# Assessment of the health system and policy environment as a critical complement to tracking intervention coverage for maternal, newborn, and child health

*Countdown Working Group on Health Policy and Health Systems**

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**In 2008, the Countdown to 2015 initiative identified 68 priority countries for action on maternal, newborn, and child health. Much attention was paid to monitoring country-level progress in achieving high and equitable coverage with interventions effective in reducing mortality of mothers, newborn infants, and children up to 5 years of age. To have a broader understanding of the environment in which health services are delivered and health outcomes are produced is essential to increase intervention coverage. Programmes to address MNCH rely on health systems to generate information needed for effective decisions and to achieve the expected outcomes. Governance and leadership are needed throughout the process not only to create policies and implement them but also to assure quality and efficiency of care, to finance health services sufficiently and in an equitable way, and to manage the health workforce. We present a systematic approach to assess the wider health system and policy environment needed to achieve positive outcomes for maternal, newborn, and child health. We report on results from 13 indicators and show gaps in policy adoption as well as weaknesses in other health system building blocks. We identify areas for future action in measurement of key indicators and their use to support decision making. We hope that this information will provide an additional dimension to the discussions on feasible and sustainable solutions to accelerate progress towards Millennium Development Goals 4 and 5, both at the global level but most importantly in individual countries.**

## Introduction

In 2008, the Countdown to 2015 initiative identified 68 priority countries for accelerated action on maternal, newborn, and child health.[1] Much attention was paid to monitoring country-level progress in achieving high and equitable health coverage with interventions effective in reducing mortality of mothers, newborn infants, and children up to 5 years of age. A broader understanding of the environment in which health services are delivered and health outcomes are produced is essential to increase intervention coverage. Programmes to address maternal, newborn, and child health are implemented through complex public and private organisations that rely on systems to provide medicines, finance health services, assure quality and efficiency of care, manage the health workforce, and generate information needed for effective operations decisions. Governance and leadership, expressed in clear policies, are necessary to provide strategic direction in all these areas.

Figure 1 illustrates the pathway to translate information and evidence for effective interventions in improved health outcomes. The pathway positions health policies and other health-system functions as essential conditions for achieving access to and increasing coverage of interventions, without compromising efforts to ensure quality and safety. In too many instances, scarce national resources can be fragmented and used inefficiently when the focus is on particular health conditions, interventions for particular diseases, or particular aspects of health systems in isolation. The challenge is to develop a systematic and sustained approach to identify key areas in which health systems need strengthening and where and why investment is needed, so that health systems can meet their overall goals of improving health and health equity in ways that are financially fair, responsive, and make the best or more efficient use of available resources, while addressing the needs of the most vulnerable population groups.

See Online for webappendix

We present a systematic approach to assess the wider health system and policy environment critical to achieving positive maternal, newborn, and child health outcomes with selected indicators, and discuss the current status of these indicators in the priority countries. We also identify areas for future action in measurement of key indicators and their use to support decision making. Our approach focuses on harmonising the selection of indicators with existing international monitoring and assessment efforts, especially where desirable targets or benchmarks have been established; making use of cross-nationally comparable data from official reports or those available in the public domain; and identifying innovative policy and programmatic directions in view of new evidence.

## Identification of indicators of health policy and health systems

We identified and tracked 13 indicators of health policy and health systems in the 68 priority countries. First, we reviewed the indicators tracked in Countdown 2005[2,3] and identified three indicators for continued monitoring: the International Code of Marketing of Breastmilk Substitutes[4] and subsequent relevant resolutions of the World Health Assembly (webappendix), community management of pneumonia with antibiotics,[5] and low osmolarity oral rehydration salts and zinc for the management of diarrhoea.[6] Experts dealing with maternal, newborn, and child health were then asked to propose other policy indicators that they deemed to be critical to improving the coverage of effective interventions. Criteria in selection

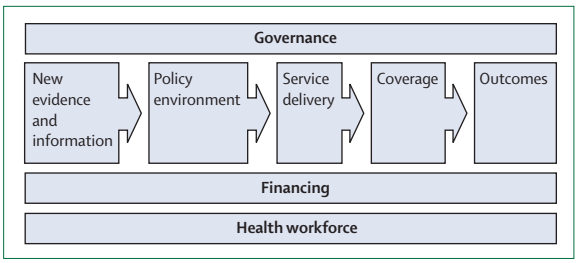


*Figure 1:* **Conceptual framework**

were the presence of a global recommendation or guideline underpinning the indicator, and the availability of data. Similarly, we asked experts in the area of human resources for health and health financing to propose critical indicators. Table 1 shows the indicators. Besides acting as measures of health-systems building blocks, these indicators address the two dimensions of the continuum of care—ie, policies on interventions across individuals' life span and across different levels of services delivery.

Where possible, data available in the public domain were used to assess the status of the indicators in the 68 priority countries. Where these data were unavailable, national authorities were contacted through WHO country and regional offices to provide the information. Table 1 summarises the indicators, data sources, and international benchmarks where applicable.

## Status of indicators in the Countdown priority countries

Table 2 summarises the status of each indicator in the 68 Countdown priority countries.

