

Challenges in measuring maternal deaths

Maternal mortality is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the site or duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management. Causes of deaths can be divided into direct causes that are related to obstetric complications during pregnancy, labour or the post-partum period, and indirect causes. There are five direct causes: haemorrhage (usually occurring post-partum), sepsis, eclampsia, obstructed labour and complications of abortion. Indirect obstetric deaths occur from either previously existing conditions or from conditions arising in pregnancy which are not related to direct obstetric causes but may be aggravated by the physiological effects of pregnancy. These include such conditions as HIV and AIDS, malaria, anaemia and cardiovascular diseases. Simply because a woman develops a complication does not mean that death is inevitable; inappropriate or incorrect treatment or lack of appropriate, timely interventions underlie most maternal deaths.

Accurate classification of the causes of maternal death, whether direct or indirect, accidental or incidental, is challenging. To accurately categorize a death as maternal, information is needed on the cause of death as well as pregnancy status, or the time of death in relation to the pregnancy. This information may be missing, misclassified or under-reported even in industrialized countries with fully functioning vital registration systems, as well as in developing countries facing high burdens of maternal mortality. There are several reasons for this: First, many deliveries take place at home, particularly in the least developed countries and in rural areas, complicating efforts to establish cause of death. Second, civil registration systems may be incomplete or, even if deemed complete, attribution of causes of death may be inadequate. Third, modern medicine may delay a women's death beyond the 42-day post-partum period. For these reasons, in some cases alternative definitions of maternal mortality are used. One concept refers to any cause of death during pregnancy or the post-partum period. Another concept takes into account deaths from direct or indirect causes that occur after the post-partum period up to one year following pregnancy.

The main measure of mortality risk is the *maternal mortality ratio*, which is identified as the number of maternal deaths during a given period of time per 100,000 live births during the same period, which is generally a year. Another key measure is the *lifetime risk of maternal death*, which reflects the probability of becoming pregnant and the probability of dying from a maternal cause during a women's reproductive lifespan. In other words, the risk of maternal death is related to two main factors: mortality risk associated with a single pregnancy or live birth; and the number of pregnancies that women have during their reproductive years.

Working together to improve estimations of maternal deaths

Several agencies are collaborating to establish more accurate measurements of maternal mortality rates and levels worldwide, and assess progress towards Target A of Millennium Development Goal 5, which seeks to reduce the maternal

mortality rate by three quarters between 1990 and 2015. The Maternal Mortality Working Group, which originally comprised the World Health Organization, UNICEF and the United Nations Population Fund, developed internationally comparable global estimates of maternal mortality for 1990, 1995 and 2000.

In 2006, the World Bank, United Nations Population Division and several outside technical experts joined the group, which subsequently developed a new set of globally comparable maternal mortality estimates for 2005, building on previous methodology and new data. The process generated estimates for countries with no national data, and adjusted available country data to correct for under-reporting and misclassification. Of the 171 countries reviewed by the Maternal Mortality Working Group for the 2005 estimations, appropriate national-level data were unavailable for 61 countries, representing one quarter of global births. For these countries, models were used to estimate maternal mortality.

For the 2005 estimates, data were drawn from eight categories of sources: complete civil registration systems with good attribution of data, complete civil registration systems with uncertain or poor attribution of data, direct sisterhood methods, reproductive-age mortality studies, disease surveillance or sample registration, census, special studies and no national data. Estimates for each source were calculated according to a different formula, taking into account factors such as correcting for known bias and determining realistic uncertainty bounds.

Measures of maternal mortality are prepared with a margin of uncertainty, highlighting the fact that while they are the best estimates available, the actual rate may be higher or lower than the average. Although this is true of any statistic, the high degree of uncertainty for maternal mortality ratios indicates that all data points should be interpreted cautiously.

Notwithstanding the challenges of data collection and measurement, the 2005 inter-agency estimates for maternal mortality were sufficiently rigorous to produce trend analysis, assessing progress from the 1990 baseline date of MDG 5 to 2005. The lack of improvement in reducing maternal mortality identified in many developing countries has helped bring greater attention to achieving MDG 5.

The 2005 maternal mortality estimates are far from perfect, and much work is still required to refine the processes of data collection and estimation. But they reflect a strong commitment on the part of the international community to continually strive for greater accuracy and precision. These ongoing efforts will support and guide actions to improve maternal health and ensure that women count.

See References, page 107.

Creating a supportive environment for mothers and newborns

by H. M. Queen Rania Al Abdullah of Jordan, UNICEF's Eminent Advocate for Children*

In 1631, a beautiful empress, Mumtaz Mahal, died while giving birth to her 14th child. Overwhelmed by grief, her husband constructed a monument in her honour: the Taj Mahal, today one of the best-known buildings in the world.

And yet, while the Taj Mahal's domes and spires are instantly recognizable, there is far less global awareness of the tragedy that inspired its creation.

Nearly 400 years after Mumtaz Mahal lost her life in childbirth, a woman still dies from causes related to pregnancy or childbirth every minute of every day – more than 500,000 women each year, 10 million per generation. How can it be that in our age of modern advances and medical miracles we are still failing to safeguard women as they perpetuate the human race itself?

The answer, of course, is that public health has made breathtaking strides, but those benefits have not been equally shared, either among countries or between the geographical areas and social groups within them. Even though the causes of pregnancy and childbirth complications are the same around the world, their consequences vary dramatically from country to country and region to region. Today, a young woman in Sweden has a 1 in 17,400 lifetime risk of dying of pregnancy-related causes. In Sierra Leone, her risk soars to 1 in 8.

And for every woman who dies, another 20 are afflicted with serious infections or injuries. An estimated 75,000 women each year become victims of obstetric fistula, a physically and psychologically devastating condition that can result in social exclusion.

The toll in women's lives is enormous. But they are not the only ones who suffer. As a group of experts stated during a global conference on women's health in 2007: "In their prime reproductive years, women 'deliver' for their societies in multiple ways: They bear and raise the next generation, and they are critical actors for progress as workers, leaders, and activists." When women's lives are cut short or incapacitated as a result of pregnancy or childbirth, the tragedy cascades. Children lose a parent. Spouses lose a partner. And societies lose productive contributors.

Our world cannot afford to keep sacrificing so many people and so much potential. We know what it takes to prevent and treat the vast majority of pregnancy-related difficulties, from eclampsia and haemorrhage to sepsis, obstructed labour and anaemia. Indeed, the World Bank estimates that such basic interventions as antenatal care, attendance at delivery by skilled health personnel, and accessible emergency treatment for women and newborns could avert almost three quarters of maternal deaths.

But expanding medical interventions is just one part of improving maternal and newborn health. More fundamentally, we need to boost women's empowerment around the world. Consider that in a century increasingly defined by information, we still do not have precise data regarding the numbers of

women who die in childbirth each year. Why are maternal deaths only partially enumerated? One possible reason is that, in too many places, women's lives do not fully count.

And as long as women remain disadvantaged in their societies, maternal and newborn health will suffer as well. But if we can empower women with the tools to take control of their lives, we can create a more supportive environment for women and children alike.

Empowerment begins with education, the best development investment we can make – from ensuring that girls as well as boys are able to attend primary school to teaching women to read and write, and providing public health education. Although much remains to be done, many countries are beginning to make strides in this direction. In Jordan, for example, nursing students from the University of Jordan are volunteering to educate girls in public schools about women's health issues.

Study after study shows that educated women are better equipped to earn income to support their families, more likely to invest in their children's health care, nutrition and education, and more inclined to participate in civic life and to advocate for community improvements.

Educated mothers are also more likely to seek proper health care for themselves; according to the 2007 *Millennium Development Goals Report*, "84 per cent of women who have completed secondary or higher education are attended by skilled personnel during childbirth, more than twice the rate of mothers with no formal education."

Children of educated mothers are 50 per cent more likely to survive until the age of five and beyond than those whose mothers did not receive or complete schooling. For girls in particular, education can make the difference between hope and despair. Research shows that young people who complete primary school are less likely to be infected by HIV than those who never managed to graduate from primary school.

Educated girls are also more likely to delay marriage and less likely to get pregnant while very young, reducing the risk of dying in childbirth while they are still children themselves. As girls continue their education, their earning potential increases, enabling them to break the bonds of poverty too often passed down through the generations.

Put simply, changing the trajectory for girls can change the course of the future. And if these girls grow into women who choose to become mothers themselves, they will view pregnancy and childbirth as something to celebrate, not fear.

See References, page 107.

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Maternal and newborn health in Nigeria: Developing strategies to accelerate progress

Nigeria is Africa's most populous country, with 148 million inhabitants in 2007, 25 million of them under age five. With almost 6 million births in 2007 – the third highest number in the world behind India and China – and a total fertility rate of 5.4, Nigeria's population growth continues to be rapid in absolute terms.

In addition to its sizeable population, Nigeria is known for its vast oil wealth. Nonetheless, poverty is widespread; according to the latest *World Development Indicators 2007*, published by the World Bank, more than 70 per cent of Nigerians live on less than US\$1 per day, impairing their ability to afford health care.

Poverty, demographic pressures and insufficient investment in public health care, to name but three factors, inflate levels and ratios of maternal and neonatal mortality. The latest United Nations inter-agency estimates place the 2005 average national maternal mortality ratio at 1,100 deaths per 100,000 live births and the lifetime risk of maternal death at 1 in 18. When viewed in global terms, the burden of maternal death is brought into stark relief: Approximately 1 in every 9 maternal deaths occurs in Nigeria alone.

The women who survive pregnancy and childbirth may face compromised health; studies suggest that between 100,000 and 1 million women in Nigeria may be suffering from obstetric fistula. Neonatal deaths in 2004 stood at 249,000, according to the latest World Health Organization figures, with 76 per cent taking place in the early neonatal period (first week of life). Inadequate health facilities, lack of transportation to institutional care, inability to pay for services and resistance among some populations to modern health care are key factors behind the country's high rates of maternal, newborn and child mortality and morbidity.

Disparities in poverty and health among Nigeria's numerous ethnolinguistic groups and between its states are marked. Poverty rates in rural areas, estimated at 64 per cent in 2004, are roughly 1.5 times higher than the urban-area rate of 43 per cent. Moreover, the poverty rate in the north-east region, which stands at 67 per cent, is almost twice the level of 34 per cent in the more prosperous south-east.

Low levels of education, especially among women, and discriminatory cultural attitudes and practices are barriers to reducing high maternal mortality rates. A study at the Jos University Teaching Hospital in the north-central region shows that nearly three quarters of maternal deaths in 2005 occurred among illiterate women. The mortality rate among women who did not receive antenatal care was about 20 times higher than among those who did. Of the several ethnic groups represented among the patients, Hausa-Fulani women accounted for 22 per cent of all deliveries and 44 per cent of all deaths. The Hausa-Fulani represent the

largest ethnic group in northern Nigeria and are therefore critically affected by this region's higher poverty rates.

Cultural attitudes and practices that discriminate against women and girls contribute to maternal mortality and morbidity. Child marriage and high rates of adolescent births are commonplace across Nigeria, exposing girls and women of reproductive age to numerous health risks.

Given these complex realities, developing strategies to accelerate progress on maternal and newborn health remains a considerable challenge. But the Government of Nigeria, together with international partners, is attempting to meet the challenge. In 2007, it began to implement a national Integrated Maternal, Newborn and Child Health (IMNCH) Strategy to fast-track high-impact intervention packages that include nutritional supplements, immunization, insecticide-treated mosquito nets and prevention of mother-to-child transmission of HIV.

The strategy is to be rolled out in three phases, each lasting three years, and has been designed along the continuum of care model to strengthen Nigeria's decentralized health system, which operates at the federal, state and local levels. In the initial phase, covering 2007–2009, the key focus will be identifying and removing bottlenecks, while delivering a basic package of services using community-based and family-care strategies. A sizeable proportion of expenditure will go towards artemisinin-based combination therapy to combat malaria in women, children and newly recruited and trained health workers, particularly in rural areas. As basic healthcare improves, it is anticipated that the demand for clinical services will increase.

The second and third phases of the IMNCH will place greater emphasis on building health infrastructure. Over nine years, the strategy aims to revitalize existing facilities, construct clinics and hospitals, and create incentives – such as dependable salaries, hardship allowances and performance-based bonuses – that will help retain skilled health professionals in Nigeria's health system.

The IMNCH strategy, if implemented in full and on time, can markedly improve maternal and newborn health. Together with this package, the country has recently passed the National Health Insurance Scheme, which integrates the public and private health sectors to make health care more affordable for Nigerians. If the government passes the National Health Bill, which is currently before the legislature, a direct funding line for primary health care will become available. These health-system improvements have the potential to set a new course for meeting Millennium Development Goals 4 and 5 in Africa's largest nation.

See References, page 107.

Expanding Millennium Development Goal 5: Universal access to reproductive health by 2015

In 2005, Heads of State meeting at the United Nations to review commitments made in the Millennium Declaration – the outcome document of the Millennium Summit of 2000 – not only reaffirmed the development goals elaborated in 2000 and ever since known as the Millennium Development Goals (MDGs), they also added four new targets to support them.

One of the major changes to the MDG configuration is the inclusion of a specific target on reproductive health: Millennium Development Goal 5, Target B, which seeks to “Achieve, by 2015, universal access to reproductive health.” This new target falls within the goal’s overarching objective of improving maternal health and complements its original target and associated indicators. The indicators selected to monitor progress towards MDG 5, Target B, are shown below:

Contraceptive prevalence rate – Percentage of women aged 15–49 in union currently using contraception.

Adolescent birth rate – Annual number of births to women aged 15–19 per 1,000 women in that age group. Alternatively, it is referred to as the age-specific fertility rate for women aged 15–19.

Antenatal care coverage – Percentage of women aged 15–49 attended at least once during pregnancy by skilled health personnel (doctors, nurses or midwives) and the percentage attended by any provider at least four times.

Unmet need for family planning – Refers to women who are fecund and sexually active but are not using any method of contraception and report not wanting any more children or wanting to delay the birth of the next child.

The addition of the reproductive health target to the MDGs reflects a long process linking reproductive health issues to development, human rights and gender equity, whose landmark event was the International Conference on Population and Development (ICPD) held in Cairo in 1994. Since then, other important events, notably the Fourth World Conference on Women (Beijing, 1995) and ICPD+5 – the UN General Assembly Special Session on the International Conference on Population and Development held in 1999 – have confirmed and extended the recommendations of the original ICPD gathering, including the goal of universal access to reproductive health services by 2015.

See References, page 107.

Sri Lanka is a story of success against the odds. A lower-middle-income country – in 2006, Sri Lanka's annual gross national income per capita was less than US\$1,500 – it has also experienced a protracted civil conflict and the devastation of the 2004 Indian Ocean tsunami. Yet the country's progress in human development, particularly in maternal and child health and education, has been one of the key success stories among developing countries in recent decades. Sri Lanka's maternal mortality ratio declined from 340 per 100,000 live births in 1960 to 43 per 100,000 live births in 2005, and 98 per cent of births now take place in hospitals. Rates of antenatal care (at least one visit) and skilled attendance at birth stand at 99 per cent. In 2007, the country had an overall fertility rate of 1.9 – compared to 3.0 for the South Asia region. These results have also had positive effects on child survival: The under-five mortality rate has fallen from 32 per 1,000 live births in 1990 to 21 per 1,000 live births in 2007. The latest available data suggest that the neonatal mortality rate has also fallen, to around 8 per 100,000 births in 2004.

In basic education, too, Sri Lanka's performance has been outstanding. According to the latest international estimates, net primary school enrolment stands at more than 97 per cent for both girls and boys, while literacy rates among young people aged 15–24 are 97 per cent for males and 98 per cent for females. Administrative data suggest that the completion rate for primary school is 100 per cent. Given the positive correlation between education and maternal and child survival, these are the results of sustained investment in all three areas.

