Countdown to 2015 decade report (2000–10): taking stock of maternal, newborn, and child survival

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The Countdown to 2015 for Maternal, Newborn, and Child Survival monitors coverage of priority interventions to achieve the Millennium Development Goals (MDGs) for child mortality and maternal health. We reviewed progress between 1990 and 2010 in coverage of 26 key interventions in 68 Countdown priority countries accounting for more than 90% of maternal and child deaths worldwide. 19 countries studied were on track to meet MDG 4, in 47 we noted acceleration in the yearly rate of reduction in mortality of children younger than 5 years, and in 12 countries progress had decelerated since 2000. Progress towards reduction of neonatal deaths has been slow, and maternal mortality remains high in most Countdown countries, with little evidence of progress. Wide and persistent disparities exist in the coverage of interventions between and within countries, but some regions have successfully reduced longstanding inequities. Coverage of interventions delivered directly in the community on scheduled occasions was higher than for interventions relying on functional health systems. Although overseas development assistance for maternal, newborn, and child health has increased, funding for this sector accounted for only 31% of all development assistance for health in 2007. We provide evidence from several countries showing that rapid progress is possible and that focused and targeted interventions can reduce inequities related to socioeconomic status and sex. However, much more can and should be done to address maternal and newborn health and improve coverage of interventions related to family planning, care around childbirth, and case management of childhood illnesses.

Introduction

> "Our world possesses the knowledge and resources to achieve the MDGs... falling short of the Goals would be an unacceptable failure, moral and practical."
>
> *Ban Ki Moon*

The UN Millennium Summit in 2000 set the stage for 189 governments and at least 23 international organisations to commit themselves to a broad set of health and development goals with defined targets to be achieved by 2015.[1] The target of Millennium Development Goal (MDG) 4 is reduction of mortality in children younger than 5 years by two-thirds, and those of Goal 5 are reduction of the maternal mortality ratio by three-quarters and achievement of universal access to reproductive health. In 2010, two-thirds of the period for attainment of the MDGs has passed, with only 5 years remaining. In September, 2010, governments will reconvene in a special Summit of the UN General Assembly to assess progress and renew commitments to these goals.

The Countdown to 2015 for Maternal, Newborn, and Child Survival is an independent suprainstitutional

Panel 1: What does Countdown to 2015 do?

- Uses evidence and wide consensus to select and track coverage of priority interventions for which there is compelling evidence that high coverage would reduce maternal, neonatal, and child deaths
- Produces data to guide action by analysing coverage, equity, financing, policies, and health systems in priority countries, with a set of concise country profiles as the key output[5]
- Develops new and innovative methods to track progress towards Millennium Development Goals (MDGs) 4 and 5
- Recommends actions to accelerate progress towards high and equitable coverage of priority maternal, newborn, and child health interventions along the continuum of care
- Promotes accountability from governments and the international community to achieve the health MDGs, especially Goals 4 and 5, by emphasising whether progress has or has not been satisfactory
- Identifies key gaps in data and implementation knowledge that are hindering progress in reduction of maternal, newborn, and child mortality

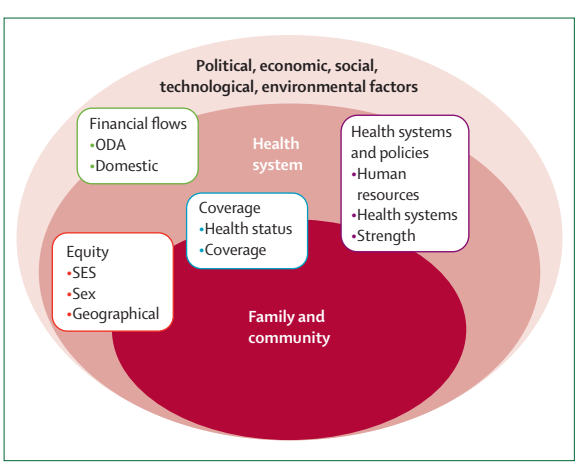

Figure 1: **Countdown databases in the context of maternal, newborn, and child survival**
ODA=overseas development aid. SES=socioeconomic status.

	Mortality rate in children younger than 5 years (deaths per 1000 livebirths)			Average annual rate of reduction (%)				
	1990	2000	2008	1990–2008	On/off track*	1990–2000	2000–08	Change
Afghanistan	260	257	257	0·1%	No progress	0·1%	0·0%	↓
Angola	260	239	220	0·9%	No progress	0·8%	1·0%	↑
Azerbaijan	98	69	36	5·6%	On track	3·5%	8·1%	↑
Bangladesh	149	91	54	5·6%	On track	4·9%	6·5%	↑
Benin	184	144	121	2·3%	Insufficient	2·5%	2·2%	↓
Bolivia	122	86	54	4·5%	On track	3·5%	5·8%	↑
Botswana	50	81	31	2·7%	On track	–4·8%	12·0%	↑
Brazil	56	34	22	5·2%	On track	5·0%	5·4%	↑
Burkina Faso	201	188	169	1·0%	Insufficient	0·7%	1·3%	↑
Burundi	189	178	168	0·7%	No progress	0·6%	0·7%	↑
Cambodia	117	106	90	1·5%	Insufficient	1·0%	2·0%	↑
Cameroon	149	147	131	0·7%	No progress	0·1%	1·4%	↑
Central African Republic	178	181	173	0·2%	No progress	–0·2%	0·6%	↑
Chad	201	205	209	–0·2%	No progress	–0·2%	–0·2%	—
China	46	36	21	4·4%	On track	2·5%	6·7%	↑
Congo (Brazzaville)	104	116	127	–1·1%	No progress	–1·1%	–1·1%	—
Côte d'Ivoire	150	138	114	1·5%	Insufficient	0·8%	2·4%	↑
Djibouti	123	106	95	1·4%	Insufficient	1·5%	1·4%	↓
DR Congo	199	199	199	0·0%	No progress	0·0%	0·0%	—
Egypt	90	47	23	7·6%	On track	6·5%	8·9%	↑
Equatorial Guinea	198	168	148	1·6%	Insufficient	1·6%	1·6%	—
Eritrea	150	89	58	5·3%	On track	5·2%	5·4%	↑
Ethiopia	210	148	109	3·6%	Insufficient	3·5%	3·8%	↑
Gabon	92	87	77	1·0%	Insufficient	0·6%	1·5%	↑
Ghana	118	111	76	2·4%	Insufficient	0·6%	4·7%	↑
Guatemala	77	47	35	4·4%	On track	4·9%	3·7%	↓
Guinea	231	185	146	2·5%	Insufficient	2·2%	3·0%	↑
Guinea-Bissau	240	218	195	1·2%	Insufficient	1·0%	1·4%	↑
Haiti	151	109	72	4·1%	On track	3·3%	5·2%	↑
India	116	94	69	2·9%	Insufficient	2·1%	3·9%	↑
Indonesia	86	56	41	4·1%	On track	4·3%	3·9%	↓
Iraq	53	48	44	1·0%	Insufficient	1·0%	1·1%	↑
Kenya	105	128	128	–1·1%	No progress	–2·0%	0·0%	↑
Laos	157	86	61	5·3%	On track	6·0%	4·3%	↓
Lesotho	101	109	79	1·4%	Insufficient	–0·8%	4·0%	↑
Liberia	219	174	145	2·3%	Insufficient	2·3%	2·3%	—
Madagascar	167	132	106	2·5%	Insufficient	2·4%	2·7%	↑
Malawi	225	162	100	4·5%	On track	3·3%	6·0%	↑
Mali	250	217	194	1·4%	Insufficient	1·4%	1·4%	—
Mauritania	129	122	118	0·5%	No progress	0·6%	0·4%	↓
Mexico	45	26	17	5·4%	On track	5·5%	5·3%	↓
Morocco	88	54	36	5·0%	On track	4·9%	5·1%	↑
Mozambique	249	183	130	3·6%	Insufficient	3·1%	4·3%	↑
Myanmar	120	107	98	1·1%	Insufficient	1·1%	1·1%	—
Nepal	142	85	51	5·7%	On track	5·1%	6·4%	↑
Niger	305	227	167	3·3%	Insufficient	3·0%	3·8%	↑
Nigeria	230	207	186	1·2%	Insufficient	1·1%	1·3%	↑
North Korea	55	55	55	0·0%	No progress	0·0%	0·0%	—
Pakistan	130	108	89	2·1%	Insufficient	1·9%	2·4%	↑
Papua New Guinea	91	77	69	1·5%	Insufficient	1·7%	1·4%	↓
Peru	81	41	24	6·8%	On track	6·8%	6·7%	↓

