

ACTIONS



Photo: Pep Bonet/Noor/Save the Children

Chapter 6.

Actions: everyone has a role to play

— Preterm Birth Action Group, including Preterm Birth Technical Review Panel and all the report authors

More than 1 in 10 of the world's babies are born too soon, and every page of this report shows the need for concerted action on the prevention of preterm birth and care of the premature baby, and the imperative to ensure mother and baby survive together. This final chapter summarizes the evidence-based interventions for preterm birth in the context of the wider health system, the implications for integrating and scaling up those available interventions and the potential lives saved as a result. Advancing the research agenda is a critical need to reduce the global burden of preterm birth, requiring innovations for both prevention and care. The previous chapters have identified gaps in coverage, quality, equity and metrics, highlighting actions that involve many constituencies. All partners are invited to join this global effort for preterm birth, which is linked closely to the health and care of women and girls, as well as to child survival and global development. Much is being accomplished by individual partners, and each has a unique role to play. By pooling our efforts collaboratively

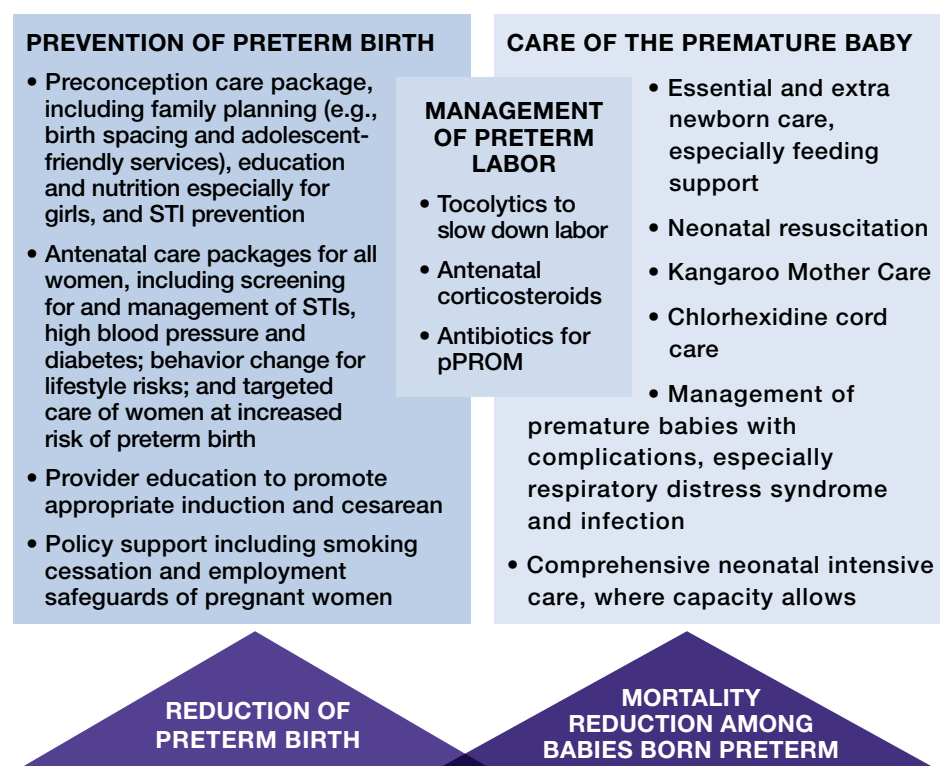
and transparently, with each organization playing to its strengths, our shared goal, as epitomized in *Every Woman Every Child*, can be realized — a day when pregnancies are wanted and safe, women survive, babies everywhere get a healthy start in life, and children thrive.

Action framework: Scale up what works while filling knowledge gaps

Addressing the burden of preterm birth has a dual track — prevention and care (Figure 6.1). Reducing risks during the preconception period and before birth in the pregnancy period advances preterm birth prevention, while actions taken during labor, delivery and after birth are necessary to reduce prematurity-associated mortality and disability. Interventions that can prevent preterm birth and reduce death and disability in premature babies have been identified through global reviews of the evidence and are summarized in Chapters 3, 4 and 5 and shown in Figure 6.1. Many of these interventions also

benefit maternal health and prevent stillbirths (Bhutta et al., 2011). More research is urgently needed for preterm birth prevention, which is a longer-term investment but would have widespread impact on mortality, childhood disability and health-care expenditure. For care of premature babies, the emphasis is on scaling up implementations more rapidly as soon as possible, so that the maximum number of premature babies and their mothers benefit. In this way, hundreds of thousands of lives could be saved with the application of current knowledge.

Figure 6.1: Approaches to prevent preterm birth and reduce deaths among premature babies



Prevention of preterm birth is primarily a knowledge gap

Despite the burden of preterm birth, few effective prevention strategies are available for clinicians, policymakers and program managers. Multiple studies in high-income contexts have attempted to prevent preterm birth, yet have failed to identify high-impact interventions in the preconception and antenatal periods. Many interventions have been evaluated, and some have been identified as beneficial though limited in public health impact, such as progesterone therapy, which has only been studied in certain high-risk populations. Reducing the rate of elective cesarean births or inductions without medical indication before the recommended 39 completed weeks of gestation may have an important impact on prevention overall, but has yet to be broadly implemented (National Collaborating Centre for Women's and Children's Health, 2011).



Photo: Chhandak Pradhan/Save the Children

Hence, for preterm birth prevention, there is a large solution gap. In high-income settings, if all existing interventions, including smoking cessation, reached universal coverage, they would avert a small proportion of preterm births. However, low- and middle-income countries with the highest burden of preterm births also carry the greatest burden of higher-risk conditions that are preventable or treatable. Hence, interventions such as family planning; prevention and management of sexually transmitted infections (STIs); use of insecticide-treated

bednets to prevent malaria in pregnancy; and antenatal care, especially to identify and treat pre-eclampsia and reduction of physical workload (e.g., working in fields or factories for long periods) would be expected to be more effective in preventing preterm birth in these locations. Unfortunately, to date, few studies have assessed preterm birth outcomes in these countries with accurate measures of gestational age (Lawn et al., 2010). The greatest potential for prevention of preterm birth, therefore, lies in strategic, sufficiently funded research of interventions that have strong potential to reduce the risk of preterm birth. This should be vigorously pursued.

There are some significant secondary prevention interventions that reduce the impact of preterm birth. Antenatal corticosteroid injections given to women in preterm labor are highly effective at preventing respiratory distress syndrome in premature babies, but remain under-used in many low- and some middle-income countries. There is, thus, a need for delivery research that can help understand context-specific reasons for the continued low coverage in these countries and identify ways to adapt known effective strategies for use in low-resource settings. Tocolytic medicines rarely stop preterm labor, but may help delay labor for hours or days, allowing the baby additional precious time to develop before birth.

Care of premature babies is primarily an action gap

As evidenced by the large survival gap between babies born in high-income countries and those born in low- and middle-income countries, effective interventions exist to reduce death and disability in premature babies, yet this care does not reach the poorest and most disadvantaged populations where the burden is highest (Chapter 5). There is a “know-do gap” or a gap between what is known to work and what is done in practice. Bridging this gap will be critical for saving premature babies globally.

More than 60% of all premature babies are born in South Asia and sub-Saharan Africa (Chapter 2), with just over half now being born in facilities. Most preterm births

occur after 32 weeks of gestation (84%), and deaths in these babies can almost all be prevented by essential newborn care. For most such babies, intensive care is not needed (Chapter 5) (Figure 6.1). It is possible to implement some evidence-based interventions for the care of premature babies at the community level through behavior change initiatives and women's groups, as well as home-visit packages with extra care for premature babies, particularly breastfeeding support and awareness of the importance of seeking care when danger signs occur (Gooding et al., 2011). In a few countries, case management of neonatal sepsis is being scaled up using community-based health workers. However, the highest impact interventions, notably antenatal corticosteroids and Kangaroo Mother Care (KMC), require facility-based care, but it is highly feasible to scale them up in low-resource settings and have them act as entry points for strengthening health systems.

If scaled up and made universally available, especially in high-burden countries, community and facility interventions would have an immediate, significant effect on reducing the 1.1 million deaths of premature babies each year. This care would also address other causes of neonatal deaths, stillbirth and maternal death and reduce the risks of associated lifelong disability for survivors. Translating knowledge into action through existing health systems platforms will require a focus on systems issues, especially human resources and, notably, nursing skills for obstetric and newborn care. Also, increasing commodities for family planning, obstetric and newborn care are key opportunities for accelerating progress. An initiative on this is being led by the UN Commission on Life-saving Commodities for Women and Children.

Packaging preterm birth interventions within the existing health system

There is increasing global consensus around essential reproductive, maternal, newborn and child health (RMNCH) interventions (PMNCH, 2011), including those

to address preterm birth. The goal is to achieve universal, equitable coverage and high quality in all these RMNCH interventions. For sustainable effect, interventions to prevent preterm birth in the preconception and antenatal periods and to reduce death and disability in premature babies must be integrated within the existing health system.