The key to Sri Lanka's outstanding improvements in maternal health was the expansion of a synergistic package of health and social services to reach the poor. The country's health system, which dates back to the late 19th century, first targeted universal provision of improved health care, sanitation and disease management. It subsequently added specific interventions to improve the health of women and children. Over the years, successive governments have followed a prudent approach of prioritizing health-care services to mothers and the poor while spending economic and human resources judiciously. The resulting improvements in women's health are supported and strengthened by measures to empower women socially and politically through education, employment and social engagement.

Sri Lanka's early written records and colonial past give a unique perspective of the evolution of maternal health in the country, starting with 9th- and 10th-century medical texts. Formal midwifery training was established under the British colonial government in 1879, and the Registrar General has recorded maternal mortality since 1902. This wealth of information and knowledge makes it possible to evaluate results of differing approaches to maternal health over time. Clear mandatory competencies helped profes-

sionalize midwives, and a no-blame policy helped make inquiries into maternal deaths routine.

The results were dramatic – maternal mortality was halved between 1947 and 1950. Thirteen years later, maternal mortality rates were cut in half again. Once health structures and networks were in place, increasingly better organization and clinical management have allowed Sri Lanka to cut the maternal mortality ratio by 50 per cent every 6 to 11 years. In addition, women's literacy rose from 44 to 71 per cent between 1946 and 1971. The rates of skilled attendance at birth and institutional delivery also grew. The public health midwife's role became more that of an institutional delivery assistant, as home midwife-assisted deliveries declined from 9 per cent in 1970 to just 2 per cent in 1995. Beginning in 1965, midwives also played a role in expanding government family planning services.

Sri Lanka's development of its health system has long been a model for other developing countries, demonstrating the degree of success that can be achieved in maternal and child health when sound strategies, sufficient resources and political commitment are judiciously applied. Despite its noteworthy advances in maternal and child health, challenges remain. In recent years, the country has faced a shortage of health workers; according to the *World Health Statistics 2008*, in the 2000–2006 period the country had only 6 doctors and 17 nurses and midwives per 10,000 inhabitants. In addition, services have deteriorated as financial resources have been squeezed, with health spending at around 4 per cent of GDP in 2005. Private spending on health, most of which is out-of-pocket, accounts for more than half of total health expenditure.

A further challenge for Sri Lanka will be to ensure food security, particularly if global food prices remain high. The country still has marked levels of undernutrition among newborns and children under five. According to the latest international estimates, more than 1 in every 5 newborns are born with low birthweight, and 23 per cent of children under five are moderately or severely underweight. Improving the level of exclusive breastfeeding for children less than six months old from its current level of 53 per cent will be vital to sustaining Sri Lanka's gains in neonatal and child mortality.

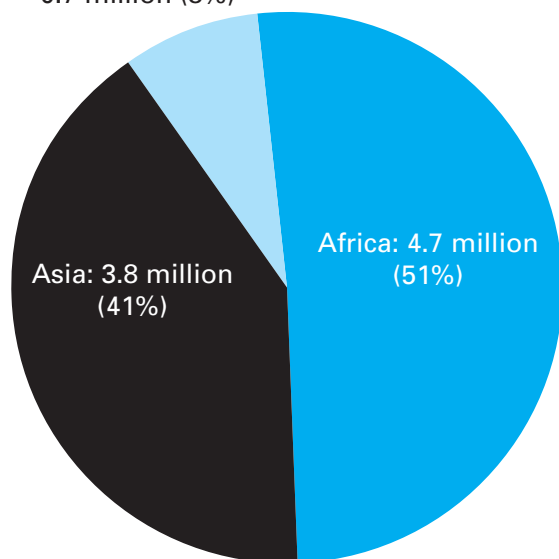
See References, page 107.

The centrality of Africa and Asia in the global challenges for children and women

The continents of Africa and Asia* present the largest global challenges to the survival of children and women. Their progress in such critical areas as child and maternal health, nutrition and education, among others, is pivotal to achievement of the Millennium Development Goals.

Deaths of children under five, 2007

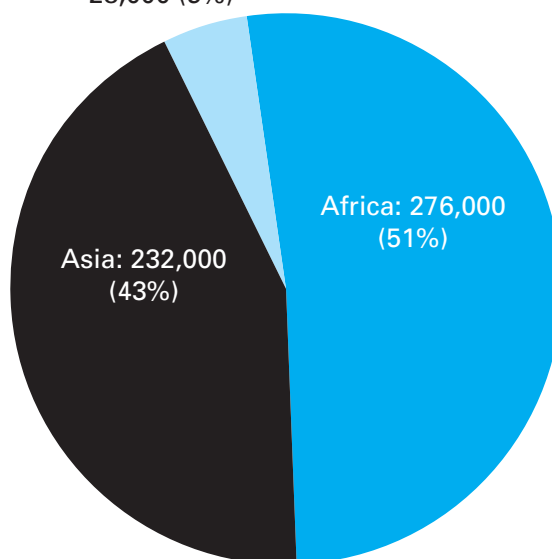
Rest of the world:
0.7 million (8%)



Source: UNICEF global databases.

Maternal deaths, 2005

Rest of the world:
28,000 (5%)



Source: UNICEF global databases.

Deaths among children under five

- In 2007, 9.2 million children died before age five. Africa and Asia together accounted for 92 per cent of these deaths.
- Half of the world's under-five deaths occurred in Africa, which remains the most difficult place in the world for a child to survive until age five.
- Although Asia has seen a remarkable reduction in the annual number of child deaths since 1970, it still accounted for 41 per cent of global under-five deaths in 2007.

Maternal deaths

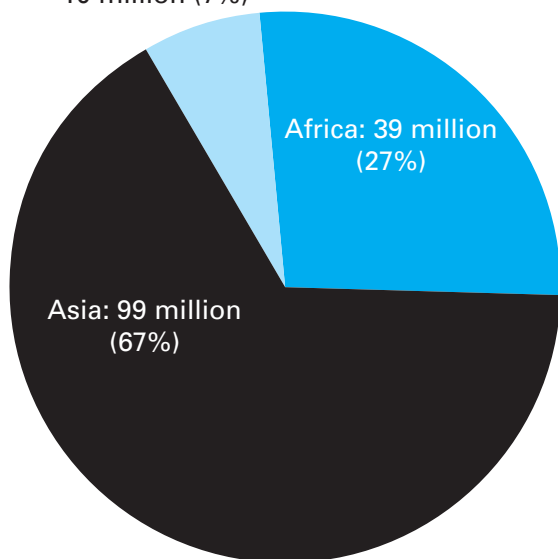
- In 2005, the latest year for which firm estimates are available, an estimated 536,000 women died from causes related to pregnancy and childbirth. Almost all – 95 per cent – of these maternal deaths occurred in Africa and Asia.
- Africa is the continent with the highest rate of maternal mortality, estimated at 820 maternal deaths per 100,000 live births in 2005. Asia's rate of maternal death is 350 per 100,000 live births.
- In Africa, the lifetime risk of maternal death is 1 in 26, four times higher than in Asia and more than 300 times higher than in the industrialized countries.

The full burden of maternal and child deaths in Africa and Asia – for each continent and for the two combined – is frequently understated due to the lack of continent-wide estimates for key Millennium Development Goal indicators. This panel presents a snapshot of key child and maternal indicators for Africa and Asia, and in their totality provides a complementary perspective to the regional breakdown presented in the Statistical Tables, pages 113-157 of this report.

Aggregating the data on children from these two vast continents provides a stark reminder of the overwhelming importance of making rapid progress across both Africa and Asia if global development goals are to be realized. In the push to accelerate progress at the continental level, however, the often startling disparities in the status of women and children and in rates of progress within countries and continents must not be forgotten. The issue of disparities and inequalities affecting children will be examined in greater detail in future editions of *The State of the World's Children*.

Underweight children under five, 2007

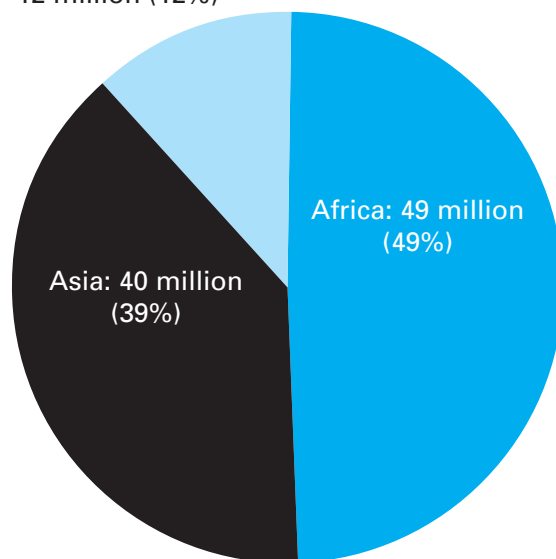
Rest of the world:
10 million (7%)



Source: UNICEF global databases.

Primary-school-age children out of school, 2007

Rest of the world:
12 million (12%)



Source: UNICEF global databases.

Nutritional status of young children

- In 2007, 148 million children under age five in the developing world were underweight for their age.
- Two thirds of these children live in Asia, and just over one quarter live in Africa.
- Together, Africa and Asia account for 93 per cent of all underweight children under age five in the developing world.

Primary education

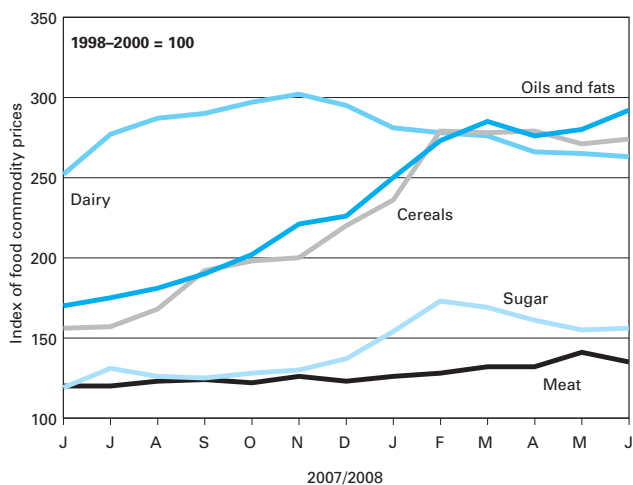
- In 2007, 101 million children of primary school age were not in school.
- Almost half of these children live in Africa, and 39 per cent live in Asia.
- Across the two regions, approximately 20 per cent of girls and 16 per cent of boys of primary school age are either not enrolled or are not attending primary school.

* Africa includes all member states of the African Union. Asia includes the countries in the UNICEF regions of East Asia and the Pacific and South Asia. Numbers may not always add up due to rounding.

The global food crisis and its potential impact on maternal and newborn health

The recent, precipitous rise in global prices that began in 2006 and continued in 2007–2008 has illustrated the vulnerability of millions to hunger and undernutrition, particularly those in countries where food security is still a major concern. The sharp increases involved such basic foodstuffs as vegetable oils, grains, dairy products and rice. Although fluctuations in the prices of commodities are common, what distinguished the situation in 2008 was that the hike in world prices affects not just a selected few products but nearly all major food and feed commodities.

Figure 1.8
Food prices have risen sharply across the board*



* The food commodity price indices displayed above are the weighted averages of price indices from a basket of basic goods under each commodity group. The weights are the average export trade shares for 1998–2000. For examples, the Oils and Fats Price Index consists of the price indices of 11 different oils (including animal and fish oils) weighted with average export trade shares of each oil product for 1998–2000. For a fuller explanation of the composition of each food commodity group index, see Source.

Source: Food and Agriculture Organization of the United Nations, Food Price Indices, <<http://www.fao.org/worldfoodsituation/FoodPricesIndex/en>>, accessed 1 August 2008.

By June 2008, the Food and Agriculture Organization of the United Nations (FAO) had identified 22 developing countries as being particularly vulnerable to the food crisis. Its assessment was based on a combination of three risk factors:

- An underweight prevalence rate of 30 per cent or more in the population.
- A high degree of dependence on imports of food staples such as rice, wheat and maize.
- A high degree of dependence on imported petroleum products.

Comoros, Eritrea, Haiti, Liberia and Niger are among the countries that demonstrate worrisome levels of all three of these identified risk factors. It comes as little surprise that most of these nations are among the least developed and lowest-income countries. Even within these countries,

however, it is the poorest sections of society – who spend the largest proportion of their disposable income on food – that are likely to be hardest hit by the food crisis.

Addressing the special nutritional needs of mothers and newborns

During an emergency such as a food crisis, pregnant and lactating mothers, together with infants, are among those considered most at risk of undernutrition, owing to their higher nutritional requirements. For example, pregnant women require almost 285 additional calories per day, and lactating women require an additional 500 calories per day. Their micronutrient needs are also higher, and they require adequate intake of iron, folate, vitamin A and iodine to ensure the health of both mother and infant.

In the face of the food crisis, FAO has urged a rapid supply response to restore a better balance between food supply and demand, especially in the countries worst affected. In addition, while food aid is being supplied to countries, policies must be applied to offset patterns of food distribution between family members that may result in pregnant and lactating women consuming less than their minimum requirements. Where food aid is being provided to those most at risk of shortages and undernutrition, additional food for pregnant women should be supplied, usually as a take-home ration, either through the general ration distribution or through supplementary feeding programmes. Pregnant and lactating women may also require other complementary, nutrition-related interventions, including food fortification, micronutrient supplementation, additional safe drinking water, malaria management during pregnancy, prophylaxis for management of internal parasites, and nutrition education counselling.

Communication and advocacy campaigns concerning food aid should highlight the special nutritional needs of pregnant and lactating women and include messages to families and communities explaining why these women are being provided extra food. The information should stress the importance of exclusive breastfeeding for the first six months of a child's life, with complementary feeding for older infants. For HIV-positive mothers, breastfeeding practices may differ, since the virus can be transmitted through breast milk, depending on the availability and safety of replacement feeding.

Information and early warning continue to have a crucial role in ensuring that timely and appropriate action can be taken to avoid suffering. FAO's Global Information and Early Warning System is demonstrating its capacity to alert the world to emerging food shortages. More needs to be done, however, to create strong response mechanisms to food crises and to develop national and international policies that prioritize and safeguard food and nutrition security – and take into account the special nutritional needs of women and young children.

See References, page 107.

Promoting healthy behaviours for mothers, newborns and children: The *Facts for Life* guide

Creating a supportive environment for maternal and newborn health requires altering behaviours that discriminate against women and girls and adopting healthy practices that safeguard them from disease and injury. Healthy practices, such as exclusively breastfeeding an infant for the first six months of its life or washing hands with soap, must be evidence-based and established by medical experts.