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	Mortality rate in children younger than 5 years (deaths per 1000 livebirths)			Average annual rate of reduction (%)				
	1990	2000	2008	1990–2008	On/off track*	1990–2000	2000–08	Change
(Continued from previous page)								
Philippines	61	36	32	3·6%	On track	5·3%	1·5%	↓
Rwanda	174	186	112	2·4%	Insufficient	–0·7%	6·3%	↑
Senegal	149	131	108	1·8%	Insufficient	1·3%	2·4%	↑
Sierra Leone	278	252	194	2·0%	Insufficient	1·0%	3·3%	↑
Somalia	200	200	200	0·0%	No progress	0·0%	0·0%	—
South Africa	56	73	67	–1·0%	No progress	–2·7%	1·1%	↑
Sudan	124	115	109	0·7%	No progress	0·8%	0·7%	↓
Swaziland	84	124	83	0·1%	No progress	–3·9%	5·0%	↑
Tajikistan	117	94	64	3·4%	Insufficient	2·2%	4·8%	↑
Tanzania	157	139	104	2·3%	Insufficient	1·2%	3·6%	↑
The Gambia	153	131	106	2·0%	Insufficient	1·6%	2·6%	↑
Togo	150	122	98	2·4%	Insufficient	2·1%	2·7%	↑
Turkmenistan	99	71	48	4·0%	On track	3·3%	4·9%	↑
Uganda	186	158	135	1·8%	Insufficient	1·6%	2·0%	↑
Yemen	127	98	69	3·4%	Insufficient	2·6%	4·4%	↑
Zambia	172	169	148	0·8%	No progress	0·2%	1·7%	↑
Zimbabwe	79	102	96	–1·1%	No progress	–2·6%	0·8%	↑

DR Congo=Democratic Republic of the Congo. *On track defined as mortality rate in children younger than 5 years of less than 40 deaths per 1000 livebirths, or less than 39 deaths per 1000 livebirths plus average annual rate of reduction (AARR) higher than 3·9%; insufficient defined as under-5 mortality rate greater than 29 deaths per 1000 livebirths plus AARR between 0·9% and 4·0%; no progress defined as under-5 mortality rate greater than 29 deaths per 1000 livebirths plus AARR lower than 1·0%.

Table 1: **Progress towards Millennium Development Goal 4**

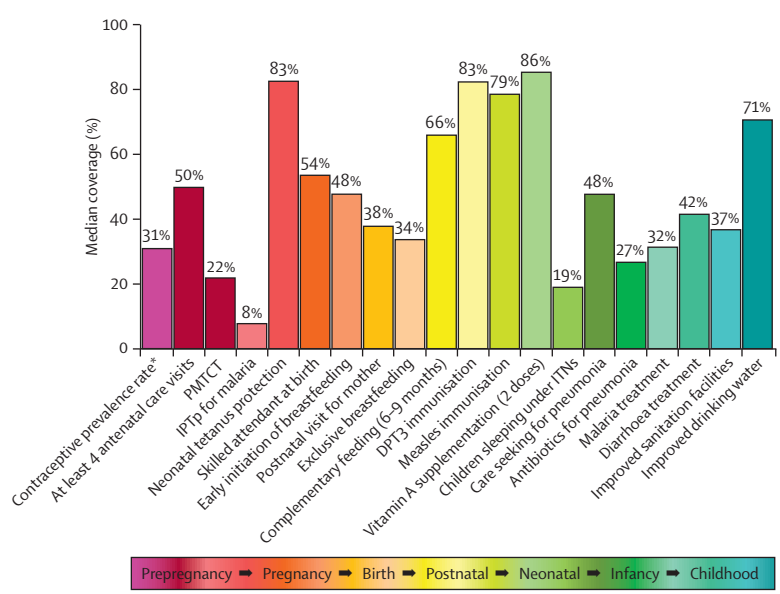

Figure 2: **Median coverage for effective maternal, newborn, and child interventions in 68 Countdown countries**
Data are most recent available estimates since 2000. PMTCT=prevention of maternal to child transmission of HIV. IPTp=intermittent preventive treatment for malaria. DPT3=diphtheria, pertussis, and tetanus. ITNs=insecticide-treated bednets. *Target coverage rate is not 100%.

initiative that was established in 2005. Its primary objective is to gather and present data for use by countries and the global health community to stimulate action on the health-related MDGs. The initiative is a collaboration of academics, UN agencies, non-governmental organisations, health-care professional associations, donors, and governments, with *The Lancet* as a key partner. Countdown specifically focuses on key evidence-based interventions that have been proven to improve maternal, newborn, and child health and survival. The work of Countdown addresses not only the fourth and fifth MDGs, but also MDG 1 through action on nutrition, MDG 6 on HIV/AIDS and malaria, MDG 7, which includes water and sanitation, and MDG 8 through a focus on partnership.

Evolution of Countdown

Countdown provides a common framework to track coverage of proven interventions and measures of mortality and nutrition in countries with the highest burden of mortality in mothers and children. In 2005, the first Countdown report included 60 countries and 17 interventions, and focused on child survival.[2] The process thereafter evolved to focus on the continuum of care from prepregnancy through to pregnancy, childbirth, the postnatal period, and early childhood. At present, Countdown tracks coverage for interventions that have proven effectiveness to reduce maternal, newborn, and child mortality and improve maternal health in the 68 countries that together account for at least 95% of maternal and child deaths worldwide.[3] Countdown mechanisms generate evidence of progress and use country profiles, publications, conferences, and other means to advance use of data for national and global action. The 2008 Countdown meeting in Cape Town was

	Survey year(s)	Most recent livebirths delivered by caesarean section (%)		
		Urban	Rural	Total
Brazil	2006	46%	35%	44%
Mexico	2006	..	..	38%
Egypt	2008	37%	22%	28%
Iraq	2006	24%	15%	21%
South Africa	2003	24%	15%	21%
Peru	2004–06	24%	6%	16%
Bolivia	2003	21%	6%	15%
Namibia	2006–07	21%	7%	13%
Djibouti	2008	..	..	12%
Guatemala	2002	19%	8%	11%
India	2005–06	17%	6%	9%
Swaziland	2006–07	8%	8%	8%
Bangladesh	2007	16%	5%	8%
Pakistan	2006–07	13%	5%	7%
Philippines	2003	10%	5%	7%
Ghana	2008	11%	5%	7%
Indonesia	2007	11%	4%	7%
Côte d'Ivoire	2005	8%	6%	6%
Gabon	2000	6%	4%	6%
Morocco	2003–04	9%	2%	5%
Lesotho	2004	8%	5%	5%
Zimbabwe	2005–06	9%	3%	5%
Azerbaijan	2006	5%	4%	5%
DR Congo	2007	5%	4%	4%
Kenya	2003	9%	3%	4%
Benin	2006	6%	2%	4%
Liberia	2007	5%	3%	4%
Senegal	2005	7%	1%	3%
Congo (Brazzaville)	2005	4%	2%	3%
Mauritania	2000–01	6%	1%	3%
Tanzania	2004–05	8%	2%	3%
Malawi	2004	4%	3%	3%
Turkmenistan	2000	4%	2%	3%
Uganda	2006	9%	2%	3%
(Continues in next column)				
(Continued from previous column)				
Haiti	2005	6%	1%	3%
Zambia	2007	6%	2%	3%
Rwanda	2005	8%	2%	3%
Eritrea	2002	7%	1%	3%
Nepal	2006	8%	2%	3%
Guinea	2007	5%	2%	2%
Cameroon	2004	4%	1%	2%
Mozambique	2003	5%	1%	2%
Cambodia	2005	6%	1%	2%
Nigeria	2008	4%	1%	2%
Mali	2006	4%	1%	2%
Sierra Leone	2008	3%	1%	2%
Ethiopia	2005	9%	0%	1%
Madagascar	2003–04	2%	1%	1%
Niger	2006	5%	0%	1%
Burkina Faso	2003	3%	0%	1%
Chad	2004	1%	0%	0%

