

EDITORIAL

Newborn survival: changing the trajectory over the next decade

Gary L Darmstadt,^{1*} David A Oot² and Joy E Lawn³

¹Bill & Melinda Gates Foundation, Seattle, WA, USA, ²Save the Children, Washington DC, USA and ³Saving Newborn Lives, Save the Children, South Africa

*Corresponding author. Bill & Melinda Gates Foundation, PO Box 23350, Seattle, WA 98102, USA.
E-mail: Gary.Darmstadt@gatesfoundation.org

The first month of a baby's life is surrounded by emotion and new experiences. The mother and father are learning how to be parents, interpreting and responding to the myriad of different cries, sounds and movements. Parents everywhere are concerned that their new baby is warm, safe and feeds well. The first month is one of soaring hopes and possibilities. Yet that month, and especially the birth and first few days after, carries the highest risk of death for mothers and newborns and the highest risk of long-term disability, for example after preterm birth, labour complications, infections or severe jaundice. Moreover, under-nutrition during the 1000-day period from conception through age 2 years has life-long consequences, including increased risk for infectious diseases, intellectual impairment, reduced economic productivity, and increased risk for adult-onset cardiovascular diseases and diabetes.

During the last decade the world has changed in many ways with urbanization, rapid uptake of communication technologies such as cell phones and changing lifestyles and health outcomes. In some countries, newborns face a more certain future than 10 years ago, yet in other countries very little has changed. Worldwide, 3.1 million newborns still die each year, and most of these deaths are preventable (Lawn *et al.* 2012).

This series presents a comprehensive analysis of the changes in newborn care and survival over the last decade at global level, as well as five detailed country assessments undertaken by over 60 experts from governments and multiple organizations, in order to better understand the process of taking solutions to scale and how to accelerate progress towards reductions in mortality and morbidity.

Recognition of the importance of newborn survival globally and nationally was stimulated by the Millennium Development Goals (MDGs), notably MDG 4 for child survival, to reduce under-five mortality by two-thirds from 1990 to 2015, and closely linked with MDG 5, to reduce maternal mortality by three-quarters (Lawn *et al.* 2005). Between 2000 and 2010, progress towards both MDGs 4 and 5 has accelerated, with an annual rate of reduction of 2.9% mortality for children 1–59 months, and 2.3% for maternal mortality (Lawn *et al.* 2012). Having specific targets and the focus of national governments and donors have been critical factors in this increased progress since 2000. Even if the targets for child and maternal mortality are not met at global level, many countries will come closer



Figure 1 Fatoumata Sogoba holds her 9 hour-old baby boy, Moussa. She is a 15 year-old mother, married at 14. She has never attended school and lives in with her husband, a 27 year-old trader, in Bougouni, Mali. © Michael Bisceglie/Save the Children.

than they otherwise would have. However, progress in reducing newborn deaths has lagged behind post-neonatal under-five mortality at only 1.7% per year from 1990 to 2000, and despite some improvement is still only 2.1% per year for 2000–2010 (Lawn *et al.* 2012). This is 40% slower progress than for older children and 30% slower than for maternal mortality. Because of the more rapid decline in post-neonatal and child survival,

the proportion of under-five deaths that occur in the first month of life is increasing and is now more than 40%. In some countries in South Asia, over half of all under-five deaths occur in the first month of life (Lawn *et al.* 2012). Globally, the causes of under-five deaths are changing, with complications of preterm birth now the number two cause after deaths due to pneumonia, and with 'birth asphyxia' deaths as common as those due to malaria (Blencowe *et al.* 2012; Liu *et al.* 2012). It is clear that new programmatic approaches are needed which specifically target the major causes of and risk factors for newborn deaths.

Progress in improving newborn survival has been slow and the global averages hide increasing regional, national and subnational disparities. For sub-Saharan Africa, on average, there has been no statistically significant change in neonatal mortality over the past decade. Without a dramatic change in the trajectory for Africa it is estimated that it will take over 150 years for an African newborn to have the same chance of survival as one born in Europe or North America (Oestergaard *et al.* 2011). In sharp contrast, five African countries have reduced neonatal deaths by over 25%, more than double their neighbours. Important lessons emerge from this supplement, especially around seizing opportunities to promote community-based newborn care, and to integrate newborn care interventions into frontline health worker delivery platforms, and especially into facility-based maternity care, which is already being scaled up (Mbonye *et al.* 2012; Zimba *et al.* 2012).

