONG STAKEHOLDERS: In every aspect of major functions in health information (data collection, monitoring and evaluation, and systematic assessment), there is a duplication of activities across and within agencies and institutions. In data collection platforms, the notable example of duplication and fragmentation is household surveys in countries.⁶⁸

Survey modules in the traditional DHS and Multiple Indicator Cluster Surveys have been expanded substantially to cover a wide range of health and other issues. Single-disease surveys, such as for AIDS, malaria, tuberculosis, or tobacco, are becoming more common, often accompanied by biological and clinical data collection. While this approach ensures more data for the disease of interest, it imposes a substantial burden on countries and misses an opportunity to collect information on a broader range of health issues at relatively little marginal cost.

The World Health Survey (WHS) implemented by the WHO in 2002–2003 was an experiment in collecting a comprehensive set of information in a systematic and comparable way.⁶⁹ Such information is required to assess adult health and risk factors, effective coverage, and health system performance, and it was not available from existing data collection platforms. However, the WHO was not strategic enough to engage other stakeholders and enhance country capacity in order to leverage the real potential of the WHS.⁷⁰

In theory, a single survey could include all priority health topics for which data are needed for decision making, from acute infectious to chronic non-communicable diseases. Limiting factors are the complexity of the survey, the length of the interview, and funding challenges. However, technological advances have made it possible to carry out efficient sampling and include biomarkers in population-based surveys in developing countries. Joint surveys can also facilitate the integration of many existing efforts to strengthen countries' capacity and provide financial and technical incentives to collect, analyze, and share better quality data.

LACK OF INVESTMENT IN STANDARD DATA COLLECTION PLATFORMS: While demand for health information grows, primary data collection platforms in most developing countries are not improving. The technological potential for linking individual records to population health metrics has not yet had a major impact on primary data collection platforms in health systems in most developing countries.⁷¹

To increase the availability of high-quality primary data, local capacity for data collection and analysis needs to be strengthened, including making

investments in country data collection platforms, as well as changing the culture around the release of public data.

While there is some funding for making data available, there is much less to support the collection and production of the right data. It is only by supporting those who collect the data and involving them in analysis that the understanding of how better data can result in better health outcomes translates into a data collection incentive.

Another major deficiency is the lack of progress in civil registration.⁷² More complete statistics on maternal and child mortality (MDGs 4 and 5); improved data on deaths from HIV/AIDS, tuberculosis, and malaria (MDG 6); and information on who dies and from what causes cannot be continuously generated at national and subnational levels with the methods currently at the disposal of the public health community in most developing countries. The absence of civil registration has other implications as well. When births are not registered, people are less likely to benefit from basic human rights—social, political, civic, or economic.

Global health and development agencies continue to skirt the challenge of confronting the lack of functional systems of civil registration. There is still no identifiable home for civil registration within the UN system, and there are few visible efforts on the part of development agencies to respond to countries' requests for assistance.⁷³ The absence of vital statistics in many developing countries has been described as both a symptom and a cause of underdevelopment.⁷⁴

LACK OF INDEPENDENT AND CONTESTABLE EVALUATIONS: In principle, results-based commitments require a relevant baseline indicator and should directly measure subsequent changes in this. This in turn requires a pre-defined monitoring and evaluation framework and benchmarking.⁷⁵ However, most current evaluations, such as the Global Fund's five-year impact evaluation, are done on an ad hoc basis with limited baseline data or based on a comparison of outcomes before and after a program was introduced for the same group.⁷⁶

Such studies do not necessarily provide compelling evidence on what actually works and what does not, since there is no way to rule out the possibility that some other policy or event that coincided with the program caused the observed change in outcomes.⁷⁷

Another major challenge in such studies includes the principle of country ownership and its inevitable conflict with independent and contestable evaluations.⁷⁸ For instance, the IHP+, while stressing the mutual accountability of