Data are latest available estimates since 2000. DR Congo=Democratic Republic of the Congo.

Table 2: **Percentage of most recent livebirths delivered by caesarean section in Countdown countries, total and for women living in urban and rural households**

linked to the meeting of the Inter-Parliamentary Union and was intended to engage politicians and policy makers in issues related to maternal, newborn, and child health and survival.[4]

An important Countdown function is identification of key gaps in data and evidence, and stimulation of development of methods and instruments to improve assessment of coverage. Countdown indicators and methods have changed in response to new evidence and improved methods, but the principal aim of Countdown has not altered—ie, to assess every 2 or 3 years until 2015 whether proven interventions and approaches are reaching women and children in greatest need, especially marginalised populations and those living in poverty. Tracking of single biologically based interventions has been complemented by inclusion of broad packages such as antenatal or postnatal care that can serve as platforms for delivery of several interventions. The list of priority countries has also expanded and attempts are being made to include an increased range of indicators including adolescent and reproductive health as well as social determinants of health. Adolescent birth rate, a tracking indicator for MDG 5 target B, was added in 2010.

Countdown focuses not only on intervention coverage, but also on major determinants of coverage, including strength, policies, and financial flows of health systems, with a focus on the relation between socioeconomic and sex inequities and intervention coverage (panel 1). These areas of emphasis are part of a broad conceptual framework guiding secondary analyses of Countdown data and are consistent with the Paris Declaration on Aid Effectiveness[6] and the monitoring and evaluation framework for health-systems strengthening that was developed by a working group of representatives from WHO, the World Bank, the Global Alliance for Vaccines and Immunisation, and the Global Fund to Fight AIDS, Tuberculosis and Malaria.[7]

Countdown uses a conceptual model that is based on the WHO health-systems framework,[8] which proposes that six linked and overlapping components of a health system (service delivery, health workforce, information, medical products, vaccines and technologies, and financing and leadership or governance) operate through

the desirable attributes of improved access, coverage, quality, and safety to improve health and other outcomes (responsiveness, social and financial risk protection, and improved efficiency). The framework reflects properties of all complex systems, including basic principles of non-linearity, interconnectedness, and synergy between systems elements and building blocks.[9] Work is also underway to include elements that are indicative of social determinants of health.[10] These elements include those contributing to excess risk of illness and undernutrition due to inadequate diet and food insecurity, poor environmental conditions including housing and sanitation, and factors such as sex discrimination and low levels of female education and empowerment that restrict access to health-care services.

Tracking of intervention coverage

Countdown draws on four linked databases of coverage, health systems and policies, financial flows, and equity (figure 1) that combine data abstracted from existing global databases with new analyses relevant to maternal, newborn, and child health and survival. Detailed methods and data sources have been described previously.[2–4,11] Increasingly, Countdown is attempting to capture subnational data, although these data are difficult to ascertain in view of the sampling frames for national surveys that are based on Demographic and Health Surveys and Multiple Indicator Cluster Surveys.

For more on **Demographic and Health Surveys** see http://www.measuredhs.com

For more on **Multiple Indicator Cluster Surveys** see http://www.childinfo.org

The unit of analysis is the country; the statistics of interest are nationally representative estimates of intervention coverage generated either through household surveys or combinations of programme and survey data reported through relevant UN agencies and subjected to supplementary independent quality reviews by technical reference groups and Countdown members. Denominators are intervention specific; for example, interventions that effectively prevent or treat malaria are measured only in the 37 Countdown countries endemic for malaria, and prevention of mother-to-child transmission of HIV coverage is assessed only in countries where this prevention is recommended for delivery to all pregnant women (all countries in sub-Saharan Africa and selected other countries on the basis of HIV seroprevalence estimates). In 2008, Countdown reported on data available up to 2006;[3,4] since then, new rounds of both Demographic and Health Surveys and Multiple Indicator Cluster Surveys have been undertaken, in addition to national surveys focusing on malaria, nutrition, and other disease-specific programmes. New datasets that are available for analysis have been included in this update.

For **additional disparity analyses** see http://aku.edu/medicalcollege/aboutus/countyprofiles-41.xls

For more on **Global Atlas of the Health Workforce** see http://apps.who.int/globalatlas/

For more on **WHO Statistical Information System** see http://www.who.int/whosis/en/

To assess within-country disparities in coverage indicators, Countdown analyses include systematic breakdowns of 16 key coverage indicators by wealth quintiles. Equity indicators are summarised as a coverage index consisting of an unweighted average of four intervention areas across the continuum of care.[12] Every area includes several selected indicators: family planning (need for family planning satisfied), maternal and newborn health (at least one antenatal visit and skilled attendant at delivery), immunisations (measles, BCG, and diphtheria, pertussis, and tetanus), and curative child care (diarrhoea and pneumonia management including oral rehydration and continued feeding and care seeking for pneumonia). The coverage gap, which is calculated as 100% minus the mean coverage index, provides an estimate of the increase needed to achieve universal coverage with all eight interventions for each wealth quintile. Coverage indices are also graphically represented as floating bars showing the range of coverage for selected indicators by wealth quintiles. Additional disparity analyses according to maternal education, sex of the child, urban or rural residence, and region of the country are available online.

Health policy and systems indicators are tracked through databases available in the public domain (eg, Global Atlas of the Health Workforce and the WHO Statistical Information System) and through ad-hoc questionnaires administered to countries by WHO. The financing indicators included an assessment of overseas

	Source	Postnatal visit for mother* (%)	Postnatal visit for babies born outside a health facility† (%)
Azerbaijan	2006 DHS	66%	..
Bangladesh	2007 DHS	19%	19%
Benin	2006 DHS	66%	..
Bolivia	2008 DHS	77%	..
Cambodia	2005 DHS	64%	..
Chad	2004 DHS	2%	..
Egypt	2008 DHS	65%	8%
Ethiopia	2005 DHS	5%	2%
Ghana	2008 DHS	68%	..
Haiti	2005 DHS	30%	4%
India	2005–06 NFHS	37%	..
Indonesia	2007 DHS	70%	..
Lesotho	2004 DHS	23%	..
Liberia	2007 DHS	60%	..
Malawi	2006 MICS	18%	3%
Nepal	2006 DHS	31%	2%
Nigeria	2008 DHS	38%	..
Pakistan	2007 DHS	39%	..
Sierra Leone	2008 DHS	58%	..
Swaziland	2006 DHS	22%	..
Uganda	2006 DHS	23%	..
Zambia	2007 DHS	39%	..
Zimbabwe	2005 DHS	30%	..