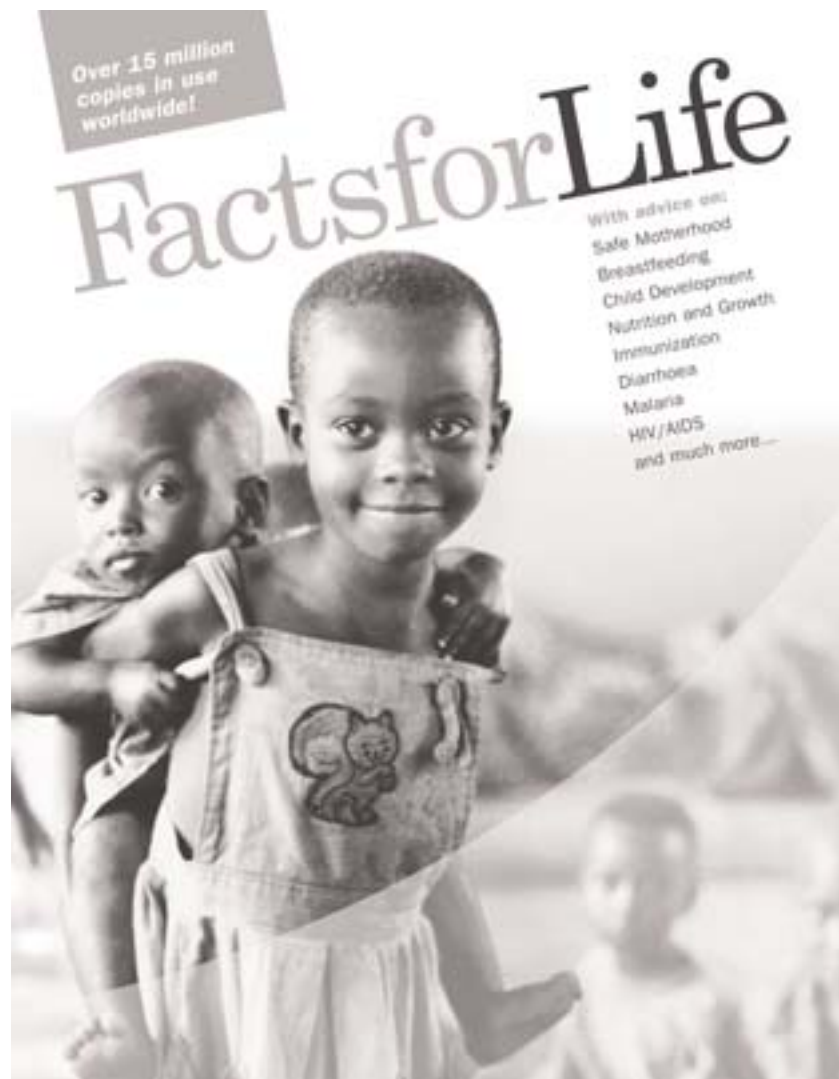
Describing these practices to parents and other caregivers in non-technical language is critical to empowering women and girls and supporting maternal and newborn health. Twenty years ago, eight UN agencies – UNICEF, WHO, UNFPA, the United Nations Educational, Scientific and Cultural Organization, the United Nations Development Programme, the Joint United Nations Programme on HIV/AIDS, the World Food Programme and the World Bank – jointly published a guide to make such life-saving knowledge available to everyone. The guide, entitled *Facts for Life*, was addressed to communicators – health workers, the media, government officials, non-governmental organizations, teachers, religious leaders, employers, trade unions, women’s groups, community organizations and others. Its third edition, published in 2002, addressed a broad range of topics:

- Timing of births
- Safe motherhood
- Child development and early learning
- Breastfeeding
- Nutrition and growth
- Immunization
- Diarrhoea
- Coughs, colds and more serious illnesses
- Hygiene
- Malaria
- HIV and AIDS
- Injury prevention
- Disasters and emergencies

Clear, brief and practical key messages explained recommended actions and offered supplementary information.

One underlying principle of the guide is that communication involves more than simply providing information. It also requires presenting the information in an interesting and accessible way and helping people understand its relevance. The guide also discusses ways to take action and overcome bottlenecks and barriers.

Facts for Life has been widely disseminated, with more than 15 million copies in circulation in 215 languages by 2002. A new edition of the guide is being prepared.



Primary health care: 30 years since Alma-Ata

The 1978 Declaration of Alma-Ata was groundbreaking because it linked the rights-based approach to health to a viable strategy for attaining it. The outcome document of the International Conference on Primary Health Care, the declaration identified primary health care as the key to reducing health inequalities between and within countries and thereby to achieving the ambitious but unrealized goal of “Health for All” by 2000. Primary health care was defined by the document as “essential health care” services, based on scientifically proven interventions. These services were to be universally accessible to individuals and families at a cost that communities and nations as a whole could afford. At a minimum, primary health care comprised eight elements: health education, adequate nutrition, maternal and child health care, basic sanitation and safe water, control of major infectious diseases through immunization, prevention and control of locally endemic diseases, treatment of common diseases and injuries, and the provision of essential drugs.

The declaration urged governments to formulate national policies to incorporate primary health care into their national health systems. It argued that attention be given to the importance of community-based care that reflects a country’s political and economic realities. This model would bring “health care as close as possible to where people live and work” by enabling them to seek treatment, as appropriate, from trained community health workers, nurses and doctors. It would also foster a spirit of self-reliance among individuals within a community and encourage their participation in the planning and execution of health-care programmes. Referral systems would complete the spectrum of care by providing more comprehensive services to those who needed them most – the poorest and the most marginalized.

Alma-Ata grew out of the same movement for social justice that led to the 1974 Declaration on the Establishment of a New International Economic Order. Both stressed the interdependence of the global economy and encouraged transfers of aid and knowledge to reverse the widening economic and technological divides between industrialized countries and developing countries, whose growth had, in many cases, been stymied by colonization. Examples of community-based innovations in poorer countries after World War II also provided inspiration. Nigeria’s under-five clinics, China’s bare-foot doctors and the Cuban and Vietnamese health systems demonstrated that advances in health could occur without the infrastructure available in industrialized countries.

The International Conference on Primary Health Care was itself a milestone. At the time, it was the largest conference ever held devoted to a single topic in international health and development, with 134 countries and 67 non-governmental organizations in attendance. Yet there were obstacles to fulfilling its promise. For one thing, the declaration was non-binding. Furthermore, conceptual disagreements over how to define fundamental terms such as ‘universal access’, which persist today, were present from the beginning. In the context of the cold war, these terms revealed the sharp ideological differences between the capitalist and communist worlds, discord perhaps heightened by the fact that the Alma-Ata conference took place in what was then the Union of Soviet Socialist Republics.

As the 1970s gave way to a new decade, a tumultuous economic environment contributed to a diversion away from primary health care in favour of the more affordable model of selective health care, which targeted specific diseases and conditions. Nonetheless, despite the mixed success of primary health care in the countries where it has been implemented, advances in improving public health illustrate the community-based model’s flexibility and applicability.

Insufficient progress towards the Millennium Development Goals, coupled with the threats posed to global health and human security by climate change, pandemic influenza and the global food crisis, have led to renewed interest in comprehensive primary health care. Yet the many challenges that prevented Alma-Ata’s implementation have evolved and must be confronted to achieve its goals now. Drawing on the growing body of evidence about cost-effective initiatives that integrate household and community care with outreach and facility-based services – such as those for maternal and child health described in Chapter 3 – will enable governments, international partners and civil society organizations to revitalize primary health care.

See References, page 108.

Addressing the health worker shortage: A critical action for improving maternal and newborn health

One of the biggest challenges for maternal and neonatal health is the shortage of skilled health personnel. A 2006 World Health Organization survey reveals that while Africa accounts for more than 24 per cent of the global disease burden, it has only 3 per cent of the world's health workers and spends less than 1 per cent of total global resources dedicated to health, even after loans and grants from abroad are taken into account. In contrast, the Americas region, which covers Latin America and the Caribbean along with North America, has only 10 per cent of the global burden of disease but commands 37 per cent of the world's health workers and spends more than 50 per cent of global resources allocated to health.

According to the World Health Organization, the world is facing a shortage of 4.3 million health workers, with every region except Europe showing a shortfall. More specifically, there are not enough skilled health workers – doctors, nurses or midwives – to attend all the world's births. A study by the Joint Learning Initiative found that countries needed an average of 2.28 health-care professionals per 1,000 people to achieve the minimum desired level of coverage for skilled attendance at delivery. Of the 57 countries that fall below this threshold, 36 are in sub-Saharan Africa. Although the countries with the largest shortages of health workers in absolute terms are found in Asia – notably in Bangladesh, India and Indonesia – the largest relative need is in sub-Saharan Africa. This region would need to increase its numbers of health workers by 140 per cent to reach the requisite density. An earlier WHO estimate calculated that 334,000 skilled birth attendants would need to be trained worldwide in the coming years to cover 73 per cent of births.

Shortages of skilled health workers arise from many factors, including underinvestment in training and recruitment, weak incentives for health-care workers, low remuneration and high levels of stress. Heavy migration of skilled health workers from developing countries to industrialized nations – spurred by the burgeoning demand for health workers in industrialized countries with ageing populations – has also taken its toll. A survey of 10 African countries showed that the number of locally trained doctors now working in eight

Organisation for Economic Co-operation and Development countries was equivalent to 23 per cent of the doctors still domestically employed in those countries.

Demographic trends within countries are also strong influences on the health worker shortage. Rapid urbanization in developing countries is exacerbating the shortage of health workers in rural areas, as trained professionals seek work in more affluent urban conurbations. Health workers, who usually qualify in urban settings, are often reluctant to base themselves in a rural location on the grounds that it involves greater hardship, more basic living conditions and less access to urban amenities and entertainment. One survey in South and South-east Asia found, for example, that rural postings were shunned because of lower income, low prestige and social isolation.

AIDS, too, is having a deleterious effect on health systems in the countries where it has reached epidemic proportions. Health workers in these countries face the same risks in their private lives as other people in high-prevalence countries, but are also exposed to significant risks at work in circumstances where protective equipment and practices are often deficient. A 2004 study in South Africa indicated that younger health workers there had an HIV-prevalence rate of 20 per cent. Such workers deserve much greater protection and care, including better supplies of protective equipment, safety schemes to prevent needle-stick injuries, prophylaxis in the event of possible exposure to the virus, and antiretroviral treatment if they become infected with HIV.

Establishing continua of quality health care to reduce maternal and neonatal mortality and morbidity will require strategies to reduce the shortfalls in health-care personnel. While part of this gap will be filled by the recruitment and training of community health workers – whose resourcefulness has been shown to have great potential to provide basic services – much more needs to be done to train and retain skilled health-care workers, particularly in sub-Saharan Africa and South Asia.

See References, page 108.

Towards greater equity in health for mothers and newborns

by Cesar G. Victora, Professor of Epidemiology, Universidade Federal de Pelotas, Brazil

The issue of equity in health outcomes, and in access to essential primary-health-care services, is receiving greater attention in the field of maternal, newborn and child health. This focus is increasingly supported by emerging evidence and research on the extent of disparities in health and other development areas. Inequities are defined as systematic differences between population groups that are unfair and avoidable, and generally include disparities related to socio-economic position, gender, ethnic group and place of residence, among other factors.

Having a skilled attendant at delivery – a key intervention for improving maternal and neonatal health and survival – is among the most inequitably distributed health interventions. Figure 2.6 shows the average share of births attended by skilled health personnel, based on results from recent national surveys of low- and middle-income countries. There are marked inequalities between the regions of the world, with Europe and Central Asia showing the highest coverage levels for all income groups, and sub-Saharan Africa and South Asia in particular trailing well behind.

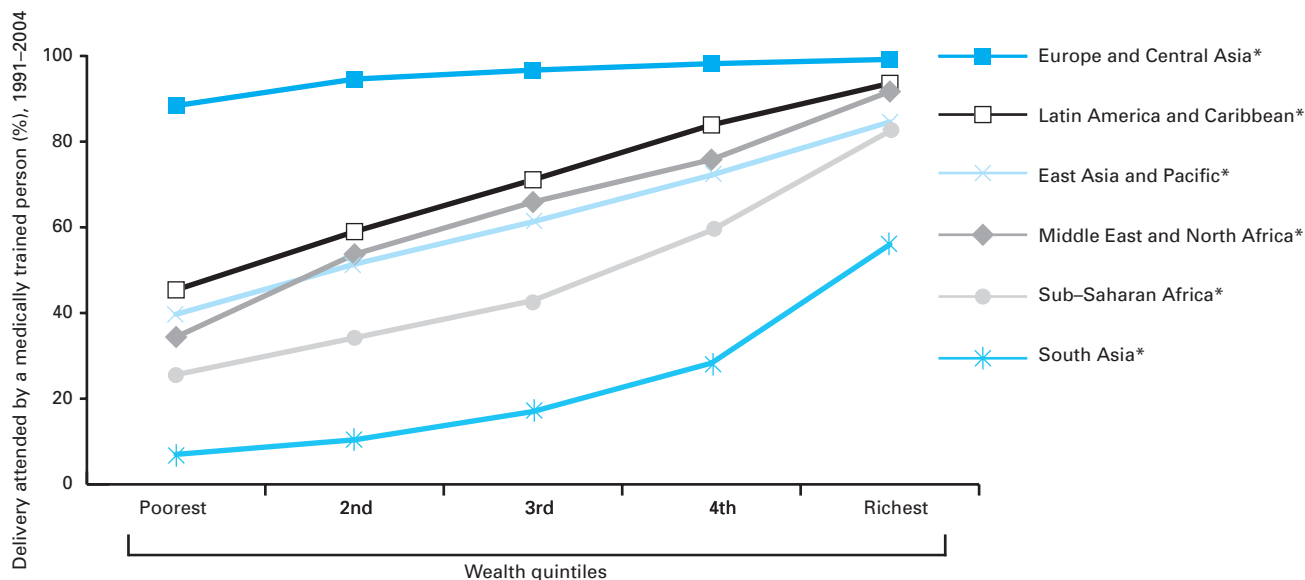
In addition to variations between regions, within each region there are important disparities by socio-economic position – as observed by comparing skilled attendance at delivery across income quintiles. Among the poorest 20 per cent of South Asian mothers, fewer than 10 per cent of births are delivered by a skilled attendant, compared to 56 per cent of births for

mothers from the richest income quintile in that region. The other developing regions exhibit similar disparities; even in Europe and Central Asia – where most countries with survey information are former socialist republics – the proportion of deliveries attended by skilled health personnel is significantly lower for the poorest women than for the most affluent.

Other measures of disparity in health-care provision are also pronounced. Urban mothers and children in developing countries tend to have greater access to health care and better health status than their rural counterparts. Socio-economic inequities are similarly marked within urban areas, where health conditions among slum dwellers are particularly adverse. Within countries, state and provincial differentials in maternal and child health are also often wide, as exemplified by the sharp variations in health indicators between Brazil's more prosperous southern states and its more impoverished north-eastern regions.

Poor mothers and children are underserved along the whole continuum of care. Data from several sub-Saharan African countries were used to document the proportion of mothers and children who received a package of four essential interventions: antenatal care, skilled attendance at delivery, post-natal care and childhood immunization. Coverage with all four interventions was two to six times higher – depending on the country – among the richest groups than it was in the poorest groups. This inequitable pattern of health-care

Figure 2.6
Mothers who received skilled attendance at delivery, by wealth quintile and region



* See References on page 108.

Source: Gwatkin, D. R., et al., *Socio-economic differences in health, nutrition, and population within developing countries: An overview*, Health, Nutrition and Population, World Bank, Washington, D.C., September 2007, pp. 123–124.

provision both reflects and entrenches the social exclusion faced by the poorest and the most marginalized groups and helps explain why maternal, neonatal and child mortality show such marked socio-economic variations.

Health systems have an important role in overcoming these disparities. Examples from across the developing world show that much can be, and is being, done to address and reduce disparities in access to essential services.

- In the *United Republic of Tanzania*, prioritizing interventions to combat diseases that affect poor mothers and children, and allocating district health budgets preferentially to these conditions, led to marked reductions in mortality.
- In *Peru*, the poorest departments (provinces) in the country are earmarked as the first to receive new vaccines; only after high coverage levels are reached in these districts are vaccines rolled out to the rest of the country.
- In *Bangladesh*, the Integrated Management of Childhood Illness (IMCI) strategy was systematically deployed in the poorest areas of the country; a similar strategy is employed by *Brazil's* Family Health Programme.