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donors and developing countries, excludes the need for independent verification of national progress toward the health-related MDGs.⁷⁹

Similarly, as health information has been instrumental in promoting disease-specific programs, there has been a debate about the potential conflict of interest if these disease-specific programs evaluate themselves.⁸⁰

Developing a common framework and collaborative community

Since the publication of the *World Health Report 2000*, various comprehensive frameworks have been proposed to assess health systems.⁸¹ Improved methods and better data have since increased the opportunities for evaluating health systems.⁸²

As these efforts progress, a comprehensive and consistent framework on health systems will need to be adopted along with a limited set of valid and reliable indicators.⁸³

Despite the large resources devoted to health worldwide, the focus of monitoring and evaluation has been on inputs (human resources, financial resources, etc.) rather than outputs and impact on health (e.g., effective coverage and health outcomes). Such an imbalance in monitoring and evaluation practices needs to be corrected in order to shed more light on the system-wide impact of various global health initiatives.

Another limitation of many previous attempts at strengthening health systems is that they were solely focused on direct delivery of services instead of all key functional elements of the health system (i.e., stewardship, resource generation, and financing). This refocus has provided us with an opportunity to provide valid evidence on how to effectively design and manage health systems, one that will require well-designed research.⁸⁴

The global health community urgently needs to correct the two major sources of inefficiencies in data described above, which are limiting the potential of health information activities at both the global and country levels. At the same time, it is necessary to bring together work and evidence on health system assessment (See fig. 1). This requires a regional and global collaborative community and shared learning across systems that can benefit all countries.⁸⁵

For example, effective coverage is considered to be a better indicator of a health system's ability to deliver services by combining needs, quality, access, and utilization of services.⁸⁶ However, this metric requires more information and analytical capacity than what is available in countries with limited resources and health information systems. One of the major objectives of the newly

established Latin American Health Observatory is to complement countries' capacities through regional collaboration among centers of excellence in health metrics and evaluation.

In the latest *World Health Report 2008*, the WHO also called for more structured and intensive inter-country collaboration around policy reviews for primary healthcare, which would yield better international comparative data on variations in the development of health systems, on models of good practice, and on the determinants of successful reforms.⁸⁷

Sustaining health information activities at the country level

The current attention to health information is primarily driven by donor agencies and foundations rather than the recipient countries. Along with the lack of capacity and incentives to carry out decent evaluations, there is chronic underinvestment in each function of health information activities, particularly in the area of country data collection and compilation. A recent report by donor agencies estimated that approximately US\$250 million will be required annually in external financing to support needed infrastructure and associated operating expenditures.⁸⁸

An innovative funding mechanism is needed in order to build country capacity to monitor and evaluate health systems and to sustain such activities at the country level.⁸⁹ One option is collective action or an arrangement that mobilizes funds for data collection and sharing by coordinating commitments of various countries, donors, and agencies.⁹⁰

As in the case of conditional cash transfer programs that transfer money to poor households on the condition that they comply with a set of requirements on health and educational services,⁹¹ some conditionality on the use of pooled resources would be necessary to give incentives and improve capacities to collect better data at the country level. Such conditions would obligate the use of standard measurements, data sharing in the public domain, and local capacity building.

POLICY RECOMMENDATIONS

The solution to the lack of accountability and transparency in global health is twofold: enhance existing efforts and create a new approach that directly addresses the lack of incentives to make these efforts representative.⁹²

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Given the G8's unique role in global health, together with its commitment to accountability and the increasingly prominent role of health metrics and evaluation in global health, we recommend that, through a collective and multi-stakeholder approach, the G8 should focus on correcting the two major inefficiencies in the current field of health metrics by undertaking the following:

- 1 Implement the G8's **Annual Review** to assess G8 countries' commitments to health systems and programs.
 - 1.1 Define a standard set of metrics and measurement strategies to monitor and evaluate aid effectiveness, health programs, and systems.
 - 1.2 Plan and assess future health-related activities by the G8 and partners using a common framework and metrics.
- 2 Establish a **Digital Commons** using a network of global and regional centers of excellence to improve access to—and the quality of—datasets and analyses at the country and global levels.
 - 2.1 Promote the principles of open access and data sharing in the public domain.
 - 2.2 Develop a global databank for common indicators (starting with the MDG targets, human resources, and resource tracking) and a data exchange and quality assurance mechanism.
 - 2.3 Establish a Cochrane-type process for global health monitoring to generate empirical evidence for health policy.
- 3 Pool resources for health metrics at the global and country levels to create the **Global Health Metrics Challenge**.
 - 3.1 Develop capacity and create an incentive structure for countries and data producers to collect, share, analyze, and interpret better quality data.
 - 3.2 Make health funding contingent upon third-party evaluation that is compliant with agreed principles, including developing a standard measurement strategy, putting data in the public domain, strengthening local capacity, and making appropriate use of information technologies.
 - 3.3 In countries with incomplete or in-existent civil registration, prioritize development of civil registration systems.
 - 3.4 Invest in a series of nationally representative household surveys for multiple diseases and risk factors.

NOTES

1. Institute for Health Metrics and Evaluation, 2008.
2. Ties Boerma and Sally K. Stansfield, "Health Statistics Now: Are We Making the Right Investments?" *Lancet* 369, no. 9563 (2007):779–86; Christopher JL Murray, "Towards Good Practice for Health Statistics: Lessons from the Millennium Development Goal Health Indicators," *Lancet* 369, no. 9564 (2007):862–73.
3. G8 Health Experts Group, "Toyako Framework for Action on Global Health—Report of the G8 Health Experts Group, 8 July 2008," G8 Hokkaido Toyako Summit, Ministry of Foreign Affairs, Japan, http://www.g8summit.go.jp/doc/pdf/0708_09_en.pdf.
4. Christopher JL Murray, Julio Frenk and Timothy Evans, "The Global Campaign for the Health MDGs: Challenges, Opportunities, and the Imperative of Shared Learning" *Lancet* 370, no. 9592 (2007):1018–20; Michael R. Reich, Keizo Takemi, Marc J. Roberts and William C. Hsiao, "Global Action on Health Systems: A Proposal for the Toyako G8 Summit," *Lancet* 371, no. 9615 (2008):865–9.