DHS=Demographic and Health Survey. NFHS=National Family Health Surveys. MICS=Multiple Indicator Cluster Survey. *Percentage of women aged 15–49 years who reported a postnatal care visit within 2 days of delivery of their last child. †Percentage of babies born outside a facility who received a postnatal care visit within 2 days of birth.

Table 3: **Coverage for postnatal visits for mothers and babies in Countdown countries with available data**

development assistance (ODA) in addition to patterns of national spending on maternal, newborn, and child health. The indicators that we present include an analysis of the maternal, newborn, and child health components of ODA on the basis of data reported by the Organisation for Economic Co-operation and Development. This analysis has been published in previous Countdown reports,[2,4] and has been updated with 2007 data. External financing for family planning is reported on the basis of resource tracking estimates from the UN Population Fund. Future Countdown reports will update ODA figures to 2008, include family planning with maternal, newborn, and child health data, and provide findings from new analyses of domestic health expenditures and national financing gaps to achieve full coverage of interventions. The full Countdown account of progress for the 2010–11 cycle will be prepared in 2011. In this report, we summarise salient aspects of progress and challenges identified in the 2010 analyses.

Present status and progress

Table 1 summarises progress towards achievement of MDG 4 targets in the 68 Countdown priority countries. Consistent with other recent findings, [13] the Inter-agency Group on Child Mortality Estimation data show progress in reduction of child mortality, although distributed unevenly between countries. The global mortality rate in children younger than 5 years fell by 28%, from an estimated 90 deaths per 1000 livebirths in 1990, to 65 deaths per 1000 livebirths in 2008. On the basis of these estimates, the absolute number of child deaths decreased to an estimated 8·8 million in 2008, from 12·5 million in 1990, which was the baseline year for the MDGs.[14] The new estimates suggest that the average rate of reduction between 2000 and 2008 was 2·3%, compared with a 1·4% average decrease between 1990 and 2000.

Progress in neonatal mortality (first 28 days) remains slow, and in Africa almost no change was recorded.[15] Neonatal deaths now account for 41% of deaths in children younger than 5 years, and this mortality is linked closely to slow progress in reduction of maternal mortality. Six of the 68 countries with high rates of mortality in children younger than 5 years (40 or more deaths per 1000 livebirths) have consistently achieved yearly rates of reduction of 4·5% or higher (Nepal, Bangladesh, Eritrea, Laos, Bolivia, and Malawi).[16] Impressive gains in child survival have been made in several countries that are not yet classified as on track to meet the MDG 4 goal. For example, Niger, Mozambique, and Ethiopia have all reduced mortality in children younger than 5 years by more than 100 per 1000 livebirths since 1990, and altogether 19 countries are on track to achieve their MDG 4 targets.[17] Although progress has been made in many countries, the rate of improvement worldwide is still insufficient to reach MDG 4 targets, and in many countries progress remains slow or non-existent.

Progress towards achievement of MDG 5 has been slow. Institute for Health Metrics and Evaluation estimates of maternal mortality[18] suggest that 342 900 (uncertainty interval 302 100–394 300) maternal deaths occurred worldwide in 2008, and that more than 50% of these deaths occurred in six countries (India, Nigeria, Pakistan, Afghanistan, Ethiopia, and the Democratic Republic of the Congo). Although the estimated number of deaths differs from 2005 WHO/UN estimates, the rate of reduction differs less strikingly. Estimates suggest that global progress between 1990 and 2005 was a reduction of 0·8% per year, which is similar to the WHO/UN estimates of 0·5% per year for the same period, and between 1990 and 2008 this reduction was 1·3% per year. Updated estimates of maternal mortality will become available in 2010, after a broad methodological review by the UN Interagency Committee for Mortality.

Notwithstanding specific mortality estimates, coverage indicators for maternal health interventions such as skilled birth attendance, antenatal care, unmet need for contraception, and contraceptive prevalence rate show that much needs to be done to reach targets A and B for MDG 5. Reduction of maternal mortality and the estimated 20 million pregnancy-related disabilities per year will necessitate concentrated efforts to improve coverage of comprehensive family planning programmes

For more on the **Inter-agency Group on Child Mortality Estimation** see http://www.childinfo.org/mortality_igme.html

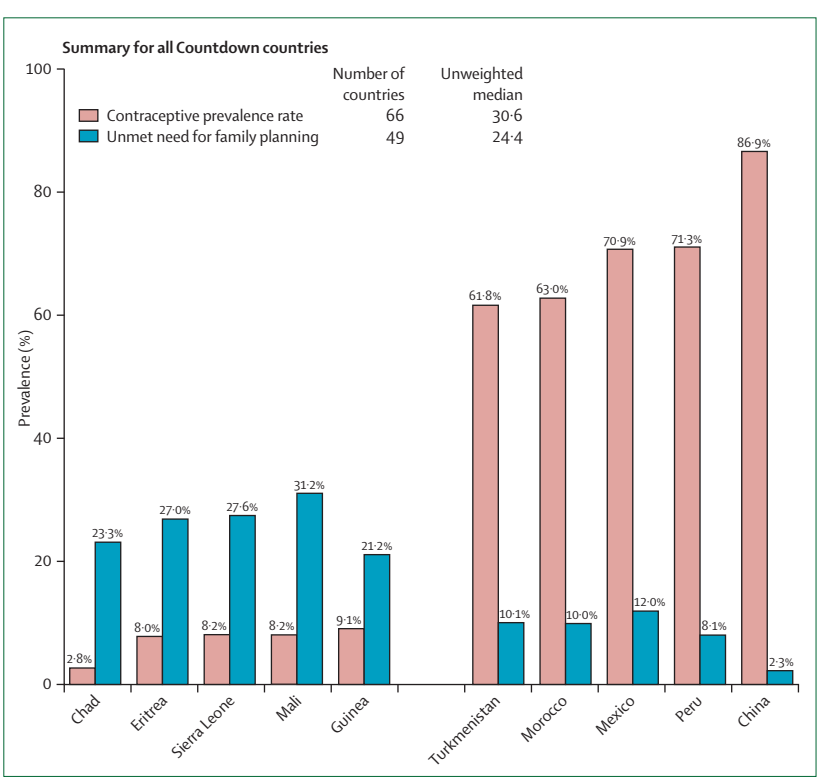

Figure 3: **Unmet need for family planning in Countdown countries with the highest and lowest contraceptive prevalence rates**
Data are most recent estimates since 2000.

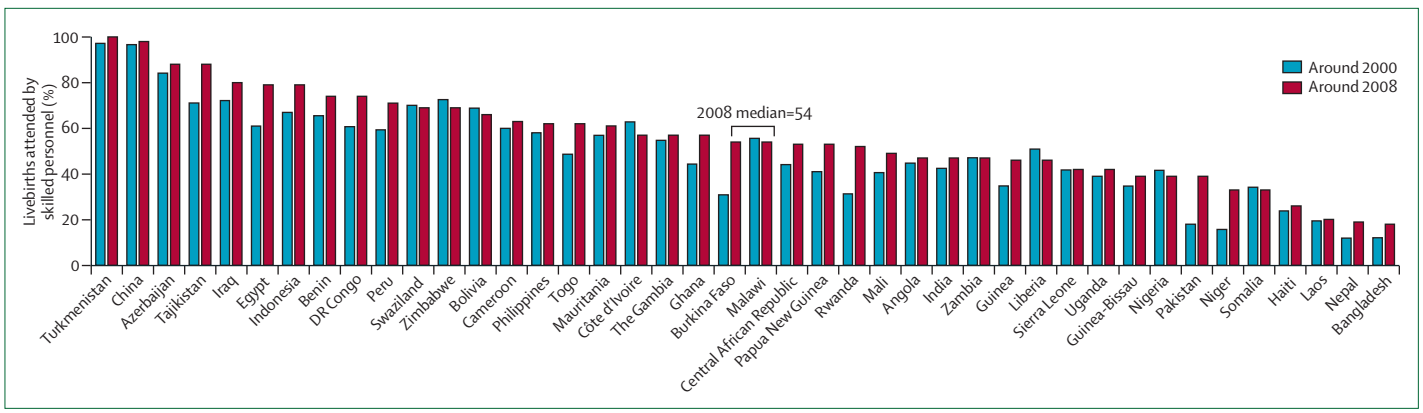

Figure 4: **Proportion of livebirths attended by skilled personnel in 34 Countdown countries with nationally representative measurements around 2000 and around 2008**
Coverage as reported in nationally represented survey closest to target year, within 2 years. DR Congo=Democratic Republic of the Congo.

