Nearly a decade ago, the Lancet published the Neonatal Survival Series, with an ambitious call for integration of newborn care across the continuum of reproductive, maternal, newborn, and child health and nutrition (RMNCH). In this first of five papers in the Every Newborn Series, we consider what has changed during this decade, assessing progress on the basis of a systematic policy heuristic including agenda-setting, policy formulation and adoption, leadership and partnership, implementation, and evaluation of effect. Substantial progress has been made in agenda setting and policy formulation for newborn health, as witnessed by the shift from maternal and child health to maternal, newborn, and child health as a standard. However, investment and large-scale implementation have been disappointingly small, especially in view of the size of the burden and potential for rapid change and synergies throughout the RMNCH continuum. Moreover, stillbirths remain invisible on the global health agenda. Hence that progress in improvement of newborn survival and reduction of stillbirths lags behind that of maternal mortality and deaths for children aged 1–59 months is not surprising. Faster progress is possible, but with several requirements: clear communication of the interventions with the greatest effect and how to overcome bottlenecks for scale-up; national leadership, and technical capacity to integrate and implement these interventions; global coordination of partners, especially within countries, in provision of technical assistance and increased funding; increased domestic investment in newborn health, and access to specific commodities and equipment where needed; better data to monitor progress, with local data used for programme improvement; and accountability for results at all levels, including demand from communities and mortality targets in the post-2015 framework. Who will step up during the next decade to ensure decision making in countries leads to implementation of stillbirth and newborn health interventions within RMNCH programmes?

Introduction

During the 1990s, more than 4 million neonatal deaths worldwide each year were hardly mentioned in global health circles, and newborn care was perceived as technical, expensive, and difficult in cost-effective solutions feasible for low-income countries. It was widely assumed that investment in newborn health would wait until countries had greater wealth and more functional health systems. These myths were challenged in 1999, when Abhay Bang published results from rural India showing that a home-based package of maternal and newborn health interventions delivered by community health workers (CHWs) could reduce neonatal mortality by 62%. In 2000, the Bill & Melinda Gates Foundation funded Save the Children’s Saving Newborn Lives initiative to develop evidence, policy, and programmes to improve global newborn survival. The Lancet Child Survival Series in 2003 catalysed rethinking of the global child-health agenda, and noted the important burden of newborn deaths, but at the time details were insufficient on neonatal causes of death, interventions (especially at community level), and how to deliver newborn care at scale in low-resource settings.

In 2005, the Lancet Neonatal Survival Series sought to accelerate action by describing the timing, causes, and location of neonatal deaths; identifying highly cost-effective interventions that could avert more than two-thirds of neonatal deaths, including about a third through community care; and outlining how these solutions can be delivered by integration and scaling up at both facility and community levels for an estimated additional cost of US$1 per person, of which about 70% would also benefit mothers and older children. A “new category of vulnerable persons that did not exist in the minds of many global health actors” received widespread attention for the first time, driven especially by the recognition that Millennium Development Goal (MDG) 4 for child survival could not be achieved without increased attention to newborn health. An ambitious call was made for ownership of newborn health outcomes across the continuum of care for reproductive, maternal, newborn, and child health and nutrition (RMNCH) for women and children, and linking community, outreach, and facility care. 1 year later progress seemed promising, but in 2013, the independent Expert Review Group of the UN Secretary General’s Every Woman Every Child movement highlighted that neonatal deaths still need more attention, and they account for an increasing proportion (now 44%) of deaths of children younger than 5 years.

This paper is the first in a five-part Series on newborn health and survival and stillbirths in which we analyse the extent to which the 2005 call to action in the Lancet was acted on, in the broader context of changes in global health (panel I). We acknowledge that measurement of effects on policy and practice is complex, and do not seek to attribute changes to the Lancet Neonatal Survival Series; rather, we aim to assess what has changed and, if something has not, then why not, as a basis for accelerating progress for every newborn baby (figure 1).
Assessment of changes and challenges

Agenda setting

We rate agenda setting for newborn health (figure 1) overall as “green”, indicating major advances (figure 2, appendix). This shows the rapidity with which evidence has been generated and disseminated. As noted by Shiffman,10 “Researchers produced reviews of evidence that summarised successful strategies for newborn care.