### Evidence and information

Worldwide interest in the Millennium Development Goals (MDGs) has generated pressure for high quality and timely data to monitor country progress. The need to translate evidence into policy and implementation has created an increasing demand for health statistics, which are useful in building global and national political and financial support for solving health problems in developing countries.[17] Maternal death notification is an example of vital registration that is crucial if we are to identify barriers in care-seeking, access, quality, and equity of obstetric services.[7,18,19] 23 countries reported having adopted such a policy, whereas 14 countries reported having a policy but no implementation. Countdown 2008 also assessed birth registration as a coverage indicator in the 68 countries; this information is in the current Countdown report.[1] In addition to these vital statistics, more specific system data are required for decision making on programme performance, deployment of human resources, and financing for maternal, newborn, and child survival.

### Leadership and governance

Governance of health systems, also called stewardship, describes the role of government in health and its relation to other agencies whose activities affect health. With dynamic leadership and governance, countries are more likely to adopt key policies and required health system improvements.[20] The adoption of the International Code of Marketing of Breastmilk Substitutes (1981)[4,8] and the ratification of the International Labour Organisation (ILO) Maternity Protection Convention 2000 (number 183)[9] were identified as two indicators of government leadership and intersectoral action critical for the protection and support of pregnant and lactating women and their infants.[8] There is a broad consensus that maternity protection at work is essential for safeguarding both the health and the economic security of women and their

| | Data source | Internationally established benchmark |
|---|---|---|
| **Evidence and Information** | | |
| Notification of maternal deaths | WHO data 2007 | Information systematically recorded and reported[7] |
| **Leadership and governance** | | |
| International Code of Marketing of Breastmilk Substitutes enacted | WHO and UNICEF data 2007 | Policy systematically adopted/enacted[4,8] |
| Maternity Protection Convention 183 ratified | ILOLEX database | Policy systematically adopted/enacted[9] |
| Costed implementation plan(s) for maternal, newborn, and child health developed | WHO data 2007 | Plan(s) systematically developed and costed[10] |
| **Service delivery** | | |
| Availability of emergency obstetric care services | UNICEF and Averting Maternal Death and Disability (AMDD) | Minimum of four basic emergency obstetric care facilities and one comprehensive emergency obstetric care facility per 500 000 population[11] |
| Midwives authorised to deliver life-saving interventions | WHO data 2007 | Policy systematically adopted where profession is recognised/regulated[7,11] |
| Integrated Management of Childhood Illness adapted to cover first week of life | WHO data 2007 | Policy adopted and systematically implemented[12] |
| Community health workers authorised to identify and manage pneumonia | WHO and UNICEF community intervention survey 2007 | Policy adopted and systematically implemented[5] |
| Promotion of low osmolarity oral rehydration salts and zinc for management of diarrhoea | WHO data 2007 | Policy adopted and systematically implemented[6] |
| **Financing** | | |
| Per-head total expenditure on health | World health statistics 2007[13] | None established |
| General government expenditure on health | World health statistics 2007[13] | No global benchmark, but target of 15% pledged by African leaders[14] |
| Out-of-pocket expenditure as a proportion of total health expenditure | World health statistics 2007[13] | None established |
| **Health workforce** | | |
| Density of physicians, nurses, and midwives | Global atlas of the health workforce[15] | Minimum 2·5 physicians, nurses, and midwives per 1000 population to meet adequate coverage levels for primary health-care interventions[16] |

*Table 1:* **Selected indicators of health policy and health systems for monitoring progress in maternal, newborn, and child health**