5. Christopher JL Murray and Julio Frenk, "Health Metrics and Evaluation: Strengthening the Science," *Lancet* 371, no. 9619 (2008):1191–9.
6. Sabina Alkire, *Valuing Freedoms: Sen's Capability Approach and Poverty Reduction* (Oxford: Oxford University Press, 2002); Commission on Human Security, *Human Security Now* (New York: Commission on Human Security, 2003); Keizo Takemi, Masamine Jimba, Sumie Ishii, Yasushi Katsuma and Yasuhide Nakamura, "Human Security Approach for Global Health," *Lancet* 372, no. 9632 (2008):13–14.
7. Jonas G. Store, "Health and Human Security: Politics, Policies, and Global Institutions," in *Global Health Challenges for Human Security*, by Lincoln Chen, Jennifer Leaning and Vasant Narasimhan, eds. (Cambridge: The Global Equity Initiative, Asia Center, Faculty of Arts and Sciences, Harvard University, 2003).
8. Murray and Frenk, "Health Metrics and Evaluation."
9. Boerma and Stansfield, "Health Statistics Now."
10. Boerma and Stansfield, "Health Statistics Now"; Alan D. Lopez, Carla Abou-Zahr, Kenji Shibuya and Laragh Gollgoly, "Keeping Count: Births, Deaths, and Causes of Death," *Lancet* 370, no. 9601 (2007):1744–6.
11. Murray, "Towards Good Practice for Health Statistics."
12. Murray, "Towards Good Practice for Health Statistics"; Christopher JL Murray, Alan D. Lopez and Suwit Wibulpolprasert, "Monitoring Global Health: Time for New Solutions," *BMJ* 329, no. 7474 (2004):1096–1100.
13. Daniel Chandramohan, Kenji Shibuya, Philip Setel, Sandy Cairncross, Alan D. Lopez, Christopher JL Murray, et al., "Should Data from Demographic Surveillance Systems Be Made More Widely Available to Researchers?" *PLoS Medicine* 5, no. 2 (2007):e57.
14. Christopher JL Murray, Thomas Laakso, Kenji Shibuya, Kenneth Hill and Alan D. Lopez, "Can We Achieve Millennium Development Goal 4? New Analysis of Country Trends and Forecasts of Under-5 Mortality to 2015," *Lancet* 370, no. 9592 (2007):1040–54; Tessa Wardlaw, "New Estimates of Global Under-5 Mortality," *Lancet* 370, no. 9596 (2007):1413–4.
15. Ties Boerma, Ed Bos, Veronica Walford, Jennifer Bryce and Carla Abou-Zahr, "A Common Framework for Monitoring Performance and Evaluation of the Scale-Up for Better Health, February 2008," International Health Partnership, http://www.internationalhealthpartnership.net/pdf/IHP_Monitoring_and_Evaluation_EN_FINAL_%20June_2008.pdf.
16. Stephen S. Lim, David B. Stein, Alexandra Charrow, and Christopher JL Murray, "Tracking Progress towards Universal Childhood Immunisation and the Impact of Global Initiatives: A Systematic Analysis of Three-Dose Diphtheria, Tetanus, and Pertussis Immunisation Coverage," *Lancet* 372, no. 9655.