Key messages

Change during the past decade

- Agenda setting for newborn health has advanced remarkably, fuelled by effective evidence generation and driven partly by a relatively small group of technically oriented newborn-health champions. Newborn health is now widely recognised as a crucial element of the reproductive, maternal, newborn, and child health and nutrition (RMNCH) continuum of care that needs more systematic attention, and political mobilisation in countries is growing.

- Advances have been notable for burden of disease measurement and evidence for interventions for the three main causes of newborn deaths—preterm birth, intrapartum-related deaths, and infections—and, more recently, for stillbirths. Evidence is scarce, however, on prevention of preterm birth, and stillbirths remain silent on the global agenda.

- Policy formulation and adoption has been relatively rapid at global level and in some countries. Country commitments, plans, and budgets are variable and poorly tracked. Coalition building for wider ownership and integration of newborn health is now needed.

- Where progress in countries has occurred, it has been enabled by strong leadership and partnerships, use of data and locally generated and adapted evidence to inform policy and programme design and implementation, and linking of community and facility-based care, bringing life-saving newborn care interventions closer to communities and engaging and equipping front-line health-care workers.

Challenges to address

- The newborn health movement aimed to promote a comprehensive, context-specific approach, with facility and community newborn care integrated in RMNCH programmes, but this has been in a context of single-issue global health investment; newborn health has only recently started to connect with global initiatives and funders.

- Partnerships across the RMNCH continuum of care are fragmented and oriented toward single-issue advocacy and funding, and newborn survival has not been among the main issues. Links with maternal health, family planning, child health, and nutrition are particularly crucial, and countries successful in reduction of neonatal mortality rate have had alliances with some of these specialties—most commonly maternal health.

- Low investment by donors and limitations in technical capabilities and capacity in many countries, absence of prioritisation among newborn health interventions, and the belief that improved maternal care or child care would trickle down to newborn care has hampered progress; countries with rapid neonatal mortality rate (NMR) change added specific care for small and ill newborn babies.

- Leadership for newborn health is poor. In high-income countries a new professional group (neonatologists) took the lead, but this cadre of health work does not exist in most areas of the world. Clinical cadres are not clear on who is responsible for newborn care (assessing all newborn babies, managing small and ill babies, and counselling the mother and family).

- Coordination of partners has been poor in provision of technical assistance and funding in countries, and Ministries of Health typically do not have designated programme managers with clear responsibility or expertise in newborn health.

- Quality of care at facilities is a key missed opportunity, and also necessitates better linkages with communities.

- Metrics and data for coverage of interventions and programme implementation, as well as accountability are limited and often poor.

- In high-income and middle-income countries, parent voices and professional groups (especially neonatologists) have pushed the agenda for newborn health and stillbirths. In low-income countries, parents—especially women—do not have powerful voices, and professionals might not speak up for newborn care.

Opportunities

- Strong consensus exists that the burden of neonatal mortality (44% of under-5 deaths), plus stillbirths and neonatal morbidity or disability is substantial, and improvement of child survival will depend on greater investment in newborn survival. Rapid progress is possible in view of highly cost-effective interventions that can be delivered through facility and community platforms.

- The Every Newborn Action Plan is the best opportunity yet to reach a high level of leadership and investment, with clear priorities, and improved stakeholder coordination with countries, tracking data and accountability at all levels. To succeed it must:
  - Set goals that are part of the post-2015 framework
  - Intensify political attention and leadership, including supporting women, families, and communities to speak up for their newborn babies and shifting from social norms that accept these deaths as inevitable
  - Invest for impact as well as harmonise funding channels and technical assistance
  - Implement at scale, with particular attention to increasing health worker numbers and skills, and quality care for newborn babies, as well as mothers and children
  - Innovate and undertake context-specific research
  - Evaluate and track coverage of priority interventions and have clear indicators and accountability to accelerate progress and reach the poorest.
and made this information widely available in forms accessible to policy makers and programme managers. Although the evidence base is incomplete, especially for prevention of preterm birth and implementation at scale, myths about newborn health being highly technical and expensive have mostly been dispelled. The importance of newborn health is clear, solutions exist, a path forward has been agreed (eg, Every Newborn Action Plan [ENAP]), and attention to newborn survival by global health actors and countries has grown substantially (figure 2).