| | Evidence and information | Leadership and governance | | | Service delivery | | | | | Financing | | | Health workforce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notification of maternal deaths | International Code of Marketing of Breastmilk Substitutes enacted | ILO Convention 183 on maternity protection ratified | Costed implementation plan(s) for maternal, newborn, and child health developed | Availability of emergency obstetric care services (year of latest data) | Midwives authorised to deliver life-saving interventions | IMCI adapted to cover first week of life | Community health workers authorised to identify and manage pneumonia | Promotion of low osmolarity oral rehydration salts and zinc for diarrhoea | Per-head total expenditure on health (in international dollars) | General government expenditure on health as proportion of total government expenditure | Out-of-pocket expenditure as proportion of total expenditure on health | Density of physicians, nurses, and midwives per 1000 population (year of latest data) |
| Afghanistan | No | Part | No | Yes | .. | Yes | No | Yes | Part | 19 | 2·3% | 81·2% | 0·4 (2001) |
| Angola | Yes | No | No | Part | .. | Yes | No | No | No | 38 | 4·4% | 20·6% | 1·4 (2004) |
| Azerbaijan | Yes | Part | Part | No | .. | Part | No | Part | No | 138 | 3·4% | 70·2% | 11·8 (2003) |
| Bangladesh | Part | Part | No | Part | 54% (2007) | Yes | Yes | Part | Part | 64 | 5·9% | 63·5% | 0·6 (2004) |
| Benin | Yes | Yes | No | Yes | 66% (2002) | Part | Yes | Part | Yes | 40 | 9·8% | 48·8% | 0·9 (2004) |
| Bolivia | .. | Part | Part | Part | 48% (2003) | .. | Yes | Yes | .. | 186 | 12·8% | 32·4% | 3·3 (2001) |
| Botswana | .. | Yes | No | .. | .. | .. | .. | .. | Part | 504 | 10·5% | 10·4% | 3·1 (2004) |
| Brazil | Yes | Yes | Part | No | .. | Part | Yes | No | No | 1520 | 14·2% | 29·5% | 5·0 (2000) |
| Burkina Faso | Yes | Yes | Part | Yes | .. | Yes | Yes | No | Yes | 77 | 15·3% | 44·3% | 0·5 (2004) |
| Burma | .. | No | No | .. | .. | .. | .. | Yes | Yes | 38 | 1·4% | 86·6% | 1·4 (2004) |
| Burundi | Part | No | No | Part | .. | No | Part | No | Part | 16 | 2·3% | 73·8% | 0·2 (2004) |
| Cambodia | Part | Part | No | Part | .. | No | Yes | Part | Yes | 140 | 11·4% | 63·4% | 1·0 (2000) |
| Cameroon | No | Yes | Part | Yes | 29% (2000) | Yes | Yes | No | Yes | 83 | 10·5% | 68·0% | 1·8 (2004) |
| Central African Republic | No | No | Part | Yes | .. | Yes | Yes | No | .. | 54 | 10·9% | 60·3% | 0·5 (2004) |
| Chad | No | No | No | Yes | 40% (2002) | Part | No | No | Yes | 42 | 9·5% | 60·5% | 0·5 (2004) |
| China | Yes | Part | No | Part | .. | Part | Yes | Part | Part | 277 | 10·1% | 53·6% | 2·1 (2001) |
| Congo | No | No | No | Yes | .. | Yes | Yes | No | Yes | 30 | 4·4% | 50·8% | 1·2 (2004) |
| Côte d'Ivoire | Part | Part | Part | Part | .. | Part | No | No | Part | 64 | 4·6% | 67·6% | 0·7 (2004) |
| DR Congo | Yes | Part | No | Yes | .. | Yes | Yes | Yes | Yes | 15 | 7·3% | 71·9% | 0·6 (2004) |
| Djibouti | Yes | Part | No | Yes | 50% (2004) | Part | No | No | .. | 87 | 11·5% | 30·4% | 0·6 (2004) |
| Egypt | Yes | Part | No | Yes | .. | Part | Yes | No | Yes | 258 | 7·9% | 58·3% | 2·5 (2004) |
| Equatorial Guinea | Part | Part | Part | Part | .. | Part | No | Yes | Yes | 223 | 7·0% | 17·2% | 0·8 (2004) |
| Eritrea | No | Yes | No | Part | .. | Part | Yes | Part | Part | 27 | 4·2% | 60·8% | 0·6 (2004) |
| Ethiopia | No | Part | No | Yes | .. | Yes | Yes | No | Yes | 21 | 9·4% | 38·0% | 0·3 (2003) |
| Gabon | No | Yes | Part | Yes | 123% (2001) | Yes | Yes | No | Yes | 264 | 13·9% | 31·2% | 5·3 (2004) |
| Gambia | No | Yes | No | Yes | 86% (2002) | Yes | Yes | Yes | .. | 88 | 5·9% | 49·7% | 1·4 (2003) |
| Guinea Bissau | Yes | Part | No | Yes | 127% (2002) | No | No | No | No | 28 | 3·5% | 65·4% | 0·8 (2007) |
| Ghana | Yes | Yes | Part | Part | 51% (2004/05) | Yes | Yes | No | Part | 95 | 8·4% | 45·2% | 0·6 (2004) |
| Guatemala | .. | Yes | Part | .. | .. | .. | .. | .. | .. | 256 | 18·8% | 53·4% | 4·9 (1999) |
| Guinea | Part | Part | Part | No | 25% (2002) | Part | No | No | Yes | 96 | 4·5% | 86·4% | 0·8 (2004) |
| Haiti | No | Part | No | No | .. | No | No | No | No | 82 | 23·9% | 42·8% | 0·4 (1998) |
| India | Yes | Yes | No | Yes | .. | Part | Yes | Yes | Yes | 91 | 2·9% | 77·6% | 1·9 (2004) |
| Indonesia | No | Part | No | No | .. | Part | Yes | No | Yes | 118 | 5·0% | 49·2% | 1·0 (2003) |
| Iraq | Yes | No | No | Yes | .. | No | Yes | No | No | 135 | 3·4% | 21·5% | 2·0 (2004) |
| Kenya | Yes | Part | No | Part | .. | Yes | Yes | No | Yes | 86 | 8·2% | 46·9% | 1·3 (2002) |

(Continues on next page)