Because the poor are more likely to live in rural and remote areas, use of appropriate channels for reaching them with essential services should be a primary concern of the health

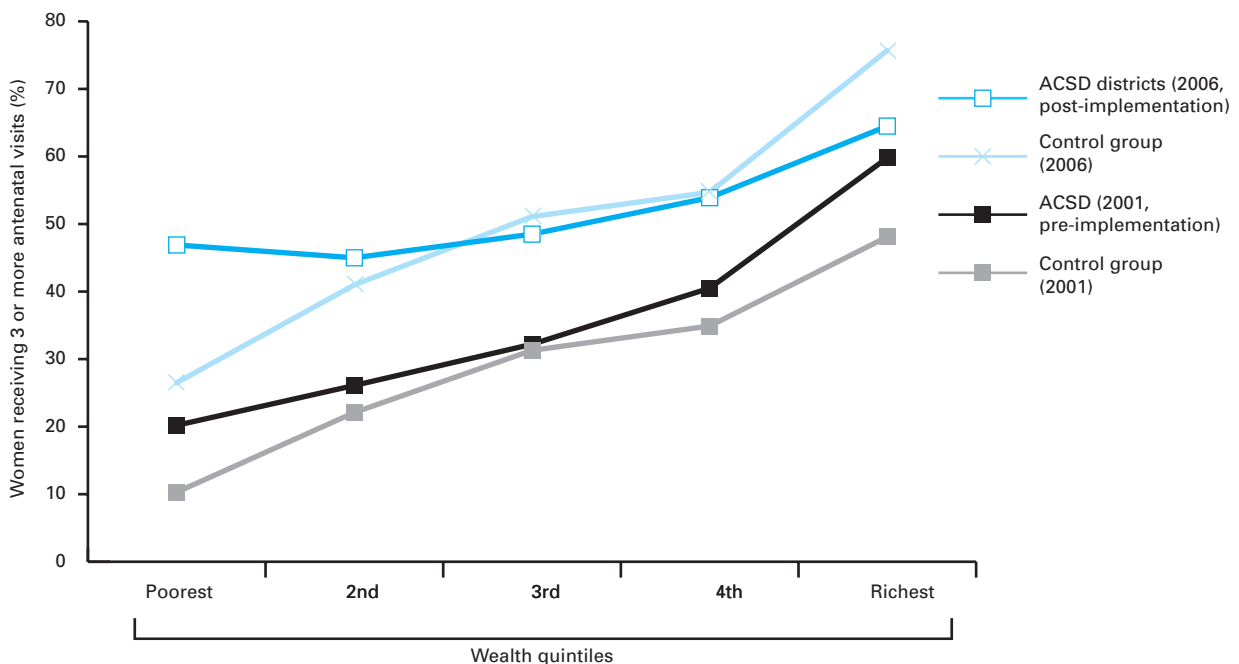
sector. Figure 2.7 shows how implementation of the Accelerated Child Survival and Development (ACSD) strategy has reduced inequities in access to antenatal care in Mali. Whereas both ACSD and control districts showed marked social disparities before the programme was deployed in 2001, five years later access to antenatal care was significantly more equitable in districts with ACSD than in the control areas. The ACSD strategy relied heavily on outreach initiatives aimed at improving access for rural mothers living in remote areas. This finding, however, was not replicated in other ACSD countries where outreach activities were not strongly implemented.

The reduction of inequalities in health is essential for the full achievement of human rights. Gaps in health-care provision contribute to the generation of these inequalities; consequently, health systems also play a role in their elimination. This is particularly true because the greatest gains in maternal, neonatal and child survival depend on effectively reaching the poorest and the most marginalized, who suffer the greatest burden of disease. There are many examples of successful initiatives that, when implemented with sufficient political support and adequate resources, have led to substantial reductions in health inequities. The main challenge for countries and societies is to disseminate these success stories, adopt best practices, and generate and sustain the political will to put equity at the top of the health agenda.

See References, page 108.

Figure 2.7

Women in Mali receiving three or more antenatal care visits, before and after the implementation of the Accelerated Child Survival and Development (ACSD) initiative



Source: Johns Hopkins University 2008.

Peru, a lower-middle-income country where 73 per cent of the population lives in urban areas, has made enormous progress in reducing child deaths from 1 in every 6 children in 1970 to 1 in 50 by 2006. Between 1990 and 2007, the country's under-five mortality rate dropped by 74 per cent – the fastest rate of decline in the entire Latin American and Caribbean region for that period. It has had less success, however, in the area of maternal health. Its maternal mortality ratio, estimated at 240 maternal deaths per 100,000 live births in 2005, is among the highest in the region. Moreover, Peruvian women face a life-time risk of maternal mortality estimated in 2005 at 1 in 140, twice the regional average of 1 in 280.

The country's relative lack of progress in reducing maternal deaths has resulted in its inclusion on the expanded list of priority countries for the Countdown to 2015 initiative, whose criteria have now been broadened to include maternal mortality thresholds in addition to those for child mortality set out in 2005. According to the Ministry of Health, women in rural areas are twice as likely as those in urban areas to die from causes related to pregnancy. A skilled attendant was present at just 20 per cent of deliveries in rural communities in 2000, compared to 69 per cent in urban areas.

Like other Latin American and Caribbean countries, Peru's challenge for improving maternal and newborn health – and greatest potential for progress – is to address disparities due to ethnicity, geography and extreme poverty. This will require delivering quality services to women and infants in or near their places of residence and providing integrated routine and emergency maternity and newborn care.

Part of the challenge is to adapt current health services, often facility-based or outreach, to the customs of the communities currently underserved by the health system. For example, following tradition and cultural practice, rural women may prefer to give birth at home in an upright position, under the guidance of traditional birth attendants, rather than in a health centre delivery room. Moreover, even if these mothers did decide to seek formal care, distance to a health facility, cost of services, language barriers and other impediments might deter them.

Ensuring that mothers have the option of delivering in their homes, with the assistance of skilled birth attendants and a strong referral system to emergency obstetric care, if it is needed, may be an appropriate way to integrate formal health services with traditional practices. Towards this end, the Ministry of Health, in conjunction with UNICEF Peru, has developed a maternal health project that includes four key strategies:

- Establishing maternal waiting houses to resolve the difficulty posed by geographic distance from health services.

- Fostering family and community support to make maternity and the mother's condition a priority.
- Increasing access to the Integral Health Service, which covers the cost of antenatal, intrapartum and post-partum care for poor families.
- Adapting maternity services to eliminate barriers between the staff at health facilities and mothers who have deeply rooted cultural traditions for childbirth.

The maternal waiting houses, dubbed 'Mamawasi', are constructed to encourage women in rural areas to choose the option of giving birth in health centres instead of at home. Currently, there are almost 400 houses located on grounds belonging to health centres or hospitals; others are in rented buildings in the regions of Apurimac, Ayacucho and Cuzco. Pregnant women from near and distant communities can stay in the waiting rooms until they deliver. Women from remote villages may stay for weeks or months. The Mamawasi is designed to resemble a typical indigenous family home in a farming village. Expectant mothers are allowed to bring family members with them to the houses, which increases their confidence and comfort level in using the service.

Health centres have also changed their practices. For instance, the vertical birth position is accommodated, a family member or traditional midwife is allowed to accompany women during birth, and the centres are kept at a warmer temperature.

This programme has transformed everyday health services by promoting cultural sensitivity in health care. Huancarani district, located in the Andean province of Paucartambo, in the Cuzco region, has been the most successful in implementing the new strategy. Overall, almost 3 out of every 4 pregnant women now visit health-care centres in the regions served, especially for childbirth, whereas previously the ratio was 1 in 4. The programme has been integrated into district and provincial health policies and was adopted in 2004 by the Ministry of Health as a national standard to be implemented throughout the country. The Ministry of Health has also created training modules to teach health personnel how to make services culturally appropriate.

See References, page 108.

Southern Sudan: After the peace, a new battle against maternal mortality

After 21 years of conflict, civil war between the north and south of the Sudan came to an end in 2005. While the fighting has mostly ceased, Southern Sudan is facing another struggle – against maternal and neonatal mortality. According to the 2006 Sudan Household Health Survey, the maternal mortality ratio for Western Equatoria, a province in Southern Sudan, stood at 2,327 deaths per 100,000 live births, one of the highest in the world. The 2006 neonatal mortality rate was 51 deaths per 1,000 live births, significantly above the Sudan's national ratio of 41 per 1,000 live births.

Overall health-care coverage, mostly managed through a small number of non-governmental organizations, is estimated at just 25 per cent. Even when health care is available, maternal health services are limited and not often used. Part of the reason may be a lack of education. The United Nations Population Fund (UNFPA) estimates that in 2006 the literacy rate for Southern Sudanese women was just 12 per cent, compared to 37 per cent for men; women therefore have limited access to health information.

Another possible reason is that pregnant women must travel long distances on foot to reach antenatal centres; consequently, attendance rates vary sharply depending on location, from 17.4 per cent in Unity State in 2006 to nearly 80 per cent in Western Equatoria. Fewer than 15 per cent of births in Southern Sudan are attended by skilled health personnel, and 80 per cent take place at home under the supervision of relatives, traditional birth attendants or village midwives (a female birth attendant who has typically received around nine months of training). Yet most of the causes of maternal death – including prolonged obstructed labour, haemorrhage, sepsis and eclampsia – could be managed by better-trained attendants.

The quality of available antenatal and delivery services is low due to a lack of technically skilled service providers. In all 10 states of Southern Sudan, midwives, traditional birth attendants and other maternal and neonatal care providers lack the necessary training required to perform simple lifesaving or nursing procedures. Lack of equip-

ment and supplies, poor referral systems and inadequate physical infrastructure and transportation also impede health-care delivery. Post-natal care services are virtually non-existent, despite the fact that most of the maternal and newborn deaths in Southern Sudan occur during the post-natal period.

Against this background, the Government of Southern Sudan and its partners are making efforts to strengthen maternal health services. The Interim Health Policy for 2006–2011 outlines an integrated approach that recognizes the need to improve health services while protecting women's rights. The Ministry of Health has committed to establishing more primary, reproductive and maternal health facilities, while supporting the use of mass media and counselling services to disseminate information on nutrition, harmful traditional practices and sexual health. To meet immediate health-care needs, community midwives who hold basic qualifications are being 'fast-tracked', with support from UNFPA. In June 2006, the first fistula repair centre in Southern Sudan was established at the Juba Teaching Hospital.

To accelerate implementation of this strategy, the Government has already established a Reproductive Health Directorate and is recruiting state coordinators to facilitate, monitor and coordinate maternal and neonatal health activities in each state. UNICEF is supporting the expansion of antenatal and emergency obstetric services in several states and the dissemination of key health messages over the radio and through community outreach.

There are challenges ahead. The return of refugees and the movements of many displaced populations, Southern Sudan's high fertility rate (6.7) and increasing rates of HIV infection among some populations necessitate a systematic health programme. The struggle may be a long one, but those committed to winning it are already at work.

See References, page 108.

Eliminating maternal and neonatal tetanus

Tetanus remains a significant cause of maternal and neonatal deaths, taking the lives of more than 180,000 newborns and between 15,000 and 30,000 mothers in 2002. The condition develops when a bacterium, *Clostridium tetani*, infects a cut or wound. Unclean delivery or abortion practices can result in maternal tetanus, while neonatal tetanus is caused by the unhygienic care of the umbilical cord or umbilical stump in babies. In the absence of intensive hospital care, neonatal tetanus is nearly always fatal. As with other causes of maternal and neonatal deaths, most of the fatalities from tetanus take place in sub-Saharan Africa and Asia, especially in poor and marginalized communities where women have limited or no access to quality health care and little knowledge of safe delivery practices.

Tetanus is readily preventable through the vaccination of adult women and through hygienic delivery practices. Increasing implementation of both measures, particularly immunization of pregnant women, has significantly reduced the number of cases and deaths from maternal and neonatal tetanus since 1980, the earliest year for which comprehensive data are available. In 1988, tetanus was responsible for causing around 800,000 neonatal deaths, and more than 90 countries reported one or more cases of neonatal tetanus per 1,000 live births at the district level. By mid-2008, the number of countries reporting one or more cases of maternal and neonatal tetanus at the district level had dropped to 46.

Immunization has been among the most significant counteractions against maternal and neonatal tetanus. Tetanus toxoid has proved efficacious against the disease, with two doses providing protective concentrations of antitoxins in the majority of cases, and almost 100 per cent immunity after the third dose. The global rate of vaccination against neonatal tetanus for pregnant women has risen sharply since 1980, when it stood at just 9 per cent, to 81 per cent in 2007. Nonetheless, this still leaves almost 1 in every 5 newborns without protection. In part, this is due to missed opportunities for vaccinating pregnant women who visit facilities to receive antenatal services, to women arriving too late for immunization, or to the failure to provide post-partum immunization to protect future pregnancies.

Those at risk of tetanus live in communities that have little access to health and immunization services. To reach them, an innovative solution – dubbed the ‘high-risk approach’ – was initiated. This approach aims to immunize all women of childbearing age living in areas deemed to be high risk with at least two doses of tetanus toxoid (TT) vaccine. The risk factors for tetanus, which include unhygienic delivery practices and lack of immunization, are explained to the communities. Improvements in delivery practices are promoted, and surveillance for neonatal tetanus is strengthened. Booster shots are provided to women with no recorded history of receiving tetanus toxoid vaccine when they were children.

The high-risk approach has been widely adopted, enabling 64 million women to receive at least two doses of tetanus toxoid

between 1999 and 2005. The results have been impressive at the country level:

- In *Nepal*, before immunization started in the early 1980s, surveys showed high rates of neonatal tetanus among newborns. After the introduction of immunization of adult women and the implementation of the high-risk approach, the rate had fallen by 2005 to less than 1 death from neonatal tetanus per 1,000 live births in every district.
- A survey conducted in *Egypt* in 1986 indicated that for every 1,000 children born, 7 would die of neonatal tetanus, with rates of 10 per 1,000 live births in rural areas. Following implementation of the high-risk approach, by 2007, the rate was brought down to less than 1 death per 1,000 live births in all districts.
- In the mid-1980s, *Bangladesh* had a high rate of neonatal tetanus, which stood at 20–40 cases for every 1,000 live births in some parts of the country. At that time, only 5 per cent of women of childbearing age were immunized with tetanus toxoid and only 5 per cent of pregnant women were able to have a clean delivery. Adoption of the high-risk approach helped Bangladesh reduce its mortality from neonatal tetanus to less than 1 death per 1,000 live births by 2008.

Some places have used the high-risk approach to deliver other interventions alongside tetanus toxoid vaccine, including measles vaccine (e.g., Kenya, Southern Sudan) and vitamin A (e.g., Democratic Republic of the Congo). Others, such as Ethiopia, Uganda and Zambia, have incorporated the approach in mechanisms for delivering packages of essential interventions. A key benefit of the high-risk approach is that, in addition to reducing neonatal tetanus, it diminishes inequities in access to maternal and neonatal health care within countries and shows that it is possible to deliver health interventions to populations that have often been forgotten or omitted.

See References, page 109.

Hypertensive disorders: Common yet complex

Hypertensive disorders are the most common medical problems in pregnancy and account for a significant proportion – between 12 and 20 per cent – of maternal deaths worldwide. They affect women in every region, causing nearly 10 per cent of maternal deaths in Africa and Asia, over 16 per cent in industrialized countries, and more than one quarter in Latin America and the Caribbean. Hypertension in pregnancy can result in a range of conditions, from elevated blood pressure, the least severe, to cerebral haemorrhage, which is fatal. It can result in fetal death, preterm delivery and low birthweight in newborns.

