Monitoring maternal, newborn and child health:
understanding key progress indicators

Countdown to 2015
Maternal, Newborn & Child Survival

HMN

unicef

World Health Organization

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- Portrait of boy, Thailand. Credit: Health Metrics Network/Pierre Virot.

Back cover photographs:

- Woman, Mexico. Credit: Health Metrics Network/Pierre Virot.
- Health worker doing paperwork and updating patients' records at a clinic, Mali. Credit: Panos/Giacomo Pirozzi.
- Woman and her newly adopted baby, one of around 100 babies abandoned in Khartoum each month, Sudan. Credit: Panos/Abbie Trayler-Smith.

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Contents

Authors 5
Introduction 7

Section 1
Health information systems: gaps and opportunities 9

The global picture 9
Data sources for the 11 core indicators 10
Data availability 12
Strengthening countries' capacity to monitor and evaluate results 13

Section 2
The Commission's 11 core indicators 17

1. Impact indicators 17
2. Coverage Indicators 22

Section 3
Commission recommendations for resource tracking 41

Section 4
Equity analyses of the Commission's 11 core indicators 43

Conclusion 47
References 48

Authors

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Countdown to 2015: Tracking Progress in Maternal, Newborn and Child Survival

Countdown to 2015 is a global movement of academics, governments, international agencies, health-care professional associations, donors and nongovernmental organizations, with *The Lancet* as a key partner. It uses country-specific data to stimulate and support country progress towards achieving the health-related Millennium Development Goals (MDGs), particularly MDGs 4 and 5. Countdown focuses on coverage of effective interventions for maternal, newborn and child health and coverage determinants, including health systems and policies, financial flows and equity. It tracks progress in the 74 countries where more than 95% of all maternal and child deaths occur, including the 49 lowest-income countries. Countdown has agreed to take responsibility for major parts of the follow-up agenda of the Commission for Information and Accountability for Women's and Children's Health, including annual reporting and analysis of country-specific information on key indicators of coverage and its determinants. More information is available at http://www.countdown2015mnch.org

Health Metrics Network

Reliable, complete and timely information is essential for public health decision-making and action, including policy making, planning, programming, monitoring and reaching the health-related MDGs. Established in 2005, the Health Metrics Network (HMN) is the first global partnership dedicated to strengthening national health information systems. HMN is hosted by the World Health Organization (WHO) and operates as a network of global, regional and country partners, mobilizing them to increase the availability of information for decisions to improve health outcomes in countries.

HMN currently has two technical work streams: *1. Monitoring of Vital Events (*MOVE-IT for the MDGs), including through innovative approaches such as information and communication technology, is a renewed drive to record every birth, death, and cause of death; 2. *Progress Tracking Tool* is under development to help countries measure health information system improvements, while the *State of the World Information Systems for Health* report will document the current state of health information systems in countries and identify priority areas for strengthening. More information is available at: http://www.healthmetricsnetwork.org

The Commission on Information and Accountability for Women's and Children's Health

The Commission on Information and Accountability for Women's and Children's Health was set up at the end of 2010 by WHO at the request of United Nations (UN) Secretary-General Ban Ki-moon in support of *The Global Strategy for Women's and Children's Health*. Its objective was to develop a framework for global reporting, oversight and accountability on women's and children's health in the 74 high-burden and low-income countries[2]. The Commission's framework aims to track whether donations for women's and children's health are made on time, resources are spent wisely and transparently, and the desired results are achieved. The Commission was co-chaired by President Jakaya Kikwete of the United Republic of Tanzania and Prime Minister Stephen Harper of Canada.

The Commission's report was presented to the UN Secretary-General at a side event on 20 September 2011 during the UN General Assembly. *Keeping Promises, Measuring Results* contains 10 recommendations in the areas of better information for better results, better tracking of resources for women's and children's health, and better oversight of results and resources at global and national levels. More information is available at: http://www.who.int/topics/millennium_development_goals/accountability_commission/en/

Relevant Millennium Development Goals

MDG 1: Eradicate extreme poverty and hunger. Target 1A: Halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day. Target 1B: Achieve full and productive employment and decent work for all, including women and young people. Target 1C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

MDG 4: Reduce child mortality. Target 4A: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate.

MDG 5: Improve maternal health. Target 5A: Reduce by three quarters the maternal mortality ratio. Target 5B: Achieve universal access to reproductive health.

MDG 6: Combat HIV/AIDS, malaria and other diseases. Target 6A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS. Target 6B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it. Target 6C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

More information is available at: http://www.un.org/millenniumgoals/

Introduction

The United Nations Commission on Information and Accountability for Women's and Children's Health (the Commission), established in December 2010 by Secretary-General Ban Ki-moon, was charged with developing a framework for global reporting, oversight, and accountability related to the *Global Strategy for Women's and Children's Health*. Specifically, the Commission was asked to develop a framework and suggest mechanisms that would:

- Track results and resource flows for women's and children's health at the global and country levels;
- Identify a core set of indicators and measurement needs for women's and children's health;
- Propose steps to improve health information and registration of births and deaths in low-income countries; and
- Explore opportunities for innovation in information technology to improve access to reliable information on resources and outcomes.

In May 2011, the Commission issued its *Keeping promises, measuring results* report[1], developed with input from working groups on results and resources. The report laid out a framework for accountability built on three essential and interconnected processes — *monitor*, *review*, and *act*, and called for the establishment of an independent Expert Review Group to assess and report on progress in terms of results and resources in 74 high-burden priority countries[2]. The Commission identified 11[3] core indicators that, taken together, enable stakeholders to track progress in improving coverage of interventions needed to ensure the health of women and children across the continuum of care. These indicators include eight measures of intervention coverage and three measures of impact. For all 11 indicators, the Commission urged that the data be disaggregated by gender and

Credit: Panos/Giacomo Pirozzi. A mother with her newborn baby soon after delivery in the maternity ward of a hospital, Uzbekistan.

[1] Commission on Information and Accountability for Women's and Children's Health. *Keeping promises, measuring results.* Geneva, World Health Organization, 2011 (http://www.everywomaneverychild.org/images/content/files/accountability_commission/final_report/Final_EN_Web.pdf, accessed 14 November 2011).

[2] The 74 original high-burden countries account for more than 95% of all maternal and child deaths and include the 49 low-income countries referred to in *The Global Strategy for Women's And Children's Health*. South Sudan is also a high-burden country and thus constitutes the 75th country, but as few data are currently available, South Sudan is not included in this report.

[3] The 11 indicators were selected from the indicators monitored for the Millennium Development Goals, and those tracked by Countdown to 2015.

other equity considerations. In addition, the Commission identified two indicators for tracking financial flows related to women's and children's health.

By focusing on a relatively small number of core indicators to be tracked across all high-burden and low-income countries, the Commission sought to reduce the reporting burden on national governments and health systems, enhance countries' capacity to monitor and evaluate progress, and ensure national leadership and ownership of results.

In this report, the Health Metrics Network (HMN) and Countdown to 2015 (Countdown) summarize the main opportunities and challenges to effective monitoring of the 11 core indicators in the 74 countries covered by the Commission and Countdown — countries that account for more than 95% of the world's maternal, newborn and child deaths. The paper first explores the extent to which health information systems in these countries are currently able to report on the Commission's recommended indicators with the accuracy, frequency, timeliness, and quality needed to ensure that stakeholders will be held to account for delivering on their commitments to women's and children's health. The paper's second section provides detailed descriptions of each of the Commission's 11 core indicators, including a discussion of data sources and areas of potential improvement. A third section discusses the two financing indicators for resource tracking recommended by the Commission, and a fourth section examines the feasibility of disaggregating data on the 11 core indicators by key dimensions of equity (e.g. wealth quintile, urban/rural residence, gender, age, etc.).

Section 1

Health information systems: gaps and opportunities

Credit: World Health Organization/Evelyn Hockstein. Data manager in Kenya.

The global picture

Country health information systems draw on a broad range of data sources, including censuses, household surveys, health facility reporting systems, health facility assessments, vital registration systems, other administrative data systems, and surveillance. A recent HMN-WHO publication, *Country health information systems: a review of the current situation and trends,*[4] concluded that, while demands for reliable and timely data are growing, information systems in most low and middle-income countries are currently not adequate to the task. The most important challenges facing country health information systems include the following:

- The proliferation of indicators used for monitoring progress towards globally-defined goals and targets, health and disease programmes, and specific projects and grants creates a considerable reporting burden for countries, without necessarily strengthening the underlying health information systems.
- Although countries have defined core indicators and targets, data are often unavailable or of poor quality, hampering their ability to monitor health system performance and progress.
- Many countries are still in the process of establishing the foundations of a sound health information system — a supportive policy and legal framework, a comprehensive national health plan, well-designed coordination and oversight mechanisms, and sufficient human and financial investments. Few countries have put in place objective and independent data quality-assurance mechanisms or explicit systems for data sharing and dissemination.
- Information and communication technologies have the potential to

4 World Health Organization/Health Metrics Network. *Country health information systems: A review of the current situation and trends*. Advance preprint copy. *Geneva, World Health Organization, 2011* (http://www.who.int/healthmetrics/news/chis_report.pdf, accessed 3 November 2011).

greatly facilitate data collection, compilation, transmission, storage, and dissemination. However, many countries do not have the norms and standards in place that are needed for their effective implementation.

While these difficulties can be found in many countries to varying degrees, those that face the greatest health challenges generally also have the weakest systems for gathering, managing, analysing, and using information. This situation, often referred to as the "information paradox," is most evident in the absence of registration and counting of vital statistics such as births, deaths, and causes of death in countries with the highest fertility and mortality rates. An estimated 40 million births (one third of the world's annual total) and 40 million deaths (two thirds of the annual total) go unrecorded each year, most of them in Africa and Asia.