At the same time, there are dozens of countries, mostly middle-income countries in Eastern Europe and Latin America, which have halved neonatal deaths in the last decade. As advanced previously in *The Lancet Neonatal Survival Series* (Darmstadt *et al.* 2005), the analysis in paper 1 of this supplement demonstrates while rapid progress in neonatal survival in these countries was linked with economic progress, significant improvements occurred in the absence of economic progress. Sri Lanka, for example, halved neonatal deaths due to prematurity despite a destabilizing internal conflict and weak economic growth, through extending their strong primary care system with effective referral level newborn care (March of Dimes *et al.* 2012). Despite limited economic growth and recurrent political instability, Bangladesh and Nepal are on track to meet MDG 4 and have reduced neonatal mortality by 4.0% and 3.6% per year since 2000 (Pradhan *et al.* 2012; Rubayet *et al.* 2012).

Countries that have achieved increases in contraceptive use, and concurrent reductions in fertility, have also made more progress. Countries with high risk of neonatal death and little change in fertility increasingly dominate the top 10 countries for number of newborn deaths. In contrast, Brazil has graduated off this list and Bangladesh has moved from 5th to 8th. This progress is due to reducing births as well as improving neonatal survival, and the two appear to be synergistic. Adolescent pregnancy, closely spaced births and high parity all place women at higher risk of adverse pregnancy outcomes. Family planning remains one of the most cost-effective ways to reduce maternal and neonatal deaths as well as stillbirths (Pattinson *et al.* 2011). Contraceptive services empower couples to choose the number and timing of their pregnancies, linking to smaller families, improved survival, educational gains and

economic growth (Gribble and Voss 2009; Bloom and Canning 2011).

This series highlights a lack of wide-scale coverage for proven and highly cost-effective newborn care interventions and the need for better data on the implementation status of interventions that are being scaled up, such as kangaroo mother care and neonatal resuscitation. In the middle of this decade, *The Lancet Neonatal Survival Series* identified a menu of evidence-based interventions that could reduce neonatal deaths by more than two-thirds (Darmstadt *et al.* 2005; Darmstadt *et al.* 2007). Since that time, these interventions have been refined, adapted and applied in varied contexts. For example, home-based care for mothers and babies is now being implemented in many countries, although few countries have reached more than 50% coverage, especially of early postnatal visits (WHO *et al.* 2009; Pradhan *et al.* 2012; Zimba *et al.* 2012). More births are being assisted by skilled birth attendants, especially due to increases in facility-based deliveries, but quality of care in facilities has not kept pace (Zimba *et al.* 2012). Some key behaviours, such as immediate and exclusive breastfeeding, have made encouraging gains, especially in Africa (Requejo *et al.* 2012). There is also momentum associated with innovative products, such as chlorhexidine cleansing of the umbilical cord, simplified devices for neonatal resuscitation, and opportunities to accelerate progress for neglected high impact commodities such as antenatal corticosteroids for preterm birth, linked to the UN Commission on Life-Saving Commodities for Women and Children (United Nations 2012).

One of the likely reasons for slow progress in the scale up of newborn care services and practices is that funding remains low. For most countries, national sources provide the majority of health financing, either from government, families or private sector; however tracking resources for reproductive and maternal, newborn and child health (MNCH) remain limited. A new analysis of donor funding databases presented in paper 1 shows there has been a significant increase in donor funding for MNCH and a marked increase in the mention of the word 'newborn' since the mid-2000s, yet by 2008 only 6.3% of MNCH funding even mentioned the word 'newborn' and just 0.1% (US\$5.49m) exclusively targeted newborns (Lawn *et al.* 2012). Despite 2.6 million third trimester stillbirths (Cousens *et al.* 2011), the words 'stillbirth' or 'fetal' are absent in donor funding databases (Pitt *et al.* 2012). In short, it appears that with few exceptions donors have not yet focused specific attention—and resources—on newborn care within maternal and child health care programmes.

This series includes evaluations of progress along a pathway for change for newborn survival in Bangladesh, Nepal, Pakistan, Malawi and Uganda. These country case studies applied a systems analysis approach, examining changes in mortality, coverage, funding, health systems, and context. A standard policy and programme timeline tool and a set of 27 'scale up readiness benchmarks' related to agenda setting and policy formulation were applied to assess national progress towards programme readiness for implementation of newborn health interventions at scale (Moran *et al.* 2012).