| | Evidence and information | Leadership and governance | | | Service delivery | | | | | Financing | | | Health workforce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notification of maternal deaths | International Code of Marketing of Breastmilk Substitutes enacted | ILO Convention 183 on maternity protection ratified | Costed implementation plan(s) for maternal, newborn, and child health developed | Availability of emergency obstetric care services (year of latest data) | Midwives authorised to deliver life-saving interventions | IMCI adapted to cover first week of life | Community health workers authorised to identify and manage pneumonia | Promotion of low osmolarity oral rehydration salts and zinc for diarrhoea | Per-head total expenditure on health (in international dollars) | General government expenditure on health as proportion of total government expenditure | Out-of-pocket expenditure as proportion of total expenditure on health | Density of physicians, nurses, and midwives per 1000 population (year of latest data) |
| (Continued from previous page) | | | | | | | | | | | | | |
| Laos | .. | Part | No | No | .. | .. | No | .. | No | 74 | 5·0% | 71·8% | 1·6 (1996) |
| Lesotho | Yes | No | No | Yes | 29% (2004) | Part | Yes | .. | Yes | 139 | 13·4% | 29·4% | 0·5 (2003) |
| Liberia | Part | .. | No | Yes | .. | Yes | Yes | No | Part | 22 | 20·1% | 35·6% | 0·3 (2004) |
| Madagascar | Part | Part | No | No | 30% (2002/03) | Part | Yes | Yes | Yes | 29 | 8·7% | 21·5% | 0·6 (2004) |
| Malawi | Part | Yes | No | Part | 37% (2004) | Yes | Yes | Yes | Part | 58 | 28·8% | 8·9% | 0·6 (2004) |
| Mali | Yes | Part | No | Yes | 38% (2003) | Part | Yes | Yes | Part | 54 | 12·8% | 50·6% | 0·7 (2004) |
| Mauritania | Part | No | Part | No | 31% (2000) | Yes | No | No | No | 43 | 5·3% | 30·6% | 0·8 (2004) |
| Mexico | Yes | Part | Part | No | .. | Part | No | .. | No | 655 | 12·9% | 50·6% | 2·9 (2000) |
| Morocco | .. | No | No | Part | 69% (2000) | .. | Yes | No | No | 234 | 5·5% | 49·9% | 1·3 (2004) |
| Mozambique | Part | Yes | No | Part | .. | Yes | Yes | Part | Part | 42 | 9·1% | 12·2% | 0·4 (2004) |
| Nepal | Part | Yes | No | Yes | 46% (2007) | Part | Part | Yes | Yes | 71 | 8·1% | 64·9% | 0·7 (2004) |
| Niger | No | Part | Part | Yes | 68% (2000) | Yes | Yes | Yes | Yes | 26 | 10·3% | 40·4% | 0·3 (2004) |
| Nigeria | No | Yes | No | Yes | .. | Yes | Yes | No | Yes | 53 | 3·5% | 62·9% | 2·0 (2003) |
| North Korea | .. | Part | No | .. | .. | Part | .. | .. | Yes | 47 | 6·0% | 14·4% | 7·4 (2003) |
| Pakistan | No | Part | No | Yes | .. | Part | Yes | Yes | Yes | 48 | 1·9% | 78·8% | 1·2 (2004) |
| Papua New Guinea | .. | Part | Part | No | .. | Part | Part | No | Part | 147 | 10·0% | 7·3% | 0·6 (2000) |
| Peru | Yes | Yes | Part | No | .. | Yes | Yes | .. | Part | 235 | 9·0% | 42·1% | 1·9 (2004) |
| Philippines | .. | Yes | No | No | .. | .. | No | No | Yes | 203 | 6·3% | 46·9% | 2·7 (2000) |
| Rwanda | No | No | No | Yes | .. | Yes | Yes | Yes | Yes | 126 | 16·5% | 15·9% | 0·5 (2004) |
| Senegal | No | Part | Part | Yes | 38% (2000) | Yes | No | Yes | Yes | 72 | 9·8% | 56·4% | 0·4 (2004) |
| Sierra Leone | Part | No | No | Part | .. | Part | Yes | Yes | Part | 34 | 7·8% | 41·0% | 0·5 (2004) |
| Somalia | .. | No | No | No | 56% (2005) | .. | No | .. | .. | .. | .. | .. | 0·2 (1997) |
| South Africa | .. | Part | No | .. | .. | .. | .. | No | Yes | 748 | 10·8% | 10·3% | 4·9 (2004) |
| Sudan | .. | Part | No | Yes | 35% (2005) | .. | No | Yes | Yes | 54 | 7·2% | 63·4% | 1·1 (2004) |
| Swaziland | Yes | Part | No | No | .. | Yes | No | No | .. | 367 | 11·2% | 14·6% | 6·5 (2004) |
| Tajikistan | Yes | No | Part | Yes | 86% (2005) | Yes | Yes | No | Yes | 54 | 4·6% | 76·3% | 7·2 (2003) |
| Tanzania | Yes | Yes | No | Yes | 21% (2005) | Yes | Yes | No | Yes | 29 | 8·5% | 46·9% | 0·4 (2002) |
| Togo | Yes | Part | No | Part | .. | Part | No | Part | Yes | 63 | 6·9% | 67·3% | 0·4 (2004) |
| Turkmenistan | No | .. | No | Yes | .. | Yes | No | Yes | Part | 245 | 14·9% | 31·1% | 13·2 (2002) |
| Uganda | Part | Yes | No | Yes | 34% (2002/03) | Part | Yes | Part | Yes | 135 | 10·0% | 34·5% | 0·8 (2004) |
| Yemen | .. | Yes | No | Yes | 14% (2004/05) | .. | No | Part | Part | 82 | 5·7% | 58·9% | 1·0 (2004) |
| Zambia | No | Yes | Part | Part | 41% (2004/05) | Part | Yes | Part | Yes | 63 | 12·8% | 32·3% | 2·1 (2004) |
| Zimbabwe | Yes | Yes | No | Part | .. | Yes | Yes | No | Yes | 139 | 8·9% | 26·3% | 0·9 (2004) |

IMCI=Integrated Management of Childhood Illness. ..=No data. DR Congo=Democratic Republic of the Congo. Sources of data are shown in table 1.

*Table 2:* **Status of indicators in the 68 Countdown priority countries**

children. This consensus is reflected in international labour standards by the ILO, which set out the basic requirements of maternity protection at work. In a similar vein, the International Code of Breastmilk Substitutes was adopted by WHO Member States in 1981 as the minimum requirement to protect and promote breastfeeding. According to global monitoring and self-reported data, 22 countries adopted legislation covering all provisions of the International Code, and 30 countries reported the adoption of voluntary measures or some provisions. These data show a substantial improvement since 2005, when 15 of the 60 Countdown priority countries reported full adoption of the International Code. None of the 68 countries has so far ratified ILO Convention 183, although 16 have ratified one of the earlier maternity protection conventions.[21] Four countries that have not ratified any maternity protection convention, have ratified the Social Security (Minimum Standards) Convention 1952 (number 102), including part VIII, which provides for cash and medical benefits during pregnancy and maternity leave.[21,22] Almost all countries have maternity protection legislation in place, but it may not be as comprehensive as Convention 183.