The continuum of care is a core organizing principle for health systems emphasizing linkages between health-care packages across time and through various service

delivery strategies (Chapter 1). An effective continuum of care addresses the health needs of the adolescent, woman, mother, newborn and child throughout the life cycle, wherever care is provided, whether it be at the home, primary care level or district and regional hospitals. Integrated service delivery packages within the continuum of care have many advantages: cost-effectiveness is enhanced; available human resources are maximized; and services are more family-friendly, reducing the need for multiple visits (Ekman et al., 2008). Most importantly, they can help prevent stillbirths, improve prevention and care of premature babies and save the lives of women, newborns and children (Friberg et al., 2010; Pattinson et al., 2011).

Interventions with the highest impact on the prevention of preterm birth and care of the premature baby can be



Photo: Chris Taylor/Save the Children

Figure 6.2: Integrated service delivery packages for maternal, newborn and child health

Clinical	REPRODUCTIVE CARE <ul style="list-style-type: none">•Family planning•STIs, HIV and immunizations•Care after pregnancy loss	CHILDBIRTH CARE <ul style="list-style-type: none">•Skilled care and immediate newborn care (hygiene, warmth, breastfeeding) and resuscitation•Antenatal steroids, antibiotics for pPROM•PMTCT of HIV•Emergency obstetric care if needed		EMERGENCY NEWBORN CARE <ul style="list-style-type: none">•Extra care of preterm babies, including Kangaroo Mother Care•Emergency care of sick newborns (context-specific e.g. CPAP, surfactant)	EMERGENCY CHILD CARE <ul style="list-style-type: none">•Hospital care of childhood illness, including HIV care
Outreach/outpatient	REPRODUCTIVE HEALTH CARE <ul style="list-style-type: none">•Family planning, including birth spacing•Prevention and management of STIs and HIV•Nutritional counseling	ANTENATAL CARE <ul style="list-style-type: none">•4-visit focused ANC package•IPTp and bednets for malaria•Prevention and management of STIs and HIV•Calcium supplementation•Diagnosis and treatment of maternal chronic conditions		POSTNATAL CARE <ul style="list-style-type: none">•Promotion of healthy behaviors, e.g. hygiene, breastfeeding, warmth•Early detection of and referral for illness•Extra care of at-risk mothers and babies•Prevention of mother-to-child transmission of HIV	CHILD HEALTH CARE <ul style="list-style-type: none">•Immunizations, nutrition, e.g. Vit A supplementation and growth monitoring•IPTi and bednets for malaria•Care of children with HIV, including cotrimoxazole•First level assessment and care of childhood illness (IMCI)•Diagnosis and treatment of prematurity associated disability
Family/community	<ul style="list-style-type: none">•Adolescent and pre-pregnancy nutrition•Gender violence•Education•Prevention of STIs and HIV•Optimize prepregnancy maternal conditions	Counseling and preparation for newborn care, breastfeeding, birth and emergency preparedness	Where skilled care is not available, consider clean birth and immediate newborn care (hygiene, warmth and immediate breastfeeding)	Healthy home care including: <ul style="list-style-type: none">•Promoting preventive care, including newborn care (hygiene, warmth), nutrition (exclusive breastfeeding, complementary feeding) and family planning for women•Seeking curative services for women, babies and children, including oral rehydration salts for prevention of diarrhea, and where referral is not available, consider case management for pneumonia, malaria and neonatal sepsis	
INTERSECTORAL Improved living and working conditions including housing, water and sanitation, and nutrition; education and empowerment, especially of girls ; folic acid fortification; safe and healthy work environments for women and pregnant women					
Pre-pregnancy		Pregnancy	Birth	Newborn/Postnatal	Childhood

Source: Adapted from (Kerber et al., 2007; Lawn et al., 2012). Note: interventions for preterm birth are bold. Acronyms used: ANC = Antenatal care; CPAP = Continuous positive airway pressure; HIV = Human Immunodeficiency Virus; IMCI = Integrated Management of Childhood Illnesses; IPTp = Intermittent presumptive treatment during pregnancy for malaria; pPROM = Prelabor premature rupture of membranes; STI = Sexually Transmitted Illness

integrated into these health service delivery packages, which exist in most health systems and involve links with maternal and child health services, as well as immunization, malaria, HIV/AIDS, nutrition and other related programs (Kerber et al., 2007). A schematic matrix of the basic health packages (Figure 6.2) outlines these packages spanning the continuum of care and through various service delivery modes within the health system, highlighting the interventions included to address preterm birth.

While these packages may exist in nearly all settings, lower-income countries cannot scale up and implement all the individual RMNCH interventions within all the packages at once. Packages usually are initially comprised of the essential interventions and then increase in complexity over time according to local needs and capacity. The functionality of health systems, such as human resource capacity, health-facility infrastructure, supply and demand systems, financial resources, government stewardship,

district-level management and use of data, will also determine the rate of scale-up within the continuum of care.

Closing gaps in coverage, equity and quality

In order for health services to save the maximum number of lives, coverage, quality and equity need to be high. Ensuring high coverage of care means reaching every woman, mother-to-be, mother, newborn, child and family with targeted interventions. Providing quality care means doing the right thing at the right time. Providing equitable care means ensuring care for all according to need, rather than income, gender or other social grouping. This holds true for the existing inequalities in care within and across high-income as well as low- and middle-income countries.

Current coverage levels across the continuum of care for the eight indicators, chosen by the United Nations Commission on Information and Accountability for Women's and Children's Health, are tracked for the

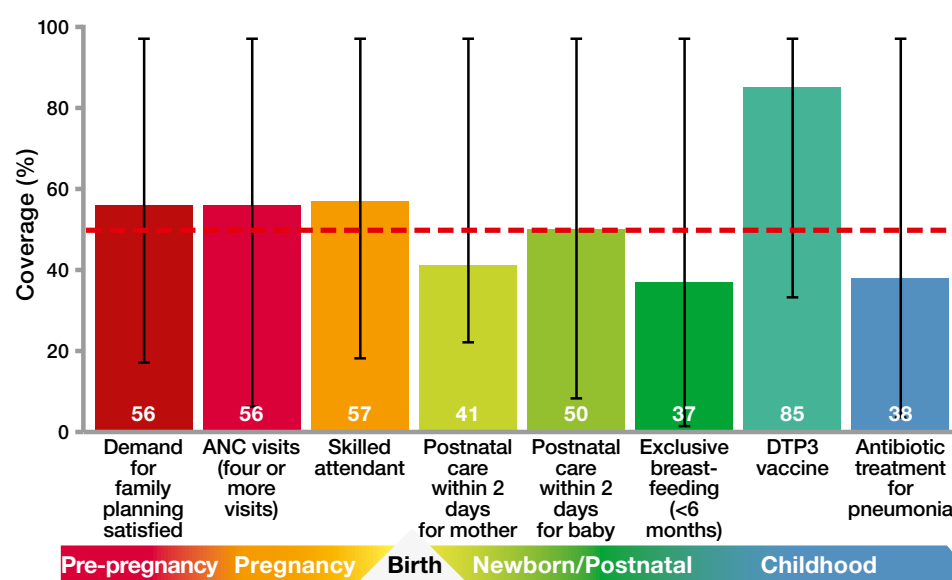
75 priority Countdown to 2015 countries that collectively account for 90% of maternal, newborn and child deaths. Essential care reaches only half of the people in need (Figure 6.3), and there is a wide variation in coverage levels among countries, with some countries achieving nearly universal coverage and others meeting less than a quarter of the need. In addition, quality gaps are a missed opportunity for reaching families, women

and babies (Chapters 4 and 5). Substantial progress is still needed for the reduction of maternal and newborn deaths, especially for the vital contact times (e.g., skilled attendant at birth and postnatal care) and for the prevention of preterm births (e.g., demand for family planning satisfied and antenatal care) (Requejo et al., 2012). Currently, there are no routine data available for many of the interventions for preterm birth prevention and care.

A research pipeline to address preterm birth

Preterm birth is not a single condition, but a single outcome due to multiple causes. Hence, there will not be a single solution, but rather from an array of solutions that address the various biological, social, clinical and behavioral risk factors that result in preterm birth. This report identifies risks for preterm birth and the solutions needed to reduce these risks across the

Figure 6.3: Coverage along the continuum of care for 75 Countdown to 2015 priority countries



Source: Countdown to 2015 (Requejo et al., 2012). Note: Eight selected Commission on Information and Accountability for Women's and Children's Health indicators, showing median for Countdown priority countries. Acronyms used: ANC = Antenatal care; DTP3 = Three doses of diphtheria, tetanus and pertussis vaccine.

RMNCH continuum; yet for many of these risks, we do not have effective solutions. Important research priorities have been highlighted in Chapters 3, 4 and 5. A strategic research approach is needed to understand why babies are born preterm or as stillbirths; how to identify women at risk, even in adolescence; how to close the global survival gap for premature babies; and how to reduce disability rates in the preterm population and improve their quality of life.