Data sources for the 11 core indicators

For the two recommended mortality indicators (maternal mortality ratio and under-five mortality rate), complete and accurate civil registration and vital statistics systems are the preferred data source. Census data is generally made available on a periodic basis in the 74 Commission countries; however, coverage levels for national registration of births, deaths, and causes of death are highly variable and generally less than satisfactory. Because vital registration systems function poorly in most of the Commission countries, household surveys are the main source of mortality data. The weakness of health information systems in many low and middle-income countries has resulted in the need for statistical modelling exercises to develop internationally comparable mortality estimates. These estimates, particularly for maternal mortality, are subject to considerable uncertainty, and vary with the assumptions and methods used. The substantial effort and attention devoted to regular updating of these estimates reflect the global community's commitment to continuously improve assessment of the maternal and child mortality burdens. The lack of quality vital statistics data points to the urgent need for investment in building country vital registration and health information systems.

For most of the remaining nine core indicators (children under five years of age who are stunted, and the eight coverage indicators), the optimal scenario is a combination of high-quality facility reporting — providing annual data by district for sub-national analysis and for planning and programmatic purposes, including at annual health sector reviews — with household surveys. Household surveys and routinely-collected data each have strengths and limitations, and are complementary. Both sources need to be continuously assessed for data quality, and adjustments made

Credit: Health Metrics Network photo library. Data collection in Ghana.

as needed, so that best estimates can be generated for monitoring progress.

At present, as shown in Table 1, household surveys are the main data source for nine of the 11 indicators. The two main surveys used to collect nationally representative data for women's and children's health are the United States Agency for International Development (USAID)-supported Demographic and Health Surveys (DHS) and the United Nations Children's Fund (UNICEF)-supported Multiple Indicator Cluster Survey (MICS). DHS are conducted approximately every five years and MICS every three years. DHS and MICS programmes work together closely to ensure comparability across surveys.

Household surveys are useful for collecting population-level coverage data, and for measuring utilization of available health care services and individual behaviours such as contraceptive use. Surveys are an indispensable source of equity information, because data can be disaggregated according to different characteristics of the population (e.g. age, gender, household wealth, education, urban/rural residence). However, household surveys are not good mechanisms for reporting on data at sub-district levels — where many programming decisions are made — because very large sample sizes would be required, driving up data collection costs. Because household surveys are typically not performed on an

Table 1 Current primary data sources and preferred data sources for the 11 core indicators of women's and children's health

Indicator	Current main source	Preferred situation
Maternal mortality ratio	Surveys	Vital registration
Under-five child mortality, with the proportion of newborn deaths	Surveys	Vital registration
Children under five who are stunted	Surveys	Surveys
Proportion of demand for family planning satisfied (met need for contraception)	Surveys	Surveys
Antenatal care coverage (at least four times during pregnancy)	Surveys	Surveys and facility reports
Antiretroviral (ARV) prophylaxis among HIV-positive pregnant women to prevent HIV transmission and antiretroviral therapy for [pregnant] women who are treatment-eligible	Facility reports	Facility reports
Skilled attendant at birth	Surveys	Surveys and facility reports
Postnatal care for mothers and babies within two days of birth	Surveys	Surveys and facility reports
Exclusive breastfeeding for six months (0–5 months)	Surveys	Surveys
Three doses of combined diphtheria-tetanus-pertussis (DTP3) immunization coverage (12–23 months)	Surveys and facility reports	Surveys and facility reports
Antibiotic treatment for suspected pneumonia	Surveys	Surveys and facility reports

annual basis, their data are not generally useful for annual or bi-annual planning and programmatic purposes.

Routine service delivery reports from health-care facilities are potentially an important data source for the eight recommended coverage indicators. Data from health facilities can be available on a continuous basis and are thus more up-to-date than household survey data. Facility reports are, however, an incomplete and potentially biased source of data, because not all people use facilities to meet their health-care needs. Family planning services, for example, are provided through various service delivery channels. Furthermore, data quality in terms of completeness, timeliness, and accuracy of reporting is often problematic in the 74 Commission countries. In some countries, the Ministry of Health web site includes reports providing district-level statistics based on health facility data, but the availability of these data are not consistent across or within countries. Applying systematic techniques to assess data quality and to reconcile facility and survey data could significantly improve estimates for the eight recommended coverage indicators, but is not currently a standard procedure in most of the Commission countries.

Data availability

Table 2 (p. 14-16) shows the status of data sources in relation to the 11 indicators for each of the 74 countries (South Sudan is not included in the table, as no data are available). The table includes the year of the most recent census (or year for which it is planned as part of the 2010 round of censuses) and the coverage levels of systems of birth, death and cause of death registration. It also shows the number of household surveys that included child mortality, maternal mortality, child anthropometry, and coverage of maternal, newborn and child health indicators during the five year period 2006-10, as well as National Health Accounts and subaccounts for maternal, newborn and child health.

Overall, 56 out of the 74 countries conducted a survey with data collection on child mortality during 2006-10. Most countries that did not conduct a survey obtain data from the birth and death registration system, or from a sample registration system, such as India, or a mix of surveillance and vital registration, such as China. Of the 74 countries, 32 had conducted a survey that included maternal mortality data. In some countries, such as India and China, child mortality data are also generated from other data sources, notably sample registration systems. Lack of data constitutes a major gap for maternal mortality because the measurement of maternal deaths, regardless of data source, is complex and often inaccurate.

Data on child stunting and other nutritional status indicators in low-income countries are drawn mainly from household surveys. All 74 countries have at least one data point since 2000. Twenty-two countries have data points for 2008-09, with most data points from 2008.

Credit: Panos/Jenny Matthews. Register of births at the Kabala Maternity Complex, Kabala, Northern Province, Sierra Leone.

For the eight coverage indicators, DHS and MICS provide a general picture of mid- to long-term progress. Because household surveys are the main and often sole source of data for the coverage indicators, data availability largely depends on whether a recent survey was conducted.

The frequency of surveys in the past 10-20 years in many of the priority countries has been too low to reliably assess coverage trends. For some of the core coverage indicators, such as DTP3 immunization, prevention of maternal-to-child transmission, and skilled attendance at birth, routine service delivery reports from health-care facilities are potentially an important complementary data source, and are often used by countries in annual reviews.

Strengthening countries' capacity to monitor and evaluate results

High quality data are critically needed in order to enable global assessment of progress on the Commission's recommended measures of coverage, impact, financing, and equity related to women's and children's health. Perhaps more importantly, the availability of accurate, timely, and consistent data at the national and sub-national levels is crucial for countries to be able to effectively manage their health systems, allocate resources according to need, and ensure accountability for delivering on health commitments. A key principle of the Commission's framework for accountability, therefore, is the enhancement of countries' capacity to monitor and evaluate their own results.

To improve measurement of the core indicators, significant strengthening of country health information systems is an urgent need. Recommended steps to achieve this goal include:

- Development of a harmonized programme of health surveys to collect data;
- Investment in building a complete and universal registration of vital events, including births, deaths and certification of cause of death[5];
- Investment in health facility and administrative data recording systems to improve data quality and monitoring efforts;
- Evaluation of current initiatives to explore the potential of information and communication technologies to improve the speed and accuracy of reporting, particularly at community level, and scaling up where there is evidence of their effectiveness; and
- Support to build country capacity to monitor, review and act on data.

These improvements will require a long-term approach with short-term milestones, and individual country plans need to be developed that take into consideration the baseline situation and investments required. A priority for the Commission countries is capacity building on data use, including assessment of data quality, triangulation and reconciliation of data from different sources, as well as the use of data for monitoring purposes and strengthening reporting mechanisms at all levels of the health system.

Section 2 describes the programmatic relevance of the 11 core indicators and shows that while a good deal of relevant data are currently available, efforts to measure, collect, and use available data on the Commission's 11 core indicators still face significant challenges.

[5] The Health Metrics Network MOVE-IT for the MDGs initiative, as well as regional partner networks, are supporting the strengthening of civil registration and vital statistics systems in Africa and Asia (http://www.who.int/healthmetrics/move_it/en/, accessed 3 November 2011). These will be evaluated and should be scaled up where there is evidence of effectiveness.

Table 2: Data availability for the 74 Commission on Information and Accountability for Woman's and Children's Health countries

World Bank Regions	Country	Census	Registration (2000-09)			Surveys (2006-10)		National Health Account (2006-09)		
			Births	Deaths	Causes of death	Child mortality	Child anthropometry	MCH coverage	Years produced	MNCH expenditures
East Asia & Pacific	Cambodia	2008	66	<25	-	2	2	2	0	0
	China	2010	-	<25	<25	4*	0	1	2	0
	Democratic People's Republic of Korea	2008	99	<25	-	1	1	1	0	0
	Indonesia	2010	53	<25	-	1	1	1	3	0
	Lao People's Democratic Republic	2005	72	<25	-	1	1	1	0	0
	Myanmar	2013	65	<25	<25	0	0	0	2	0
	Papua New Guinea	2011	-	-	-	0	0	0	0	0
	Philippines	2010	>90	90-100	90-100	1	1	2	2	0
	Solomon Islands	2009	80	-	-	1	1	0	0	0
	Viet Nam	2009	>90	<25	-	2	3	2	2	0
Europe & Central Asia	Azerbaijan	2009	>90	50-74	50-74	1	1	1	0	0
	Kyrgyzstan	2009	>90	75-89	75-89	0	0	0	4	0
	Tajikistan	2010	88	50-74	50-74	0	0	0	2	0
	Turkmenistan	2012	96	-	-	1	1	1	0	0
	Uzbekistan	1989	100	75-89	75-89	1	1	1	0	0
Latin America & Caribbean	Bolivia (Plurinational State of)	2012	74	<25	-	1	1	1	2	0
	Brazil	2010	91	75-89	75-89	0	1	0	1	0
	Guatemala	2012	>90	75-89	75-89	0	1	0	3	0
	Haiti	2013	81	<25	<25	0	0	0	0	0
	Mexico	2010	-	90-100	90-100	0	1	0	4	1
	Peru	2007	93	50-74	50-74	2	2	2	0	0
Middle East & North Africa	Djibouti	2009	89	<25	-	1	1	1	0	0
	Egypt	2006	>90	90-100	90-100	1	1	1	2	0
	Iraq	2011	95	<25	-	2	1	2	0	0
	Morocco	2014	85	25-49	25-49	3	3	3	1	0
	Yemen	2014	22	<25	-	2	1	2	2	0

MCH: Maternal and child health; MNCH: Maternal, newborn and child health

* Data points from sample registration systems.