The quality, frequency, and visibility of data for newborn health have improved notably (appendix). A decade ago, the frequency with which country-level neonatal mortality estimates were published was erratic and, in many cases, limited in a particular country to only one timepoint. Neonatal mortality trend estimates are now produced annually by more than one group. Neonatal health is represented in the Global Burden of Disease study (although stillbirths are missing), and data inputs and methods are well described in peer-reviewed journals and in the public domain, enabling use of estimates for decision making.

Substantial increases have occurred in absolute numbers and proportions of publication search terms that mention newborn (11–4% in 1990–95 to 22–0% in 2006–10) and stillbirth (16–8% to 26–1%), and are set in low-income and middle-income countries (appendix). However, few publications address stillbirths (0–04 ratio of stillbirth:newborn) and, because all publications related to human health are continuing to increase, the proportions that mention newborns (4–5%) or stillbirths (0–2%) have not changed. Preterm birth—the biggest cause of newborn deaths and the second biggest cause of death in children younger than 5 years—has gained wider attention (panel 2). Stillbirths are woefully neglected in research, advocacy, policy, and programme action, despite the case presented in the Lancet Stillbirths Series. The estimated 1·2 million intrapartum stillbirths are the largest burden for deaths at birth, and this rate might be the most sensitive indicator of quality of a country’s health system. Analyses of neurodevelopmental impairments and disabilities after neonatal insults emphasise the importance of improvement of measurement and follow-up systems, especially when neonatal intensive care is being scaled up.

Several journal supplements and Lancet Series summarise evidence on the burden, interventions, and approaches to scaling up solutions for stillbirths, intrapartum-related deaths (birth asphyxia), and preterm birth. Influential reports have helped policies to gain momentum, achieve media coverage, and draw attention to these issues. Evidence has emerged for the efficacy of several interventions—eg, kangaroo mother care, chlorhexidine cord cleansing, topical emollient therapy—and four commodities for newborn health have been prioritised by the UN Commission on Life Saving Commodities (appendix).

Panel 1: Policy analysis
We synthesise learning and progress in global newborn health and survival and for stillbirths during the past decade across five categories adapted from a policy process heuristic agenda setting, policy formulation and adoption, leadership and partnerships, implementation, and evaluation (defined in figure 1). Our theory of change includes these five components (figure 1), and posits that evidence and issue-attention stimulates policy formulation and adoption, that advocacy and leadership alongside country commitment and domestic funding drive programming, resulting in increases in coverage of interventions and, ultimately, reductions in neonatal mortality. Leadership and partnership is not a phase in the policy process but a support to all phases; technical assistance and funding from global partners might also contribute to these processes. In reality, it is well recognised that policy progress is rarely linear, and many changes might occur at once, because a particular input might often address more than one element in the process of change. Inadequate assessment leads to missed opportunities to accelerate progress all along the path to effect.

To enable our assessment of progress against the 2005 call for action, we created a method for assessment of actions in newborn health across the five categories (appendix). We grouped the calls to action according to these categories and summarised progress in a scorecard (figure 2).

Figure 1: Policy process heuristic used to frame assessment of changes and challenges for newborn survival

More than a dozen large randomised controlled trials have examined the effectiveness of community-based care, including home visits for maternal and newborn care, women’s groups, and community case-
Figure 2: Scorecard on global performance in achievement of the Call to Action from the 2005 Lancet Neonatal Survival Series, by category of policy analysis heuristic (figure 1). Red=minimal progress; Yellow=partial progress; Green=incremental advances. NMR=neonatal mortality rate; RMNCH=reproductive, maternal, newborn, and child health; IMCI=integrated management of childhood illnesses; CLtL=Closing the Loop initiative; GPNI=Global Platform for Innovation and Newborns; iERG=International Early Resuscitation Group; PMNCH=Partnership for Maternal, Newborn, and Child Health; SUN=Scaling Up Nutrition; FP2020=the London Summit on Family Planning; GAVI=Global Alliance for Vaccines and Immunizations; LHGNU/LHGNU=Leadership and Health Sector Partnerships; NMN=National Maternal and Newborn Health Taskforce; iERG=International Early Resuscitation Group; UNICEF=United Nations Children’s Fund; UNHCR=United Nations High Commissioner for Refugees; UNICEF=United Nations Children’s Fund; NMR=neonatal mortality rate; IERG=International Early Resuscitation Group; SP=Strategies Plus; PMNCH=Partnership for Maternal, Newborn, and Child Health; SUN=Scaling Up Nutrition. FP2020=the London Summit on Family Planning. IERG=Independent Expert Review Group. UN-IGME=United Nations Inter-agency Group for Mortality Measurement. IHME=Institute for Health Metrics and Evaluation. 1 Call to action quotes from Martines and colleagues’ and Lawn and colleagues’. More details in appendix pp 2–15.