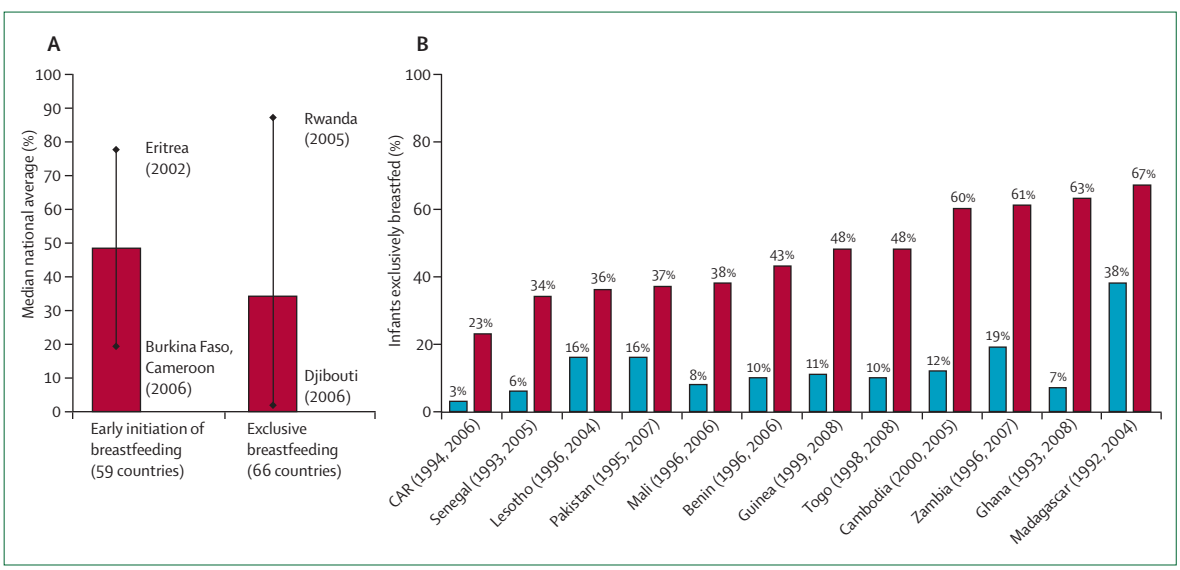

Figure 5: **Median national coverage for breastfeeding practices in Countdown countries and rates in countries with the largest gains since 1990**
(A) Median national coverage in Countdown countries. Data are most recent estimates since 2000; error bars show the highest and lowest coverage estimates in Countdown countries since 2000. (B) Percentage of infants younger than 6 months who were exclusively breastfed, in selected Countdown countries with highest rates of increase since 1990. Source: UNICEF Global Database (November, 2009). Compiled from Multiple Indicator Cluster Surveys, Demographic and Health Surveys, and other national surveys. CAR=Central African Republic.

For the **UNICEF Global Database** see http://www.childinfo.org

and antenatal, delivery, emergency obstetric, and postpartum care—all indicators that are tracked by Countdown. Although data for access and coverage are not available, increased access to safe abortion care in countries where abortion is legal could also reduce maternal deaths. Coverage of skilled attendance at birth is often used to track progress towards MDG 5 target A, and is a sensitive measure of health-system strength. Tracking of coverage of caesarean sections, especially in rural areas, is also important for assessment of access to emergency obstetric care. Rates lower than 5% signal restricted access to care and are a marker of human-resource and other health-systems challenges. 33 of 51 Countdown countries with data obtained since 2000 reported rural coverage rates lower than 5%, and four countries had rural rates of less than 1% (Burkina Faso, Chad, Ethiopia, and Niger).

Figure 2 shows median coverage for 20 Countdown interventions for which the target rate is universal coverage. Interventions are presented along the continuum of care from prepregnancy to early childhood, and show highly variable results. Median coverage is high for vaccinations, vitamin A (two doses in the preceding 12 months), and other interventions than can be delivered vertically and at prescheduled times, and low for interventions that have to be delivered on demand, such as treatment for childhood illness and caesarean sections (table 2). There are gaps between the proportions of women in contact with health services for antenatal care or assistance at birth and the receipt of interventions that can and should be delivered during or in association with those contacts, such as intermittent preventive treatment for malaria and prevention of mother-to-child

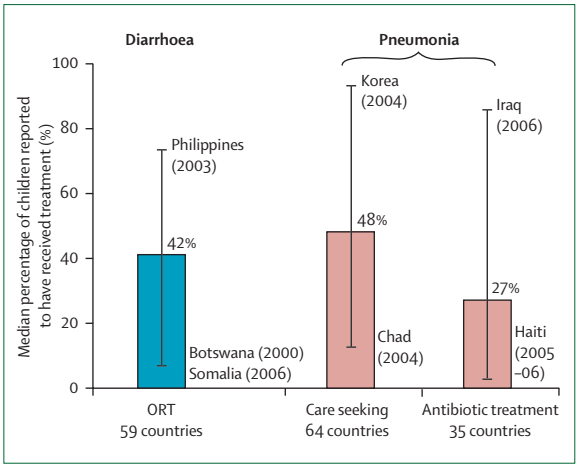

Figure 6: **Median proportion of children with suspected illness in previous 2 weeks who received treatment, in Countdown countries with most recent estimate since 2000**

Estimates of antibiotic treatment do not include treatment of neonatal sepsis. Oral rehydration therapy (ORT) includes oral rehydration solution and/or recommended homemade fluids or increased fluids, and continued feeding. Error bars show the lowest and highest coverage estimates in Countdown countries since 2000.

transmission of HIV, when appropriate. Interventions confirmed as effective and promoted only recently, such as insecticide-treated bednets to prevent malaria, have low median coverage, but have made rapid gains in individual countries. Countdown draws attention to data gaps that need to be addressed to allow countries to make informed decisions about how to accelerate progress towards MDGs 4 and 5. For example, only 23 Countdown countries have access to data for postnatal care in women and only six have data for postnatal care in neonates (table 3). Additionally, several crucial interventions are not yet tracked by Countdown (eg, kangaroo mother care) because coverage data are not yet available, although efforts are underway to include coverage questions on these interventions in nationally representative household surveys.

Countdown focuses on individual countries and tries to limit crossnational aggregation, which masks high variation in coverage between and within countries along the continuum of care. We present coverage results for several individual interventions, showing wide variability between countries and drawing attention to the need for targeted efforts and assistance. For example, figure 3 shows the most recent estimates of contraceptive prevalence and unmet need for family planning in the five countries with the highest and lowest contraceptive prevalence rates. Unmet need exceeds contraceptive prevalence rate in all five countries with the lowest coverage. The wide disparity between these two groups of countries represents a gap that needs to be filled if the effectiveness of family planning for reduction of maternal mortality is to be realised in all Countdown countries.