Important research themes can be summarized across the research pipeline of description, discovery, development and delivery science, showing the dual agenda of preventing preterm birth and addressing the care and survival gap for babies born preterm (Table 6.1). For the preterm prevention research agenda, the greatest emphasis is on discovery and descriptive research, which is a longer-term investment. For

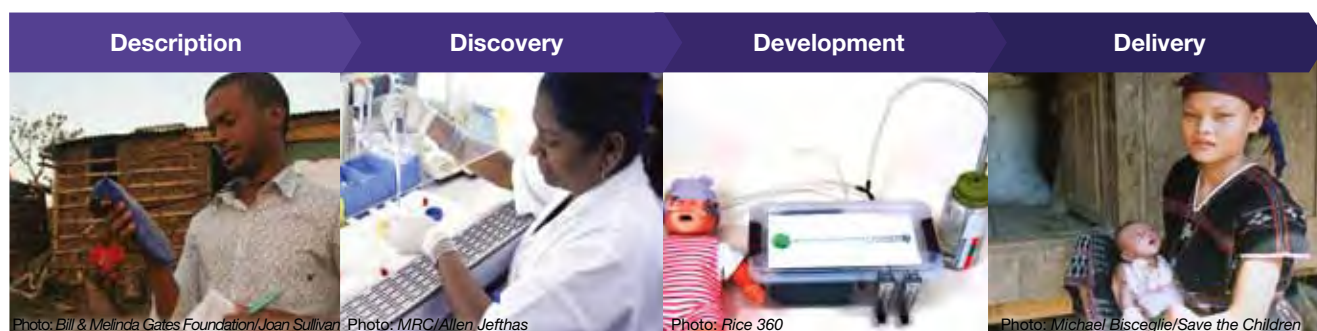


Table 6.1: A research pipeline advancing knowledge to address preterm birth

	Description Characterize the problem	Discovery Understand the problem	Development Create and develop new interventions	Delivery Advance equitable access to interventions
Research aim	Descriptive epidemiology to understand determinants, advance definitions	Development of new interventions or adapting or improving existing interventions	Development of new interventions or adapting or improving existing interventions	Delivery of interventions at scale through innovative approaches
Preterm prevention research themes	<ul style="list-style-type: none"> • Improve collection, analysis, interpretation, application of epidemiological data for: <ul style="list-style-type: none"> » Refining, disseminating standard definitions of exposures, outcomes and phenotypes » Further understanding of risk factors for preterm birth » Monitoring and evaluating impact of interventions » Improving the estimates and data collection systems 	<ul style="list-style-type: none"> • Increase knowledge of the biology of normal and abnormal pregnancy • Better understand modifiable mechanisms contributing to preterm birth (e.g., preconceptional or antenatal nutrition, infection and immune response) • Advance understanding of underlying pathophysiology of preterm newborns and impact of co-morbidities on outcomes in different country settings 	<ul style="list-style-type: none"> • Create, develop new interventions (e.g., novel approaches to preventing preterm birth) • Adapt existing interventions to increase effect, reduce cost, or expand utilization and access 	<ul style="list-style-type: none"> • Evaluate impact, cost and process of known interventions to reduce preterm birth (e.g., family planning, STI management, malaria prevention) • Social behavior change research to address lifestyle factors and other risks for preterm birth • Effective approaches to increase use of antenatal steroids in low- and middle-income settings
Premature baby care research themes			<ul style="list-style-type: none"> • Create new devices and drugs for preterm babies that are feasible to use in low-income settings • Adapt existing interventions to increase effect, reduce cost, and/or improve deliverability in challenging settings or at community level (e.g., robust, simpler technologies) 	<ul style="list-style-type: none"> • Implementation research to adapt and scale up context-specific packages of care for preterm babies (e.g., examining task shifting, innovative commodities, etc.) • Create and implement effective community-based approaches (e.g., community health workers home visit packages, women's groups)
Typical timeline to impact	Near-term to Long-term (2 to 15 years)	Long-term (5 to 15 years)	Medium-term (5 to 10 years)	Near-term (2 to 5 years)

Source: Adapted from Lawn et al., 2008; Rubens et al., 2010; with thanks to Boston Consulting Group for help on the table

the premature baby care agenda, the greatest emphasis is on development and delivery research, with a shorter timeline to impact at scale.

Descriptive research

Improved and consistently applied epidemiologic definitions and methods are the foundation for tracking the burden of preterm birth and better addressing the multiple and often interrelated causes of preterm birth to help identify methods for prevention. Simpler and lower-cost methods for measuring gestational age are particularly needed in low- and middle-income countries where the burden of preterm birth is highest. Social and racial disparities in preterm birth rates are a major issue, yet remain poorly understood. Another important need is standardized methods for diagnosing

and treating prematurity-related impairment in childhood and more consistent measures and timing for assessing multi-domain impairments.

Discovery research

Discovery research focuses on better understanding the causes and mechanisms of preterm birth and the physiological processes of pregnancy, labor and birth. A multi-disciplinary approach is needed to identify women at risk and discover new strategies for prevention, related to the multiple biological, clinical, behavioral, social, infectious and nutritional causes of preterm birth. Although infectious and inflammatory processes contribute to many early spontaneous preterm births, antibiotic treatment of reproductive tract infections has generally failed to reduce preterm risk. Novel

strategies for prevention are urgently needed, especially those that are feasible solutions for low-resource settings.

Development research

Equipment and commodities are considered essential for neonatal care units in high-income countries, yet for many such units in low-income settings, basic equipment and essential medicines are not available or no longer functioning. Development of robust, fit-for-purpose equipment, as outlined in Chapter 5, is a critical next frontier for referral care for preterm babies in the settings where most die, especially for care in hospitals. Some examples include oxygen condensers and pulse oximeters to ensure safe oxygen use in babies, low-cost and effective methods for intervening in complications of labor and delivery, syringe drivers for safer intravenous fluid and drug administration, devices for testing bilirubin (jaundice levels) and innovative phototherapy equipment. Commodities, such as antenatal corticosteroids, could reach more women and babies if they could be prepackaged in single-dose syringes or, ideally, needle-free devices.

Delivery research

Delivery or implementation research addresses how interventions can be best implemented, especially in resource-constrained settings where coverage inequalities are more pronounced so that all families are reached with effective care.

Addressing preterm birth brings the focus back to the woman before, during and after pregnancy. This includes highlighting the critical need for basic and applied research in the complications of pregnancy and delivery and pre-existing chronic diseases in pregnant women, including pre-eclampsia, hypertension, diabetes, aberrations in placentation and placental growth and infectious diseases. Multiple socioeconomic, behavioral and biomedical factors are major contributors to poor fetal outcomes, both preterm births and stillbirths.

These require implementation research and program evaluation on how best to achieve broad delivery and uptake of interventions, including programs for emergency obstetric care and infectious diseases such as malaria, HIV and STIs; improved nutrition; smoking cessation; and reducing indoor air pollution. In many high-income countries and those with

emerging economies, there is evidence of an increase in elective inductions and cesareans without clear medical indication. More information is urgently needed from both providers and patients on the reasons for these shifts in clinical practice and how to promote more conservative obstetric management.

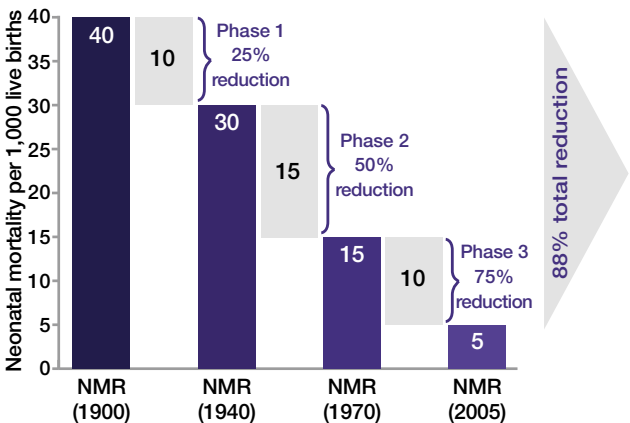
The vast majority of published studies on neonatal care relate to high-technology care in high-income settings. Implementation research from low- and middle-income settings is critical to inform and accelerate the scale up of high-impact care, such as KMC and neonatal resuscitation. Evaluation of context-specific neonatal care packages regarding outcome, cost and economic results is important, including adaptations such as task shifting to various cadres and use of innovative technologies. There is also a need to understand how to screen more effectively for and treat possible prematurity-related cognitive, motor and behavioral disabilities, even in older children. In addition, the economics of preterm birth prevention and care, including the cost/benefit and cost/effectiveness of interventions delivered singly or as a package across the continuum of care and in different settings and populations as well as the costs of doing nothing, need to be better studied.