management of common newborn illnesses (appendix). Analyses of programme learning in selected countries have reinforced the value of a systematic approach to programme management, first outlined in the 2005 Lancet Neonatal Survival Series and revisited in 2012 (appendix). However evidence on effective processes...
for integration of newborn health care into low-income health systems is limited. Similarly, the research gap into understanding of solution pathways for preterm birth—eg, the biological basis of term and preterm labour and invention of new ways to prevent preterm birth—needs to be bridged.11

Policy formulation and adoption

Our overall scorecard assessment of progress is “yellow” for partial progress (figure 2, appendix), with substantial variability across countries. Since 2005, newborn survival has attained increased policy visibility. Maternal, newborn, and child health (MNCH) has become everyday parlance in the public health community, replacing “maternal and child health” and indicating the expectation that care for mothers and children will include newborn health interventions.12 Several important policy changes and programmatic shifts have occurred during a relatively brief period (appendix), such as global guidance from WHO and UNICEF on content and timing of postnatal home visits for newborn care in 2009, and recommendations for implementation of women’s groups.13

In 2005, a major call to action was for countries to do situation analyses and develop national plans of action, with defined neonatal mortality reduction targets and timelines, to be implemented within maternal health and child survival programmes (appendix). 13 high-burden countries, six since 2007, have produced national newborn situation analyses (appendix). Among these 13 countries, 11 have national health plans that mention “newborn” or “neonatal” (plans for the other two could not be accessed), six mention “stillbirth” or “fetus” (appendix), and nine have targets for reduction of neonatal mortality with timelines (appendix). The Countdown to 2015 profiles suggest that 40 Countdown countries have developed costed implementation plans for maternal, newborn, and child health,14 although we have not verified whether these plans specifically address newborn health, and donor response to these plans has been poorly coordinated (appendix). After WHO and UNICEF issued the Joint Statement on Home Visits for the Newborn Child,15 all countries in south Asia and most in Africa reportedly began implementing home-visit packages for women and newborn babies, and most included postnatal family planning.16 Countdown found, in 2012, that 30 countries had a policy recommending early postnatal home visits to mother and baby within the first week of life, and CHWs were authorised to do postnatal home visits in the first week of life in 18 countries.

Although the evidence base for interventions and packages was presented in 2005, the call for a comprehensive, integrated approach might have been an impediment for countries with poor technical capabilities in newborn health. In 2005, at least 20 African governments approached WHO for technical assistance in addressing newborn health,17 and from 2006–08, WHO led a series of African regional workshops on integration of newborn health into existing maternal and child health platforms.18,19 Countries that adopted newborn health policies had strong local leadership and consistent convening mechanisms supported by ongoing technical and funding inputs.20

Policies have tended to be heavily focused on the public sector even though an increasing proportion of families are delivering babies and seeking treatment in the private sector, especially in Asia.21 After the 2005 series, development partners were promoting, and countries were demanding, support for community-based newborn

Panel 2: Born Too Soon and World Prematurity Day—collective power of parents, professionals, and politicians

Although preterm birth is well recognised in high-income countries as the most common cause of deaths and disability in children, global health circles rarely note that this is the second most common cause of death for children worldwide, and should be a major global issue. In 2012, the combination of new data, a policy-relevant and programme-relevant report,22 and parent power with media coverage led to major global issue-attention.