Figure 4 shows similar disparities between countries for the presence of a skilled attendant at birth; notably,

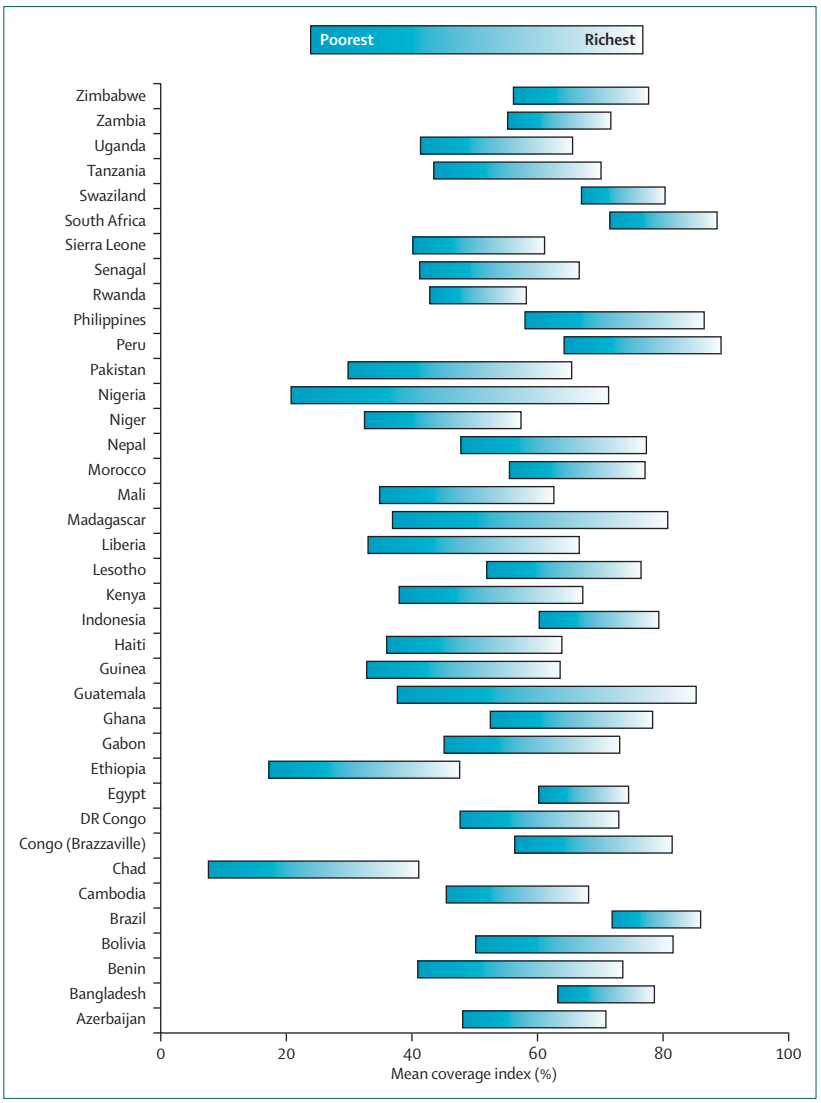

Figure 7: **Mean coverage index of eight reproductive, maternal, newborn, and child interventions in the poorest and richest quintiles of 38 Countdown countries with a Demographic and Health Survey, by country**

Long bars correspond to greater magnitude of inequalities than do short bars. Indicators are: need for family planning satisfied, antenatal care at least one visit, skilled attendant at birth, measles vaccination, diphtheria, pertussis, and tetanus vaccination, BCG vaccination, oral rehydration and continued feeding, care seeking for pneumonia. DR Congo=Democratic Republic of the Congo.

many countries have made substantial progress, although overall rates remain unacceptably low in most regions. Burkina Faso, Pakistan, and Rwanda had gains of more than 20% from around 2000 to around 2008, whereas 11 countries showed no progress or decreases in coverage during this time. Figure 5 shows median national coverage rates for breastfeeding practices and the range of coverage across the 68 Countdown countries. Early and exclusive breastfeeding are major contributors to child survival, but rates are currently very low in many countries. The figure does show, however, 12 countries that have made gains of at least 20% since 1990 in the proportion of infants exclusively breastfed. Viewed together, figures 5 and 6 draw

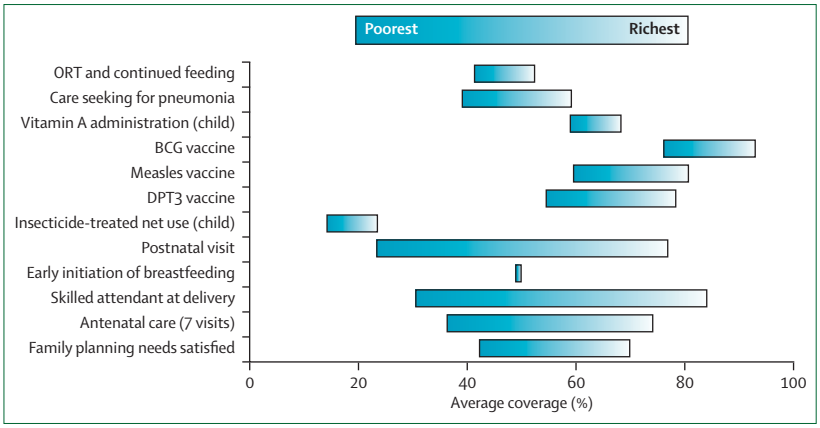

Figure 8: **Average coverage levels of selected reproductive, maternal, newborn, and child interventions in the poorest and richest wealth quintiles of 38 Countdown countries with a Demographic and Health Survey and available data, by intervention**

Long bars correspond to greater magnitude of inequalities than do short bars. Postnatal care indicator refers to postnatal care for all newborn infants. ORT=oral rehydration therapy. DTP3=diphtheria, pertussis, and tetanus.

attention to the inadequacies of use of measures of central tendency in guidance of national priorities and development assistance. They also show that rapid progress is possible. Figure 6 is a final example showing unacceptably low rates of correct treatment for diarrhoea and pneumonia, which together account for more than one in three deaths in children younger than 5 years worldwide. Prevalence of correct treatment for childhood malaria is also very low, with a median rate of 30% on the basis of the most recent national estimates since 2000. Even this low rate is greatly reduced when coverage is assessed only for effective treatment with artemisinin-based combination therapies.

Improvement of equity and access to care

Countdown profiles include updated information about equity for 38 countries with a Demographic and Health Survey. In figure 7, mean coverage indices for the poorest and richest quintiles are shown as a floating bar for every country with a Demographic and Health Survey. As has been reported previously, in all countries analysed intervention coverage is substantially higher in mothers and children from rich families than in those from poor families. Notably, in groups of countries with similar overall coverage, inequity can vary substantially. For example, both Guatemala and Zambia have an overall coverage index of 59%, but in Guatemala, mothers and children from the poorest quintile have 38% coverage, whereas in Zambia this coverage is 55%, pointing to widely different patterns of inequality in access to services. Countries with small gaps between rich and poor groups, such as Bangladesh, Brazil, Egypt, Swaziland, and Zambia, merit in-depth study to understand how they have bridged the equity gap.

Degree of inequality varies with type of intervention. Among the interventions shown in figure 8, disparities are greater for maternal and newborn interventions than for those delivered to older children. Disparities in

Panel 2: Country profiles

Brazil's success in narrowing the gap

Brazil is one of the Countdown countries that are on target to reach the Millennium Development Goals (MDGs) related to child health and nutrition. In children younger than 5 years, mortality has been dropping by about 5% a year since 1990, which is substantially faster than the 4·4% yearly reduction needed to reach the MDG target. Currently, 22 of every 1000 children die before their fifth birthday. Underweight prevalence in children younger than 5 years dropped from 5·7% in 1990, to 1·7% in 2006,[18] and stunting fell from 19·9% to 7·1% in the same period. Overall progress has been accompanied by a sharp reduction in inequalities between socioeconomic quintiles (figure 9). In 1996, about 30% of all births to mothers in the poorest quintile did not receive skilled care, but by 2007, coverage was universal. Likewise, stunting prevalence fell from 40% to 10% in children in the poorest quintile between 1989 and 2007, remaining stable at around 3–5% in the richest quintile.[19] These examples are only two of many indicators of reproductive, maternal, newborn, and child health for which equity has improved in the past two decades.