To ensure adequate commitment and resources, each country should have a clear implementation plan to scale-up interventions for maternal, newborn, and child health. The plan should have been costed and be integrated into the overall health sector investment strategy.[10] 31 countries reported having developed and costed an implementation plan for maternal, newborn, and child health. This indicator has a limitation in that some countries made a full investment plan for achieving MDGs 4 and 5, whereas others developed a programmatic scale-up plan without costing intervention delivery.

### Service delivery for maternal, newborn, and child health

The delivery of effective, safe, and good quality health services is essential to reach high levels of coverage of interventions to improve maternal, newborn, and child health. Within the continuum of care some interventions can be delivered at home or in the community—eg, the management of diarrhoea and pneumonia. Others—eg, skilled care at birth—require strong facility-based services backed up by appropriate referral care. We identified four indicators of policies for service delivery and one indicator of actual availability of services for emergency obstetric care (table 1). The adoption of these policies can be regarded as a measure not only of the responsiveness of a health system to new evidence but also of the intent to increase access and coverage of essential interventions through innovative approaches.

Since 1997, global guidelines have called for trained midwives to be authorised to do a set of signal functions that include administration of parenteral antibiotics, parenteral oxytocics, and parenteral anticonvulsants; manual removal of placenta; removal of retained products of placenta; assisted vaginal delivery; and newborn resuscitation.[7] Health facilities able to deliver these emergency obstetric care services should be available in a ratio of five per 500 000 population and include at least one facility that can also provide caesarean sections and blood transfusions.[11] Of the Countdown priority countries that recognise and regulate the midwifery profession, 27 countries report the presence of a policy that authorises midwives to do all these functions, and 25 allow midwives to do some of them. Of the 27 countries with comparable data for estimating availability of emergency obstetric care services, 11 had 50% or more of the recommended minimum number of functioning emergency obstetric care facilities, and 16 had from 14% to 48% of the required number.

The first few days and weeks after delivery are critical for the health and survival of newborn babies. Support for good home-care practices and early recognition of signs of illness and timely referral are essential. WHO has developed practical guidelines to incorporate the entire newborn period as part of the Integrated Management of Childhood Illness (IMCI) strategy,[12] which form a complement to the newborn guidelines of the Integrated Management of Pregnancy and Childbirth (IMPAC) strategy.[23] In this Countdown, 39 countries reported to have incorporated clinical guidance for newborn children aged 0–7 days into existing IMCI guidelines that previously started at 1 week, while three countries reported to have made some adaptations to this effect.

Pneumonia remains a leading killer of children under 5 years of age, and requires prompt identification and antibiotic treatment, an intervention that can often effectively be provided through community health workers. WHO and UNICEF encourage governments to support community health workers to treat uncomplicated pneumonia.[5,24] We found that 18 of the 68 Countdown priority countries now have a policy that authorises community health workers to identify and manage pneumonia; 11 countries reported having no such policy but some implementation of community-based treatment of pneumonia. There has been modest progress since 2006, when 16 of 60 Countdown countries reported having adopted the policy, two had no policy but some implementation, and 41 did not authorise community-based workers to manage cases of pneumonia.

By contrast, there has been substantial progress in the adoption of policies that promote low osmolarity oral rehydration salts and zinc supplementation for the management of diarrhoea.[6] Such treatment reduces the duration and severity of diarrhoeal episodes and lowers their occurrence. WHO and UNICEF have promoted updated guidelines and materials since 2006.[25] However, restricted availability of an appropriate zinc supplement on the global market has been a constraining factor. 34 countries updated their policy for management of diarrhoea to include both new oral rehydration salts and zinc, 17 adopted policy on either low osmolarity oral

rehydration salts or zinc, and ten have made no policy change. In the 2005 Countdown assessment, only six of the 60 Countdown countries reported adoption of the new policy and 36 countries had not adopted the new policy.

Complete data on the policy indicators for service delivery were available for 50 countries. Figure 2 shows the distribution of policy adoption in these countries by completeness of adoption. Few countries have been able to take up all policy recommendations, which warrants further exploration of the factors that govern whether and when global recommendations are incorporated into national policy frameworks.

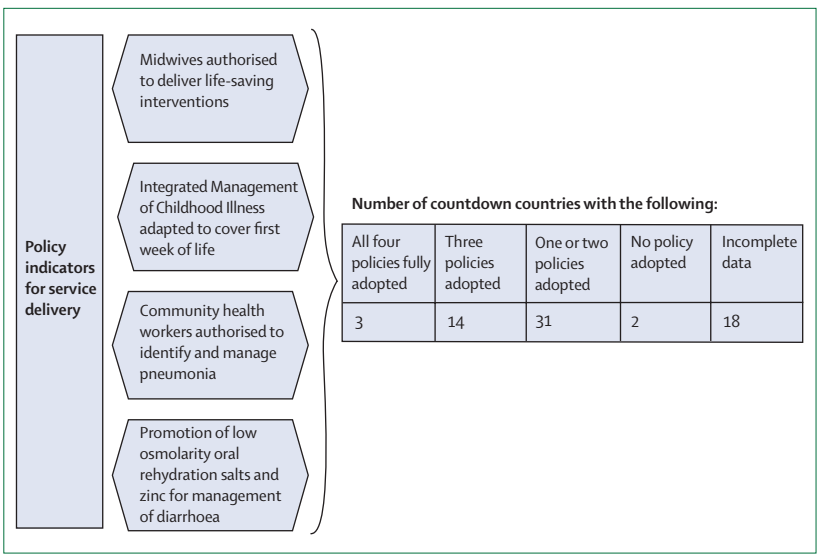


*Figure 2:* **Policy environment for health service delivery in the 68 Countdown priority countries (by end of 2007)**