The first national estimates of preterm birth undertaken by WHO and published in The Lancet23 drew attention to the fact that 15 million babies are born preterm every year—11% of all births. Born Too Soon: the global action report on preterm birth delineated evidence-based solutions, especially for the care of preterm babies, feasible even in low-income settings.23,24 The report involved more than 100 experts from more than 50 international, regional, and national organisations, showing collective action by the global reproductive, maternal, newborn, and child health and nutrition (RMNCH) community and with high-level leadership given in a foreword by the UN Secretary General. The report achieved major media coverage, reaching an audience of more than 1 billion through traditional and social media.25 In 2012, World Prematurity Day was accompanied by events with parliamentarians, health professionals, and parents in more than 60 countries.26 In 2013, World Prematurity Day reached an estimated 1·5 billion people through a global media release of new preterm data, television coverage, and coordinated Facebook and Twitter campaigns.27 This momentum led to the development of the Every Newborn Action Plan.28,29 Strategies that worked to raise attention included repeated and refreshed messaging with new data, leveraging of partner networks at global and regional level, promotion of cooperation not competition between partners, and agreeing on common messaging, timing, and branding, including freely available planning methods with new national data.30 These methods built on learning from HIV/AIDS activism, and also on what worked and did not work in the 2005 Lancet Neonatal Survival Series.30

The voices and actions of parents and people affected by preterm birth were the most vocal agents for change, as in the AIDS movement. Thousands of people shared personal stories on the World Prematurity Day Facebook page, millions of people engaged in Twitter discussions, and many blogs were written and videos and photos shared. Increasingly, parents are organising among themselves to raise awareness, petition governments for policy changes, and call for improved quality of facility health professional training and public education on care for premature babies.31 To maximise the influence of parents necessitates coordinated political and social mobilisation strategies and an intentional effort from all stakeholders to engage affected parents in media and in accountability fora.

The effectiveness of the Every Newborn Action Plan will need data and technical content from professionals and accountability from politicians for their most vulnerable citizens—their newborn babies. But the most important and powerful voices are those of parents, especially women who are the primary carers of newborn babies and carry the heaviest load of loss, and even stigma, if their babies die or are disabled.
care approaches, in view of the evidence for their effect. However, a more balanced emphasis across community and facility care is necessary, especially in view of increasing birth facility coverage and the imperative to address preterm birth and intrapartum complications.

**Leadership and partnerships**

Our overall assessment for leadership and partnerships is “yellow” for partial progress (figure 2, appendix). As noted by Shiffman, newborn health has been taken up by several global initiatives and organisations during the past decade (figure 3, appendix). The establishment in 2010 of Every Woman Every Child has created a potentially powerful umbrella “to mobilize and intensify global action to improve the health of women and children around the world”. The Saving Newborn Lives programme, with support from the Bill & Melinda Gates Foundation, in close collaboration with the US Agency for International Development (appendix) linked to leadership from a highly aligned group of champions and technical experts, is credited with playing a central part in the rise of the political prioritisation of newborn health. UNICEF and WHO, potentially two of the most influential organisations at country level, have shown variable involvement and leadership (appendix). In 2013, they began to cochair the development of ENAP, signalling new leadership from both institutions.

Shiffman noted little evidence that grassroots organisations have fuelled awareness of the importance of newborn health; our assessment has shown civil society to be weak to non-existent in driving accountability for newborn care at a country level, and in need of activation (appendix). Since 2012, parent groups and an engaged public, largely in high-income countries, have actively supported newborn health, for example in the Born Too Soon movement and World

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**Figure 3: Timeline for global initiatives, partnerships, and organisations relevant to newborn health, January 2000-December 2013**

MDG=Millennium Development Goal. IPU=Inter-Parliamentary Union. PEPFAR=President’s Emergency Plan for Aids Relief. MNCH=maternal, newborn, and child health. RMNCH=reproductive, maternal, newborn, and child health and nutrition. GAVI = Global Alliance for Vaccines and Immunisation.
Prematurity Day (panel 2), and helped to energise the emergence of ENAP.

Since 2005, several initiatives and partnerships have emerged that focus on elements of the RMNCH continuum with relevance to newborn health. However, few have prioritised newborn health, nor has it had high-level political prioritisation among global stakeholders or in most countries (figure 3, appendix). Several corporate players have committed to participate in and fund RMNCH initiatives in low-income countries. While global rhetoric has promoted integrated RMNCH programming, several single-issue initiatives and partnerships have received high-level attention and substantial commitments of funds from donors (figure 3). In this context, the call to action of the 2005 *Lancet* Neonatal Survival Series—which resembled comprehensive primary health care in calling for integration of newborn care along the continuum of care and across the health system—might have put newborn survival at odds with single-issue initiatives. In the past several years, there has been a shift among several global health funders, for example the World Bank through its Health Results Innovation Trust Fund, and by countries, towards funding across the RMNCH continuum, recognising that to strengthen antenatal or postnatal care, or both, and the overall system, results in benefits for disease-specific initiatives and the continuum of care, including newborn survival.