Brazil's successful reduction of inequities cannot be attributed to one factor alone. Although economic growth has been moderate since 1990, income distribution has improved strikingly in recent years. A nationwide tax-based Unified Health System without any user fees was launched in 1989, and geographical targeting has guided deployment of family health teams of doctors, nurses, and community health workers in the poorest areas of the country. As a result, primary health-care coverage is now almost universal, as shown in the example of skilled delivery. Additionally, conditional cash transfer programmes cover about a third of the population, and several health sector initiatives—including immunisation, HIV/AIDS control, and breastfeeding promotion activities—have been highly successful. Perhaps more than any one policy or initiative, the reduction of regional and socioeconomic disparities in health and development has been a central element in Brazil's political agenda for the past 20 years, and this approach is now starting to bear fruit.

Narrowing of sex differentials in Bangladesh

Historically, Bangladeshi boys were more likely to receive life-saving interventions than were girls. Such a pattern is common in south Asian countries. However, figure 10 shows that sex disparities in measles vaccine coverage have effectively disappeared in Bangladesh in the past decade. As with Brazil, success cannot be attributed to one initiative, but rather a series of initiatives aimed at empowerment of women (microcredit, women's groups, female education) coupled with increased access to health care, particularly through community workers, might account for these changes. An in-depth analysis in the Matlab area showed that community health workers contributed to reduction of sex inequities in immunisation coverage.[20]

interventions that are most frequently delivered in fixed health facilities (eg, antenatal or delivery care) tend to show greater disparities than do those delivered in the community (eg, vaccines, vitamin A, or insecticide-treated bednets). Family planning interventions, which can be delivered in facilities, in the community, or in both settings, fall in between these two groups in terms of inequalities. Early initiation of breastfeeding shows remarkably small disparities—possibly because this intervention is largely dependent on longstanding cultural practices and is yet to be affected by promotion efforts. The Countdown tracking process for inequities also provides examples of how countries have reduced disparities in key interventions by targeting of and improvement of access. Panel 2 provides information about trends and correlates of equitable access to key interventions in Brazil (figure 9) and Bangladesh (figure 10).

The role of health systems

Strengthening of health systems is crucial for effective delivery of reproductive, maternal, newborn, and child health care across phases of life and places of caregiving. In addition to coverage of key interventions, Countdown also tracks indicators of progress in strengthening of the main building blocks of health systems. Acute shortages and poor distribution of human resources continue to negatively affect the performance of health systems in many countries. Only 22% of the 68 Countdown countries met the minimum threshold of 23 physicians, nurses, and midwives per 10 000 people that was established by WHO as necessary to deliver essential health services.[20,21] The shortage of personnel is compounded by uneven geographical distribution within countries, including between urban and rural areas. In the subsample of countries with disaggregated data,[21] the median density is four times higher in urban areas than in rural areas, with important implications for equitable delivery of services. Countries are increasingly addressing shortages of highly skilled personnel through scale-up of production and appropriate task sharing. For example, in 2010, 29 countries had a policy allowing community-based health workers to manage pneumonia with antibiotics, compared with 18 countries in 2008. Increased investment in education and training of health workers, strategies motivating health workers to remain where they are most needed, and effective regulatory frameworks including processes for skills substitution remain priorities for workforce governance, policy, and management. Crucial evidence to support decision making for the roles, training, and deployment of community health workers, for example, is now falling into place.[20,22,23]

Countdown countries are adopting evidence-based policies and investing in equipment, medical supplies, and infrastructure, but further progress is needed. Figure 11 summarises the number of countries that have adopted specific policies to increase access to and quality of care. Implementation of new policy guidelines for management of diarrhoea with zinc accelerated as production of zinc tablets increased—UNICEF's procurement alone rose by seven times from 20·5 million tablets in 2006, to 158 million in 2008. Conversely, availability of emergency obstetric care is alarmingly low, with data for two-thirds of 30 countries showing availability of less than 50% of the required minimum facilities.

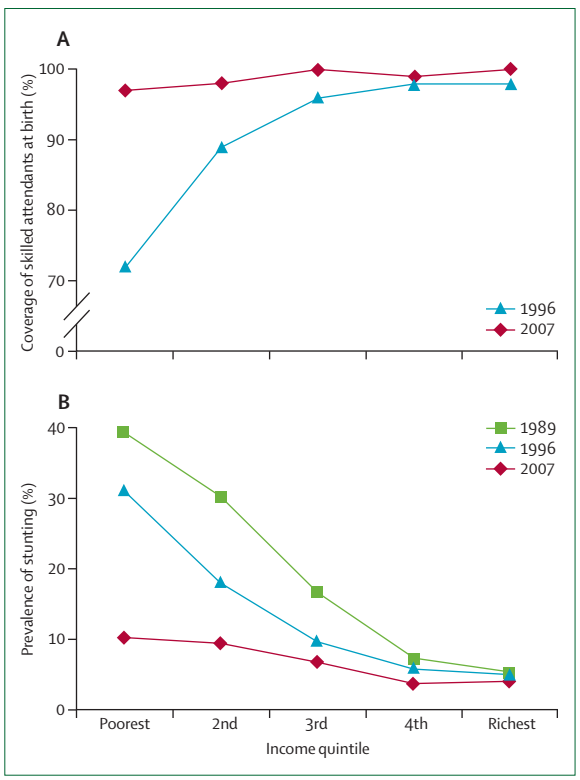

Figure 9: **Coverage of skilled attendants at birth (A) and prevalence of stunting in children younger than 5 years (B) in national surveys, by quintiles of family income in Brazil, 1989–2007[19]**

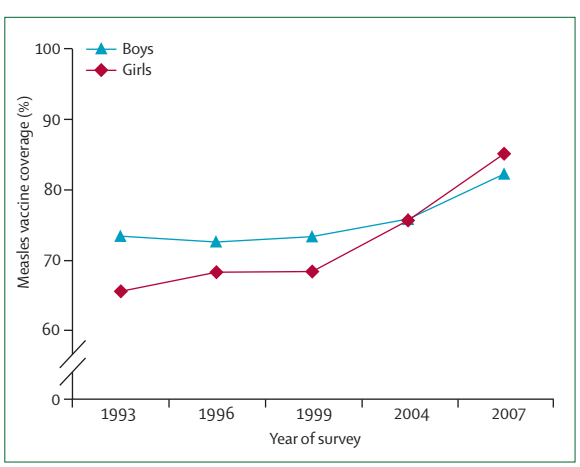

Figure 10: **Measles vaccine coverage in Bangladesh, 1993–2007**

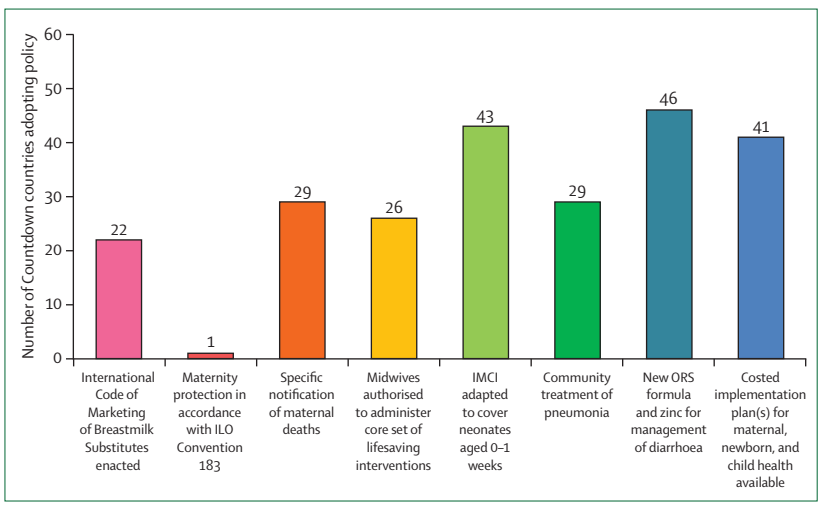

Figure 11: **Status for adoption of evidence-based policies related to maternal, newborn, and child health in 68 Countdown countries**
ILO=International Labour Organisation. IMCI=Integrated Management of Childhood Illness. ORS=oral rehydration solution.