The causes of hypertension are still not fully understood, but research suggests that obesity, high salt intake and genetic predisposition are factors. Some forms of hypertension in pregnancy may arise from the biology of pregnancy itself. Pre-eclampsia, which develops after the first 20 weeks of pregnancy, is defined as pregnancy-induced hypertension accompanied by excess protein in the urine, and brings the greatest risk to maternal and fetal health, particularly when it accompanies chronic hypertension. It is a leading cause of premature births.

Several risk factors predispose mothers to these disorders, including first pregnancy, multiple pregnancy, history of chronic hypertension, maternal age over 35, gestational diabetes, obesity and fetal malformation. One study showed that intervals of 59 months or longer between pregnancies were also associated with higher rates of pre-eclampsia and eclampsia. Researchers have also proposed that hormonal imbalances, calcium deficiency and insulin resistance are possible causes.

Calcium supplementation has been shown to be an effective intervention in developing countries where pregnant women may be calcium deficient, reducing the incidence of pre-eclampsia by 48 per cent. If this intervention has a similar effect on maternal deaths from hypertensive disorders, calcium supplementation could prevent some 21,500 maternal deaths. The Magpie Trial, the largest trial for hypertensive disorders of pregnancy, conducted in 1998–2002 in

both industrialized and developing countries, and follow-up studies have produced strong evidence that magnesium sulfate given to women in the pre-eclampsia stage can reduce their risk of progression to eclampsia. Subsequent studies have strengthened the evidence base for this critical and cost-effective intervention.

Ideally, care should begin before conception, so that a reproductive woman's medical history can be tracked and her options for managing chronic hypertension known. Hypertensive women also need information about their risks in pregnancy and changes in their lifestyle that illness may require. Bed rest is a common recommendation for hypertensive pregnant women. Regular examinations by skilled health personnel are required to monitor the onset and development of pre-eclampsia and other hypertensive conditions.

Hypertension in pregnancy has long been understood as an obstetric condition, with interventions focusing mostly on outcomes for the pregnancy and less on long- and short-term effects on the mother. New research has shown, however, that hypertension in pregnancy can also affect the post-natal health of a mother, increasing her risks of developing chronic hypertension and cardiovascular disease. With high maternal mortality and morbidity resulting from these disorders, further research is warranted. Treatment or management of these conditions will have great significance for the continuum of care model of maternal and newborn health care.

See References, page 109.

The first 28 days of life

by Zulfiqar A. Bhutta, Professor and Chairman, Department of Paediatrics & Child Health, Aga Khan University, Karachi, Pakistan

It is widely recognized that a large proportion of child deaths occur in the newborn period, the first 28 days of life. Of an estimated 9.2 million deaths of children under five around the world in 2007, around 40 per cent occurred in the newborn period. In many developing countries, deaths of newborns account for over half of all deaths in infancy, with the vast majority occurring in the first few days of life. The major causes of such deaths are serious infections (36 per cent), prematurity (27 per cent), birth asphyxia (23 per cent) and congenital malformations (7 per cent). These figures do not include an estimated 3 million stillbirths annually. Some 30–40 per cent of these stillbirths may be related to events during labor and delivery, which in turn may result from intrauterine problems and asphyxiation.

The relative lack of progress in reducing newborn deaths is due to several factors. Most important is that, unlike health in the post-natal period (29 days to 59 months), newborn health is closely tied to maternal health. Improving it requires interventions that address complex issues such as maternal empowerment, sociocultural taboos and health-system responsiveness.

Specific factors leading to neonatal deaths include:

- A lack of attention to maternal health, with limited access to skilled care providers.
- The poor state of maternal health care, especially during home births, which are associated with at least half of all newborn deaths.
- Inadequate recognition of newborn illnesses and insufficient care-seeking among families and communities.
- A limited repertoire of interventions for early neonatal disorders such as birth asphyxia and problems due to premature birth.
- A lack of consensus on interventions and delivery strategies to prevent and treat serious neonatal infections – other than neonatal tetanus – in community settings.

Recent years have brought significant improvement in our understanding of neonatal illnesses and mortality. Inequities in distribution of maternal and newborn deaths indicate that most deaths occur in poor, rural populations and in often-ignored urban squatter settlements. Many countries also recognize that reaching the Millennium Development Goal for reducing child mortality will not be possible without improving care for mothers and newborns, focusing efforts on reducing deaths during the first 28 days of life.

The evidence supporting strategies and interventions that use community partnerships has also improved. A number of programmes, largely based in South Asia, have attempted to reduce newborn morbidity and mortality in community settings using innovative approaches. In a landmark study undertaken in rural Maharashtra, India, Dr. Abhay Bang and his colleagues trained community health workers, working with traditional birth attendants, to recognize serious neonatal illnesses such as birth asphyxia or suspected bacterial infections and treat them with home-based resuscitation or oral and injectable antibiotics, respectively. The programme showed a significant reduction in neonatal mortality through these home-based newborn care strategies. More recently, researchers from Johns Hopkins University have demonstrated the efficacy of using trained community health workers to

deliver an integrated package of preventive and curative newborn care in Sylhet, rural Bangladesh. While home-based care provision was important in these studies, it is possible that major benefits also accrued from improved family practices and newborn care. In a study in Makwanpur, in rural Nepal, women's support groups, assisted by trained facilitators, effected a significant reduction in neonatal mortality. Further studies have shown that a concerted strategy of community-based education in newborn care can lead to significant change in practices and reductions in neonatal mortality.

All of these recent studies provide evidence that community-based education in improved maternal and newborn care and home-based treatment for newborn infections can significantly enhance newborn survival. To affect public-health systems in the foreseeable future, these strategies need to be replicated at scale using feasible motivation and training of available health-care workers. Such an expansion has taken place in rural Pakistan, where community-based Lady Health Workers work with village health committees and women's groups. A recent evaluation of the Pakistan initiative has shown a significant reduction in perinatal and neonatal mortality and improved care-seeking for skilled maternal care.

This emerging evidence provides support for strategies to improve maternal and newborn health in the very communities and families with the highest burden of mortality and least access to quality health care. The challenge is to integrate effective strategies and interventions across the continuum of maternal and newborn care in both community settings and health facilities. Recent estimates indicate that providing basic preventive and curative interventions for mothers and newborns in primary-health-care settings at pragmatic levels of coverage has the potential to reduce maternal and newborn deaths by 20–40 per cent.

While these measures show promise, particularly when several complementary interventions are packaged together and delivered through a range of health-care providers, important bottlenecks to improved service delivery remain in many developing countries, including poorly functioning health-system facilities and limited numbers of skilled health-care providers. These bottlenecks can and must be addressed through strategies targeted to reach those families, communities and districts most at risk of missing out on basic health care and maternity services. Despite these difficulties, and the still important gaps in our knowledge of how best to tackle difficult newborn problems such as birth asphyxia, the fragility of preterm infants and serious bacterial infections in community settings, one point is clear: We know enough about what works to make a difference. The critical need is to implement what we know and create the policy framework for appropriate maternal and newborn care where it matters: among the rural and urban poor.

See References, page 109.

Decades of conflict and instability have disrupted Afghanistan's basic health infrastructure. Women in particular have suffered from a lack of access to health services. As a consequence, maternal mortality among Afghan women is extremely high, standing at 1,800 deaths per 100,000 live births in 2005, according to the latest inter-agency estimates.

Women in Afghanistan face a lifetime risk of death from causes related to pregnancy or childbirth of 1 in 8, the second highest rate in the world. More women die in Afghanistan from these causes than from any other, with haemorrhage and obstructed labour the most common. The proportion of maternal deaths ranges from 16 per cent of all deaths of women of childbearing age in Kabul (the largest urban center in Afghanistan) to 64 per cent in the Ragh district of Badakhshan.

The high rates of maternal death reflect several factors, including limited access to quality maternal health care, particularly in rural parts of Afghanistan; a lack of knowledge of maternal health and safe delivery; and the scarcity of qualified female health providers, since there is a strong cultural preference for women to be cared for by other women. It is estimated that 9 out of 10 rural women deliver their babies at home, without skilled birth attendants or access to emergency obstetric care. Sociocultural factors that inhibit women's mobility without the permission or escort of male relatives can also limit their access to essential services. Other factors contributing to maternal mortality are the low social status of women and girls, poverty, poor nutrition and lack of security.

Improving the survival rates of mothers in Afghanistan is an issue of immense importance. Midwives can provide crucial care. The World Health Organization recommends one midwife or other skilled birth attendant for every 175 women during pregnancy, childbirth and the post-natal period. Using this estimate with the estimated number of births, Afghanistan should have 4,546 midwives to cover 90 per cent of pregnancies. The country actually had only 467 trained midwives in 2002. Fewer than half of health facilities had any female staff. In rural Nooristan, the ratio of male to female health personnel was as high as 43 to 1.

Although much remains to be done to improve maternal and newborn health in Afghanistan, many successful efforts to date have focused on expanding and strengthening midwifery.

Afghanistan's Government is collaborating with local and international partners, including UNICEF, to develop a comprehensive approach that includes strengthening and expanding midwifery education, creating policies to ensure the pivotal role of midwives in providing essential obstetric and newborn care, supporting the establishment of a professional association for midwives, and developing initiatives to increase access to skilled care during childbirth.

The Community Midwifery Education (CME) programme, an 18-month, skills-based training programme that has less stringent entry requirements than previous midwifery programmes, is considered an appropriate approach to scaling up training and deployment of skilled birth attendants. In 2008, there were 19 CME programmes, each with 20–25 trainees. This represents a marked increase in training capacity over 2002, when there were only six nurse midwifery training programmes run by the Institute of Health Science at regional centres, and one community midwifery programme in Nangahar province. The number of midwives available in the country has increased rapidly, from 467 in 2002 to 2,167 in 2008.

The CME encourages applications from women in districts with shortages, with the understanding that they will work in those districts once they are trained. This policy has resulted in a sharp increase in facilities having skilled female health personnel (doctors, nurses or midwives), from 39 per cent in 2004 to 76 per cent in 2006. It is also having a tangible impact on maternal care; the number of deliveries attended by skilled workers has risen from roughly 6 per cent in 2003 to 19.9 per cent in 2006. The success of the skills-based training approach has resulted in the existing midwifery programmes adopting the CME curriculum and certification process.

See References, page 109.

Kangaroo mother care in Ghana

Kangaroo mother care for low-birthweight babies was introduced in Colombia in 1979 by Drs. Hector Martinez and Edgar Rey as a response to, inter alia, high infection and mortality rates due to overcrowding in hospitals. It has since been adopted across the developing world and has become an essential element in the continuum of neonatal care across the world.

The four components of kangaroo mother care are all essential for ensuring the best care options, especially for low birthweight babies. They include skin-to-skin positioning of a baby on the mother's chest; adequate nutrition through breastfeeding; ambulatory care as a result of earlier discharge from hospital; and support for the mother and her family in caring for the baby.

The most important method of spreading kangaroo mother care has been by means of training programmes. Often, the training remains confined to hospital settings. A new approach was adopted in Ghana under a kangaroo mother care (KMC Ghana) project undertaken in four regions, with the support of UNICEF and the South African Medical Research Council's Unit for Maternal and Infant Health Care Strategies. Instead of merely providing training, a longitudinal, 'open door' approach based on continuous support from health-care facilities was adopted.

Under the programme, kangaroo mother care is singled out for special attention for two to three years. This requires

participants to focus on one aspect of newborn care, implement it well and in the process integrate it into the normal spectrum of newborn care practices.

The implementation model identifies specific roles for districts and regions, depending on the way authority is devolved in a country. In Ghana, the region is the nodal point for implementation, with districts being responsible for the actual implementation actions. Although half of all births still occur at home, one of the cornerstones of the KMC Ghana project is the establishment of centres of excellence at regional hospitals and 24-hour, continuous kangaroo mother care in each district hospital.

Implementation is overseen by a KMC Steering Committee in each region, consisting of one member from each of the districts. These representatives, in turn, establish steering committees at the district level. Although the focus is on introducing KMC in district hospitals, other health care facilities and community organizations are also sought as partners.

While a comprehensive evaluation of the KMC Ghana programme has yet to take place, preliminary evidence suggests that it is effective in improving the survival of low birthweight babies and strengthening the bond between mothers and newborns.

See References, page 109.

HIV/malaria co-infection in pregnancy

Co-infection with HIV and malaria presents specific complications for pregnant women and fetal development. HIV lessens pregnancy-specific malaria immunity normally acquired during the first and second pregnancies. Placental malaria is associated with increased risk of maternal anaemia and HIV infection, especially among younger women and those experiencing their first pregnancy. The role of co-infection in mother-to-child transmission of HIV is unclear, with some studies reporting an increase and others reporting no change. The potential risks of adverse drug interactions have critical implications for effective management of co-infection, and call for increased research.

Although malaria affects Asia, Latin America and the Caribbean, and sub-Saharan Africa, the largest burden of co-infection lies in Africa, the continent with the greatest burden of malaria, and where more than three quarters of all HIV-infected women live. Variations exist across the African continent. Most affected by HIV/malaria co-infection are the Central African Republic, Malawi, Mozambique, Zambia and Zimbabwe, where some 90 per cent of adults are exposed to malaria and average adult HIV-prevalence surpasses 10 per cent. In parts of southernmost Africa, where the HIV epidemic is most severe, there is a lower incidence of malaria, although outbreaks do occur in particular areas, such as Kwazulu-Natal, South Africa.

Data for other regions are not as clear, but the overlap of infections may be present in the general populations of Belize, El Salvador, Guatemala, Guyana and Honduras – and, to a lesser extent, Brazil. Research indicates that certain populations, such as migrant goldmine workers in Brazil and Guyana, may have greater risk of co-infection. The HIV epidemic is generalized in Asian countries such as Myanmar and Thailand, but malaria transmission is unstable and heterogeneous across this region, as in Latin America and the Caribbean. The most common species of malaria in each region also differs – *P. falciparum* in Africa, *P. vivax* in Asia and Latin America and the Caribbean – and the effects of the disease may vary by the degree of immunity a woman has achieved by the time she becomes pregnant. Women in Asia are less exposed to intense malaria transmission and therefore have less opportunity to develop acquired immunity. This is also true of areas of unstable malaria transmission in parts of southern Africa. Most studies of malaria in pregnancy are from Africa, and more are needed from other regions and *non-falciparum* species.

Malaria sufferers with severe anaemia who require blood transfusions, particularly children, also are at higher risk of acquiring HIV. Every year, between 5,300 and 8,500 children in areas of endemic malaria in Africa become infected with HIV from blood transfusions administered for severe malaria.

Regional differences notwithstanding, co-infection affects all pregnant women in similar ways. HIV in pregnancy combined with malaria increases the risk of severe anaemia and reduces any acquired immunity that women living in areas of stable malaria transmission may have developed – effectively

meaning that HIV-positive women in their second, third and fourth pregnancies have the same low immunity to malaria as women in their first pregnancy. Pregnant women infected with HIV become twice as susceptible to clinical malaria, regardless of gravidity. In these women, malaria can restrict fetal growth, cause preterm delivery and low birthweight in newborns and reduce the transfer to children of maternal immunities and cellular responses to infectious diseases such as streptococcus pneumonia, tetanus and measles. Recent evidence suggests that HIV-positive mothers with malaria are more likely to have low-birthweight infants; in turn, low-birthweight infants were shown to have significantly higher risks of mother-to-child transmission of HIV compared with infants of normal birthweight.

The effects of malaria on HIV are less clear, though episodes of acute malaria can increase viral load and hasten disease progression. Malaria infection during pregnancy may increase the risk of mother-to-child transmission of HIV in utero and during birth, and higher viral load can result in greater risk of transmission during breastfeeding. Some research shows that viral loads can return to pre-episode levels following malaria treatment, which suggests that management of malaria may be critical to slowing the spread of HIV and its progression to AIDS.