## Financing

The financing of health systems has a substantial effect on whether people can obtain the health care that they need and whether they experience financial hardship as a result of illness.[26] In 2005 the World Health Assembly endorsed a resolution[27] that urged countries to work towards universal coverage through financing arrangements that include prepayment and risk-pooling to promote equitable access.

We identified three indicators—using data for 2004—that are important for accelerating access to key interventions for maternal, newborn, and child health. The first of these indicators, per-head total expenditure on health (in international dollars), acts as a measure of the total financial resources available for health, from all sources, both internal and external, and adjusts for differences in prices (purchasing power) across countries. Although to say what level of spending is necessary to provide a minimum package of benefits is not possible, expenditure of less than US$45 (in 2007 prices at official exchange rates) might be too low to ensure access to a very basic set of needed services.[28] However, high levels of health expenditure are not necessarily linked to improved outcomes. Some countries with high per-head health expenditures have not achieved good results for maternal, newborn, and child health, whereas others with low expenditures, such as Malawi or Eritrea (international $58 and $27, respectively), are reducing the mortality rate of children aged under 5 years.

The second indicator is the general government expenditure on health as a proportion of total government expenditure. African heads of states have approved the Abuja Declaration on HIV/AIDS, tuberculosis, malaria, and other infectious diseases,[14] which sets a target of 15% of total government expenditure to be spent on health. This target can be regarded as aspirational, currently reached by only six—ie, less than 10%—of the Countdown priority countries. Although some of them already allocate a high percentage of government expenditure to health—eg, Malawi (29%), Haiti (24%), and Liberia (20%)—the effect on MDGs 4 and 5 has been unequal across countries. Nevertheless, research has shown that there might be an indication of a relation between general government expenditure on health and infant mortality rate.[29]

The third indicator is out-of-pocket expenditure as a proportion of total health expenditure, which refers to the proportion of payments made by households at the point of use of health services—ie, consultation fees, medication costs and hospital bills, or insurance co-payments. A high reliance on out-of-pocket expenditure prevents many people from seeking or continuing care and also results in severe financial hardship and impoverishment for some who obtain care. Although there is as yet no internationally agreed benchmark, where out-of-pocket expenditure is less than 15% of total health spending, very few households tend to be affected by catastrophic payments.[30] Catastrophic payments occur when households need to spend a large proportion—in this study, 40% or more—of their capacity to pay for out-of-pocket health expenditures. Available evidence for out-of-pocket expenditure for maternal health services shows that households in low or lower-middle income countries, including many of the Countdown priority countries, face a disproportionate financial burden, or do not seek care because they cannot afford the costs.[31–36] We found wide variation in this indicator across the 68 Countdown priority countries. The countries with the lowest proportions of out-of-pocket spending were Papua New Guinea (7·3%) and Malawi (8·9%). However, 60 of the 67 countries for which data were available had out-of-pocket expenditure of more than 15%.

## Health workforce

The preparation, recruitment, and retention of a health workforce sufficient to achieve a country's health objectives is a key set of challenges for its health system. There are at present no comprehensive and robust