World Bank Regions	Country	Census	Registration (2000-09)			Surveys (2006-10)		National Health Account (2006-09)		
			Births	Deaths	Causes of death	Child mortality	Child anthropometry	MCH coverage	Years produced	MNCH expenditures
South Asia	Afghanistan	2011-13	6	<25	-	0	0	0	0	0
	Bangladesh	2011	10	<25	-	3	3	3	3	0
	India	2011	41	<25	<25	2*	0	0	0	0
	Nepal	2011	35	<25	-	1	1	1	0	0
	Pakistan	2011	27	<25	-	1	0	1	1	0
Sub-Saharan Africa	Angola	2013	29	<25	-	2	0	0	0	0
	Benin	2012	60	<25	-	1	1	1	2	0
	Botswana	2011	72	<25	-	0	0	0	0	0
	Burkina Faso	2006	64	<25	-	3	3	2	3	0
	Burundi	2008	60	<25	-	1	1	1	1	0
	Cameroon	2005	70	<25	-	1	1	1	0	0
	Central African Republic	2013	49	<25	-	1	1	1	0	0
	Chad	2009	9	<25	-	1	1	1	0	0
	Comoros	2013	83	<25	-	0	0	0	0	0
	Congo	2007	81	<25	-	1	1	1	0	0
	Côte d'Ivoire	2011	55	<25	-	1	2	1	2	0
	Democratic Republic of the Congo	2012	31	<25	-	2	2	2	2	1
	Equatorial Guinea	2013	32	<25	-	0	0	0	0	0
	Eritrea	2011	-	<25	-	0	0	0	0	0
	Ethiopia	2007	7	<25	-	1	1	1	1	1
	Gabon	2013	89	<25	-	0	0	0	0	0
	Gambia	2013	55	<25	-	0	0	0	0	0
	Ghana	2010	71	<25	<25	2	2	3	0	0
	Guinea	2012	43	<25	-	0	1	0	0	0
	Guinea-Bissau	2009	39	<25	-	2	3	2	0	0
	Kenya	2009	60	25-49	25-49	3	2	3	1	2
	Lesotho	2006	26	<25	-	1	1	1	0	0
	Liberia	2008	4	<25	-	2	2	1	1	1
	Madagascar	2011	75	<25	-	1	1	1	1	0
	Malawi	2008	-	<25	-	2	2	2	1	0
	Mali	2009	53	<25	-	1	1	1	0	0

World Bank Regions	Country	Census	Registration (2000-09)			Surveys (2006-10)		National Health Account (2006-09)		
			Births	Deaths	Causes of death	Child mortality	Child anthropometry	MCH coverage	Years produced	MNCH expenditures
	Mauritania	2012	56	<25	-	1	2	1	0	0
	Mozambique	2007	31	<25	-	1	4	1	1	0
	Niger	2012	32	<25	-	2	1	2	1	0
	Nigeria	2006	30	<25	-	4	2	3	0	1
	Rwanda	2012	82	<25	-	2	1	2	1	2
	Sao Tome and Principe	2011	69	-	-	2	2	2	0	0
	Senegal	2012	55	<25	-	0	0	0	0	0
	Sierra Leone	2014	51	<25	-	1	1	1	1	0
	Somalia	1987	3	<25	-	1	2	1	0	0
	South Africa	2011	92	90-100	90-100	1	1	0	0	0
	Sudan	2008	33	<25	-	0	1	0	1	0
	Swaziland	2007	30	<25	-	1	1	1	0	0
	Togo	2010	78	<25	-	1	2	1	0	0
	Uganda	2012	21	<25	-	5	3	1	1	0
	United Republic of Tanzania	2012	22	<25	-	3	3	3	1	2
	Zambia	2010	14	<25	-	1	1	1	1	0
	Zimbabwe	2012	74	25-49	25-49	1	1	1	0	0

Section 2

The Commission's 11 core indicators

Credit: Panos/Mads Nissen, Berlingske. A pregnant woman has her abdomen and unborn fetus examined at a rural health clinic in Hetauda, Makwanpur, Nepal.

1. Impact indicators

Indicator	Maternal Mortality Ratio (MMR)
Indicator definition	The ratio of the number of recorded (or estimated) maternal deaths during a given time period per 100 000 live births during the same time period (the number of maternal deaths in a population divided by the number of live births – depicting the risk of maternal death relative to the number of live births). A maternal death refers to a female death from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy.[6]
Programme relevance	Maternal mortality is a sensitive measure of health system strength, access to quality care and coverage of effective interventions to prevent maternal deaths. The MMR represents the risk associated with each pregnancy and is also a useful barometer of social and economic conditions such as women's and girls' access to education, equality, and political commitment to health and development. Reduction of the MMR by three quarters between 1990 and 2015 is a tracking indicator for Millennium Development Goal (MDG) 5 target 5A.
Data source(s)	The MMR can be calculated from data collected through vital registration systems, household surveys (direct methods), sisterhood methods, verbal autopsies, reproductive age mortality studies (RAMOS), disease surveillance or sample registration systems, special studies on maternal mortality, health services records, and national population censuses. Weaknesses in many countries' health information systems have required the use of statistical modelling exercises to develop comparable maternal mortality estimates. Estimation procedures use available data, and adjust for underreporting and potential misclassification of deaths. For official MDG tracking, the United Nations uses interagency-adjusted estimates produced by the Maternal Mortality Estimation Interagency Group (MMEIG), which is composed of WHO, UNICEF, United Nations Population Fund (UNFPA) and the World Bank, together with demographic experts from academic institutions. Maternal mortality estimates using an alternate set of assumptions and methods have been produced by the Institute of Health Metrics and Evaluation (IHME), a global health research centre at the University of Washington, United States of America.

[6] *International statistical classification of diseases and related health conditions*, 10th revision. Geneva, World Health Organization,1989.

Indicator	Maternal Mortality Ratio (MMR)
Data availability and quality	A recent analysis of empirical observations from the late 1980s to 2008 found only 484 data points globally, an average per country of less than three over about two decades.[7] In sub-Saharan Africa, there were only 74 national data observations over the same period. MMRs may be calculated from vital registration data for 63 countries in the world. For other countries, to ensure international comparability, model-based estimates are used. Maternal mortality is difficult to measure. Identifying a maternal death requires accurate data on cause of death, pregnancy status and the time of death in relation to pregnancy or childbirth for women of reproductive age. Vital registration and health information systems in most developing countries are weak, and thus, cannot provide an accurate assessment of maternal mortality. Estimates derived from all of the possible data sources, even estimates derived from complete vital registration systems in industrialized countries, suffer from missing data, misclassification and underreporting of maternal deaths. Because maternal mortality is a relatively rare event, large sample sizes are needed if household surveys are used, increasing the cost of data collection. Surveys (including sisterhood methods where respondents are asked about the survival of all their adult sisters) identify pregnancy-related deaths, and provide a retrospective rather than a current mortality estimate. In addition, owing to the very large confidence limits around maternal mortality estimates because of sample size issues, trends in maternal mortality should be interpreted with caution. It is recommended that process indicators, such as attendance by skilled health personnel at delivery and use of health facilities for delivery, be considered in assessing progress towards the reduction of maternal mortality. Censuses can provide estimates of maternal mortality by including a limited number of questions on household deaths in the last 12 months to two years prior to the census. They are carried out in 10 year intervals, limiting the use of census data for regular monitoring.
Specific data improvements needed	Generating accurate estimates of maternal mortality poses a considerable challenge due to the limited availability of high-quality data for many low and middle-income countries. Complete vital registration systems are the preferred source of data because they collect information as events occur and cover the entire population. Investments in vital registration systems to ensure correct reporting of births, maternal deaths, and causes of maternal deaths are needed. Continued advancements in statistical modelling approaches, data collection through household surveys, improvements in the reporting of maternal deaths from health care facilities, and methods for properly carrying out RAMOS are a critical interim measure as vital registration systems are strengthened. Furthermore, the Commission's recommendations provide an excellent opportunity to develop or strengthen maternal death surveillance and response systems in countries, benefitting from the rapid spread of information technology.

[7] Wilmoth J. *Technical paper on maternal mortality estimation 2011* (forthcoming).

Credit: Panos/Kieran Dodds. A nomadic Khampa child receives basic medical treatment in a small clinic in Dengke, Sichuan Province, China.