One of the most pressing questions about co-infection concerns drug therapies. The World Health Organization recommends that all pregnant women in areas of high HIV prevalence (>10 per cent) receive at least three doses of sulfadoxine-pyrimethamine as intermittent preventive treatment (IPT), even in asymptomatic cases, unless they are receiving cotrimoxazole for the treatment of opportunistic infections of HIV.

Many African governments use artemisinin-based combination therapy for malaria case management in pregnancy; with research still limited, WHO continues to recommend this treatment be used for uncomplicated malaria in pregnancy during the first trimester, if it is the only effective treatment available. In cases of severe anaemia, treatment with either artemisinin-based therapy or quinine, should be administered, although the former is preferred in the second or third trimester. There is little published information on the risks of co-administration of antiretrovirals and anti-malarials, including artemisinin derivatives, but artemisinins have not yet been observed to have important toxicities when co-administered with antiretrovirals or when given in early pregnancy.

See References, page 109.

The challenges faced by adolescent girls in Liberia

by the Honourable Vabah Gayflor, Minister of Gender and Development, Liberia

Ensuring that adolescent girls have a supportive environment for their growth and development and are protected from abuse, exploitation, violence and premature entry into adult roles such as marriage and labour is particularly challenging in my country, Liberia.

An adolescent girl living in Liberia:

- *has probably not been to primary school*; the net primary school enrolment for girls stands at only 39 per cent, according to the latest national estimates.
- *is unlikely to go on to secondary school*; just 14 per cent of girls of secondary school age are enrolled in secondary education.
- *is at high risk of being illiterate*, like 24 per cent of adolescent girls and young women aged 15–24 in the country.
- *has a high risk of suffering rape* – the most frequently reported crime, with girls aged 10–14 the most frequent victims of rape.
- *probably has limited knowledge of HIV and AIDS*; only 21 per cent of young women aged 15–24 have comprehensive knowledge of HIV and AIDS.
- *has a high probability of either being married or in union*; 40 per cent of women aged 20–24 in Liberia were married before the age of 18.
- *faces the strong likelihood of being pregnant*; the adolescent birth rate for girls aged 15–19 stands at 221 per 1,000 – the second highest rate in the world.
- *is unlikely to give birth in a hospital or health facility*, as only 37 per cent of births take place in institutional settings.
- *will possibly have to give birth without the assistance of a skilled health worker*, which only attend 51 per cent of births.
- *runs a high risk of death from pregnancy and childbirth*; the maternal mortality rate stands at 1,200 per 100,000 live births.
- *has an even higher risk of death from maternal causes if under 15*; girls aged 10–14 are five times more likely to die

from causes related to pregnancy and childbirth than those of ages 20–24.

- *may be left with a delivery-related injury if she survives her pregnancy*, such as fistula or uterine prolapse.
- *faces a high lifetime risk of death from her first and subsequent pregnancies*; the lifetime risk of maternal deaths stands at 1 in 12.
- *may see her child die within the first year of life*, with almost 1 in every 10 infants dying before their first birthday.
- *will probably not have support from a partner, even if she is married*.
- *has little or no recourse to protection from further abuse, exploitation and disempowerment*.

Creating a supportive environment for adolescent girls in Liberia begins with protecting them from violence and abuse, and ensuring that they obtain a quality education.

It will also necessitate ensuring that families do not allow their girls to marry before age 18 or allow them to be engaged in exploitative labour.

It requires that knowledge of HIV and AIDS be promoted among young people, and that victims of sexual violence have recourse to justice.

It necessitates investment in reproductive, maternity and basic health care for millions of adolescent girls.

Most of all, it demands that communities and society respect the rights of women and girls, and have the courage to address customs and practices that harm and discriminate against them.

Under the leadership of President Ellen Johnson-Sirleaf, the Government of Liberia is striving to provide the protection adolescent girls need and to help them acquire the skills that will enable them to protect themselves. We welcome the support of the international development community in assisting us to act quickly and effectively.

See References, page 109.

Using critical link methodology in health-care systems to prevent maternal deaths

by Rosa Maria Nuñez-Urquiza, National Institute of Public Health, Mexico

Critical link methodology (CLM) examines each maternal death as a sentinel event. It reviews all the health-care interactions between a woman and health personnel prior to her death, providing a timeline of health-seeking actions and corresponding care provision across the health system.

CLM assesses health care through three dimensions:

- clinical performance (delays, omissions and compliance with quality standards compared to established guidelines).
- internal hospital organization.
- continuity of care between health-care facilities.

Through this process of review, CLM focuses on those crucial interventions that, if provided in an expeditious manner, can avert future maternal deaths. It enables safe motherhood committees to shift their focus from a medical cause of death to a managerial perspective of missed opportunities. This change in perspective is highlighted through the following lines of enquiry:

- *During which interactions between the woman and the health system could the condition leading to her death have been better addressed?*
- *Based on this analysis, what specific steps must be done differently in the future to prevent the deaths of women in similar circumstances?*
- *To sustain these specific changes, what processes in each care unit require modification to ensure quality of care, and what factors of the health system should be redesigned to ensure the continuity of care during obstetric emergencies?*

Furthermore, the comparison of near-miss cases (complications that lead to severe morbidity but which ultimately do not prove fatal) with cases of maternal mortality highlights the imperative of timely provision of care. This has resulted in a new category of analysis: therapeutic time interval, which calls for clinical research to establish the time interval during which interventions are effective. The therapeutic time interval helps demonstrate that even when appropriate treatment is provided, it may fail to save women's lives unless applied in a timely manner.

From single-case red alerts to further research

Open and regular communication between CLM field supervisors and federal authorities ensured that alerts detected by individual case studies spurred further analysis of routine data systems (hospital registries of 1,029,000 obstetric patients yearly from 617 public hospitals) to explore the magnitude and distribution of these gaps in maternal care across the health system.

One such example is provided by a CLM study of women with post-partum haemorrhage who died as they were transferred from community hospitals to referral hospitals. The assessment identified the lack of stabilization of women prior to transportation as a fatal omission. In the seven states where the percentage of maternal deaths due to post-partum haemorrhage was above the national average, up to 60 per cent of maternal deaths occurred while transporting patients to larger hospitals. When ambulances and trained personnel were provided in one of those health districts, the maternal mortality rate from post-partum haemorrhage fell by 30 per cent the following year.

CLM is helping to redesign the way facilities are networked in each district health system. In addition, applying CLM necessitates involving a broader group of stakeholders than those traditionally engaged in safe motherhood committees, i.e., heads of clinical laboratories and blood banks, as well as health district administrators.

One outcome of CLM is that the reproductive health divisions at both the Ministry of Health and the Instituto Mexicano de Seguridad Social (IMSS, the Mexican social security system) now report the Causes of maternal deaths not only as medical causes, like "pre-eclampsia, sepsis, etc.," but also by detected failures in the process of care. For example, the report of maternal mortality of a given district or state health system will now state, "15 per cent of maternal deaths due to lack of IV solutions in health centres leading to failure to stabilize the women before transfer" or "10 per cent of maternal deaths due to delays in bringing in the surgeon on call to district hospitals during weekends." Seeing beyond the medical causes helps to diagnose health-system failures which, if immediately addressed, will avert maternal deaths.

See References, page 111.

New directions in maternal health

by Mario Meriardi, World Health Organization, and Jennifer Harris Requejo, Partnership for Maternal, Newborn and Child Health

Twenty-one years ago, the global health community came together under the auspices of the Safe Motherhood Initiative to focus on maternal mortality, whose upper and lower bounds represent the starkest disparity in international public health. Yet by 1990, the baseline year for the Millennium Development Goals, more than half a million women, 99 per cent of them in developing countries, were still dying every year due to complications related to pregnancy and childbirth. Maternal mortality estimates for 2005 indicate that around 536,000 women continue to die each year in pregnancy and childbirth, equivalent to roughly one woman dying every minute from largely preventable causes. These deaths, which are heavily concentrated in the most disadvantaged population groups within low-resource countries, are reflective of a persistent, unjust, social inequality that is long overdue for greater attention. These deaths are disproportionately occurring in sub-Saharan Africa, which accounts for half of annual maternal deaths, and South Asia (35 per cent), leaving the world a long way from its target of reducing the maternal mortality ratio by three quarters between 1990 and 2015 (Millennium Development Goal 5, Target A).

Despite the disappointing lack of progress in reducing maternal mortality since the launch of the Safe Motherhood Initiative, important advances in maternal health have been achieved on several fronts. An unprecedented amount of resources apportioned to health at the international level, combined with renewed political commitment to primary health care and with new complementary initiatives focusing specifically on maternal, newborn and child health, suggests that momentum is building to address the historically neglected issue of maternal mortality. Other developments in this direction include the adoption of the continuum of care as a core framework for public health programs; the establishment of the Partnership for Maternal, Newborn and Child Health in 2005 to guide and promote the continuum; ratification of the Maputo Plan of Action to implement the continental framework for sexual and reproductive health and rights in Africa; the addition of a new MDG 5 target (5.B) that seeks universal access to reproductive health by 2015; and the inclusion of maternal survival in the Countdown to 2015 assessments. These developments are testament to the revitalized focus in the global health community on maternal and newborn survival and well-being.

Improvements in procedures for estimating maternal mortality, new estimates of the incidence of abortion and increased efforts to map the global burden of maternal ill-health are important epidemiological advancements that will enable better decision-making by governments and their partners. The growing recognition of the causal role of undernutrition in maternal mortality has resulted in renewed interest in micronutrient supplementation during pregnancy and a stronger emphasis on the need to address underlying and basic factors, such as poverty and gender discrimination and disempowerment – including limited access to education for many girls and young women and their high exposure to infections. A broad consensus has also emerged about the core health-sector strategies required to reduce maternal mortality. Comprehensive reproductive health care is now considered to include family planning, skilled care for all pregnant women during pregnancy and delivery, and emergency care for all women and infants with life-threatening

complications. Coverage indicators for proven interventions and approaches linked to each of these three pillars – including antenatal care, availability of emergency obstetric care, Caesarean section rates, contraceptive prevalence, skilled attendance at delivery, post-natal care and unmet need for family planning – are now being tracked in the Countdown to 2015 initiative, by national governments, UN agencies, international health partnerships and non-governmental organizations.

Improvements in documenting the global distribution of maternal mortality and morbidity, and identifying and tracking effective interventions, have been complemented by important research findings on ways of countering maternal health risks. Several interventions, shown to improve maternal survival in epidemiological studies and appropriate for universal application, are now ready for wide-scale implementation. These include magnesium sulphate and calcium supplementation for the prevention of hypertensive disorders of pregnancy, effective dissemination strategies for guidelines on the prevention and treatment of post-partum haemorrhage, and the recommended provision of at least four antenatal visits to pregnant women and one post-partum visit to new mothers. Increasing awareness of the inextricable link between maternal and newborn health has also resulted in the introduction of effective programmes for the prevention and treatment of malaria and HIV, through measures to expand provision of insecticide-treated mosquito nets and intermittent preventive treatment of malaria in pregnancy, interventions to prevent mother-to-child transmission of HIV, preventive measures to avoid HIV infection – particularly among young people – and antiretroviral treatment for HIV-positive women and children.

Key areas of promising research include activities focused on developing strategies for ensuring the delivery of comprehensive packages of maternal and newborn health services along the continuum of care. An essential component of these strategies is the establishment of mechanisms for integrating services traditionally delivered through vertical approaches – such as immunization and micronutrient supplementation – with antenatal and post-natal care as part of health-system strengthening. Recent years have also witnessed an encouraging trend towards the establishment of collaborative partnerships between international organizations, governmental agencies, research institutions, non-governmental organizations and the private sector to promote multi-country research projects on major complications in pregnancy and childbirth – including preterm delivery, stillbirths, impaired fetal growth, hypertensive disorders, post-partum haemorrhage and obstructed labour and obstetric fistula.

The growing political and financial support for programmatic and research initiatives aimed at improving maternal and newborn health, and the shift from single issue, sectoral approaches to health care to collaborative forms of delivering primary health care in a continuum of care, raises hopes and expectations that the long-awaited gains in maternal, newborn and child health that are so critical for the well-being and development of populations will become increasingly apparent in the near future.

See References, page 111.

Strengthening the health system in the Lao People's Democratic Republic

The Lao People's Democratic Republic is a mountainous, largely rural, country in South-East Asia with an average gross national income per capita of less than US\$ 600 in 2007. Nearly 40 per cent of the population in this ethnically diverse nation – which comprises nearly 50 different ethnic groups – lives below the poverty line. Although the country is on track to meet Millennium Development Goal 4, having managed to reduce its under-five mortality rate by 57 per cent between 1990 and 2007, significant health challenges remain for mothers and newborns.

Chief among them are undernutrition, improving feeding and hygiene practices, immunization, environmental health and ensuring adequate skilled health personnel to deliver quality health services. More than 1 in 7 newborns suffer from low birthweight, a condition that is often associated with poor maternal nutrition. Exclusive breastfeeding, at 23 per cent according to the latest estimates, is far below the regional average of 43 per cent for East Asia and the Pacific. Only 60 per cent of the population have access to improved drinking-water supplies, and just 48 per cent have access to adequate sanitation facilities. Access to both of these critical services is far lower still in rural areas. In 2007, only 40 per cent of infants under age one were immunized against measles and just 47 per cent of pregnant women were immunized against neonatal tetanus. With maternal mortality standing at 660 deaths per 100,000 live births in 2005, the Lao People's Democratic Republic has the highest rate of maternal deaths in the region. The lifetime risk of maternal death stood at 1 in 33 in 2005.

Notwithstanding these challenges, advances are steadily being made to expand health services to the country's large rural population. One such programme involves Save the Children Australia, which has worked with the Provincial Health Office and other partners in Sayaboury to expand and enhance primary-health-care infrastructure in four three-year phases. Their goals are:

- **Phase I:** Strengthen the provincial management team responsible for training district teams and village health volunteers and traditional birth attendants, develop fixed and mobile maternal and child health clinics and provide essential equipment.
- **Phase II:** Integrate primary health care at all levels – provincial, district and village.
- **Phase III:** Expand programmes into four remote districts.
- **Phase IV:** Strengthen the skills of health workers through adoption of the Integrated Management of Childhood Illness framework.

The programme also prioritizes education for women in improved nutrition practices, including breastfeeding and complementary foods, since studies have shown strong linkages between inappropriate feeding practices and child undernutrition in the Lao People's Democratic Republic. The dissemination of other health information, including clinical care and immunization, is also an important component of the programme.

The Sayaboury programme has shown significant success, at a highly affordable cost of around US\$4 million over a 12-year period, representing a per capita expenditure of just US\$ 1 per year. The district's maternal mortality ratio fell from 218 per 100,000 live births to 110 per 100,000 live births between 1998 and 2003. The median age at which infants received complementary foods increased from 2.8 months in 1999 to 3.7 months in 2001, while the rate of exclusive breastfeeding for the first four months rose from 28 per cent in 1999 to 66.2 per cent in 2004. Vaccination coverage remained inadequate, however, with only 50 per cent of children under age one receiving three or more doses of diphtheria, pertussis and tetanus vaccine – the benchmark indicator for routine immunization coverage – in 2007.

Complementing efforts to improve maternal and newborn health, the Caring Dads communication campaign encourages fathers to support pregnant women and mothers in caring for themselves and their babies. The Ministry of Health, in collaboration with UNICEF and the Lao Trade Union, has collaborated on comprehensive methods to advocate for greater involvement by men in family care. These campaigns are aimed primarily at wage-earning fathers, who have been identified as the group most likely to engage in commercial sex, the source of the growing HIV prevalence within the country. While the Lao People's Democratic Republic has a lower adult HIV prevalence rate than some of its neighbouring countries, poverty and cross-border migration are contributing to the spread of the virus. Posters and booklets on themes such as the Caring Dad in Pregnancy have been reprinted because of unexpectedly high demand.