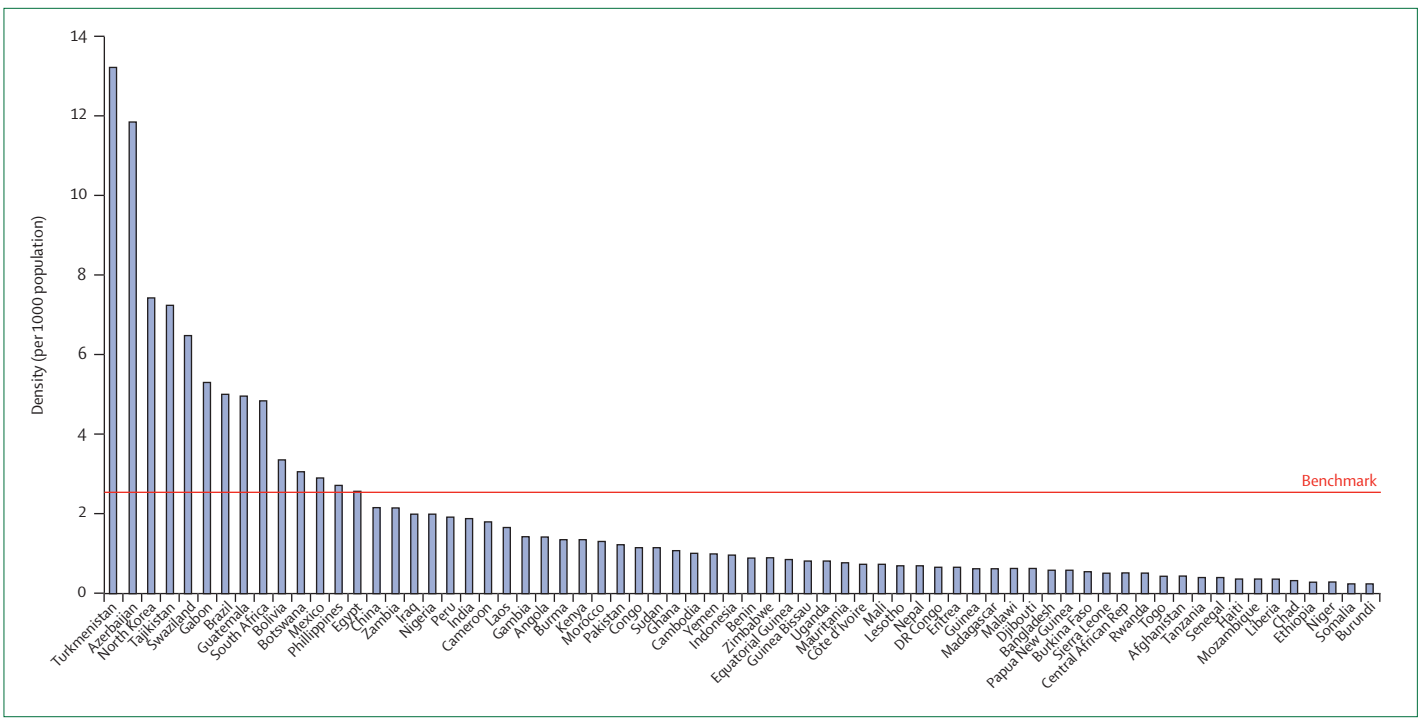


*Figure 3*: **Density of physicians, nurses, and midwives in the 68 Countdown priority countries**

methods for assessing the adequacy of the health workforce to address the health-care needs of a given population. However, estimates suggest that countries with fewer than 2·5 health-care professionals (counting only physicians, nurses, and midwives) per 1000 population generally fail to achieve adequate coverage rates for selected primary health-care interventions—notably those that are critical to maternal, newborn, and child health.[16] According to international estimates,[15] 54 of the 68 priority countries have workforce densities below this critical threshold (figure 3). There are wide cross-national differences, from a high of 13·2 per 1000 population in Turkmenistan to a low of 0·2 per 1000 in Burundi and Somalia.

Cross-national differences in categorisation and professional boundaries of some types of health workers present a challenge in international analyses of health workforce data. For instance, midwifery personnel could be subject to different legislation and practice regulations from one country to another. Additionally, comprehensive data for human resources for health are not available in any one repository in most countries; accurate monitoring requires some degree of harmonisation and triangulation of information from several sources (eg, national population census, labour force and employment surveys, health facility assessments, and records from professional and administrative sources).

Assessment of the sufficiency of the health workforce requires more than merely the enumeration of skilled health-service providers, but also an assessment of their distribution, knowledge, skills, and motivation. Different policy and programmatic actions might be needed to address the health workforce crisis in the Countdown priority countries, including development of new approaches to pre-service and in-service training of health workers, strengthening of the management, supervision, and support of the health workforce, establishment or improvement of incentives for enhancing worker productivity and retention as well as encouragement of workers to serve in underserved areas, and task shifting, or delegating tasks, where appropriate, to less specialised health workers. For example, many low-income countries with critical shortages of skilled medical and nursing professionals in their rural areas have opted for the training and posting at village level of a large number of semi-skilled health workers. Another example is the recourse to non-physician clinicians or surgeons to do life-saving interventions where there is no specialist.[37,38] International support is needed urgently to help countries to reduce their shortage and to achieve the best use of existing human resources for health.

## Discussion

Indicators of the health system and policy environment for maternal, newborn, and child health in the 68 Countdown priority countries show great variation within and between countries. All policies that we assessed are relevant to strengthen the performance of health systems in these countries; it is essential to consider indicators of health-system performance to

design effective programmes that balance a specific-disease focus with system-based solutions.[39] The fact that there are many gaps in policy adoption highlights the necessity of strengthening governance and leadership for maternal, newborn, and child health nationally and internationally. It also begs the question of whether progress can be achieved in a short time.

We identified three potential conflicts that might affect policy uptake. The first conflict is that of commercial interests. Policies that require intersectoral action and involve employment, trade, and financial sectors seem to be the hardest to adopt. Examples are the International Code of Marketing of Breastmilk Substitutes and the Maternity Protection Conventions that have been recommended for a long time but still show slow uptake. The adoption of the International Code in particular faces resistance from the commercial sector, even resulting in a few attempts to challenge the regulation through court actions. Strong national leadership accompanied by clear monitoring and accountability mechanisms is then needed to move forward in policy adoption and implementation.

A second potential conflict is that of professional interests. Policies that promote task delegation and support task shifting to lower cadres are often resisted by higher cadres. Here, we assessed the authorisation of midwives to do life-saving tasks and of community-based workers to manage cases of pneumonia as two examples of task delegation. We found that few countries had embraced these policies fully. This finding calls for intensified efforts to facilitate dialogue between professional associations and programme planners, to review the evidence, and to assess successful experiences in other settings. The panel provides an illustration of what can be achieved.[40]

The third potential conflict is that of product availability. Although good progress has been made in the adoption of a new policy on management of diarrhoea, the availability of a suitable zinc supplement on the international market has been a barrier to implementation. Concerted efforts of the international community in developing guidelines on product formulation and to work with manufacturers to produce the zinc supplement are now bearing fruit and will facilitate the translation of policy into action, the results of which hopefully can be shown in the coverage indicators of the next Countdown.