Indicator	Under-five mortality rate (with the proportion of newborn deaths)
Indicator definition	The probability that a child born in a specific year or time period will die before reaching the age of five, if subject to current age-specific mortality rates (expressed as a rate per 1000 live births – number of deaths of children less than five years of age per 1000 live births). The proportion of newborn deaths is the proportion of all child deaths that occur among infants up to four weeks (28 days) of age.
Programme relevance	The under-five mortality rate is a key indicator for measuring child well-being, including health and nutritional status. It is also a key indicator of the coverage of child survival interventions and, more broadly, of social and economic development. Reduction of under-five mortality by two thirds between 1990 and 2015 is a target indicator of MDG 4. Proven preventive and curative interventions are often packaged together to target the leading causes of death of children under the age of five (e.g. pneumonia, diarrhoea, malaria and under-nutrition). More than 40% of all child deaths now occur in the neonatal period, and in many countries reduction of neonatal mortality is progressing more slowly than reduction of child mortality. Systematic action is required by governments and their partners to reach all women and newborns in addition to children under five with effective care. Highly cost-effective interventions are available and feasible for delivery even at the community level.

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Indicator	Under-five mortality rate (with the proportion of newborn deaths)
Data source(s)	Under-five mortality rates are computed from data collected in vital registration systems, local demographic surveillance systems, household surveys (full or summary birth histories) and censuses (summary birth histories). In most of the 74 countries, household surveys conducted as part of the United States Agency for International Development (USAID)-supported Demographic and Health Surveys (DHS) and United Nations Children's Fund (UNICEF)-supported Multiple Indicator Cluster Surveys (MICS) are the main data source. The United Nations Inter-agency Group for Child Mortality Estimation (IGME) produces comparable estimates for 195 countries on an annual basis. The IGME uses all available national-level data after reviewing data quality, and produces country-specific child mortality estimates with publicly available data inputs, adjustments and a replicable statistical model (http://www.childmortality.org, accessed 3 November 2011). The Institute for Health Metrics and Evaluation (IHME), a global health research centre at the University of Washington, United States has produced estimates using an alternative set of statistical assumptions. The two sets of estimates are generally consistent in terms of measures of overall global trends in mortality declines.
Data availability and quality	Complete vital registration systems are considered the gold standard for mortality measurement. The majority of low and middle-income countries, however, does not have fully functioning vital registration systems. Population-based survey data are critical for developing sound mortality estimates for these countries. The number of such surveys has increased dramatically in the last two decades, notably because of the DHS and MICS international survey programmes, with 56 of the 74 countries conducting a survey between 2006 and 2010. Data from more than one survey are available for 21 of the 74 countries. Information from mothers about the survival of their children is collected through these two household surveys. The most common approach is the full birth history (used in all DHS and some MICS) whereby each woman aged 15 to 49 at the time of the survey is asked about the date of birth and, if the child has died, age at death of each live-born child she has had. Many MICS collect only summary birth histories from mothers to gather information on number of children ever-born, surviving or dead. Censuses can provide estimates of child mortality by including summary birth histories or questions on household deaths in the last 12 months prior to the census. Under-five mortality calculated from household surveys is often subject to sampling and non-sampling errors and those derived from census or vital registration systems may also have non-sampling errors. Age misreporting, selection bias and recall bias can all negatively impact the accuracy of estimates of the under-five mortality rate. Underreporting of births and particularly early neonatal deaths is also very common. Pregnancy history data available in some DHS and other surveys may allow for measurement of stillbirths and a more accurate approach for capturing early neonatal deaths.
Specific data improvements needed	Generating accurate estimates of child mortality poses a considerable challenge because of the limited availability of high-quality data for many low and middle-income countries. Complete vital registration systems are the preferred source of data because they collect information as events occur and cover the entire population. Strengthening vital registration systems to ensure correct reporting of births and deaths is essential for improving estimates of neonatal and child mortality. For estimates derived from household surveys, well-designed questionnaires, proper training and supervision of survey interviewers, and reasonable interview length are important measures for improving data quality. Lengthy questionnaires may affect data quality, particularly for those data derived from full birth histories. Household surveys that include data collection on child mortality through a full birth history or pregnancy history should ideally be carried out at least once every five years. Sample sizes should be large enough for the detection of significant trends in equity.

Indicator	Stunting prevalence
Indicator definition	Percentage of children under five who are stunted
Numerator	Number of children under five years of age whose length-for-age or height-for-age is below minus two standard deviations from the median of the World Health Organization (WHO) Child Growth Standards
Denominator	Number of children under five years of age with a valid length or height measurement
P**rogramme relevance**	Stunting is widely recognized as the most important anthropometric indicator for young children, because adequate linear growth depends on optimal nutrition, disease prevention and child care practices. Stunting reflects continued, long-term exposure to poor health and nutrition, particularly during the first two years of life. The indicator for nutrition (under MDG 1 target 1C) is the proportion of children who are underweight (low weight for age), which captures a mix of children suffering from chronic and acute under-nutrition. Children from populations undergoing the nutrition transition (the shift from high levels of under-nutrition to reductions in famines to increases in the prevalence of overweight and nutrition related non-communicable diseases that typically occurs as countries develop) can experience a combination of stunting and overweight, and, as a consequence, underweight prevalence in the population may be low. For this reason, stunting is a better indicator of under-nutrition than underweight. Children under the age of five around the world have the same growth potential, and prevalence of stunting above what would be expected in a well-nourished population (about 3% prevalence) indicates the need for remedial actions.
Data source(s)	In low and middle-income countries, health facility data do not provide reliable estimates of stunting rates in the child population. Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), and other national household surveys usually collect data on stunting. Their results are available in the UNICEF Global Database on Under-nutrition (http://www.childinfo.org, accessed 3 November 2011) as well as in the WHO Global Database on Child Growth and Malnutrition (http://www.who.int/nutgrowthdb/, accessed 3 November 2011).
Data availability and quality	All 74 Commission countries had at least one survey with child anthropometry data collection in the last decade: 24 countries had one survey, 29 had two surveys and 21 had three or more surveys. Viet Nam and Indonesia had 12 and 9 surveys respectively with anthropometric data collection during this time period. On average, the last survey in the Commission countries was about six years ago (in 2005). More than half of these countries (45) conducted a survey in 2006 or later. DHS and MICS are the main vehicles, but countries also conducted other socioeconomic and nutrition surveys with anthropometric data collection. Unlike measurement of weight, which is relatively simple, measuring recumbent length (in children under two years of age) or standing height (in children aged two to five years) requires thorough interviewer training, compliance with standard anthropometric protocols, and regular sessions to standardize data collection procedures in the field. Extreme length/height-for-age values (defined as plus or minus four standard deviations from the sample median value) are usually due to measurement errors, and are routinely excluded from data analyses.
Specific data improvements needed	At global and regional levels, data availability is adequate, but it is strongly recommended that at least one survey with anthropometric data collection should be carried out every four to five years in every country. Thorough training and standardization of measurement approaches, and use of appropriate equipment, are essential for ensuring data quality.

Credit: Panos/Giacomo Pirozzi. Family planning motivator, North Cameroon.

2. Coverage Indicators

Intervention	Demand for family planning satisfied (met need for contraception)
Indicator definition	Percentage of women of reproductive age (15-49 years or age), either married or in a union, who have their need for family planning satisfied. This indicator is determined by the current levels of contraceptive use and the unmet need for family planning.
Numerator	The Contraceptive Prevalence Rate (CPR) is the percentage of women of reproductive age (15-49 years old) who are married or in a union and who are currently using, or whose sexual partner is currently using, at least one contraceptive method, regardless of the method used (modern or traditional).
Denominator	Total demand for family planning is defined as the sum of the CPR (as defined above) and the unmet need for family planning. Unmet need for family planning is the proportion of women of reproductive age (15-49 years old) either married or in a consensual union, who are fecund and sexually active but who are not using any method of contraception (modern or traditional), and report not wanting any more children or wanting to delay the birth of their next child for at least two years. Included are: • all pregnant women (married or in a consensual union) whose pregnancies were unwanted or mistimed at the time of conception; • all postpartum amenorrhoeic women (married or in consensual union) who are not using family planning and whose last birth was unwanted or mistimed; • all fecund women (married or in consensual union) who are neither pregnant nor postpartum amenorrhoeic, and who either do not want any more children (want to limit family size), or who wish to postpone the birth of a child for at least two years or do not know when or if they want another child (want to space births), but are not using any contraceptive method.

Intervention	Demand for family planning satisfied (met need for contraception)
Programme relevance	The proportion of demand for family planning satisfied (met need for contraception) indicator enables assessment of family planning programmes and progress in providing contraceptive services to women who wish to avoid getting pregnant. Access to family planning provides women and their partners opportunities to make decisions about family size and timing of pregnancies. This contributes to maternal and child health by preventing unintended pregnancies and pregnancies that are too closely spaced, which are at higher risk for poor obstetrical outcomes. Unmet need for family planning shows the gap between women's reproductive intentions and their access to or use of contraceptives. The CPR provides an estimate of contraceptive use in a population. Both the unmet need for family planning and CPR indicators are used for tracking progress towards the MDG 5 target 5B of achieving universal access to reproductive health. The proportion of demand satisfied (met need for contraception) indicator can range from a value of 1 to 100 % with 100 % coverage as the target, and is therefore easier to interpret and compare across countries than either CPR or unmet need for family planning. CPR and unmet need for family planning never approximate 100 %in a population since, at any one time, some women wish to become pregnant and others are not at risk of pregnancy. The relationship between unmet need for family planning and CPR is also not straightforward, as it depends upon a range of factors including where countries are along the transition from high to low fertility. For example, both CPR and unmet need may increase at the same time in countries where the demand for family planning is growing as the number of children desired declines.
Data source(s)	Information on CPR and unmet need for family planning is collected through household surveys such as United States Agency for International Development (USAID)-supported Demographic and Health Surveys (DHS), United Nations Children's Fund (UNICEF)- supported Multiple Indicator Cluster Surveys (MICS), Reproductive Health Surveys (RHS), and national surveys based on similar methodologies. DHS are conducted approximately every five years and MICS are carried out every three years. Other survey programmes, like the Pan-Arab Project for Family Health (PAPFAM) and the European Fertility and Family Surveys (FFS), can also be used.