All of the five countries highlighted have reduced neonatal mortality, four of the five have annual rates of change that are greater than their regional averages, and remarkably, three are

Table 1 Programme management steps to integrate and scale up interventions for newborn survival, summarizing some lessons learned over the last decade

	Step as defined in <i>The Lancet Neonatal Survival Series</i>	Lessons and questions
Step 1	Assess the situation and create a policy environment conducive to neonatal health	<p><i>Situation analysis and planning considerations:</i></p> <ul style="list-style-type: none"> – Critical use of data and evidence, lives saved and cost analysis, effective policy dialogue and the importance of context – Identify and engage with key user groups in the co-creation of solutions – Consider more newborn-specific focus to gain traction and then integrate, or start with an ‘integrated agenda’ <p><i>Varying mechanisms for convening:</i></p> <ul style="list-style-type: none"> – The options of formal vs informal groups, or informal that become formal – Alliances with child or maternal or both, especially if several relevant government ministries. Also consider ‘non-traditional’ alliances, e.g. with HIV/AIDS – Systematically developing and sustaining champions
Step 2	<p>Achieve optimum neonatal care within the constraints of the situation</p> <ul style="list-style-type: none"> – Start with outreach or community care if the health system is not strong – Identify missed opportunities in facilities – Co-ordinate across various programmes relevant to neonatal health 	<p><i>Implementation realities and challenges notably:</i></p> <ul style="list-style-type: none"> – Scaling up home visit packages where there is no national extension worker or community health worker cadre <p><i>How to achieve wide-scale and especially early postnatal visit:</i></p> <ul style="list-style-type: none"> – Facility care at birth coverage increases are gaining momentum, but quality is lagging and more systematic attention is required to urgently address missed opportunities for effective care in facilities, more frontline workers, more skills, and basic equipment and commodities. – Increased co-ordination between programmes to facilitate effective newborn care can be a mechanism for increased collaboration, co-ordination and integration along the continuum of care, but requires continual attention to fostering alliances
Step 3	<p>Systematically scale up neonatal care</p> <ul style="list-style-type: none"> – Strengthen supply – Improve demand – Overcome supply and demand obstacles 	<p><i>Importance of coverage AND quality:</i></p> <ul style="list-style-type: none"> – Supply side – major investments still needed in many countries especially in training skilled workers, ensuring midwives, nurses and others have skills to care for ill newborns – Demand side – investments to address demand-related barriers still a missing or weak link especially in low coverage populations, progress e.g. on financial incentives but needs more client-focused innovation – Rising issues such as public vs private (and not for profit) services and insurance schemes are critical to consider
Step 4	Monitor coverage and measure effect and cost	<p><i>Data to inform scale up:</i></p> <ul style="list-style-type: none"> – Improved mortality and cause of death data, and some advances in coverage data but key gaps in coverage data for high impact interventions and in health system process data, for tracking the strength of implementation, and specifics e.g. supplies and human resources – More focus needed on vital registration systems – Lack of comparable cost analyses and cost data for health system planning – Prioritizing implementation research gaps

Institutionalization

Repeating the 4-step programme cycle above to increase coverage and quality of care in order to reach institutionalization of newborn survival, the point at which public demand, political commitment and resources for quality services to promote and preserve newborn health have been normalized in a society.

Adapted from Knippenberg *et al.* (2005) *Lancet Neonatal Survival Series*.

on track to reach MDG4 targets, bolstered by their progress in reducing neonatal deaths (Pradhan *et al.* 2012; Rubayet *et al.* 2012; Zimba *et al.* 2012). The context varies within and across countries as well as the entry points and approaches taken, and the challenges faced have been different.

There is no ‘cookie cutter’ approach to saving newborn lives. Instead a systematic step-by-step approach is key, using data and evidence to assess the situation, identify solutions and drive continuous programme improvement; and ensuring consensus and commitment (Knippenberg *et al.* 2005). These case

studies highlight lessons learned about this step-by-step approach and what works and what does not (Table 1).