Reliable and timely evidence and information, including vital registration and death audits to improve quality of care, are necessary for effective stewardship of health systems. Countdown data showed that only a third of countries implemented a policy on maternal deaths notification and audit, and the proportion of babies registered at birth in the vital registration system was less than 70% in 38 countries. These findings emphasise the need to strengthen all health-system functions if efficient and sustainable improvements in coverage of interventions are to be made. This process will need a balance between investment in interventions to tackle specific health issues and investment to address general systemic bottlenecks to service delivery. For many key elements of health-systems performance, such as governance, availability of commodities and diagnostics, and costs for services, there are key gaps in available information and monitoring systems. Countdown will continue to track policy and system indicators that reflect both recognised and innovative evidence-based approaches to meet both objectives. Attention will also be directed to assessment of progress in service integration across various levels of care (clinical, outreach, and community-based).

Financial flows for maternal, newborn, and child health

Resources remain a crucial gap, and both overall and government health spending have remained low in most countries. The median per head total health expenditure in 68 countries is a mere 80 international dollars (2007); only five Countdown countries are devoting 15% or more of their national budgets to health, and only five countries have household out-of-pocket expenditures of less than 15%.[24] The goal is to move away from out-of-pocket payments through several approaches including development of prepayment and risk-pooling schemes.[25]

Total ODA for maternal, newborn, and child health in 2007 (in 2005 dollars) was US$4·1 billion, which was a 16% increase from 2006, and almost double the amount of aid in 2003 in inflation-adjusted terms (US$2·1 billion). Although these data show improved commitment to maternal, newborn, and child health, funding for this sector only accounted for 31% of all ODA for health in 2007 and, as shown in earlier analyses, this funding is often not well targeted to countries with the greatest need. Our findings also show that ODA for family planning has slightly fallen in real terms, continuing a steeper longer-term decline that started in the mid-1990s. This reduction has been concurrent with increases in ODA for other maternal, newborn, and child health components of a comprehensive reproductive health approach. This pattern might represent some degree of replacement, with funds targeted to family planning being rerouted to other maternal, newborn, and child health interventions—especially because some of the interventions are delivered in the same service settings.

Accurate reporting by donors and attribution to specific service areas are also difficult with available data sources. To the extent that these factors contribute, some of the increase in ODA for maternal, newborn, and child health might not be additional funding, but rather include some funds that would have gone to or been attributed to family planning. Improved analysis of synergies in outcomes is also needed, since well resourced reproductive and maternal health services result in similar improvements in maternal, newborn, and child survival, as well as other benefits. In-depth analyses of these questions are underway and will be reported in 2011. Recent analysis has raised some concerns about the degree to which external aid flows might inhibit additional domestic flows to health.[26] Work in progress by the Countdown for 2011 will include new data for domestic resource flows for maternal, newborn, and child health and family planning, which are an important source of support for scaling up of and sustaining of these interventions.

Implications

In the 2 years since the last Countdown report,[4] 19 million women of childbearing age and children younger than 5 years have died because of preventable disorders.[16] Pneumonia, diarrhoea, and malaria still kill more than 3 million children every year, and our report shows that the long-established treatments for these infections still do not reach half of the children who need them. Newborn survival remains a challenge and demonstrable change might need a mix of strategies addressing maternal health and nutrition as well as improvements in delivery of postnatal and other targeted primary care services. China's successful reduction of newborn and child mortality during the past two decades is a remarkable example of progress through steady

investments in reproductive health, primary care, and economic development.[27,28]

Progress remains mixed for MDGs 4 and 5—some countries are on track to meet MDG 4 and many others have reported accelerating progress in the past decade, whereas in a few countries progress has decelerated. Recent and upcoming data are likely to show an improved rate of reduction in maternal mortality ratios compared with previous UN estimates,[18] but much increased progress is needed if MDG 5 is to be achieved. Inadequate progress in reduction of maternal deaths is closely linked to inadequate reduction of newborn deaths, underscoring the link between MDGs 4 and 5. Our findings show that although coverage of skilled delivery care increased in 12 countries, others had little or no improvement. Similarly, wide variation across and within the 68 countries in coverage of other maternal interventions and service contact points including antenatal, emergency obstetric, and postnatal care is evidence of uneven progress in delivery of services to women in need. The inclusion of target B on universal access to reproductive health in MDG 5 in 2008 was a crucial acknowledgment of the importance of comprehensive family planning for prevention of unplanned pregnancies (including in adolescents) and improvement of maternal health. The low contraceptive prevalence rate, inequitable distribution of family planning services, and high unmet need in many Countdown countries show that increased prioritisation of family planning is needed.

Notwithstanding the limitations of health systems in provision of maternal health services such as family planning, skilled delivery, and emergency obstetric care, social determinants also act as an important barrier to universal coverage. Families need access to rapid transportation to functional facilities when danger signs occur during labour, delivery, and the immediate post-partum period. Increased education of women, improved sex equality, comprehensive family planning services so that women can space or limit births, and strengthening of women's empowerment in decision making about seeking care are essential elements of strategies to improve maternal health and to reduce neonatal and child deaths. Analyses are also needed to improve understanding of the interactions between age at pregnancy, parity, and spacing between births and maternal, newborn, and child health outcomes.[29]

Countdown remains committed to improving availability and use of data for effective health-sector stewardship. Timely and reliable information is necessary to inform adoption of appropriate policies and achieve optimum return of investment in health systems, and to drive change in countries towards equitable coverage of key interventions for maternal, newborn, and child survival. In the 5 years since the first Countdown report, much consensus has been reached among academics, public health experts, UN agencies, non-governmental organisations, health-care professional associations, and policy makers to focus on use of data to prioritise interventions that have the greatest potential to bring about tangible change. Indicators and data sources have diversified in response to Countdown's adoption of the continuum of care approach and as new evidence emerges about effective strategies to improve maternal, newborn, and child health and survival. Efforts have been made to include additional sensitive markers of maternal and child undernutrition, newborn care, and infant and young child feeding as well as family planning. Focus has increased on the determinants of coverage, including policy and health systems, financial flows, inequities, and social determinants, in addition to increased recognition of the need for crosscutting analysis to understand what lies behind the numbers. The 2011 Countdown report will provide increased detail and updated estimates of coverage for all Countdown interventions, and in-depth analyses of coverage determinants and characteristics of countries that have made the greatest progress.

Contributors

ZAB, JB, and JR wrote the first draft of this report with inputs from lead authors from all working groups (coverage, equity, health systems, financial flows, etc). All authors contributed to the review and writing process.

Conflicts of interest

We declare that we have no conflicts of interest.

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For more on **Countdown membership** see http://www.countdown2015mnch.org/

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