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Intervention	Demand for family planning satisfied (met need for contraception)
Data availability and quality	At the time of publication, all 74 priority countries have data from a DHS or MICS from the year 2000 forward that include questions on contraceptive use, including a breakdown by method. Sixty countries have data on contraceptive use from surveys dated 2005 or later. Fifty-three priority countries have survey data available on unmet need for family planning from the year 2000 forward, 38 of these have data from a survey dated 2005 or later. According to The Millennium Development Goals Report 2011[8], CPR data is available for 135 of the 149 developing countries. Only 93 of the 135 countries have data for unmet need for family planning – estimates for 12 countries are from years before 2000, and estimates for 59 countries are from 2005 or later. Estimates of the unmet need for family planning and CPR are produced at the global level by the United Nations Population Division (UNPD), in collaboration with the United Nations Population Fund (UNFPA). Estimates are generally obtained from national household surveys that are internationally coordinated, such as DHS, MICS (rounds 3 and 4), and RHS. When DHS or RHS data are not available, data from national surveys, which have incorporated the DHS methodology but were conducted by national authorities without international technical assistance, are used as inputs. National surveys conducted as part of the European Fertility and Family Surveys (FFS) and the Pan-Arab Project for Family Health (PAPFAM) may also be used. Differences in the questions included in particular surveys may affect the estimates of unmet need for family planning and make comparability difficult over time or across countries. Questions about contraceptive use, desired family size, and assessment of postpartum amenorrhea may also indirectly affect the measured level of unmet need for family planning. In 2011, the agencies involved in developing the unmet need for family planning indicator (UNFPA, UNPD, WHO, UNICEF, USAID and ICF Macro (DHS)) agreed on a revised standard definition of unmet need for family planning. This will allow for the re-calculation of past estimates and trend analyses (when using DHS data), as well as the production of comparable estimates moving forward (when using data from DHS, MICS and PAPFAM programmes).
Specific data improvements needed	According to the standard definition of unmet need for family planning, women who are using a traditional method of contraception are considered to have a met need for family planning. Because traditional methods can be considerably less effective than modern methods, additional analyses may be conducted to distinguish between women relying on traditional and modern methods in order to determine the unmet need for modern contraception. Improvement of the reporting of contraceptive uptake from health-care facilities should be carried out as part of the strengthening of facility reporting systems.

[8] The Millennium Development Goals Report 2011. New York, United Nations, 2011(http://www.un.org/millenniumgoals/11_MDG%20Report_EN.pdf, accessed 3 November 2011).

Credit: World Health Organization/Christopher Black. A health worker weighs an internally displaced pregnant woman in Ndosho Health Clinic, Democratic Republic of the Congo.

Intervention	Antenatal care, four or more visits
Indicator definition	Percentage of women attended at least four times during pregnancy by any provider (skilled or unskilled) for reasons related to the pregnancy. The Commission recommendation specifies skilled provider. These data are not currently available and are not likely to become available through household surveys given the complexity of determining type of provider for each visit.
Numerator	Number of women attended at least four times during pregnancy by any provider (skilled or unskilled) for reasons related to the pregnancy in the *x* years prior to the survey
Denominator	Total number of women who had a live birth in the same time period
Programme relevance	The antenatal period represents an important opportunity for providing pregnant women with interventions that may be vital to their health and well-being and that of their infants. WHO recommends at least four antenatal visits based on a review of the effectiveness of different models of antenatal care. Measurement of whether pregnant women received antenatal care, however, is not sufficient for capturing information on the specific services delivered. WHO guidelines are specific on the content of antenatal care visits, which should include at a minimum: • blood pressure measurement • urine testing for bacteriuria and proteinuria • blood testing to detect syphilis and severe anaemia, and other conditions as necessary (e.g. HIV) • weight/height measurement (optional) Other interventions that can be delivered during antenatal care visits include, but are not limited to, prevention of mother-to-child transmission of human immunodeficiency virus (HIV) (PMTCT) and intermittent preventive treatment of malaria during pregnancy (IPTp) when and where appropriate, counselling on birth preparedness and other health-related topics including family planning and exclusive breastfeeding, identification and prevention of violence against women, and the provision of iron/folic acid supplements. Antenatal care (four or more visits) is a tracking indicator for MDG 5 target 5A.

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Intervention	Antenatal care, four or more visits
Data source(s)	National-level household surveys are the main sources used to collect data on antenatal care. These surveys include USAID-supported Demographic and Health Surveys (DHS), UNICEF-supported Multiple Indicator Cluster Surveys (MICS), Reproductive Health Surveys (RHS), and national surveys based on similar methodologies. DHS are conducted approximately every five years and MICS surveys every three years. For industrialized countries, data sources include routine service statistics.
Data availability and quality	Fifty of the 74 Commission countries have conducted nationally representative household surveys which included data collection for antenatal care (four or more visits) since 2005. Ten countries have household survey estimates from 2000 to 2005. Antenatal care computations based on facility data are also prepared by most countries, but data quality problems are persistent. There is often no systematic analysis of facility and survey data, as is done for other indicators such as immunizations, to estimate coverage trends. A key limitation of the antenatal (four or more visits) indicator is that it does not provide information on the type of health-care provider. The indicator also does not provide information on the actual interventions delivered during the service contact.
Specific data improvements needed	The indicator for antenatal care (four or more visits) refers to visits with *any* provider because national-level household surveys do not collect provider data for each visit. In terms of survey methodology, obtaining provider information on each antenatal care visit is not a practical approach. Ideally, these data should be collected through facility reports that are representative of the population. Investments in facility data collection processes (e.g. the use of antenatal cards, electronic reporting systems) are needed. In addition, standardization of the definition of *skilled* health personnel for delivering antenatal care would improve measurement of this indicator given variations in training of health personnel in different countries.

Credit: Panos/Dieter Telemans. Twenty-nine year old HIV-positive mother holds her cocktail of antiretroviral drugs at a hospital in Pourk District, Siem Reap, Cambodia.

Intervention	**1. Antiretrovirals for HIV-positive pregnant women to reduce the risk of mother-to-child transmission during pregnancy and delivery;** **2. Antiretroviral therapy for (pregnant) women who are treatment eligible**
Indicator definition	**1.** Percentage of HIV-infected pregnant women provided with antiretroviral drugs to reduce the risk of mother-to-child transmission during pregnancy and delivery [United Nations General Assembly Special Session/Universal Access/Joint United Nations Programme on HIV/AIDS (UNAIDS)] **2.** Percentage of HIV-infected (pregnant) women who are treatment eligible provided with antiretroviral therapy
Numerator	**1.** Number of HIV-infected pregnant women who received antiretroviral drugs during the past 12 months to reduce mother-to-child transmission of HIV. The numerator can be disaggregated by four options. The first three are recommended by WHO for HIV-infected pregnant women for the prevention of mother-to-child transmission of HIV (PMTCT): a) ARV therapy for HIV-infected pregnant women eligible for life-long treatment b) Maternal triple ARV prophylaxis. This includes the following azidothymidine/also called zidovudine (AZT)-based regimens when all three drugs are started simultaneously: • AZT + 3TC + LPV-r • AZT + 3TC + ABC • AZT + 3TC + EFV[9] c) Maternal AZT. This includes women who receive only AZT starting at 14 weeks and those that receive other ARVs (such as 3TC and NVP[10]) at labour and delivery, or postpartum (as a "tail"). A regimen with AZT as the primary prophylactic agent regardless of the duration and receipt of other drugs should be included in this category. d) Single-dose nevirapine only (SDNVP). Although this regimen is not recommended by WHO and national PMTCT programmes are being encouraged to move towards using more efficacious regimens, it should be recorded and reported when it is provided. Progress reports on PMTCT will now present two versions of the indicator, one with and one without SDNVP included in the estimate. **2.** ARV therapy for HIV-infected pregnant women eligible for life-long treatment

[9] AZT = azidothymidine/zidovudine; 3TC = lamivudine; LPV-r = lopinavir/ritonavir; ABC = abacavir; EFV = efavirenz.

[10] NVP = nevirapine.