The Partnership for Maternal, Newborn and Child Health (PMNCH) was formed in 2005, from three separate partnerships for maternal, newborn, and child survival, and now represents more than 500 organisations across seven constituencies spanning the RMNCH continuum. PMNCH is beginning to assume leadership in advocacy for newborn babies, especially in the lead-up to the launch of ENAP in 2014, identifying interventions for scale-up in country programmes and including newborn health in policy briefs for countries. However, a major challenge for the PMNCH is to try to coordinate across the plethora of global health initiatives and partners, and to track their commitments (figure 3).

Absence of clear leadership and mechanisms across global partners and initiatives for coordination in funding, advocacy, and technical assistance to country programmes, and absence of feedback loops linking global action with clear country plans and their needs for budgetary and technical support, have hampered advancement of newborn survival (appendix). The RMNCH Steering Committee was created to help to fill these gaps, specifically among UN agencies. A Promise Renewed emerged from the Child Survival Call to Action in 2012 and more than 175 governments and 400 civil society and faith-based organisations have been enlisted in a pledge to end preventable child deaths. A Promise Renewed’s weak engagement in maternal and reproductive health needs to be strengthened if this platform is to deliver on its promise to improve newborn health and survival.

Tapping into additional individuals and organisations across the continuum will be necessary to effectively integrate newborn health into health policy. However, some stakeholder groups along the RMNCH continuum have shown reluctance to embrace newborn care. A misperception that the 2005 *Lancet* Series promoted a community focus to the neglect of facility-based care necessary for maternal survival created tension and inhibited partnership between maternal health and newborn health champions. More recently, however, there has been increased common ground in approaches to programmes for maternal health and newborn health. It might be swayed to focus attention in areas in which donors have prioritised funding. As noted by Shiffman, some child survival specialists also question the need for separate attention to newborn health, since this might diminish resources for other unfinished aspects of the child survival agenda. It will be important to systematically identify constituencies within the RMNCH continuum, and better understand their interests and perceptions of the benefits and risks of engaging in newborn health; identification of common ground is essential for development of joint messaging and advocacy, and to capitalise on potential synergies in integration of newborn health into broader programmes.

**Implementation**

**Overview**

In view of the wide variability in progress across and within countries, our overall assessment of progress in implementation (across funding and country programmes) is “red”, indicating minimum progress in institutionalisation of newborn health across RMNCH programmes in most countries (figure 2, appendix).

As noted by Shiffman, “The fate of newborn health in the next decade depends on the extent to which this unfinished agenda reaches beyond global health actors and is successfully pursued within countries”. Although developments in global leadership and partnerships provide new opportunities for newborn health, the key to progress in increasing coverage of interventions and saving newborn lives lies with and within countries.

**Funding**

In the future, increases in support for health programmes in developing countries will come primarily from...
domestic budgets; however, data for country spending on newborn health are inaccessible. National Health Accounts data, for example, do not separate financing for newborn health or even for RMNCH as a category; efforts are underway to track this financing in the future. Trend data on specific human resources, such as midwives with newborn care skills, are incomplete, and in high-burden countries neonatal nurses or neonatologists are almost absent.

To understand aid flows for newborn health, we updated (appendix) the analyses by Pitt and colleagues,75 who used key terms associated with newborn survival to search donor disbursement records and identify investments that affect newborn health (but also benefit maternal health and child health), and by Hsu and colleagues,76 who analysed official development assistance flows to maternal, newborn, and child health. We found that total non-research donor disbursements increased substantially from about US$52 million in 2003, to $613 million in 2010 (figure 4). In 2003, only 2% of MNCH official development assistance disbursement mentioned the word newborn, whereas by 2010, 10% mentioned newborn. Only about 4% of child health investments go to newborn health, despite 44% of deaths of children younger than 5 years being in the neonatal period; the bulk of this funding goes instead to immunisation, HIV, and malaria. Opportunities exist to improve the effectiveness of maternal and child health funding for newborn survival—eg, through the Health Results Innovation Trust Fund and other performance-based mechanisms, and the use of Global Fund to Fight AIDS, Tuberculosis and Malaria funding to strengthen antenatal care and childbirth services.77 The words stillbirth or fetal are almost absent from donor funding databases.75