Building the platform to accelerate research

Underlying this entire research agenda is the development and implementation of the capacity to advance the science of prevention of preterm birth, manage preterm labor and improve care of premature babies. Standard case definitions of the types and causes of preterm birth are being developed (Goldenberg et al., 2012; Kramer et al., 2012) and will be critical to accelerating discovery and making comparisons across studies from basic science to clinical trials and program evaluation. Multi-country studies tracking pregnant women with improved and accurate gestational dating will contribute to a better understanding of all pregnancy outcomes for women, stillbirths and newborns. Improved communication and collaboration among researchers investigating these linked outcomes will accelerate the discovery, development and delivery of innovation, especially across disciplines and between laboratory benches and remote and under-resourced

Box 6.1: Historical phasing of reductions in neonatal mortality rates in the United Kingdom and United States during the 20th century

Figure 6.4: Phased reductions of NMR in US and UK



PHASE 1: NMR reductions associated with public health approaches

- Early 20th century saw significant improvements in sanitary practices including at birth, mass education programs for hygiene, and rise of public health experts devoted to children's issues

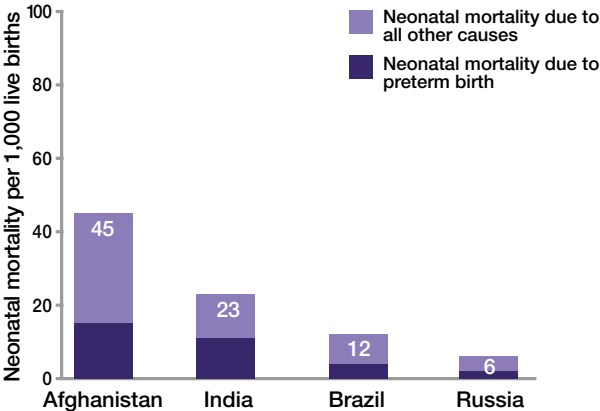
PHASE 2: Improved individual patient management associated with a further halving of NMR reduction prior to NICUs:

- Enhanced maternal health care, obstetric care, shift to facility births
- Wide uptake of antimicrobials
- Basic thermal care, further increased focus on neonatal and infant nutrition, introduction of incubators.

PHASE 3: Neonatal intensive care introduction and scale up:

- Incubators, ventilation, increasing complexity of care

Figure 6.5: Example countries in each NMR level



Start from where you are:

Some examples for countries in each NMR group show the preterm-specific mortality rates (Figure 6.5).

Afghanistan (NMR: 45) could reduce newborn deaths by about 10% through public health approaches, or more with increased focus on improved care of premature babies.

India (NMR: 23) could reduce deaths by 50% by increasing case management of neonatal infections and improved thermal care and feeding support for premature babies, and scaling up KMC.

Brazil (NMR: 12) could halve neonatal mortality with universal coverage of high-quality neonatal intensive care.

Data sources for UK and US historical data: (CDC, 2012, Office for National Statistics, 2012, NIH, 1985, Smith et al., 1983, Jamison et al., 2006, Lissauer and Fanaroff, 2006, Baker, 2000, Philip, 2005, Wegman, 2001). With thanks to Boston Consulting Group
Note: more information on history of neonatal mortality reduction in UK and USA available in Chapter 5.
Data sources for Afghanistan, India, Brazil, and Russia from Child Health Epidemiology Reference Group/World Health Organization cause of death estimates for 2010 (Liu et al., 2012).

hospitals. Expanding training, research opportunities and mentorship for researchers in low-income settings will promote a pipeline of expertise to advance the science with the skills to use this science effectively to promote change.

Potential for lives saved

To understand the impact of evidence-based interventions on deaths due to complications of preterm birth, we considered both historical data and a new analysis using lives saved modeling.

History lessons

The historical data from the United States and United Kingdom (Box 6.1) demonstrate convincingly that a

moderate increase in coverage of selected interventions results in a mortality reduction (Figure 6.4), even in the absence of neonatal intensive care. A number of lessons can be drawn from this historical data:

- Basic care and infection case management interventions have an important effect on neonatal deaths and on deaths amongst moderate and late preterm births, which account for over 80% of preterm births.
- More targeted care is necessary for reducing deaths among babies 28 to <32 weeks, and this reduction could be accelerated as higher-impact interventions are now known, such as KMC and antenatal corticosteroids which were not available in the mid-20th century in the the United States and United Kingdom.

- Intensive care may be necessary to reduce deaths among extremely premature babies (<28 weeks), who account for 5% of all premature babies though a larger proportion of deaths.

Lives saved modeling

A Lives Saved Tool (LiST) analysis was undertaken

("LiST: The Lives Saved

Tool. An evidence-based tool for estimating intervention impact", 2010). LiST is a free and widely used module in a demographic software package called Spectrum, which allows the user to compare the effects of different interventions on the numbers of maternal, neonatal and child deaths and stillbirths, as well as stunting and wasting. National time series data for mortality, health status and intervention coverage is preloaded for 75 Countdown to 2015 priority countries¹. The detailed review process to estimate the effect sizes of cause-specific mortality and the modeling assumptions in LiST are based on *The Lancet's* Series on Child Survival, Neonatal Survival, Maternal Health, Stillbirths and Child Undernutrition as well as about 40 published reviews. The modeling methods have been published elsewhere (Boschi-Pinto and Black, 2011; Stover et al., 2010).

The LiST analysis (Table 6.2) was conducted for 75 Countdown to 2015 priority countries. Table 6.2 lists the interventions included in the analysis that benefit preterm birth prevention and survival of premature babies. We considered the period from 2010 to 2015 and then up to 2025 to allow for a more feasible time frame to scale up care and progress on the prevention agenda. The results of the LiST analysis found that 84% of premature babies

Table 6.2: Estimated lives saved of premature babies in settings with universal coverage of interventions

Intervention reaching 95% coverage	Also saves mothers or other babies	By 2015		By 2025	
		% deaths averted	Lives saved	% deaths averted	Lives saved
Family planning*	M, SB, N	24	228,000	32	345,000
Antenatal corticosteroids	N	40	373,000	41	444,000
Antibiotics for pPRoM	N	9	85,000	9	101,000
Immediate assessment and simple care of all babies	N	5	44,000	5	53,000
Neonatal resuscitation	N (SB)	7	65,000	7	77,000
Thermal care	N	15	142,000	16	171,000
Kangaroo mother care	N	48	452,000	48	531,000
Interventions implemented together	M, SB, N	81	757,000	84	921,000

Note: interventions marked with M will also save maternal lives, SB would avert stillbirth, and N will save newborns dying from causes other than preterm birth.

* Family planning scaled to 60% coverage or to a level whereby the total fertility rate is 2.5.

Note that obstetric care would also have an impact, but is not estimated separately

(more than 921,000 lives) could be saved in 2025 if these interventions were made universally available (95%). Full coverage of antenatal corticosteroids alone resulted in extremely high mortality reductions, a 41% decrease from 2010 (Mwansa-Kambafwile et al., 2010). Implementing KMC suggests even more dramatic results are possible (Lawn et al., 2010), averting approximately 531,000 deaths in 2025. If these were added to existing health system packages, especially noting the recent shifts to more facility births in Africa and Asia, then a high impact is possible even in a relatively short time frame.

Goals for action by 2025

This report initiates a process towards goals for preterm birth prevention and presents a new goal for the reduction of deaths due to complications of preterm birth (Box 6.2). This goal was set through consultation by a group of technical experts. Several analyses were undertaken, notably

- (1) projections by country of the deaths due to preterm birth from now until 2025, assuming no change in trends and assuming expected changes in Gross National Income (GNI);
- (2) reduction in preterm-specific neonatal mortality if the historical trends from the United Kingdom or the United States (Box 6.1) were applied or if more rapid recent reductions in middle-income countries were applied (Box 6.3);

1. These countries are: Afghanistan, Angola, Azerbaijan, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, China, Comoros, Congo, Democratic Republic of the Congo, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Haiti, India, Indonesia, Iraq, Kenya, Democratic Republic of Korea, Kyrgyz Republic, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mexico, Morocco, Mozambique, Myanmar, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Peru, Philippines, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tajikistan, United Republic of Tanzania, Togo, Turkmenistan, Uganda, Uzbekistan, Vietnam, Yemen, Zambia, and Zimbabwe.

Box 6.2: Goals for action by 2025

As a specific action from this report, a technical expert group will be created to consider a **goal for reduction of preterm birth rate** by 2025 for announcement on World Prematurity Day 2012.

This report includes a new goal for the **reduction of deaths due to preterm birth**. The global goal is broken down into two different country groups: those that have already achieved a low level of neonatal mortality (less than 5 per 1,000 live births) and those countries that have not yet achieved this level.

For the countries that have already reached a neonatal mortality rate (NMR) of 5 per 1,000 live births or below by 2010:

The goal is to eliminate remaining preventable preterm deaths, focusing on equitable care for all and quality of care to minimize long-term impairment.

For countries with a neonatal mortality rate above 5 per 1,000 live births in 2010:

The goal is to reduce their preterm birth-attributable mortality by 50% between 2010 and 2025. This reduction will mean that 550,000 premature babies will be saved each year by the target year of 2025. In addition, more babies will be saved who are moderately preterm but die of other causes (e.g. infections).

(3) preterm-specific neonatal mortality reductions predicted based on coverage changes according to Lives Saved Tool Modeling (Table 6.2).

All these analyses used data from UN demographic projections of births (UN, 2010) and the Child Health Epidemiology Reference Group/World Health Organization neonatal cause of death time series, 2000 to 2010 (Liu et al., 2012).

Using the results from analyses of the three future scenarios (Box 6.4), a target for mortality reduction of preterm births was set and agreed by the technical experts (Box 6.2).

Scenario 1: “Business as usual”

Should country governments and the global community take no further direct action to address deaths due to preterm birth, analysis of regional trends over the past decade and forward projection shows that mortality, will decline by 24%

by 2025 (or 16%, if the projection is based on forecasted GNI change) (Box 6.4). Given this scenario and taking into account changing numbers of births, the global total of preterm deaths will not reduce significantly by 2025, with around 900,000 premature babies continuing to die every year.