Strong national leadership is evident in each of these five case studies but comes from different constituencies. In each case, partnerships of key actors in national systems for health care delivery at scale have been critical for progress, some as formally mandated committees, others through informal networks, sometimes behind the scenes. A consistent finding is that early engagement of the user groups has been critical to successful scale up for newborn care innovations. Further

engagement of these groups as network agents for the sharing and spread of knowledge also underpins the spread of health care solutions. A Newborn Steering Committee in Uganda has changed the policy and programme landscape for newborn care and has also been catalytic for improved linkages across the continuum of care (Mbonye *et al.* 2012). Civil society, coupled with professional and academic opinion leaders, was critical for development and approval of a national newborn health strategy in Bangladesh (Rubayet *et al.* 2012). In Pakistan, a partnership of academics and NGOs has helped shape national policy and their continued engagement will be critical for accountability. Despite Pakistan facing humanitarian disasters and political instability, newborn care has been integrated into a large-scale frontline health worker delivery platform (Khan *et al.* 2012). In Malawi, newborn care has been integrated into a comprehensive national health sector strategy, building especially on the momentum for maternal health care services (Zimba *et al.* 2012). All five countries have used locally-adapted evidence to inform the design and implementation of a national community-based maternal and newborn care strategy that is being taken to scale. A recurring theme is the use of data and evidence to inform policies and programmes, with locally-generated evidence often found to be critical in creating the ownership needed for adoption and replication at scale. However, the pathway from evidence to research is often complex and non-linear, with site visits to view successful programmes sometimes as influential as peer-reviewed publications (Rubayet *et al.* 2012).

A common thread in these countries is the importance of bringing life-saving newborn care interventions closer to communities, and of engaging user groups, such as frontline workers and mothers in a jointly-owned process of intervention design and adaptation. Frontline health workers are often the first and only link families have to health care in low-income countries, especially in remote and rural areas. Social and behavioural change cannot be left out of the conversation when discussing newborn care, whether innovations are technical or behavioural. Cultural beliefs often reinforce harmful newborn care practices, such as giving water or tea as the first liquid instead of breast milk or using cow dung to dress the umbilical cord (Darmstadt 2007). Understanding the mechanisms underlying behaviour change at a population level, appreciation of the sociocultural context of newborn care behaviours and risk factors for morbidity and mortality, co-design of communications messages with the community, and negotiation for improved practices through an active process of behaviour change management are all critical for success (Kumar *et al.* 2010).

Achieving impact at scale starts with a spark, a catalyst that triggers a chain reaction. The progress made in the countries highlighted in this supplement can be a catalyst for other countries, showing that change is possible in these challenging settings. With the deadline for MDG 4 rapidly approaching and neonatal mortality increasing in its proportion of child mortality, this supplement brings optimism that change is possible but highlights the need for more concerted efforts to advance newborn care within the continuum of women's and children's health (Ban 2010). The challenge for newborn survival is now more apparent than ever, thanks to better data on mortality

and cause-of-death, but it is clear that progress in implementation is not fast enough, despite encouraging changes in attention, and in some countries, rapid changes in policy (Shiffman 2010; Lawn *et al.* 2012).

Yet it is also clear that the conditions for more rapid and sustainable change at scale are increasingly in place, including greater understanding of how to harness social and organizational partnerships for the spread of innovations and availability of a number of products that could energise accelerated programme change. More investments are needed to integrate what we know works into large-scale delivery systems, applying the science of social and behaviour change. Empowered and well-connected frontline workers will be critical to the delivery of integrated, high-quality, care to mothers and their newborns.

Over the last decade, the global health community and families in countries have changed previously unquestioned beliefs—today it is no longer acceptable for someone who is HIV positive to not be treated just because they live in a low-income country. It is no longer acceptable for women to die while giving birth or for men and women to not be able to plan their families due to lack of access to contraceptives. As impatient optimists, we believe that the next decade will bring transformational change for newborns and it will no longer be acceptable for babies around the world to die of preventable causes.

Funding

This analysis and the supplement were funded by Save the Children's Saving Newborn Lives programme through a grant from The Bill & Melinda Gates Foundation.

Conflict of interest

None declared.

References

- Ban K. 2010. *Global Strategy for Women's and Children's Health*. New York: United Nations. Available from: <http://everywomaneverychild.org/>, accessed 14 May 2012.
- Blencowe H, Cousens S, Oestergaard M *et al.* 2012. National, regional and worldwide estimates of preterm birth rates in the year 2010 with time trends for selected countries since 1990: a systematic analysis. *The Lancet*. in press.
- Bloom D, Canning D. 2011. Demographics and Development Policy. *Development Outreach*. April 2011.
- Cousens S, Blencowe H, Stanton C *et al.* 2011. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. *The Lancet* **377**: 1319–30.
- Darmstadt GL, Bhutta ZA, Cousens S *et al.* 2005. Evidence-based, cost-effective interventions: how many newborn babies can we save? *The Lancet* **365**: 977–88.
- Darmstadt GL, Hussein MH, Winch PJ *et al.* 2007. Neonatal home care practices in rural Egypt during the first week of life. *Tropical Medicine & International Health* **12**: 783–97.
- Darmstadt GL, Walker N, Lawn JE *et al.* 2008. Saving newborn lives in Asia and Africa: cost and impact of phased scale-up of