Such programmes aimed at community initiatives in health, together with expanded immunization and supplementation campaigns supported by UNICEF in 2007 and health infrastructure-building, are steadily beginning to help reduce the still high burden of maternal and newborn deaths in the Lao People's Democratic Republic.

See References, page 111.

Saving mothers and newborn lives – the crucial first days after birth

by Joy Lawn, Senior Research and Policy Advisor, Saving Newborn Lives/Save the Children-US, South Africa

Investing in post-natal care can generate high returns in maternal and newborn survival

Across the human lifespan, an individual faces the greatest risk of mortality during birth and the first 28 days of life – the neonatal period. Each year, nearly 4 million newborns die during this period – equivalent to around 10,000 per day. Three quarters of these deaths take place within one week of birth, and 1–2 million die during the first day following birth. Most of these deaths occur at home, are unrecorded, and remain invisible to all but their families. Millions more suffer severe illness each year, and an unknown number are affected with lifelong disabilities. Moreover, the risks of maternal mortality and morbidity also are highest at birth and in the immediate post-natal period.

For babies and mothers facing such complications as neonatal sepsis or post-partum haemorrhage, delay of even a few hours before appropriate care is delivered can be fatal or result in long-term injuries or disability. Important new data from Bangladesh show that a home visit on the first or second day after birth can reduce neonatal deaths by two thirds, but later visits are less effective at reducing mortality. The early post-natal period – the first seven days of life – is also the critical period for initiating high impact life-saving behaviours, including exclusive breastfeeding. Optimal breastfeeding does not start at the six-week visit for infant immunization – evidence shows that effective support and counselling in the first days of a child's life directly increase rates of exclusive breastfeeding. Other key behaviours during the neonatal period, such as hygienic cord care and keeping the baby warm, can make the difference between life and death – particularly for babies who are born prematurely. The post-natal period is also a critical time for preventing mother-to-child transmission of HIV and for providing women with access to family planning options.

Coverage gap for early postnatal care

Providing effective care for mothers and newborns during the early post-natal period has the potential to generate the greatest gains in survival and health of any period in the continuum of care. Despite this promise, however, the first days following birth are the time when coverage of appropriate services and behaviours is currently lowest. Among the 68 priority countries identified by the Countdown to 2015 initiative, a median of just 21 per cent of women received post-natal care.

Changing paradigms in post-natal care

Growing recognition of the critical importance of providing care to mothers and newborns, and the substantial gaps in coverage that currently exist, along with evidence generated mostly from trials in South Asia, have prompted paradigm shifts. Three tenets have emerged:

- **Who for?** Integration of post-natal care for mothers and newborns provides more effective and efficient care than separate approaches to post-partum and newborn care.
- **Where?** Routine post-natal visits should be provided at home or close to home, both to promote healthy behaviours and to link with curative care – instead of just hoping that the mother or baby will be brought to a health facility if problems arise.
- **When?** Early contact with mothers and babies is critical, ideally within 24 or at most 48 hours of birth for the first visit – instead of the more common visit six weeks after birth. The indicator measuring post-natal care published by the Countdown to 2015 in its 2008 report focuses on care within two days of birth. Large-scale surveys are changing to measure this indicator in more countries and communities.

Closing the gap between policy and action

Changing policies and indicators to reflect the importance of post-natal care is necessary, but not sufficient, to save lives. Services must also be scaled up to ensure high coverage and quality care during this period. While the content of a post-natal care package is fairly clear, the most effective delivery mechanism will vary, especially to provide services in remote rural areas and to reach newborns and mothers immediately after birth. Figure 4.5 maps delivery options with conditions of access to health facilities and human-resource availability in facilities and at community level. Many of the tasks involved in post-natal care can be delegated to an extension worker who is adequately supervised and effectively linked with the health system.

Case management of neonatal infections is an urgent priority

While early post-natal care visits for preventive care are immensely important, these are most effective at reducing mortality rates when integrated with curative care. Almost one third of newborn deaths result from infections; in poor, high-mortality settings, this proportion is far higher. Many of these babies are born preterm.

With an effective post-natal care package, infections in newborns will be identified early. In most countries, however, newborn illness can only be treated through referral to a health facility; even then, only a low percentage of those referred will actually seek the care. One option is to have first level, routine IMCI health-care workers begin antibiotic treatment. In countries where community health workers already provide case management for pneumonia or malaria, case management of neonatal infections may also be considered to bring care closer to home. Several Asian studies have shown how such strategies can result in large reductions in neonatal mortality, and community case management of neonatal sepsis is now being scaled up in Nepal, linked to case

management of childhood pneumonia. Of the 68 Countdown priority countries, 39 have changed policy to include case management of neonatal sepsis within the Integrated Management of Childhood Illness framework. The key challenge now is to identify the appropriate providers of such care in each country.

Closing the knowledge gap

Almost all (98 per cent) of newborn deaths occur in low- and middle-income countries. Yet most research and funding have focused on incremental advances in highly technical care for the 2 per cent of newborn deaths occurring in high-income countries. An increasing number of studies are providing new guidance on the 'how, who, when and where?' questions for

provision of life-saving interventions where the majority of newborn deaths occur and particularly where access to health facilities is low. A network of studies is under way in eight African countries examining nationally adapted packages and potentially scalable cadres of workers. Analysis of lives saved and costs will help guide policies and programmes to improve maternal and newborn care in the earliest days of life.

See References, page 111.

Figure 4.6

Post-natal care strategies: Feasibility and implementation challenges

	Possible strategies for post-natal care contact	Mother-friendly	Provider-friendly	Implementation challenges
1	Mother and baby go to facility	*	***	Requires mother to go to the facility within a very short time after birth. More likely following a facility birth, but still challenging in first days after birth.
2	Skilled provider visits the home to provide post-natal care for mother and baby	***	*	Conditional on sufficient human resources, which is challenging. Providing post-natal care may not be highest priority for skilled health personnel in settings where their attendance at birth is still low. Many post-natal care tasks can be delegated to another cadre. A skilled provider may be able to provide home visits during the post-natal period if rural health facilities are quiet during afternoons.
3	Community health worker visits home to see mother and baby	***	*	Requires sufficient numbers of community health workers with adequate training, supervision and incentives.
4	Combination: Facility birth and first post-natal care visit in facility, then home visit within two to three days, with subsequent post-natal care visits at a health facility	**	**	Requires team approach between facility-based and community health workers, sufficient human resources, management and supervision, effective referral systems and an efficient information tracking system so that the progress of the mother and baby is easy to track.

Note: * Low degree. ** Moderate degree. *** High degree

Source: Lawn Joy, and Kate Kerber, editors, *Opportunities for Africa's Newborns: Practical data, policy and programmatic support for newborn care in Africa*, Partnership for Maternal, Newborn and Child Health, Cape Town, 2006.

Burundi: Government commitment to maternal and child health care

Burundi is one of the world's least developed countries. Protracted civil war and halting political restructuring have stymied economic and social progress. Poverty rates are soaring, with nearly 88 per cent of Burundians living on just US\$ 2 a day. Undernutrition affects 66 per cent of the population, and more than half of children under age five suffer from moderate or severe stunting. In 2005, women faced a lifetime maternal death risk of 1 in 16. The adjusted maternal mortality ratio stood at 1,100 deaths per 100,000 live births in 2005, and the neonatal mortality rate was 41 per 1,000 live births in 2004.

Burundi has learned through experience the importance of providing affordable, quality health care for the poor in general, and for mothers and children in particular. In February 2002, the Government implemented a cost-recovery programme that required patients to pay for medical consultations, tests and drugs. The initiative aimed to generate resources for a nascent health-care system and was implemented in 12 of 17 rural provinces, covering 5 million of the country's 8.5 million inhabitants. The programme's introduction increased the numbers of patients who were unable to pay for the medical services they received in public hospitals, and many of them were subject to detention in the facility. Women who had delivered by Caesarean section comprised an estimated 35 per cent of indigent hospital patients included in a 2006 Human Rights Watch report on patient detentions; 10 per cent of the indigent patients in the study were children. In addition to the burdensome expenses, health-care services for women and children were often of poor quality.

The current Government, led by President Nkurunziza, has begun to take steps towards tackling this health-care crisis. In 2005, when Burundi joined the International Monetary Fund-World Bank 'Heavily Indebted Poor Countries Initiative' with interim debt relief in 2005, the health budget was tripled. In 2006, the Government took the critical step of announcing free health care for pregnant women and children. A new policy, 'Road Map for the Reduction of Neonatal and Maternal Mortality', was drawn up and launched in that same year with the assistance of the United Nations Population Fund, World Health Organization, World Food Programme

and UNICEF. Another important step was taken in 2007, when Burundi was one of eight countries to join the International Health Partnership, a country-led and outcome-driven collaboration between governments, international organizations and non-governmental organizations. A major objective of this partnership is to identify a set of key goals, which include raising the number of institutional deliveries and increasing services to prevent mother-to-child transmission of HIV.

Burundi's National Reproductive Health Policy now includes newborn care as a critical strategy in reducing child mortality. A central feature of this policy will include scaling up services to prevent mother-to-child transmission of HIV. The median HIV-infection prevalence rate for young pregnant women aged 15–24 in Bujumbura stood at 16 per cent in 2005. One area for future programming may be securing greater male support for prevention of mother-to-child transmission strategies.

The country has also embarked on providing badly needed basic health care that will positively affect women and children. Immunization programmes have provided tetanus toxoid vaccine to nearly three quarters of women in high-risk districts. Such efforts have galvanized stakeholders at the national and local levels. But sustained governmental prioritization of health care for the poor will be necessary for the continued support of international and grass-roots actors in building Burundi's health infrastructure.

See References, page 112.

Integrating maternal and newborn health care in India

India's progress is critical to improving maternal and newborn health on a regional and global scale. According to the latest international estimates, India's maternal mortality ratio stood at 450 per 100,000 live births in 2005, while the neonatal mortality rate was 39 per 1,000 live births in 2004. Both figures represent reductions of rates in previous years. Yet even as its economy grows rapidly – with real gross domestic product expanding at an average annual rate in excess of 9 per cent in 2007–2008 – widening disparities are prevalent in health outcomes between income groups and between social and caste groups. Growing inequities, combined with shortages in the provision of primary health care and the rising cost of care, are complicating the country's efforts to meet the health-related Millennium Development Goals.

With a total population of roughly 1.1 billion, broad environmental and sociocultural diversity and an intricate political system comprising 28 states and 7 union territories, India's efforts to manage its citizens' health care have been largely decentralized. The Government of India has emphasized expanding primary health care, which is, by constitution, under the purview of the states. Beginning in 2000, it began a greater push to provide care to women and children in rural areas and in poor-performing states such as Bihar, Orissa and Rajasthan. It has also encouraged private health care, which few can yet afford, while spending on public health care has fallen to just 2 per cent of gross domestic product.

To address the widening disparities, the Government of India has issued a commitment to 'inclusive growth'. One such initiative is Janani Suraksha Yojana, a government-sponsored project under the National Rural Health Mission that provides cash incentives for antenatal care during pregnancy, assisted institutional delivery, and post-partum care by field-level workers. The benefits extend to all pregnant women aged 19 and older living below the poverty line in 10 states, for up to two pregnancies. Women who are not enrolled in the programme but who experience complications such as obstructed labour, eclampsia and sepsis are also eligible for benefits. The programme also includes a mechanism for accrediting and compensating participating private practitioners.

According to one follow-up study undertaken in select districts in Rajasthan in 2007–2008, Janani Suraksha Yojana has increased access to antenatal and post-natal care. The review also revealed that 76 out of 200 participants in the study, or nearly 40 per cent, were girls under 18, the legal age of marriage in India. The programme is successfully expanding access to care while allowing the Government to monitor more closely the situation of girls and women.

Some states have also taken the initiative to inaugurate health partnerships with the private sector. In Gujarat state, one of India's most developed provinces, the shortage of skilled health-care providers has prompted the state government to join with private hospitals to provide free obstetric care for pregnant women living below the poverty line, especially those of scheduled castes and scheduled tribes. Chiranjeevi Yojana – meaning 'a programme for long life' – was launched in 2005 and operates through a memorandum of understanding between the Government of Gujarat and private obstetricians. For every delivery, the Government pays Rs 1,795 (US\$ 40), which also includes Rs 200 towards transportation costs for each patient and Rs 50 for the person accompanying the beneficiary, to compensate for the loss of earnings.

In 2006, a United Nations Population Fund study of Chiranjeevi Yojana reported that the programme had successfully raised the number of births delivered in health facilities, and that private practitioners were mostly enthusiastic about their participation in the initiative. It also noted the reluctance of patients to utilize facilities for births, and that their spouses and in-laws had great influence on decision-making, which limited their ability to actively seek healthcare. The study made several recommendations, including the establishment of an independent body to ensure quality control and equitable implementation.

The Gujarat Government's initiative is a departure from previous practice in that it took sole responsibility for the reimbursement of private health-care providers, rather than relying on intermediary parties such as insurers. The state government is working with professional agencies such as associations of obstetricians and academic organizations to plan and implement the new arrangements.

Showing remarkable successes, the programme has been expanded from five to all 25 districts of Gujarat. Between January 2006 and March 2008, 180 doctors were enlisted. Nearly 100,000 deliveries were performed, with each doctor performing an average of 540. While a promising experience, ongoing monitoring and evaluation are required to ensure improvements are made and the desired impact is achieved.

See References, page 112.

Working together for maternal and newborn health

by Sarah Brown, Patron of the White Ribbon Alliance for Safe Motherhood and wife of Gordon Brown, Prime Minister of the Government of the United Kingdom.

Much of my work over the past few years has focused on preventive programmes to improve the health of infants born prematurely or following difficult pregnancies. Increasingly, by working together, the medical community in the developed world is improving interventions to ensure that a newborn arriving in difficult circumstances receives the necessary care in the first crucial stages of life to survive and enjoy quality of life.

However, the state of infant survival in the developing world sits in stark contrast to the situation in industrialized countries like the United Kingdom. As a representative of the international advisory board of the Royal College of Obstetricians and Gynaecologists, I have observed the training programmes that the RCOG conducts in numerous countries in Africa and Asia at first hand. What this practical experience has brought home to me is the realization that you cannot start saving the most vulnerable infants and children without first ensuring the health of their mothers.

The reason is simple: It is the mothers who do the work of raising their children, feeding them, getting them into school and taking them for their vaccinations. By contrast, children who have lost their mothers are almost five times more likely to die in infancy than those who still have their mothers, and motherless newborns are ten times more likely to die.

The scale of this problem becomes evident when you look at annual numbers of maternal deaths, which are little changed in almost 20 years. Across the world this year, more than half a million mothers will lose their lives in pregnancy and childbirth, and almost all of these deaths will occur in poorer countries. In addition, for every mother who dies, 20 women are left suffering from injuries and disabilities as a result of complications in childbirth.

It is vital that we – governments, non-governmental organizations, faith-based organizations, private-sector companies and committed individuals – all work together to ensure that in every country and community around the globe, women have access to essential primary health care and skilled health workers. This is what will save the lives of mothers – and so bring better life chances to newborns and children otherwise at grave risk.