Global Action for Health System Strengthening

17. Chandramohan, Shibuya, Setel, Cairncross, Lopez, Murray, et al., "Should Data from Demographic Surveillance Systems"
18. Osamu Kuniti, "The Okinawa Infectious Diseases Initiative," *Trends in Parasitology* 23, no. 2 (2007):58–62.
19. G8 Health Experts Group, "Toyako Framework for Action."
20. Murray, Frenk and Evans, "Global Campaign for the Health MDGs."
21. World Health Organization, *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action* (Geneva: World Health Organization, 2007).
22. Christopher JL Murray and Julio Frenk, "A Framework for Assessing the Performance of Health Systems," *Bulletin of the World Health Organization* 78, no. 6 (2000):717–31.
23. Nirmala Ravishankar, Emmanuela Gakidou, Stephen Lim, Ziad Obermeyer and Christopher JL Murray, "Doris Duke Charitable Foundation PHIT Partnership Implementation Research Framework" (Seattle: Institute for Health Metrics and Evaluation, 2008).
24. Murray, Frenk and Evans, "Global Campaign for the Health MDGs."
25. Murray, Laakso, Shibuya, Hill and Lopez, "Can We Achieve MDG 4?"
26. The Lancet, "A New Institute for Global Health Evaluations," *Lancet* 369, no. 9577 (2007):1902.
27. Murray and Frenk, "Health Metrics and Evaluation"; Health Metrics Network and World Health Organization, "Framework and Standards for Country Health Information Systems" (Geneva: World Health Organization, 2008); Measurement and Health Information Systems, "WHO Strategy for Health Information," World Health Organization, <http://sharepoint.who.int/sites/healthinfo/Lists/MHI%20teams/DispForm.aspx?ID=12>.
28. World Health Organization, *International Statistical Classification of Diseases and Health Related Problems, 10th Revision (ICD-10)*, 2nd ed. (Geneva: World Health Organization, 2005).
29. Boerma and Stansfield, "Health Statistics Now"; Health Metrics Network and World Health Organization, "Framework and Standards."
30. Murray and Frenk, "Health Metrics and Evaluation."
31. Murray, "Towards Good Practice for Health Statistics."
32. Nirmala Ravishankar, Emmanuela Gakidou, Stephen Lim, Ziad Obermeyer and Christopher JL Murray, "Doris Duke Charitable Foundation PHIT Partnership Implementation Research Framework" (Seattle: Institute for Health Metrics and Evaluation, 2008); William D. Savedoff, Ruth Levine and Nancy Birdsall, "When Will We Ever Learn? Improving Lives through Impact Evaluation" (Washington DC: Center for Global Development, 2006).
33. Kenji Shibuya, "Decide Monitoring Strategies before Setting Targets," *Bulletin of the World Health Organization* 85, no. 6 (2007):423.
34. John J. Kirton, Nikolai Roudev and Laura Sunderland, "Making G8 Leaders Deliver: An Analysis of Compliance and Health Commitments, 1996-2006," *Bulletin of the World Health Organization* 85, no. 3 (2007):192–9.
35. John J. Kirton, "The G8 and Global Health Governance: The Case for a 2006 Eurasian HIV/AIDS Initiative" (paper prepared for the International Parliamentary Conference in Conjunction with Russia's G8 Presidency on HIV/AIDS in Eurasia and the Role of the G8, on behalf of the G8 Research Group, University of Toronto, 2006), http://www.g8.utoronto.ca/scholar/kirton2006/kirton_health_060609.pdf.
36. G8 Health Experts Group, "Toyako Framework for Action"; Reich, Takemi, Roberts and Hsiao, "Global Action on Health Systems."
37. Kirton, Roudev and Sunderland, "Making G8 Leaders Deliver."
38. G8 Health Experts Group, "Toyako Framework for Action."
39. Ronald Labonte and Ted Schrecker, "Foreign Policy Matters: A Normative View of the G8 and Population Health," *Bulletin of the World Health Organization* 85, no. 3 (2007):185–91; Justin