Scenario 2: Countries take action to catch up with top performers within their region

Should country governments take action now to match the improvements of the top performers within their regions or to match the historical reductions in the United States and the United Kingdom from basic interventions before widespread use of intensive care, preterm mortality could decline by 44 to 50% by 2025 (Box 6.1). The examples of Sri Lanka and Turkey (see Box 6.3) present models that could result in a significant reduction in mortality, halving deaths in 10 years, before the 2025 target. Even those countries with higher mortality rates that are not yet ready to scale up intensive care could see a 50% reduction as shown in the mid-20th century in the United States and the United Kingdom. This reduction is achievable with improved essential care of premature babies and better case management of infections and respiratory distress syndrome, especially since the deaths of moderately preterm babies are the most common and preventable ones.

As this report shows, there are new high-impact, low-cost interventions currently at low coverage, such as



Photo: William Hirtle/Save the Children

antenatal corticosteroids and KMC, that could significantly accelerate progress, which were not available in the United States and the United Kingdom in the middle of the 20th century when NMR was significantly

reduced. Hence, it would be expected, with the inclusion of these and other innovations, that mortality reduction would be more rapid than for the historical examples.

Box 6.3: Some countries have halved their deaths due to preterm birth in just one decade

Several low- and middle-income countries have demonstrated a major reduction in preterm-specific neonatal deaths in low- or middle-resource settings (Figure 6.6). The experiences of two of these countries — Sri Lanka and Turkey — are briefly described here. Differences between approaches are immediately apparent, as countries customize their approach to availability of resources and “readiness” of the systems.

TURKEY

Turkey, an upper middle-income country, has made significant progress in health care over the past decade. Health system transformation was comprehensive, but maternal and neonatal health policies, in particular, played a central role. As a result, the neonatal mortality rate dropped from 21 per 1,000 live births in 2000 to 10 per 1,000 live births in 2010 (UNICEF et al., 2011). Births with a skilled attendant rose from 83% in 2003 to more than 90% in 2009, and institutional facility births rose to more than 90% by 2009 (Demirel and Dilmen, 2011). In fact, Turkey achieved in a decade what took 30 years in the OECD countries.

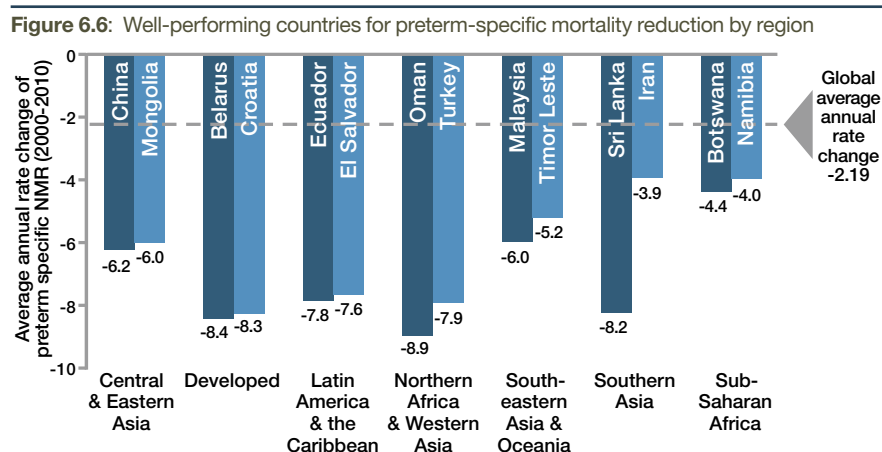
Part of Turkey’s success was through the implementation of demand and supply strategies. There was significant promotion of antenatal care and facility births, including cash incentives and free accommodation in maternity waiting homes in cities for expectant women from remote areas (Kultursay, 2011). In addition, wider public health approaches were an important foundation, such as focused elimination of maternal and neonatal tetanus, breastfeeding promotion and UNICEF “baby-friendly” hospitals campaigns. Turkey invested in health systems improvements, such as systematizing referral to neonatal care with transport systems, and upgrading neonatal intensive care units, focusing on nursing staff skills and standardization of care especially for neonatal resuscitation (Baris et al., 2011).

SRI LANKA

Sri Lanka, a lower middle-income country, has benefited from a reduction in its NMR as a result of policies and gradual improvements in health care that have been continually implemented over the past five decades. Despite relatively low per-capita income, Sri Lanka has achieved impressive results and has often been cited as an example of success for reduction of maternal mortality through a primary health care approach (WHO, 2006).

Many of these advances have come due to Sri Lanka’s investment in primary care initiatives as well as provision of free health care at government facilities. Antenatal care coverage is at 99% for the country, with approximately 51% of pregnant woman having more than 9 antenatal visits. Skilled birth attendance at delivery is universal (99%). Postnatal care is also robust, with 90% of women receiving public health midwife visits within 10 days of discharge (United Nations Millennium Project, 2005; Senanayake et al., 2011).

From an NMR of 80 per 1,000 live births in 1945, Sri Lanka progressed steadily to 22 per 1,000 live births by 1980, and now to around 10 per 1,000 live births (Senanayake et al., 2011; UNICEF et al. 2010). More recent advances included reinvigoration of community-based health care, including maternity clinics, and strengthening of referral and transportation networks such that women in preterm labor are rapidly transported to appropriate secondary and tertiary care centers. A recent focus has been additional investment in tertiary care centers equipped for neonatal intensive care, training of specialists and investment in expensive technologies (WHO Country Cooperation, expert interviews).



Scenario 3: Countries achieve universal coverage of basic interventions

Should countries adopt universal coverage of interventions (95%) ensuring that every woman and child who needs an intervention receives it, then, according to both the LiST analysis (Table 6.2) and the historical data (Box 6.1), countries could achieve an 84% reduction of 1.1 million deaths due to preterm birth complications. While ensuring a 95% coverage rate is ideal and would result in a major mortality reduction, this process will take time. Working towards this goal will achieve significant progress from now until 2015 and beyond. Many other causes of newborn death, as well as maternal deaths and stillbirths, would be saved by such shared interventions as skilled care at birth.

Call to action

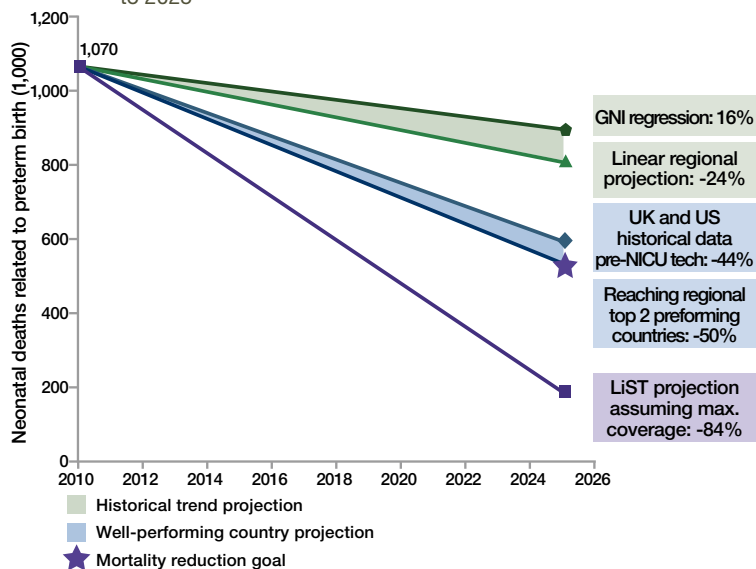
This report is sobering in the news it delivers and in the personal stories of loss that it tells. Yet it is also a story of hope in the significant opportunities for change, especially as we approach the final sprint for the MDG 4 target and aim to maintain momentum beyond 2015. These first-ever country estimates for preterm birth tell a grim story (Chapter 2). In 2010, 15 million babies — more than 1 in 10 births — were

born too soon, exacting an emotional and economic toll on families, the communities in which they live and their countries. The problem is not diminishing; for the countries with 20-year trend data, the majority show an increase in preterm birth rates. Even worse, the burden is not shared equally, with the impact of preterm birth falling most severely on the poorest families and in low- and middle-income countries where health systems are less prepared to respond. There are also high preterm birth rates in many high-income countries, including the United States. These facts demonstrate that the problem of preterm birth is one that we all share; therefore, the solutions must be ones that we not only share, but also tackle through cooperation, collaboration and coordination of the many constituencies and stakeholders that need to be involved if the toll of preterm birth is to be optimally reduced and the lives of mothers and newborns saved.

A number of specific actions, if pursued by all partners and applied across the RMNCH continuum of care, will not only help prevent preterm birth, but will have an immediate, profound and sustained impact on family health and human capital in the highest-burden countries. The seven constituencies, as identified by *Every Woman Every Child*

Box 6.4: Three scenarios inform a target for mortality reduction for premature babies

Figure 6.7: Results of three scenarios of preterm-specific mortality reduction to 2025



Preterm mortality reduction target by 2025

- 50% for countries with NMR above 5 per 1,000 live births
- Eliminate all preventable preterm deaths for countries with NMR below 5 per 1,000 live births

Source: Analysis conducted by Mortality Reduction Goal Group and Boston Consulting Group using multiple data sources (Liu et al., 2012; EIU GDP projections 2010 to 2030; World Population Prospects, 2010; UN Department of Economic and Social Affairs; LiST analysis). Note: Analysis is for countries with NMR of more than 5 per 1,000 live births; other countries are excluded. Interventions in the LiST analysis included KMC, antenatal corticosteroids, antibiotics for pPROM, skilled birth attendance, and others.