- interventions within the continuum of care. *Health Policy and Planning* **23**: 101–17.
- Gribble J, Voss M. 2009. Family planning and economic well-being: new evidence from Bangladesh. Policy Brief. Washington, DC: Population Reference Bureau. Online at: <http://www.prb.org/pdf09/fp-econ-bangladesh.pdf>, accessed 14 May 2012.
- Khan A, Kinney MV, Hazir T *et al.* 2012. Newborn survival in Pakistan: a decade of change and future implications. *Health Policy and Planning* **27**(Suppl. 3):iii72–iii87.
- Knippenberg R, Lawn JE, Darmstadt GL *et al.* 2005. Systematic scaling up of neonatal care in countries. *The Lancet* **365**: 1087–98.
- Kumar V, Kumar A, Darmstadt GL. 2010. Behavior change for newborn survival in resource-poor community settings: bridging the gap between evidence and impact. *Seminars in Perinatology* **34**: 408–15.
- Lawn JE, Cousens S, Zupan J. 2005. 4 million neonatal deaths: when? Where? Why? *The Lancet* **365**: 891–900.
- Lawn JE, Cousens SN, Darmstadt GL *et al.* 2006. for The Lancet Neonatal Survival Series steering team. 2006. 1 year after The Lancet Neonatal Survival Series—was the call for action heard? *The Lancet* **367**: 1541–7.
- Lawn JE, Kinney MV, Black RE *et al.* 2012. Newborn survival: a multi-country analysis of a decade of change. *Health Policy and Planning* **27**(Suppl. 3):iii6–iii28.
- Liu L, Johnson H, Cousens S *et al.* 2012. Global, regional and national causes of child mortality: an updated systematic analysis. *The Lancet*. in press.
- March of Dimes, PMNCH, Save the Children, WHO. 2012. In: Howson CP, Kinney MV, Lawn JE (eds). *Born Too Soon: The Global Action Report on Preterm Birth*. Geneva: World Health Organization.
- Mbonye AK, Sentongo M, Mukasa GK *et al.* 2012. Newborn survival in Uganda: a decade of change and future implications. *Health Policy and Planning* **27**(Suppl. 3):iii104–iii117.
- Moran AC, Kerber K, Pfitzer A *et al.* 2012. Benchmarks to measure readiness to integrate and scale up newborn survival interventions. *Health Policy and Planning* **27**(Suppl. 3):iii29–iii39.
- Oestergaard MZ, Inoue M, Yoshida S *et al.* 2011. Neonatal mortality levels for 193 countries in 2009 with trends since 1990: a systematic analysis of progress, projections, and priorities. *PLoS Medicine* **8**: e1001080.
- Pattinson R, Kerber K, Buchmann E *et al.* 2011. Stillbirths: how can health systems deliver for mothers and babies? *The Lancet* **377**: 1610–23.
- Pradhan YV, Upreti SR, KC NP *et al.* 2012. Newborn survival in Nepal: a decade of change and future implications. *Health Policy and Planning* **27**(Suppl. 3):iii57–iii71.
- Requejo JH, Bryce J, Deixel A *et al.* 2012. *Accountability for Maternal, Newborn & Child Survival: An update on progress in priority countries*. Geneva: World Health Organization.
- Rubayet S, Shahidullah M, Hossain A *et al.* 2012. Newborn survival in Bangladesh: a decade of change and future implications. *Health Policy and Planning* **27**(Suppl. 3):iii40–iii56.
- Shiffman J. 2010. Issue attention in global health: the case of newborn survival. *The Lancet* **375**: 2045–9.
- United Nations. 2012. UN Launches Commission on Life-Saving Commodities for Women and Children. Online at: <http://www.everywomaneverychild.org/component/content/article/10-media/290-un-launches-commission-on-life-saving-commodities-for-women-and-children>, accessed 14 May 2012.
- WHO, UNICEF, USAID, Save the Children. 2009. WHO-UNICEF Joint Statement on home visits for the newborn child: a strategy to improve survival. Geneva: World Health Organization.
- Zimba E, Kinney MV, Kachale F *et al.* 2012. Newborn survival in Malawi: a decade of change and future implications. *Health Policy and Planning* **27**(Suppl. 3):iii88–iii103.