- McCurry, "G8 Meeting Disappoints on Global Health," *Lancet* 372, no. 9634 (2008):191–4.
40. John Kirton, Ella Kokotsis, Vanessa Corlazzoli, Mike Varey, Aaron Raths and Laura Sunderland, "Gleneagles Final Compliance Report" (report prepared by the G8 Research Group, University of Toronto, 2005). (<http://www.g8.utoronto.ca/2005g8compliance060612c.pdf>)
 41. Kirton, "The G8 and Global Health Governance."
 42. Prasanta Mahapatra, Kenji Shibuya, Alan D. Lopez, Francesca Coullare, Francis C. Notzon, Chalapati Rao, et al., "Civil Registration Systems and Vital Statistics: Successes and Missed Opportunities," *Lancet* 370, no. 9599 (2007):1653–63.
 43. Lopez, Abou-Zahr, Shibuya and Gollogly, "Keeping Count."
 44. Health Metrics Network, HMN countries site, <http://www.who.int/healthmetrics/library/countries/en/index.html>.
 45. Dean T. Jamison, Julio Frenk and Felicia Knaul, "International Collective Action in Health: Objectives, Functions, and Rationale," *Lancet* 351, no. 9101 (1998):514–7.
 46. William D. Savedoff and Ruth Levine, "Learning from Development: The Case for an International Council to Catalyze Independent Impact Evaluations of Social Sector Interventions" (Washington DC: Center for Global Development, 2006).
 47. Boerma and Stansfield, "Health Statistics Now."
 48. Savedoff, Levine and Birdsall, "When Will We Ever Learn?"; Savedoff and Levine, "Learning from Development."
 49. Murray, "Towards Good Practice for Health Statistics"; Shibuya, "Decide Monitoring Strategies."
 50. Murray, "Towards Good Practice for Health Statistics"; International Monetary Fund, "Data Quality Assessment Framework (DQAF), 2003," <http://dsbb.imf.org/Applications/web/dqrs/dqrsdqaf/>.
 51. Child Mortality Coordination Group, "Tracking Progress Towards the Millennium Development Goals: Reaching Consensus on Child Mortality Levels and Trends," *Bulletin of the World Health Organization*, 84, no. 3 (2006):225–32.
 52. Murray, Laakso, Shibuya, Hill and Lopez, "Can We Achieve MDG 4?"; Wardlaw, "New Estimates."
 53. Inter-Agency Coordination Group on Child Mortality Estimation, "Report of the Inter-Agency Coordination Group on Child Mortality Estimation, 6–7 March 2008," World Health Organization, <http://www.who.int/whosis/mort/20080306event/en/> (<http://www.who.int/whosis/mort/20080306mtgReport.pdf>).
 54. World Health Organization, *Regulations Regarding Nomenclature, 1967*, World Health Organization, <http://www.who.int/entity/classifications/icd/docs/en/NOMREGS.pdf>.
 55. World Health Organization, *International Health Regulations, 2005* (Geneva: World Health Organization, 2005), http://www.who.int/entity/csr/ihr/wha_58_3/en/index.html.
 56. Mahapatra, Shibuya, Lopez, Coullare, Notzon, Rao, et al., "Civil Registration Systems."
 57. World Health Organization, *WHO Mortality Database*, World Health Organization, <http://www.who.int/whosis/mort/en/>.
 58. Ties Boerma and Carla Abou-Zahr, "Monitoring Global Health: Bottom Up Approach Is More Likely to Be Successful," *BMJ* 330, no. 7484 (2005):195–6.
 59. G8 Health Experts Group, "Toyako Framework for Action."
 60. Amir Attaran, "An Immeasurable Crisis? A Criticism of the Millennium Development Goals and Why They Cannot Be Measured," *PLoS Medicine* 2, no. 10 (2005):e318.
 61. Murray, "Towards Good Practice for Health Statistics"; "Millennium Development Goals Indicators: The Official United Nations Site for the MDG Indicators," United Nations Statistics Division, <http://mdgs.un.org/unsd/mdg/Default.aspx>.
 62. Murray, "Towards Good Practice for Health Statistics."
 63. Chandramohan, Shibuya, Setel, Cairncross, Lopez, Murray, et al., "Should Data from