Scenario 1: Business as usual, assuming continuing trends (lowest option for goal)
Forward projection based on average annual rate of change of neonatal mortality due to preterm birth (-24%) or if adjusted for GNI forecast (-16%)

Scenario 2: Well-performing country analysis (midpoint)
Matching top global or regional performers indicates potential reduction of 40-50%

Scenario 3: LiST analysis of interventions without intensive neonatal care but very high coverage (potential upper target)
95% coverage of suite of interventions predicts 84% reductions, similar to historical data from the United Kingdom and the United States

(Ban, 2010), have four action themes, which link closely to the principles of Act, Monitor and Review recommended by the Commission on Information and Accountability for Women's and Children's Health.

Invest:

Bring both financial and other resources to address maternal and newborn health and the burden of preterm birth.

Implement:

- Adapt integrated packages of care, taking into account national and local contexts, and tailored to national health service delivery models.
- Increase reach of existing preventive interventions in the preconception period, especially family planning, to all women, including adolescent-friendly services.
- Ensure that every woman receives the high-quality care she needs during pregnancy, at birth and post-natal, especially if she is at risk of preterm birth. There should be greater emphasis on the universal provision of antenatal corticosteroids, building on the work of the UN Commission on Life-saving Commodities for Women and Children as an opportunity to accelerate progress.
- Undertake immediate action to scale up KMC as a standard of care for all preterm babies under 2,000 grams, regardless of resource setting.
- Improve methods for diagnosing and treating prematurity-related impairment in childhood.
- Ensure that every family has the support they need, immediately after birth of a premature baby, following its loss, or living with a child with prematurity-associated disability.

Inform:

Improve the data for preterm birth rates, mortality, impairment and their causes, with regular tracking of coverage, quality and equity gaps, as is done through Countdown to 2015 and linked to the work of the Commission for Information and Accountability using the data for action and accountability, including the establishment of national birth registrations.

Innovate:

Conduct multi-country collaborative research on the:

- Etiology of preterm birth in order to develop innovative solutions to help reverse the almost universal rise in preterm birth rates, in particular, advancing the understanding of important maternal health conditions associated with preterm birth (e.g., preeclampsia and gestational diabetes) and improving identification of diagnostic markers and related screening tools.
- Implementation research to develop and deliver innovations to reach the poorest.

This agenda is ambitious, yet it can and must be accomplished if the actions detailed in this report are to be given the visibility, funding and attention they deserve. To be successful in our goals, the constituencies identified must work together collaboratively and in partnership in ways that are transparent to all, vigorous and accountable.

All of the partners, donors and contributors involved in the preparation and dissemination of this report see its publication not as a final step (see page viii for partner commitments), but as an important next step towards a world where every woman and every newborn is given the best chance to survive and thrive.

Everyone has a role to play...
to reach every woman, every newborn, every child

*To be accountable to reaching the poorest,
 reviewing information and accelerating change.*

Partner commitments for addressing preterm birth detailed on page viii and available at www.everywomaneverychild.org

Governments and policy-makers at local, national, regional and global levels:

Invest

- Commit to reducing neonatal deaths due to preterm birth by 2025, in the context of continued progress for child survival (MDG 4) and maternal health (MDG 5) to 2015 and beyond
- Set targets for improved survival of premature babies (50% for countries with NMR more than 5 per 1,000 live births) and for preterm prevention (target to be announced in November 2012)
- Commit more funds for preterm birth prevention and care, including increased funding for research and innovation to improve both in the context of national health plans
- Ensure equitable access to and provision of quality care before, between and during pregnancy, at birth and care of the premature baby

Implement

- Strengthen health systems for quality maternal and neonatal care, with a focus on the health systems, including key commodities and a priority workforce, specifically midwives and neonatal nurses
- Strengthen community care and increase awareness and demand for RMNCH services and link to referral systems
- Introduce or amend legislation and policies to promote universal access to quality preconception and maternal and perinatal services, including family planning services, and ensure labor rights for all women, especially pregnant women
- Harmonize stakeholder efforts to reduce the toll of preterm birth; include academic institutions, health care organizations, the private sector, civil society, health care workers and donors

Innovate:

- Promote the discovery, development and delivery of affordable, essential medicines, new technologies and novel models for training and service delivery, to prevent preterm birth and improve care of premature babies, in partnership with the private sector where needed

Inform:

- Track progress towards MDGs 4 and 5, RMNCH coverage as outlined by Commission on Information and Accountability for Women's and Child's Health: and specifically improve the data for preterm birth rates, mortality, disability, quality of life and equitable coverage of evidence-based interventions

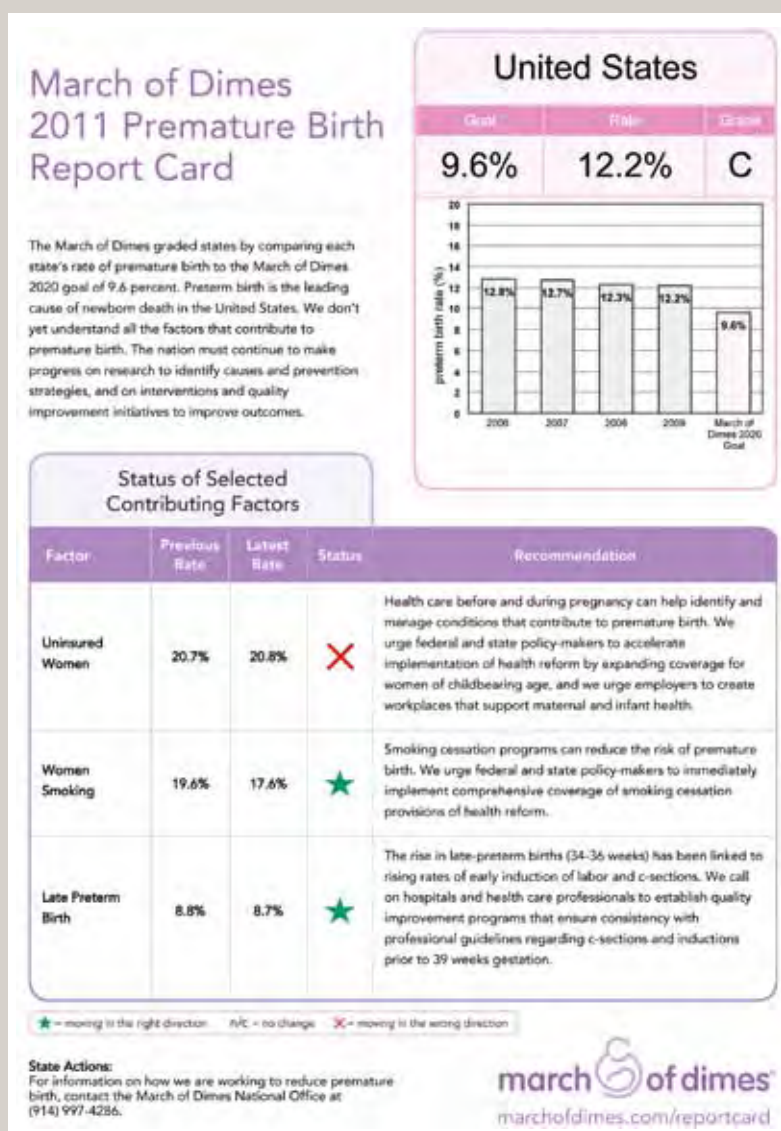
Box 6.5: National integrated campaign for preterm births

Parents, advocates and civil society have captured the attention of governments and monitored progress in the United States through support of an annual Premature Birth Report Card. The Report Card, a familiar means of assessing progress for school-age children, has been a powerful tool used in the United States to prevent preterm birth and its serious health consequences. These grades, used as a rallying point, have helped bring visibility and promote change. Issued by the March of Dimes every year since 2008, the Report Cards assign a letter grade to the United States and to each of 50 state governments. In addition, they summarize the actions that must be taken to fund prevention programs, address health care access and bring about needed change in health care systems.

One southern U.S. state, with the second highest preterm birth rate in the country, has received an “F” on its Report Card every year since 2008. The failing grade mobilized state health officials in early 2012 to launch a statewide initiative with the goal of reducing rates. An important factor in the success of the Report Cards is the accuracy and objectivity of the data and analysis used to derive the grades. For transparency, this information is made publicly available each year. In the first year, great care was taken to explain to the states the methodology and the basis of comparison. Media coverage and use of the Report Card grades by state governments have grown in each of the subsequent years.

The U.S. Surgeon General has participated in media outreach to publicize the Report Cards and their recommended actions. Sustained effort by health care leaders and advocates at all levels, inside and outside of government, has elevated the issue of preterm birth on the nation’s health agenda, contributing to an announcement of new federal resources to test promising practices. As new resources are brought to bear on the problem, the Report Cards will continue to mobilize stakeholders and mark progress.