If we get this right, we will save lives at every stage of the life cycle. Millennium Development Goal 5, which seeks to improve maternal health, lies at the heart of all of the MDGs. Access to skilled health workers supports the continuum of care women and their children need. Mothers give birth safely when they can access antenatal support and skilled care during childbirth and the critical time afterwards. A well staffed, well stocked health centre will also ensure that infants receive essential vaccinations and that the necessary medications are available to keep them from dying from malaria or pneumonia.

We must do more than focus on vertical solutions. All active organizations working to eradicate poverty and disease and to improve health care and education must find the opportunity to integrate delivery. We need to maximize the effectiveness of

precious resources and respond to genuine local need. We have seen the difference that effective health services can make. The evidence is clear.

Japan reduced its maternal mortality rate by two thirds in the decade following 1945. It achieved this by introducing community health workers that provided consistent health care from pregnancy right through to when a child starts school. Mothers were educated on their rights and the importance of quality health care through a mother-and-child handbook of which the Japanese are rightly proud. Also important to this achievement was the vital injection of political will and momentum that continue even today. International leadership is critical to focusing attention and channelling resources for maternal health.

Right now, as we count down to the MDG deadline in 2015, we have worldwide momentum. Right now we can achieve worldwide change. Never before has this issue had so much visibility and support from so many different sources around the world. At the G8 Summit in Japan this year, for the first time, maternal health was on the agenda.

However, we must understand that governments cannot dramatically reduce maternal mortality on their own. Non-governmental organizations are increasingly making maternal health a priority and working together. They are joining grass-roots organizations, such as the White Ribbon Alliance for Safe Motherhood, whose members have been campaigning in more than 90 countries for progress. An impressive start has been made by the world's midwives, obstetricians and gynaecologists. Their professional organizations, led by the International Federation of Gynaecology and Obstetrics and the International Confederation of Midwives, are committed to working together to help developing countries train health workers in antenatal care, delivery and infant care skills.

We can all play our part in reducing maternal mortality. Individuals can campaign for change, communities can raise awareness among their men and women, and non-governmental organizations, private-sector organizations and governments can work together to find practical solutions.

Let each of us bring our skills to the table and work together to raise the bar in maternal and child health around the world.

We must work together to ensure that there is access to well-trained health workers in every country and community that needs them, and that each government is ready to put them to work.

We owe it to the millions of mothers who have lost their lives unnecessarily over the last 20 years. We owe it to the thousands of pregnant women around the world giving birth every day in fear of their lives.

We owe it to the next generation of children born in the poorest countries of the world – children who need, and deserve, their mothers.

Key global health partnerships for maternal and newborn health

In recent years, global health partnerships have emerged to lend attention to, and raise resources for, maternal and newborn health. Some of the key partnerships are highlighted below.

- **The Partnership for Maternal, Newborn and Child Health** is a global health partnership launched in September 2005 that brings together maternal, newborn and child health organizations into an alliance of some 240 member groups. The Partnership, hosted and administered from Geneva by the World Health Organization, advocates for greater investment and commitment to saving the lives of mothers and children. In July 2008, it issued a Global Call asking G8 leaders to fund basic health services for women, newborns and children and urging organizations and individuals to sign on to its demands for political leadership and investment.

- **Deliver Now for Women + Children Campaign** is a new advocacy drive to eliminate maternal and child deaths and improve the health of women and children around the world, co-ordinated by the Partnership for Maternal, Newborn & Child Health. It is a response to concern that the world is lagging far behind in reaching the Millennium Development Goals (MDGs) for reducing maternal and child deaths.

- **The Global Campaign for the Health Millennium Development Goals** was unveiled on 26 September 2007 by Norwegian Prime Minister Jens Stoltenberg at the Clinton Global Initiative in New York. The Global Campaign is supported by several governments, including the UK, Norway, Canada, France and Germany, as well as a number of prominent global health and advocacy organizations. It attaches special importance to the health of women and children, “whose needs remain the most neglected.” The Global Campaign brings together a number of related initiatives including:

- **The International Health Partnership**, launched in London by UK Prime Minister Gordon Brown in September 2007, aims to help build national health systems in some of the poorest countries in the world.
- **The Catalytic Initiative to Save a Million Lives**, launched by Canadian Prime Minister Stephen Harper in November 2007, aims to strengthen health systems by training frontline health workers and delivering affordable healthcare services directly to local communities.
- **Innovative Results-Based Financing**, launched by Norway and the World Bank in November 2007, seeks the most cost-effective ways of obtaining better health outcomes.
- **Providing for Health Initiative**, launched by Germany and France in 2008, aims to strengthen health systems by putting appropriate social health protection mechanisms in place with a view to achieving universal coverage.

- **Women Deliver** was launched in London in October 2007 to mark the 20th anniversary of global efforts to reduce high rates of maternal and newborn death and disability in the developing world – and to apply the knowledge gained from two decades of study and experience. The initiative aims to reframe maternal health as a basic human right and an integral strategy for achieving just development, reducing poverty and ensuring environmental sustainability. The organizing partner is Family Care International.

- **Saving Newborn Lives** is a Save the Children project to improve newborn survival in high-mortality countries. Since its launch in 2000, the initiative has reached more than 20 million mothers and babies with critical health services in 18 countries in Asia, Africa and Latin America.

- **The White Ribbon Alliance for Safe Motherhood** is an international coalition of individuals and organizations formed to promote safe pregnancy and childbirth for all women. Members of the Alliance take action in their own countries to make this issue a priority for their governments and other international organizations.

- **The Initiative for Maternal Mortality Programme Assessment (IMMPACT)** is a global research initiative whose aim is to promote better health for mothers-to-be in developing countries. By carrying out studies of different strategies, and judging their effectiveness and the value for money they represent, IMMPACT aims to improve measurement and the supporting evidence that will help in the assessment of each strategy’s potential.

- **Countdown to 2015** was formed in 2005 by a group of scientists, policymakers, activists and institutions to track progress towards Millennium Development Goal 4. Coverage reports were made available at a conference for 60 priority countries for child survival initiatives. The second conference, held in April 2008, expanded the mandate of the Countdown to include maternal and neonatal survival, and the number of countries tracked in reports increased to 68.

- **Averting Maternal Death and Disability** is a global programme run by the Mailman School of Public Health, Columbia University, New York, that contributes to reducing maternal mortality and morbidity through research, advocacy, policy analysis and programme support. In recent years, the programme has operated in around 50 countries across the developing world.

See References, page 112.

Partnering for mothers and newborns in the Central African Republic

The Central African Republic is among the world's lowest income countries, with a gross national income per capita of US\$360 in 2007. Located in the heart of the African continent, the country has endured a decade of conflict. The worst-affected regions are located in the northeast and northwest, where rebel groups and government forces frequently clash. This ongoing violence has resulted in mass displacement and disruption of public infrastructure such as health care services, especially in the northern region.

Maternal and neonatal survival and health remain at risk from poverty and conflict. The lifetime risk of maternal death is 1 in 25, and UN inter-agency estimates put the country's maternal mortality ratio at 980 maternal deaths per 100,000 live births in 2005. The neonatal mortality rate was 52 per 1,000 live births in 2004, above the West and Central Africa average of 44 per 1,000 – which itself was the highest regional aggregate for this indicator in the developing world. Only 53 per cent of women in the country are attended by a skilled health worker at delivery.

Maternal and infant health is undermined by poor control of communicable diseases, insecurity and the lack of comprehensive maternal health programmes. Among other infectious diseases, tetanus is an important cause of neonatal death. Cases are prevalent in poor, remote and disenfranchised communities where unhygienic obstetric

and post-natal practices prevail and access to maternal tetanus toxoid immunization during pregnancy is poor.

Despite the challenges posed by ongoing insecurity, international agencies are collaborating with the Government to tackle maternal and neonatal tetanus as part of a wider effort in support of maternal, newborn and child health. In January 2008, the Ministry of Health, together with the World Health Organization, the United Nations Population Fund and UNICEF, launched the Mother and Child Survival Campaign. The first phase of the campaign prioritized immunization, resulting in the vaccination of 700,000 women of reproductive age against tetanus. A second round of immunization was held in March, and the campaign is set to reach 1.5 million women and children across the country. The tetanus immunization campaign represents an important initial step in the drive to reduce maternal and neonatal deaths.

The Central African Republic and its partners face the challenge of consolidating these gains and strengthening the health system to deliver maternity services and basic health-care interventions that can help improve maternal and newborn health. Enhancing security will also be pivotal to widening access to women and children.

See References, pages 112.

UN agencies strengthen their collaboration in support of maternal and newborn health

At the High Level Event on the Millennium Development Goals held in September 2008 at the UN General Assembly, the four major health agencies – the World Health Organization, UNICEF, United Nations Population Fund and the World Bank – made a joint declaration of their intent to intensify and harmonize their efforts towards Millennium Development Goal 5, the goal that has made the least progress. The main objective of this renewed commitment to collaborative action is to coordinate efforts at the country level and jointly raise the required resources.

The four agencies pledged to strengthen support to countries with the highest levels of maternal mortality – especially the 25 countries with the most elevated maternal mortality ratios or numbers of maternal deaths. Based on their comparative advantage, core specialties and experience, and collective strengths, the agencies plan to jointly contribute to capacity building, health systems development and costing and financing of maternal, newborn and child health plans.

Strengthening national capacity

The agencies will work with governments and civil society to enhance national capacity in the following ways:

- Conduct needs assessment and ensure that health plans are MDG-driven and performance-based;
- Cost national plans and rapidly mobilize required resources;
- Scale up quality health services to ensure universal access to reproductive health, especially for family planning, skilled attendance at delivery and emergency obstetric and newborn care, ensuring linkages with HIV prevention and treatment;
- Address the urgent need for skilled health workers, particularly midwives;
- Address financial barriers to access, especially for the poorest;
- Tackle the root causes of maternal mortality and morbidity, including gender inequality, girls' low access to education – particularly at the secondary level, child marriage and adolescent pregnancy;
- Strengthen monitoring and evaluation systems.

Core agency functions and responsibilities in the continuum of maternal and newborn care

In an earlier document on joint country support for accelerated implementation of maternal and newborn continuum of care published in July 2008, the four agencies also pledged to work with governments to strengthen the continuum of maternal and newborn care. Based on their comparative advantages and expertise, the core functions to be undertaken by each agency were also specified:

World Health Organization: policy, normative, research, monitoring & evaluation.

United Nations Population Fund: reproductive health commodity security, support to implementation, human resources for sexual and reproductive health including maternal and newborn health, and technical assistance on building monitoring and evaluation capacity.

UNICEF: financing, support to implementation, logistics & supplies, and monitoring & evaluation.

World Bank: health financing, inclusion of maternal, newborn and child health in national development frameworks, strategic planning, investment in inputs for health systems, including fiduciary systems and governance, and taking successful programs to scale.

In addition, focal agencies, or shared focal agencies, were identified for each component of the maternal and newborn continuum of care to ensure optimal support, accountability and enhanced coordination. The identification of agency responsibilities, outlined in *Figure 5.5*, does not preclude the involvement of other agencies in each area, but rather implies that the focal agency or agencies will coordinate the UN response to support the national health plan in that area. Furthermore, the work of each agency will continue to be guided by the prevailing situation in each country, the existing strengths and experience of each agency within the country, and other contextual factors such as sector-wide approaches (SWAps) and other national health plans or compacts. In each case, the government will continue to lead and coordinate the process.

See References, page 112.

Figure 5.5

Focal and partner agencies for each component of the continuum of maternal and newborn care and related functions

Area	Focal agencies	Partners
Continuum of maternal and newborn care		
Family planning	UNFPA, WHO	UNICEF, World Bank
Antenatal care	UNICEF, WHO	UNFPA, World Bank
Skilled attendance at birth	WHO, UNFPA	UNICEF, World Bank
Basic emergency obstetric and newborn care	UNFPA, UNICEF	WHO, World Bank
Comprehensive emergency obstetric and newborn care (C EmONC)	WHO, UNFPA	UNICEF, World Bank
Post-partum care	WHO, UNFPA	UNICEF, World Bank
Newborn care	WHO, UNICEF	UNFPA, World Bank
Maternal and neonatal nutrition	UNICEF, WHO, WB (for maternal nutrition)	UNFPA
Additional areas of maternal and newborn health work		
Girls' education	UNICEF	UNFPA, World Bank
Gender/culture/male involvement	UNFPA, UNICEF	WHO, World Bank
Gender-based violence	UNFPA, UNICEF	WHO
Adolescent sexual reproductive health – young people	UNFPA, UNICEF, WHO	World Bank
Communication for development	UNFPA, UNICEF	WHO, World Bank
Obstetric fistula	UNFPA	WHO
Prevention of unsafe abortion/post abortion care	WHO	UNFPA
Female genital mutilation	UNFPA, UNICEF, WHO	World Bank
Maternal and newborn health in humanitarian situations	UNFPA, UNICEF, WHO	World Bank
Sexually transmitted infections	WHO	UNFPA, UNICEF
HIV/AIDS and integration with family planning	As per UNAIDS <i>Technical Support Division of Labor</i>	
Pre-and-in-service training of human resources for MNH	WHO, UNFPA	UNICEF, World Bank
Regulations/legislation for human resources for health	WHO	UNFPA, UNICEF, World Bank
Essential drug list	WHO	UNFPA, UNICEF
Road maps' development and implementation	WHO, UNFPA, WB	UNICEF

Source: WHO-UNFPA-UNICEF-World Bank Joint Country Support for Accelerated Implementation of Maternal and Newborn Continuum of Care, 22 July 2008.

Enhancing health information systems: The Health Metrics Network

Sound information is essential to public health decisions. It informs policy, programmes, budgets and evaluation and forms the basis of accountability for governments' commitments to their citizens. In many developing countries, however, underinvestment in health information systems has left gaps in data collection, dissemination and analysis. With health challenges on the rise, and the deadline for the health-related Millennium Development Goals drawing ever closer, fulfilling the demand for sound information is imperative.

The Health Metrics Network (HMN) is an international partnership between developing countries, international agencies, foundations, global health partnerships and technical experts that aims to strengthen health information systems. Such systems incorporate all the multiple subsystems and data sources that, taken together, contribute to generating health information: vital registration, censuses and surveys, disease surveillance and response, service statistics and health management information, financial data and resource tracking. In line with current trends in health-system development, HMN seeks to broaden the base of health information and statistical systems beyond specific diseases and to foster leadership in the production and use of health information at the national level. These objectives require enhanced coordination and cooperation between countries and international partners, and a harmonized plan to develop health information systems. A further aim of HMN is to focus donor participation on a unified, country-owned plan to develop health information systems, thereby reducing duplication, fragmentation and overlap.

Central to the harmonized plan is the development of the Framework and Standards for Country Health Information Systems – known as the HMN Framework – which the

partnership intends to set as the universal paradigm for data collection, reporting and usage by 2011. At the core of the framework is the HMN tool, a standardized questionnaire with which country stakeholders assess the current status of the health information against specific criteria. The tool provides a gauge of baseline status, critical gaps in health information results, processes, context and resources, and an assessment of performance and achievements. Countries receiving technical and financial assistance from the partnership are required to undergo an assessment using the HMN tool.

The purpose of the HMN Framework is twofold: to target investment on the standardization of health information, and to enhance access and, by extension, usage of better health information at the national and international levels. Rather than seeking to replace existing guidelines on health systems information, the HMN framework seeks to build on appropriate standards and promote best practices. The process is envisaged as a dynamic one, which will evolve through the incorporation of better evidence and wider experience.

In addition to developing the dynamic framework, the HMN has two related objectives: to deepen health information systems through providing technical and catalytic financial support to implement the HMN Framework; and to broaden access, dissemination and usage of health information by stakeholders at all levels. The partnership is based on a single and sound premise: It is not because countries are poor that they cannot afford good health information; it is because they are poor that they cannot afford to be without it.

See References, page 112.