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Intervention	Antiretrovirals for HIV-positive pregnant women
Denominator	**1.** Estimated number of pregnant HIV-infected women within the past 12 months. **2.** Estimated number of HIV-infected pregnant women eligible for ART.
Programme relevance	These two indicators allow countries to monitor coverage with antiretroviral medicines of HIV-infected pregnant women to reduce the risk for transmission of HIV to infants, and for their own health. These indicators are important measures of progress towards MDG 6. When disaggregated, the first indicator can show progress in access to more effective antiretroviral drug regimens for PMTCT in countries that are scaling up newer regimen categories. As the indicator measures antiretroviral drugs dispensed and not those consumed, it is not possible to determine adherence to the regimen in most cases. Antiretroviral drug regimens to reduce mother-to-child transmission during pregnancy and delivery (peripartum transmission) should be accompanied by an appropriate postpartum regimen for the mother and for the infant. The postnatal regimen ('tail') to reduce the mother's resistance to nevirapine and the infant's dose are not captured by this indicator, even though they are recommended by WHO as standards of care for PMTCT.
Data source(s)	The numerator for both indicators is calculated from national programme records aggregated from facility registers. National data should be collated and reported annually or more frequently, depending on a country's monitoring needs. National data is sent to UNAIDS and WHO for inclusion in the Global AIDS Progress and Towards Universal Access reports. Antiretroviral drugs can be given to HIV-infected women at various sites (antenatal care, labour and delivery and HIV care and treatment) during pregnancy, during labour or shortly after delivery. The numerator is calculated from national programme records aggregated from facility registers. Two methods for calculating the numerator can be used: a) Counting at the time of antiretroviral drug provision b) Counting at the time of labour and delivery All public, private and nongovernmental organization-run health facilities that provide antiretroviral drugs to HIV-infected pregnant women for PMTCT should be included. Two methods can be used to estimate the two denominators: a) a projection model, such as that provided by Spectrum software b) if Spectrum projections are unavailable, multiply the number of women who gave birth in the past 12 months by the most recent national estimate of HIV prevalence in pregnant women (see note in *Specific data improvements needed*)

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Intervention	Antiretrovirals for HIV-positive pregnant women
Data availability and quality	Data from 2010 on the number of pregnant women receiving antiretrovirals for PMTCT was available from 141 low and middle-income countries. Out of the 74 Commission countries, 70 reported the number of women receiving antiretrovirals, and 60 reported disaggregated data on ARV regimen categories. The PMTCT statistic is collected along with information on the proportion of women attending antenatal care (ANC), being HIV tested and counseled, testing positive for HIV, and receiving antiretrovirals (for both mother and infant, and by regimen type). Multiple interventions delivered across multiple service delivery points and the follow-up of mother-baby pairs through the cascade of interventions challenge data quality. Efforts to systematically address double-counting and under-counting by reviewing service delivery structure and data aggregation mechanisms can improve data quality. In settings with low facility delivery rates, the numerator should be compiled from patient registers, depending on where the drugs are dispensed and where the data are recorded. For example, where antiretroviral drug prophylaxis is provided in the antenatal care clinic and antiretroviral therapy in the HIV care and treatment unit, countries could aggregate data from the antenatal care register (or a register for following up HIV-positive pregnant women) and/or the antiretroviral therapy register. Note that there is a risk of double-counting when antiretroviral drugs are provided at different times or in different health facilities; countries should therefore ensure that a data collection and reporting system is in place to minimize double-counting. In settings where a high proportion of women give birth in health facilities, countries can aggregate the numerator entirely from the labour and delivery register by counting the number of HIV-infected pregnant women who had received a specific antiretroviral drug regimen by the time of delivery. For example, when a woman who received zidovudine (AZT) during her pregnancy gives birth, health workers would record in the labour and delivery register what she received during pregnancy.

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Intervention	Antiretrovirals for HIV-positive pregnant women
Specific data improvements needed	National estimates of HIV-infected pregnant women should be derived by adjusting surveillance data from sentinel sites at antenatal clinics and other sources, taking into consideration characteristics such as age distribution and rural and urban patterns of HIV prevalence. Ideally, data for eligibility assessment for lifelong antiretroviral therapy, whether provided on or off-site, should be recorded in and aggregated from antenatal care registers or other registers of HIV-positive women; i.e. data should be transferred back and recorded in the antenatal care register even if the service is provided at another location. This may, however, lead to under-reporting if the data are not transferred adequately or women do not return to antenatal care facilities for subsequent visits. Strategies to minimize double-counting include: a) When services are offered in different units (e.g. antiretroviral drug prophylaxis dispensed at antenatal care clinics and antiretroviral therapy at HIV care and treatment sites), countries could use a single register from which to compile data, such as the antenatal clinic (ANC)/PMTCT register. b) When antiretroviral drugs are dispensed at different times, countries could subtract women who have already received another drug during pregnancy from the summary reporting form or during aggregation of summary forms and then report by regimen. c) Data can be reported retrospectively by reviewing them at the end of the pregnancy period. When data from antenatal care registers provide only an incomplete picture on initiation of lifelong ART, complementary approaches may be considered. When referrals are made on site within the same health facility, such as from antenatal care to HIV care and treatment sites, providers should select one source from which data are to be aggregated. When women are referred to another health facility (off site), the data should be aggregated from antenatal care or pre-therapy/antiretroviral therapy registers at the referral facility. Patient registers in HIV care and treatment and laboratories should reflect the pregnancy status of patients who are assessed for eligibility for lifelong antiretroviral therapy to facilitate aggregation of the data.

Credit: Panos/Jocelyn Carlin. A baby is born by Caesarean section at Helena Goldie Hospital in Munda, New Georgia, Western Province, Solomon Islands.

Intervention	Skilled attendant at birth
Indicator definition	Percentage of live births attended by skilled health personnel. Skilled health personnel have the required skills to provide life-saving obstetric care, including giving the necessary supervision, care and advice to women during pregnancy, labour and the post-partum period; conduct deliveries on their own; and care for newborns. Traditional birth attendants, even if they receive a short training course, are not included.
Numerator	The number of live births to women ages 15-49 in the *x* years prior to the survey attended during delivery by a skilled health personnel (doctor, nurse, midwife, or auxiliary midwife)
Denominator	Total number of live births to women ages 15-49 in the *x* years prior to the survey
Programme relevance	Skilled attendant at birth is a measure of a health system's ability to provide adequate care for pregnant women during labour and delivery. The indicator may not sufficiently capture women's access to high quality care, particularly when complications arise. It also does not provide information on availability of any supplies and equipment a skilled attendant may need. This indicator is considered a key process measure for assessing country progress in reducing maternal mortality and is a tracking indicator for MDG 5 target 5A.
Data source(s)	Nationally representative household surveys, including USAID-supported Demographic and Health Surveys (DHS) and the UNICEF-supported Multiple Indicator Cluster Survey (MICS), are the most common source of data. DHS are conducted approximately every five years and MICS every three years. The United States Centers for Disease Control and Prevention Reproductive Health Surveys (CDC, RHS) are also used. In countries where the majority of births occur in health facilities, administrative records are used.

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Intervention	Skilled attendant at birth
Data availability and quality	All 74 priority countries have at least one estimate from household surveys on skilled attendant at birth from 2000 forward. Sixty-eight of the 74 countries have survey data from the year 2005 or later. Institutional birth rates are also available through routine health facility reporting , with variable quality. There is often no systematic combined analysis of facility and survey data. The lag time between the reference year for an estimate and the recall period used to develop the estimate can vary by survey. Standardization of the definition of skilled health personnel is also a challenge because of differences in training of health personnel across countries. Although efforts have been made to standardize the definitions of doctors, nurses, midwives and auxiliary midwives used in most household surveys, it is probable that many skilled attendants' ability to provide appropriate care under normal conditions and in an emergency depends on the environment in which they work.
Specific data improvements needed	Skilled health personnel refers to workers/attendants who are accredited health professionals — such as a midwife, doctor or nurse — who have been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. Depending on the setting, health care providers referred to as something other than "doctor, nurse, midwife, or auxiliary midwife" may qualify as a skilled attendant. Further work is needed to review and standardize the skill set of the "skilled birth attendant". Health systems information such as input measures on essential medicines and equipment are also needed to fully assess quality of care.

Credit: Panos/Abbie Trayler-Smith. A newborn in the Maternity Unit at the Ahmed Shah Baba Hospital in Kabul, Afghanistan.

Intervention	Postnatal care for mothers and babies within two days of birth
Indicator definition	Percentage of mothers and babies who received postnatal care within two days of childbirth
Numerator	**1.** Number of women who received postnatal care within two days of childbirth (regardless of place of delivery) **2.** Number of babies who received postnatal care within two days of childbirth (regardless of place of birth)
Denominator	**1.** Total number of women ages 15-49 years with a last live birth in the *x* years prior to the survey (regardless of place of delivery) **2.** Total number of most recently born babies in the *x* years prior to the survey (regardless of place of birth)
Programme relevance	The majority of maternal and newborn deaths occur within a few hours after birth, mostly within the first 48 hours. Deaths in the newborn period (first 28 days) are a growing proportion of all child deaths. Postnatal care contacts, especially within the first few days following birth, are a critical opportunity for improving maternal and newborn health and survival and for provision of information about birth spacing. Interventions provided through postnatal care include promotion of healthy practices such as exclusive breastfeeding, newborn care (hygiene, warmth), and recognition of danger signs and illness, with support for referral. Extra visits may be provided for mothers or babies at particular risk, for example, those with HIV or for small or preterm babies. Effective referral and quality of emergency care for women and newborns at the referral site are essential for maximizing impact. Postnatal care may include a range of contacts including a pre-discharge check for mother and baby, home visits and/or follow-up visits at a health facility. In settings with many home births or early discharge with poor access to primary care, strategies to reach women and babies at home in the first two days after birth are critical.

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Intervention	Postnatal care for mothers and babies within two days of birth
Data source(s)	Nationally representative household surveys, including USAID-supported Demographic and Health Surveys (DHS) and the UNICEF-supported Multiple Indicator Cluster Survey (MICS), are the most common source of data. DHS are conducted approximately every five years and MICS every three years.
Data availability and quality	For the year 2010, data on postnatal care within two days were available for the mother for 28 of 74 countries, but only for five countries for the baby. Postnatal care for mothers has been tracked in DHS for more than a decade, and questions were added to MICS in 2010. Questions regarding postnatal care for babies were progressively added to the DHS over the last decade. Up until 2006, DHS employed an assumption that most women who deliver in an institution will receive some type of postnatal care before discharge and this may well have resulted in over-estimation. It was also assumed that women could not know if their baby received a postnatal check, so questions on postnatal care for babies were only asked for home births. DHS as well as MICS have been modified to collect information on postnatal care for all women regardless of place of delivery, as well as whether or not their babies received a postnatal health check regardless of place of birth. In addition, there are now questions on the provider, timing, and location of postnatal care. As with all reporting in household surveys, responses to questions about postnatal care are subject to recall bias regarding timing and content or to misinterpretation, for example, regarding the cadre of health provider.
Specific data improvements needed	Data from more countries are required especially for postnatal care for babies, and these data will increase over time given the recently revised survey modules. Additional advances are still required to further clarify the scope of questions on postnatal care to broaden data collection beyond the immediate postnatal period. Since almost all programmes are providing care for mother and baby together in the immediate postnatal period, when more data are available for both, it may be possible to track these together. Detailed questions on content of care will be needed as global guidelines are developed, especially for high-priority interventions such as family planning and healthy newborn care behaviours.