More information is available at http://www.marchofdimes.com/prematurity_reportcard.html



The United Nations and other multilateral organizations:

Invest

- Help countries develop and align their national health plans, including implementation costing to achieve the health MDGs and preterm birth mortality-reduction targets
- Support systems that track progress of global and national preterm birth rates and associated mortality and morbidity, and advocate to address funding gaps

Implement

- Define norms and guidelines to support efforts to improve women's and children's health, and encourage their adoption
- Work together and with other partners outside the UN system to strengthen technical assistance and programmatic support for the prevention and treatment of preterm births, helping countries scale up high-impact interventions and strengthen their health systems, including health care workers and community-level care
- Ensure linkages along the continuum of care and among health sectors (e.g., education, environment and indoor air pollution) and integrate with other international efforts promoting the MDGs

Innovate

- Generate and disseminate evidence on preterm birth, and provide a platform for sharing best practices; generate and disseminate evidence on cost-effective interventions and research findings
- Utilize the UN Commission on Life-saving Commodities for Women and Children to innovate, in collaboration with the private sector and other partners, to address gaps for essential equipment and medicines (e.g., antenatal corticosteroids)

Inform:

- Promote standard definitions and advance sufficiently detailed metrics for measuring preterm birth outcomes, linking with other partners and collaborating on regular estimates for preterm birth, alongside other RMNCH tracking
- Support the production, dissemination and use of coverage data for evidence-based interventions through the Countdown to 2015 and Commission on Information and Accountability for Women's and Children's Health through the independent Expert Review Group

Box 6.6: Life-saving Commodities for Women and Children — potential for action to reduce preterm deaths

The United Nations (UN) Secretary General's The Global Strategy for Women's and Children's Health highlighted inequities for women and children around the world and advocated for universal access to basic health care for all essential medicines and other commodities necessary to achieve MDGs 4, 5 and 6. Too often, cost-effective, high-impact health commodities do not reach the women and children who need them. Some of the barriers to access include the lack of affordable products, lack of age-appropriate formulations, weak supply chains, lack of awareness of how, why and when to use these commodities and inadequate regulatory capacity at the country level to protect the public from sub-standard or counterfeit medicines that cause harm.

The UN has established a Commission to address this issue, bringing together industry, civil society and technical experts to champion the effort to reduce the barriers that obstruct access to essential health commodities. Selected commodities will be:

1. High-impact and effective, addressing major causes of death and disease among children under 5 years of age and women during pregnancy and childbirth
2. Inadequately funded by existing mechanisms
3. Ready for innovation and rapid scale up in product development and market shaping

An initial list of 13 commodities has been selected for consideration, and includes four with potential to reduce the 3.1 million deaths amongst newborns, especially those who are preterm. All of these commodities are high-impact, low-coverage, and none has had previous global funding:

- Antenatal corticosteroids reduce the risk of severe respiratory complications by half if given by injection to women in preterm labor, but this commodity is low-coverage even in middle-income countries, due to a number of supply and regulation issues and low awareness among health care providers. It has been estimated that up to 400,000 babies could be saved with this intervention, and the unit costs, if dexamethasone is used, is around one dollar per dose.
- Chlorhexidine cord care has recently been shown to be effective in reducing neonatal deaths due to sepsis: 320,000 babies die each year of sepsis and many of them are moderately preterm. Rapid policy and program uptake of chlorhexidine could save many of these babies.
- Resuscitation devices and training mannequins have undergone recent innovations, but are still not widely available in many high-burden countries with scope to reduce neonatal deaths from intrapartum insults, as well as from preterm birth complications.
- Injection antibiotics, including gentamicin, are crucial for treating neonatal infections and yet, due to low dosing, are often mis-administered; innovations such as pre-packaged doses and needle-free technology could have a major effect on reaching the poorest.

Promotion of a robust supply of quality products with fair pricing is a unique opportunity to accelerate progress and save lives of women and children, and could contribute to halving the 1.1 million deaths due to preterm birth.

More information available at <http://www.everywomaneverychild.org/resources/un-commission-on-life-saving-commodities>



Photo: CAPRISA

Donors and philanthropic institutions:

Invest

- Provide sustained long-term support (financial and programmatic) in line with national health and RMNCH plans that incorporate preterm births and are harmonized with other related global health initiatives
- Advocate for emphasizing preterm birth within the broader development, global health and RMNCH context, and align preterm birth mortality-reduction goals with country-specific needs
- Invest in national systems to improve measurement of risk factors for preterm birth, pregnancy and birth outcomes, and the strengthening of research institutions

Innovate

- Support high-priority research efforts to address solution gaps and implementation research to inform the scale up of evidence-based interventions to reduce preterm deaths

Inform:

- Promote transparent tracking of commitments and accountability, and long-term improvements in national health management and information systems

Box 6.7: Helping Babies Breathe as an example of a public-private alliance to save newborns

In 2010, the United States Agency for International Development (USAID) instituted a formal public-private partnership, called Global Development Alliance, to accelerate the scale up of a simplified neonatal resuscitation package, called Helping Babies Breathe (HBB). HBB brought together differing skills with a professional association, American Academy of Pediatrics (AAP), civil society and industry. Key constraints that had impeded scale up of neonatal resuscitation were in the lack of robust, fit-for-purpose equipment and the complexity of guidelines and training. AAP and others developed an evidence-based simplified pictorial algorithm for basic neonatal resuscitation. Laerdal designed and manufactured low-cost equipment, including bag and mask, a penguin suction device and Neonatalie (a robust training mannequin). A non-exclusive partnership with Laerdal facilitated the availability of these devices, as well as those of other manufacturers. Save the Children's role facilitated uptake, integration and sustainable scale up with ministries of health in lower-income countries.



Photo: Laerdal

The U.S. National Institutes of Health (NIH) helped with evaluation. Other partners, including Johnson & Johnson and the Latter-day Saints Charities, have joined and generated momentum at global and country level.

In less than 2 years, HBB was rapidly introduced in 34 countries, 10 of which have developed national roll-out plans. A similar partnership model could be applied to other preterm birth interventions to accelerate progress.

More information available at <http://www.helpingbabiesbreathe.org/GDAinformation.html>

The business community:

Invest

- Invest additional resources to develop and adapt devices and commodities to prevent and treat preterm birth in low-income settings; look for innovative partnerships and business models for scalable, equitable and sustainable change

Implement

- Scale up best practices and partner with the public sector to improve service delivery and infrastructure for prevention and management of preterm birth

Innovate

- Develop affordable new diagnostics, medicines, technologies and other interventions, including social and behavioral change, for preterm birth and make them available to the most vulnerable and marginalized

Inform:

- Use and strengthen existing tracking systems for commodities and devices to improve supply-chain logistics

Box 6.8: Industry partnership for innovative technology for preterm baby care in Asia

Many countries lack the technical capacity and human and financial resources to successfully implement facility-based neonatal intensive care. Equipment failures, management and personnel training, and stock outs of consumables hamper health delivery efforts. GE Healthcare and the East Meets West Foundation (EMW) have forged an alliance to solve these challenges. Building on the success of a program called Breath of Life, EMW and GE Healthcare are creating a suite of neonatal technologies that are durable, require few consumables, are easy to use and are specifically designed for sustainability in low-resource settings. The equipment is delivered in the context of a multi-year program of training, monitoring, clinical supervision and technical support. Since its launch by EMW in 2005, the Breath of Life program has been implemented in more than 280 hospitals across eight countries of South Asia, currently treating more than 55,000 babies a year.

Designed locally in Vietnam, EMW's neonatal equipment has maintained a failure rate below 5% compared to more than 80% for donated equipment from Western countries. Beyond core technologies of bubble CPAP, LED phototherapy and radiant warmers, the program also provides infection-control systems, ambu-bags, baby bonnets and a long list of ancillary equipment. Monitoring and training — a pervasive shortcoming of many technology-based programs — are core strengths of the Breath of Life program. EMW staff typically monitor every hospital in the network 3 to 5 times per week, and visit as often as twice a month for extended technical and clinical training and supervision.

In partnership with GE Healthcare, the Breath of Life program will be significantly expanded in scope and scale. Future devices will be engineered according to local design principles and follow stringent quality and regulatory review processes. As a global leader in the design and manufacture of advanced neonatal intensive care equipment, GE Healthcare can deliver and service these neonatal devices virtually anywhere in the world. Volume manufacturing should result in both lower costs and higher quality. This alliance of EMW and GE Healthcare is a powerful example of what partnerships can accomplish to help reduce the rate of preterm birth.