What, then, are the conditions that facilitate policy change, and most importantly, reduce the gap between policy and implementation? The answers seem to be strong global and national commitment, adequate financial resources, and intensive technical support. The recent experience of introducing *Haemophilus influenzae* vaccine illustrates that countries can adopt a new policy recommendation swiftly and turn this into action, measured by high levels of coverage.[1] But high levels of coverage will only be sustained as long as the health system is able to deliver on the basis of its internal strength. We must focus not only on selected inputs and outcomes, but also on strengthening the functions of health systems that are essential to deliver high-quality service. System-oriented approaches are receiving increasing emphasis and important new opportunities for investment have become available, for example through the GAVI Alliance and the Global Fund to Fight AIDS, Tuberculosis and Malaria. The International Health Partnership and the Global Campaign for the Health Millennium Development Goals emphasise the principles of aid harmonisation and health-system support to achieve improved health outcomes. In this context, it is only appropriate for the Countdown initiative to pay increasing attention to health systems and the policy environment that determine the context in which scaling up of effective interventions for maternal, newborn, and child health has to take place.

The exercise of identifying, measuring, and interpreting the findings for a core set of indicators of health systems and the policy environment was not easy. First, we had difficulties in selecting the most appropriate indicators that are relevant to assess the continuum of care for maternal, newborn, and child health within the context of the overall strengthening of health systems. There were several alternative indicators that could have been assessed, and hence we propose that the Countdown initiative adopts an evolving approach that not only ensures some continuity but also allows for updating of the indicator selection in each round of measurement. Second, there were no clear and consistent indicator definitions, especially for the policy indicators. Definitions were constructed and peer reviewed, but the process of data collection has shown that further work is needed on standardisation. Because most data for policy indicators were gathered through expert opinion, they have limitations with regard to source, quality, and reference year. Third, although critical thresholds based on international experience were identified for some of the health-system functions,

***Panel:* Case story**

Mozambique has unacceptably high maternal mortality. The government has adopted a policy to authorise midwives and clinical officers to practise live-saving skills, and has also instituted a comprehensive set of complementary measures to improve infrastructure, transportation, communication systems, and management targeted to dealing with obstetric emergencies. Access to fully functional emergency obstetric care facilities has quadrupled, and the number of women admitted for treatment of obstetric complications has tripled, thus halving the proportion of women dying from obstetric complications in a 5-year project in Sofala Province in Mozambique.[40]

evidence-based benchmarks have not yet been established in other areas, and hence prioritisation of future monitoring actions need further investigation. We believe that these challenges can be minimised with further research and investment in information and monitoring systems nationally, and that the Countdown process is appropriate to spearhead this work.

Much has been done already with regard to establishing the evidence base to measure progress in maternal, newborn, and child health outcomes and coverage. More efforts are needed to help countries to plan more rationally to scale-up maternal, newborn, and child survival interventions, and determine what programme inputs and outputs are required. Making available in the public domain an estimate of the number of livebirths every year will be the basis for a quantification of the target groups for maternal, newborn, and child survival interventions in every country. Compulsory birth registration will help to strengthen these estimates, and will also ensure the right of every newborn baby to be noticed and cared for.

High levels of health expenditure per head are not necessarily linked with improved outcomes. Although resources need to be mobilised for countries devoting too little to health, it is also true that some countries with low expenditures (but with greater efficiency and equity in their spending) have better maternal, newborn, and child health outcomes than do others with higher expenditures. One example is Sri Lanka, which is one of the few countries to have achieved remarkable progress in health and social development despite its low-income status. This example shows that factors other than income can have a substantial effect on health outcomes, including child mortality.[41]

Lastly, it would be useful to show how indicators of health policy and health systems relate to intervention coverage and health outcomes. We analysed the relation between single policy indicators and related indicators of intervention coverage, and found one apparent association between adoption of the International Code of Marketing of Breastmilk Substitutes and exclusive breastfeeding rates (data not shown). However, we are not surprised about the lack of association for other interventions, since our conceptual framework clearly shows the many additional functions that need to be in place to translate policy into action. We hope, however, that with increased attention to effective policies and investment in health system functions, we will soon witness increased intervention coverage in countries where these other dimensions have been strengthened as well.

Thus, we have assessed a limited set of critical indicators of health systems and the policy environment that are important to improve access and quality of service delivery for mothers, newborn babies, and children. We hope that this information will provide an additional and critical dimension to the discussions on feasible and sustainable solutions to accelerate progress towards MDGs 4 and 5, both worldwide but most importantly in individual countries. Where weaknesses in health systems are important obstacles to improving maternal, newborn, and child survival, governments and other stakeholders need to prioritise allocation of resources for system strengthening. If governments are to exert leadership to promote the maternal, newborn, and child health agenda, policies need to be in place to create a facilitating environment and direct the use of scarce resources. To be compatible with strategic directions for the health sector as a whole, such policies should focus not only on targeted interventions but also on issues that affect more than one population group or programme. The Countdown initiative will continue to monitor the status of indicators of health policy and health systems as a complement to coverage indicators, will seek to work with partners to improve the measurement methods, and will facilitate the integration of policy and health system considerations into the efforts to rapidly scale-up maternal, newborn, and child health interventions.

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**Conflict of interest statement**
We declare that we have no conflict of interest.

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