Credit: Panos/Giacomo Pirozzi. A woman breastfeeds her baby at a district hospital in Makeni, Northern Province, Sierra Leone.

Intervention	Exclusive breastfeeding (up to six months)
Indicator definition	Percentage of infants ages zero to five months who are exclusively breastfed
Numerator	Number of infants zero to five months who are exclusively breastfed
Denominator	Total number of infants zero to five months surveyed
Programme relevance	Breast milk alone is the ideal nourishment for infants for the first six months of life, providing all of the nutrients, including vitamins and minerals, an infant needs, which means that no other liquid or food is required. Exclusive breastfeeding (up to six months) confers many benefits to the infant. Chief among these is the protective effect against gastrointestinal infections, which is observed not only in developing but also in industrialized countries. The risk of mortality due to diarrhoea and other infections can increase many-fold in infants who are either partially breastfed or not breastfed at all. In the context of HIV, introducing other milks, foods, or liquids significantly increases the risk of HIV transmission through breast milk, and reduces an infant's chance of HIV-free survival. For the mother, exclusive breastfeeding can delay return to fertility.
Data source(s)	Nationally representative household surveys, including USAID-supported Demographic and Health Surveys (DHS), the UNICEF-supported Multiple Indicator Cluster Survey (MICS) and national nutrition surveys, are the most common source of data. DHS are conducted approximately every five years and MICS every three years.

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Intervention	Exclusive breastfeeding (up to six months)
Data availability and quality	Data availability depends on the frequency of household surveys. Fifty-six of the 74 Commission countries have estimates for exclusive breastfeeding from 2006-10. Since the exclusive breastfeeding questions have remained consistent for the last two decades, long-term trend information is available. MICS and DHS are conducted in participating countries every three to five years, from the early 1990s to the present time. National nutrition surveys are conducted annually or semi-annually in many countries. However, there are still a number of developing countries where estimates of infant and young child feeding indicators are either more than 10 years old or non-existent. Infant and young child feeding indicators are estimated based on survey respondents' recall of feeding with the 24-hour period preceding the interview. Since status of exclusive breastfeeding is determined by excluding consumption of all other food and liquid, the accuracy of this indicator is affected by the range of food groups being asked and the accuracy of respondents' recall. Both across and within countries, infant feeding practices can vary substantially, and are influenced by geography, wealth, and custom. Thus, questions that relate to liquids and foods must always be adapted to the context of the survey area. Over the years, the number of food groups included in survey questions has expanded, raising the issue of comparability of estimates derived from earlier surveys to later ones. In addition, most household surveys have a sample size around 600 for infants 0 – 5 months. This relatively small sample gives rise to a wider confidence interval for the indicator estimates, as compared to confidence intervals of other indicators that have larger sample sizes.
Specific data improvements needed	In a number of countries, data are either outdated or non-existent and thus more frequent data collection may be needed. In addition, improvements in data collection, such as proper questionnaire adaptation to local contexts and thorough training of the interviewers, are essential in producing quality estimates of the exclusive breastfeeding, as well as other infant and young child feeding, indicators.

Credit: Panos/Heldur Netocny. At a health centre in the village of Tirildih, medical workers register women and babies for a maternity check up and child vaccination, Jharkhand, India.

Intervention	Three doses of combined diphtheria-tetanus-pertussis (DTP3) vaccine immunization coverage
Indicator definition	Percentage of infants who received three doses of diphtheria-tetanus-pertussis vaccine (DTP3)
Numerator	Number of surviving infants (under 12 months of age) who received three doses of diphtheria-tetanus-pertussis vaccine (DTP3)
Denominator	Number of surviving infants (under 12 months of age) in the reference year
Programme relevance	Diphtheria, tetanus, and pertussis are serious diseases. Although vaccine-preventable, these diseases cause a substantial global disease burden, particularly in low and middle-income countries and among children under five years of age. Immunization of children during their first year of life against diphtheria, tetanus and pertussis has been a core component of the Expanded Programme on Immunization since its inception in 1974. Immunization coverage with three doses of DTP is often used as an indicator of a health system's performance. Despite the remarkable strides made during the past 30 years, the benefits of vaccination continue to elude many of the world's children as an estimated 19.3 million infants did not receive three doses of DTP in 2010.
Data source(s)	Estimates of DTP3 coverage rates are derived from two data sources: 1) Reports from health facilities of the numbers of children immunized on a monthly basis which provide the data for annual coverage estimates for the country as a whole and for districts, and 2) WHO and UNICEF estimates of national routine immunization coverage. Data sources used by the WHO and UNICEF working group for the estimation of national immunization coverage include reported coverage levels by national authorities on the WHO/UNICEF Joint Reporting Form, survey results, and grey literature.

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Intervention	Three doses of combined diphtheria-tetanus-pertussis (DTP3) vaccine immunization coverage
Data availability and quality	Almost all countries conduct at least one survey including immunization data collection every five years. Virtually all countries have a reporting system for immunizations given to infants. WHO has promoted the use of district data to assess sub-national progress. The Reach Every District (RED) initiative aims to attain at least 80% immunization coverage in every district. Of the 74 countries in the Commission's report, 64 reported data about district-level coverage in 2010 to WHO. Neither facility nor survey data are perfect, but it is generally accepted that a high quality household survey with an adequate national sample provides the best estimate of immunization coverage. Surveys, however, are generally not conducted on an annual basis and do not have sample sizes that allow sub-national estimates beyond the provincial level. For the facility data, the main challenges are incomplete and inaccurate reporting of the number of vaccinations and uncertainty about the true size of the denominator, which is the target number of children. Household surveys collect information on the vaccination status of children by asking the mother to provide the child's health card and copying the vaccination dates from the card. If there is no card, mothers are asked to recall the vaccinations given to their child. The quality of household survey data on DTP3 depends on the sample design and how successful interviewers are in obtaining information directly from the child health cards. Out of 160 DHS conducted in the past two decades, 12% of surveys obtained less than half of the DTP3 coverage data from the child health cards; 31% of surveys between 50% and 75% of information from the cards; and in 57% of surveys, the card was seen for at least 75% of children.
Specific data improvements needed	Investments in robust immunization recording systems of the number of children vaccinated and on accurate information on the target population (i.e. surviving infants) are of extreme importance. Survey data may be subject to bias due to problems with immunization cards at the household level (missing cards, for example) as well as respondent recall.

Credit: Panos/Abbie Trayler-Smith. Nurse Margaret Ganga gives out antibiotics to a young mother at Bwalia 'Bottom' Hospital in Lilongwe, Malawi.

Intervention	Antibiotic treatment for childhood pneumonia
Indicator definition	Percentage of children ages 0-59 months with suspected pneumonia receiving antibiotics
Numerator	Number of children ages 0-59 months with suspected pneumonia in the two weeks prior to the survey receiving antibiotics
Denominator	Total number of children ages 0-59 months with suspected pneumonia in the two weeks prior to the survey
Programme relevance	Pneumonia accounts for an estimated 18% of deaths among children under five. Pneumonia prevention and treatment is therefore essential to the achievement of MDG 4. Pneumonia is closely associated with under-nutrition and poor home environments that leave children more exposed to disease-causing pathogens, which means that pneumonia deaths are highly concentrated in the world's poorest settings. A key intervention for controlling pneumonia in children is prompt treatment with a full course of appropriate antibiotics. Effective case management at the community and health facility levels is needed to ensure that sick children receive appropriate treatment.
Data source(s)	Nationally representative household surveys, including USAID-supported Demographic and Health Surveys (DHS) and the UNICEF-supported Multiple Indicator Cluster Surveys (MICS) and other national nutrition surveys, are the most common source of data. DHS are conducted approximately every five years and MICS every three years. Forty-three of the 74 countries have an estimate for antibiotic treatment for childhood pneumonia from household surveys carried from 2005 forward.

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Intervention	Antibiotic treatment for childhood pneumonia
Data availability and quality	Standardized questions on antibiotic use for suspected pneumonia are a core component of both DHS and MICS. National level estimates on the use of antibiotics for treating pneumonia were first collected in DHS in the 1990s. Data on this indicator became more widely available in the 2000s, when standard questions were incorporated into the MICS programme. This indicator is subject to variation as the denominator – children with suspected pneumonia in the two weeks preceding the survey – will vary by season and caretaker reporting. In terms of the numerator, this indicator does not measure timing or dosage of treatment, or the type of antibiotic used. Notably, the responses on antibiotic use will be dependent upon the mother or caretaker's knowledge about the drugs used to treat the illness.
Specific data improvements needed	The Child Health Epidemiology Reference Group (CHERG) has several studies under way with the aim of assessing and improving the measurement of treatment for suspected pneumonia in DHS and MICS.

Section 3

Commission recommendations for resource tracking

Credit: Health Metrics Network/Melinda Henry. Currencies.

The Commission's report recommended that, by 2015, all 74 countries should be tracking and reporting, at a minimum, two aggregate resource indicators: 1) total health expenditure by financing source, per capita; and 2) total reproductive, maternal, newborn and child health expenditure by financing source, per capita. Table 3 describes the two indicators.