Photo: Design that Matters

<http://www.eastmeetswest.org> and <http://www.gehealthcare.com>

Academic and research institutions:

Invest

- Agree upon and disseminate a prioritized and coordinated research agenda for preterm birth and pregnancy outcomes, including longer-term discovery science to address preterm prevention, and immediate implementation research to reduce deaths from preterm birth
- Encourage increased budget allocation for research into the causes of preterm birth, and innovative interventions for prevention and treatment

Implement

- Ensure accurate information on preterm birth outcomes are included in research studies assessing other pregnancy outcomes, and that preterm birth studies measure other relevant pregnancy outcomes
- Build capacity at research institutions, especially in low- and middle-income countries, and train professionals

Innovate

- Advance policy development by improving the metrics for impairment outcomes as well as preterm birth rates, and link to other pregnancy outcomes, reporting on trends and emerging issues relating to preterm births
- Advance innovative research into the multiple causes of preterm birth and innovative strategies for prevention

Inform:

- Disseminate new research findings and best practice related to preterm birth
- Strengthen global networks of academic providers, researchers and trainers through leveraging the momentum from this report and commitments of these institutions

Box 6.9: A global alliance to address knowledge gaps for preventing preterm birth

The Global Alliance to Prevent Prematurity and Stillbirth (GAPPS), an initiative of Seattle Children's, leads a collaborative effort to increase awareness and accelerate innovative research to improve maternal, newborn and child health. A global effort to prevent preterm birth and stillbirth requires an interdisciplinary research approach and a diverse network. GAPPS collaborates with a wide range of stakeholders, including families, foundations, corporations, hospitals, universities, governments, non-governmental organizations and research organizations.

At the International Conference on Prematurity and Stillbirth, key stakeholders developed the Global Action Agenda (GAA) on preterm birth and stillbirth. This defined strategic research priorities, including social and biological mechanisms of preterm birth and stillbirth, and testing new diagnostic, treatment and prevention interventions. The GAA also set goals to increase advocacy and scale up known prevention strategies, and strategies for funding organizations, while underscoring the need for better data on maternal mortality, stillbirths, preterm birth and the impact of preterm birth on newborn and child health.

Since the conference, GAPPS worked with scientists on preterm birth and stillbirth definitions and terminology for normal and abnormal pregnancy in order to improve comparability of research studies (Goldenberg et al., 2012; Kramer et al., 2012). The GAPPS Repository for data and specimen collection offers a standardized source of high-quality specimens linked to phenotypic data from diverse populations of pregnant women.



Recently, the Preventing Preterm Birth initiative was launched, funded by a \$20 million (USD) grant from the Bill & Melinda Gates Foundation, as part of the Grand Challenges in Global Health. The initiative provides grants to scientists around the world to investigate infectious, nutritional and immunologic factors contributing to preterm birth and preterm-related mortality, especially in the developing world.

More information is available at www.gapps.org

Health care workers and their professional associations:

Invest

- Advocate for and participate in evidence-based training, deployment and retention of workers with the necessary skills to address the burden of preterm birth

Implement

- Adapt and adopt evidence-based standards to prevent or treat preterm births; implement training plus continuing competency-based education, particularly for specialized health professionals such as neonatal nurses; and update curricula with evidence-based interventions
- Provide the highest-quality evidence-based care to prevent preterm birth in the preconception and antenatal periods and to improve care for premature babies; share best practices; test new approaches; use the best tools possible; and audit clinical practice
- Ensure that women, newborns and children are treated with respect and sensitivity when receiving health care, including provision of adolescent-friendly services

Innovate

- Identify areas for improved services and innovations to prevent or treat preterm birth
- Prioritize working in partnership to provide universal access to the essential package of interventions, including both prevention and care, and involving task shifting where appropriate

Inform:

- Improve data collection to track preterm births, such as consistent assessment of gestational age, birthweight, cause of death, data on impairment and retinopathy of prematurity

Box 6.10: Health care providers as champions of change for mothers and newborns

A premature baby's survival is dependent on both his mother's survival and on care received from several health care professional groups:

- Obstetricians, who provide effective care to the woman, prevent or manage preterm labor
- Midwives, who ensure safe delivery and resuscitate, if necessary
- Pediatricians, who undertake advanced resuscitation and ongoing care, if needed. Where most premature babies are born and die, there are few pediatricians and almost no neonatologists.

This cross-unit team can save lives; however, if none of these groups takes responsibility for premature babies, where minutes count between life and death, then more babies will die. Indeed, nurses and midwives are the front line workers for millions of premature babies in facilities in low- and middle-income countries. However, there is an acute shortage internationally of neonatal nurses, or nurses who receive specific training in newborn care, particularly in low-income countries. Those nurses, who commit to newborn care, often receive little or no recognition for providing excellent care against all the odds.

Regina Obeng has worked in the neonatal unit at the Komfo Anokye Teaching Hospital in Kumasi, Ghana for over 20 years. Not accepting newborn deaths as inevitable, she has dedicated her life to saving babies in her crowded ward, where 350 to 400 newborns are cared for each month. She has been a consistent voice for these babies and their mothers, speaking up for more space, better supplies and, especially, more staff and ways to retain skilled staff, and places for mothers to stay. Regina was awarded the International Neonatal Nursing Excellence Award in 2010, given by the International Conference of Neonatal Nurses (ICNN) together with Save the Children, the Council of International Neonatal Nurses (COINN) and the Neonatal Nurses Association of South Africa (NNASA). Now her voice is even stronger in Ghana, raising public awareness about the issues facing mothers and newborn babies, particularly prematurity, and has influenced even the highest levels of the Ministry of Health to ensure neonatal nurses' training will start in Ghana.



Photo: Jane Purnell/Getty Images for Save the Children

<http://www.healthynetwork.org/success-story/international-neonatal-nursing-excellence-award-regina-obeng>

Civil society:

Invest

- Advocate for increased attention to the health of women (including adolescents and mothers), newborns and children, with particular attention to strengthening prevention of and treatment for preterm birth, as well as strategic research
- Coordinate and support national campaigns, parent support groups and other agents of change

Implement

- Strengthen community and local capabilities to scale up implementation of effective, feasible and culturally appropriate interventions for prevention and care (e.g., KMC)
- Ensure family support for acute loss of stillbirth and preterm birth, or long-term support for disability

Innovate

- Develop and test innovative approaches to deliver essential services for prevention and care, particularly ones aimed at the most vulnerable and marginalized people, including women, newborns, and especially premature babies

Inform:

- Educate, engage and mobilize communities about preterm birth to encourage early care, beginning in adolescence, as well as to raise visibility of the problem of preterm birth and the availability of cost-effective solutions
- Track progress and hold all stakeholders at global, regional, national and local levels accountable for their commitments, to improve pregnancy outcomes and preterm birth.
- Promote accountability through annual Countdown to 2015 country data profiles, and global and national reports that document preterm birth rates and associated mortality and coverage of evidence-based interventions

Box 6.11: Chinese parents mobilizing for their preterm babies

Groups of parents affected by preterm birth are an influential civil society group, supporting affected families and being their voice in government and among health policy planners. The Home for Premature Babies (HPB) is an example of a parent group advocating for improvements in care and support. As the largest preterm birth association of parents and families among Chinese-speaking nations, the membership of HPB now exceeds 400,000 families.



Photo: Home for Premature Babies

Formed in 2005 by Mrs. Jianian Ma, a mother of a very preterm baby, HPB now encompasses several foundations that provide nationwide services in support of prevention and care. With the sponsorship of the China National Committee for the Well-being of the Youth, HPB was established as a semi-governmental organization. This close central government tie has helped ensure continuity of HPB's funding and the ability to partner more effectively with other organizations in China.

HPB has established three centers dedicated to the care of children with prematurity-related disabilities; launched an interactive website to allow parents and prospective parents to ask qualified medical experts about ways to help minimize the risk of having a preterm birth and how to care for their preterm baby; implemented a telephone hotline to provide immediate responses to parents' questions; and established a "Green Track" in more than 100 hospitals nationwide that allows families with a sick preterm child to see a pediatrician quickly.

"As we have experienced in China, groups of parents affected by preterm birth can be an independent and uniquely powerful grassroots voice, calling on government, professional organizations, civil society, the business community and other partners in their countries to work together to prevent prematurity, improve care of the preterm baby and help support affected families." *Dr. Nanbert Zhong, Chair, Advisory Committee for Science and International Affairs, HPB*

Together rapid change is possible

Over the last decade, the world has changed. Just as it is no longer acceptable for people with HIV/AIDS to remain untreated because they live in poor countries, it is no longer acceptable for women to die while giving birth. Likewise 3.1 million newborns, including those who are born too soon, do not need to die. We need more frontline health workers who are skilled and confident in newborn care. We need health clinics equipped with life-saving commodities. Girls, women and mothers must be educated, nourished and enabled, so that they can protect their own health, and that of their babies.

Over three-quarters of premature babies who die could be saved if basic care reached them and their mothers. Rapid progress is possible, contributing to greater advances in reaching the MDGs and beyond. At the same time research and innovation for preterm birth prevention is urgent. These actions would also improve reproductive and maternal health, reduce disability and chronic disease and build sustainable health systems.

Together, as professionals, as policy-makers and as parents, we commit to our common goal: all pregnancies wanted and healthy, all women survive, and all babies – including those born too soon – with a healthy start in life, and thriving as children, fulfilling their potential as adults.

More information:

www.who.int/pmnch/media/news/2012/preterm_birth_report/en/index.html

Related materials and interactive map of preterm births: www.marchofdimes.com/borntoosoon

Every Woman Every Child commitments to preterm birth: www.everywomaneverychild.org/

World Prematurity Day on November 17

www.facebook.com/WorldPrematurityDay



Photo: Jeff Holt/Save the Children