Global Action for Health System Strengthening

- Demographic Surveillance Systems.”
64. Ibid.
 65. Ibid.
 66. Boerma and Stansfield, “Health Statistics Now.”
 67. The Lancet, “New Institute for Global Health Evaluations.”
 68. Boerma and Stansfield, “Health Statistics Now.”
 69. Saba Moussavi, Somnath Chatterji, Emese Verdes, Ajay Tandon, Vikram Patel and Bedirhan Ustun, “Depression, Chronic Diseases, and Decrements in Health: Results from the World Health Surveys,” *Lancet* 370, no. 9590 (2007):851–8; Ziad Obermeyer, Christopher JL Murray and Emmanuela Gakidou, “Fifty Years of Violent War Deaths from Vietnam to Bosnia: Analysis of Data from the World Health Survey Programme,” *BMJ* 336, no. 7659(2008):1482–6.
 70. UN Statistical Commission, “Report of Friends of the Chair Group on Health Statistics (E/CN.3/2004/4),” (New York: United Nations, 2004).
 71. Boerma and Stansfield, “Health Statistics Now”; Murray, “Towards Good Practice for Health Statistics”; Bulletin of the World Health Organization, “The Usual Words of Caution,” *Bulletin of the World Health Organization* 86, no. 3 (2008):162.
 72. Murray and Frenk, “Health Metrics and Evaluation.”
 73. Lopez, Abou-Zahr, Shibuya and Gollogly, “Keeping Count”; Philip W. Setel, Sarah B. Macfarlane, Simon Szreter, Lene Mikkelsen, Prabhat Jha, Susan Stout, et al., “A Scandal of Invisibility: Making Everyone Count by Counting Everyone,” *Lancet* 370, no. 9598 (2007):1569–77.
 74. Carla Abou-Zahr, John Clelan, Francesca Coullare, Sarah B. Macfarlane, Francis C. Notzon, Philip Setel, et al., “The Way Forward,” *Lancet* 370, no. 9601 (2007):1791–9.
 75. Murray and Frenk, “Health Metrics and Evaluation”; Shibuya, “Decide Monitoring Strategies”; Rafael Lozano, Patricia Soliz, Emmanuela Gakidou, Jesse Abbott-Klafter, Dennis M. Feehan, Cecilia Vidal, et al., “Benchmarking of Performance of Mexican States with Effective Coverage,” *Lancet* 368, no. 9548 (2006):1729–41.
 76. Boerma, Bos, Walford, Bryce and Abou-Zahr, “A Common Framework for Monitoring”; The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), “The Five Year Evaluation of the Global Fund,” Global Fund, <http://www.theglobalfund.org/en/terg/evaluations/5year/?lang=en>.
 77. Ravishankar, Gakidou, Lim, Obermeyer and Murray, “PHIT Partnership Implementation Research Framework”; Savedoff, Levine and Birdsall, “When Will We Ever Learn?”
 78. Boerma, Bos, Walford, Bryce and Abou-Zahr, “A Common Framework.”
 79. Murray, Frenk and Evans, “Global Campaign for the Health MDGs.”
 80. Murray, Lopez and Wibulpolprasert, “Monitoring Global Health”; Kenji Shibuya, Suzanne Scheele and Ties Boerma, “Health Statistics: Time to Get Serious,” *Bulletin of the World Health Organization* 83, no. 10 (2005):722.
 81. Reich, Takemi, Roberts and Hsiao, “Global Action on Health Systems”; Boerma, Bos, Walford, Bryce and Abou-Zahr, “A Common Framework”; World Health Organization, *Everybody’s Business*; Murray and Frenk, “A Framework for Assessing”; Ravishankar, Gakidou, Lim, Obermeyer and Murray, “PHIT Partnership Implementation Research Framework.”
 82. Murray and Frenk, “Health Metrics and Evaluation”; Lozano, Soliz, Gakidou, Abbott-Klafter, Feehan, Vidal, et al., “Benchmarking of Performance of Mexican States”; Health Metrics Network, “Health Systems Metrics: Report of a Technical Meeting, Glion, Switzerland, 28-29 September 2006,” Health Metrics Network, http://www.who.int/healthinfo/health_system_metrics_glion_report.pdf.
 83. Murray, Frenk and Evans, “Global Campaign for the Health MDGs.”
 84. Ibid.
 85. Murray and Frenk, “Health Metrics and Evaluation.”

86. Lozano, Soliz, Gakidou, Abbott-Klafter, Feehan, Vidal, et al., "Benchmarking of Performance of Mexican States"; Bakhuti Shengelia, Ajay Tandon, Orvill B. Adams and Christopher JL Murray, "Access, Utilization, Quality, and Effective Coverage: An Integrated Conceptual Framework and Measurement Strategy," *Social Science and Medicine* 61, no. 1 (2005):97–109.
87. World Health Organization, *World Health Report 2008: Primary Health Care Now More Than Ever* (Geneva: World Health Organization, 2008).
88. MDG Africa Steering Group, "Achieving the Millennium Development Goals in Africa," http://www.mdgafrica.org/achieving_mdg.html.
89. Ravindra P. Rannan-Eliya, "Strengthening Health Financing in Partner Developing Countries," in this volume, 2008.
90. Savedoff, Levine and Birdsall, "When Will We Ever Learn?"
91. Kenji Shibuya, "Conditional Cash Transfer: A Magic Bullet for Health?" *Lancet* 371, no. 9615 (2008):789–91.
92. Savedoff, Levine and Birdsall, "When Will We Ever Learn?"

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TASK FORCE ON GLOBAL ACTION FOR HEALTH SYSTEM STRENGTHENING

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