Table 3 Resource tracking indicators recommended by the Commission

Indicator definition	
1. Total health expenditure (THE) by financing source, per capita.	2. Total reproductive, maternal, newborn, and child health (RMNCH) expenditure by financing source, per capita.
Numerator	
The numerator is defined according to standard criteria in national health accounts. It requires establishing an expenditure boundary to determine what is included and estimation of aggregate quantities. Financing sources should include at least external resource flows, government expenditures/revenue sources, out-of-pocket spending, and other non-government sources.	Countries will need to apply a functional classification to identify services to include as RMNCH services. Total RMNCH expenditures should be partitioned according to source as in THE.
Denominator	
Total population	Total population

Programme relevance

Total health expenditure by financing source will assist national authorities and civil society in monitoring the level and trends of government fiscal effort for health, and the role of external resources in supporting that effort. Non-government expenditure, especially out-of-pocket expenditure, is useful for monitoring the extent of burden on households from health spending, and provides an indicator of financial protection afforded by the national financing system as well as an indicator of potential barriers to access and use of services.

Total RMNCH expenditure by financing source assists national authorities in monitoring the relative contribution to RMNCH services from governments' own revenue and that of external sources. This can contribute to government and development partner accountability for commitments, as well as identify the degree of additionality of external resources to domestic government spending. Out-of-pocket spending on RMNCH is similarly an indicator of potential barriers to access and use of services.

Data sources

The World Health Organization (WHO) facilitates annual reporting for almost all 74 countries of total health expenditure per capita[11] as well as aggregate figures on the main categories of sources. However, in some countries this information is not being calculated with that frequency using national data sources. Annual estimation of that indicator can be strengthened through improvements in government expenditure reporting, regular reports on disbursements by external sources, and periodic household surveys of health care utilization and expenditure. The latter can be supplemented by other national data sources such as health care market information, for example, as well as pharmaceutical consumption.

Estimation of total RMNCH expenditure at country level will require additional information in most countries. Where patient or encounter-based health financing data is available, this is likely to be easier. In other cases, methods have been developed to estimate function-specific expenditures by, for example, combining household survey-based estimates of utilization and out-of-pocket payment with facility-based data to estimate service delivery costs and applying average allocation coefficients to data on total health expenditure by funding source.

Data quantity and quality

Data on total health expenditure by funding source per capita is available for most countries. Quality checks are possible and methods exist for improving estimation at national level.

At the time of publication, data on total RMNCH expenditure by funding source per capita is available for only a few of the 74 priority countries, and even some of these estimates are for single years and not maintained on an annual basis. For countries wishing to track this indicator, methods are available which could be applied in many cases. While these methods may lack exact detail, applying them consistently over time may reflect trends reasonably well. Countries may want to access technical support from development partners for national teams to develop these indicators.

[11] Presenting figures in per capita terms is helpful to correct for large differences in population size among countries.

Section 4

Equity analyses of the Commission's 11 core indicators

Credit: Panos/Giacomo Pirozzi. Sarah washes dishes; she does not go to school; Yemen.

The Commission's report highlights the limitations of aggregate national level statistics, which can hide important inequalities among population subgroups. It requests that:

> *The 11 indicators of women's and children's health should be reported for the lowest wealth quintile, gender, age, urban/rural residence, geographical location and ethnicity; and, where feasible and appropriate, for education, marital status, number of children and HIV status.*

In partnership with the WHO Global Health Observatory and with Gapminder from Karolinska University, Sweden Countdown includes equity analyses as a regular component of its reporting on progress towards MDGs 4 and 5. Table 4 shows that the Countdown equity database includes four of the six stratification variables recommended by the Commission for all 74 priority countries (wealth quintiles, gender, urban/rural residence and geographical location). Women's age can be analysed with existing data, and can be carried out by Countdown by the end of 2012. There are no data for the ethnicity breakdown for most countries. Of the four optional stratification variables, women's education is available. Analyses by marital status and number of children may be carried out in the near future; however, analyses by HIV status are not currently possible.

Table 4: Availability of stratification variables

Stratification variable	Current status in Countdown database	Comments
Requested by Commission on Information and Accountability for all countries		
Wealth quintiles	Available	
Gender	Available	
Age[12]	Not available	Will require additional analyses; could be made available by late 2012
Urban/rural residence	Available	
Geographic location	Available	Breakdowns are available for regions of each country
Ethnicity	Not available	The Countdown equity group attempted to carry out analyses broken down by ethnicity, but very few countries collected such information in their surveys
Optional (where feasible and appropriate)		
Education	Available	
Marital status	Not available	Will require additional analyses; could be made available by late 2012
Number of children	Not available	Will require additional analyses; could be made available by late 2012
HIV status	Not available	The information on HIV status is not available except for very few surveys that collected samples for testing.

Data availability to carry out equity analyses on the 11 core impact and coverage indicators is presented in Table 5.

[12] Countdown assumes that the Commission is referring to age of the woman/mother, rather than the age of the child. Access to services and health outcomes vary by maternal age, with young adolescent mothers at particularly high risk. Although immunization and infant feeding indicators are specific age-related measurements, most interventions are not disaggregated by age of the child.

Table 5 Availability of data for the 11 core indicators

Core Commission indicator	Current status in Countdown database	Comments
Maternal mortality ratio	Not available	Maternal mortality is currently estimated through modelling for most countries at national level only, and equity breakdowns are not available.
Under-five child mortality (with the proportion of newborn deaths)	Available	The equity breakdowns are based on survey data only and thus may be inconsistent with global modelled estimates; the national level Countdown estimates also take into account other data sources and use statistical modelling approaches.
Children under five who are stunted	Available	
Proportion of demand for family planning satisfied (met need for contraception)	Available	The available indicator is the percentage of demand for family planning satisfied using the algorithms employed by DHS and MICS; will need to be revised in light of the new definitions being proposed by UNFPA. This can be done by the end of 2012.
Antenatal care coverage (four visits)	Not available as defined, but related indicators are available.	Current international databases include two indicators: "four or more ANC visits to any provider" (currently available from DHS, and available in future rounds of MICS) and "one or more ANC visit to a skilled provider" (available from both DHS and MICS). The Countdown equity analyses use the latter because it is available for a larger number of countries.
ARV prophylaxis for HIV+ pregnant women (PMTCT) and ART for (pregnant) women who are treatment-eligible	Not available	This information is not available in the databases that allow equity breakdowns.
Skilled birth attendants	Available	
Postnatal care (within two days) for mother and baby	Available for baby	For countries with existing data, this can be calculated for postnatal care for mothers; nevertheless, few countries have information on postnatal care (either by mother or baby) and for several countries these indicators were only measured for home deliveries.
Breastfeeding exclusively for six months		The Countdown equity database includes equity analyses of "early initiation of breastfeeding"; similar analyses of "breastfeeding exclusively for six months" are possible but will be available by late 2012.

Core Commission indicator	Current status in Countdown database	Comments
DTP3 vaccine coverage	Available	The equity breakdowns are based on survey data only; the national level Countdown estimates also take into account other data sources.
Children with suspected pneumonia receiving antibiotics	Not available; but a related indicator is available.	The Countdown equity database includes breakdowns of "care-seeking for suspected pneumonia" which is available from a large number of surveys; antibiotic use is available for a few countries only; analyses can be carried out by late 2012.

ANC: antenatal care. ART: antiretroviral therapy. DHS: Demographic and Health Surveys. HIV+: human immunodeficiency virus positive. MICS: Multiple Indicator Cluster Survey. PMTCT: Prevention of mother-to-child transmission of HIV. UNFPA: United Nations Population Fund.

Table 3 shows that equity data are available for five of the 11 core indicators, and data are available for a closely related indicator for another four. Existing data do not allow for stratification of the maternal mortality and PMTCT/ART indicators.

There are, however, methodological limitations to carrying out the equity analyses. Stratification variables with several categories (for example, wealth or geographical region of the country) tend to have poor precision, due to smaller samples sizes in each subgroup. This is particularly severe for outcome or impact indicators that are themselves calculated for subsamples, for example antibiotic use among children with pneumonia (often 15% or so of the sample of children) or exclusive breastfeeding among children aged less than six months (about 20% of all under-five children). This limitation can be partly addressed by using summary measures of inequality (such as concentration indices) that are calculated on the basis of the whole distribution in the population rather than for each subgroup. A disadvantage of these summary indices, however, is that they are more difficult to explain to non-specialized audiences such as policymakers or practitioners.

Conclusion

In recommending a framework for accountability for progress on women's and children's health, the Commission established a global, independent Expert Review Group to monitor and assess progress across countries annually through 2015, while also highlighting the need to establish or strengthen accountability mechanisms in countries. Because the availability of timely and high-quality data is a necessary precondition for accountability, this report has focused on assessing the current capacity of health information systems in the 74 high-burden countries to report on the core health, financing and equity indicators recommended by the Commission. It has provided information on data sources, programme significance, and areas where further work is needed to improve the measurement of these indicators.

Information must be available in order to be used for programme management, planning and evaluation purposes, and it must be used in order to make a difference in the lives of women and children. In order to accelerate progress on MDGs 4 and 5 in the limited time left between now and 2015, it is therefore crucial that attention, effort and action be focused simultaneously on two areas:

- Improving countries' capacity to measure and report on the Commission's core health, financing, and equity indicators, through the optimal combination of facility reports, surveys, censuses, vital registration systems, national health accounts, and other essential sources of data; and
- Improving policy makers' capacity to act on the data reported to strengthen programme management and ensure resources are allocated according to need.

Movement on these equally important and mutually reinforcing efforts will help to realize the Commission's vision of greater accountability and the *Global Strategy for Women's and Children's Health* 's promise of saving the lives of millions of women and children and improving the lives of millions more.

Credit: Panos/Jenny Matthews. Mother and baby, Para State, Brazil.

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