About 25% (n=75) of all commitments under Every Woman Every Child include newborn survival, with 31% of these commitments from middle-income and low-income countries and another 20% from non-governmental organisations; the remaining commitments from high-income countries, health-care professional associations, the private sector, and others vary from 3–15% across these categories.78 Most of these commitments were linked to the launch of the Born Too Soon report.79 A new Global Investment Framework for Women’s and Children’s Health80 estimates that the right investment of $5 per person per year could prevent 147 million child deaths (including 60 million newborn babies), 32 million stillbirths, and 5 million maternal deaths cumulatively by 2035, and would yield a return of close to nine times in the form of social and economic benefits during the 23 year period 2012–35. The costing methods and approaches used in this framework, as well as the Lives Saved Tool,80 are available to countries,81,82

Country programmes

Here we draw from data collected through a systematic process in six Saving Newborn Lives focus countries which assessed progress towards programme readiness for implementation of newborn health interventions at scale,41 examined country context and changes in health systems, and mapped pathways to change in newborn health (appendix),44,48 Outside Saving Newborn Lives-supported work,22,83–90 and analyses of political prioritisation of newborn health in selected countries,91–93 little programme-learning is published on scaling up of newborn health interventions. Several key factors exist for success in scaling up newborn health interventions: strong national leadership, especially partnerships of organisations central to health-care delivery at scale, and early engagement of these partners in policy dialogue and as network agents for spread of learning; use of data and locally generated and adapted evidence to inform policy and programme design and implementation; linking of community with good facility-based care, building on national cadres of CHWs to bring life-saving newborn care interventions closer to communities, engaging well trained and well supervised frontline workers and communities in intervention design and adaptation, and in behaviour change of both providers and beneficiaries; availability of life-saving newborn health commodities;95–98 formation of a national interest group early in programme development to convene partners with focus on newborn health; and appointment of a newborn health-specific programme manager, for example within the Ministry of Health, with clear accountability for newborn health and survival.99

A crucial element missing in both communities and in facilities in many countries is a clear definition of clinical roles and responsibilities in newborn care—ie, which cadre is accountable for assessment, management, and treatment of the newborn baby, counselling of the mother and family, and ensuring the newborn baby

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Figure 4: Changes in official development assistance for maternal, newborn, and child health as tracked by Countdown to 2015

Data from the Organisation for Economic Co-operation and Development and new analysis to update that by Pitt and colleagues,75 and Hsu and colleagues.76 ODA=official development assistance. MNCH=maternal, newborn, and child health.

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[Figure legend: This figure shows changes in official development assistance for maternal, newborn, and child health as tracked by Countdown to 2015. The data are from the Organisation for Economic Co-operation and Development and new analysis to update that by Pitt and colleagues, and Hsu and colleagues. ODA (official development assistance) and MNCH (maternal, newborn, and child health) are highlighted in the figure. The years 2003 to 2010 are shown, with values indicating millions of US dollars (constant 2010). The figure illustrates the trend in official development assistance for maternal, newborn, and child health, with a sharp increase seen from 2003 to 2010.]
survives? Additionally, community-based interventions depend heavily on social and behavioural change and a functional system of support for CHWs and extension workers for scale-up. There is no single starting point (eg, newborn single-issue vs linking of newborn health to maternal health, child health, or both) or sequencing (eg, starting with maternal or child health) that is necessary in development of newborn health programmes. As country programmes evolve, they tend to strengthen links between community and facility care, and across maternal health and child health. Well functioning health systems are not necessary to begin the process of improvement of newborn survival, and experience has shown that, as country health systems develop, and women and newborn babies seek facility-based care, the gap in quality of care at all levels, including health facilities, becomes more visible, and overcrowded facilities might either be agents for change or could put off women and families from seeking care.80–84 Provision of obstetric care is crucial, but will not automatically trickle down to improve perinatal outcomes; active steps are needed to improve skills of health workers and availability of commodities for newborn care.85 The reduction of 1·2 million intrapartum stillbirths needs specific attention to intrapartum fetal monitoring and timely assisted delivery or caesarean section if necessary.86 Reduction of neonatal deaths necessitates that the attendant be able to provide emergency care for the baby as well as the mother—notably resuscitation.87 No country has achieved major reduction in neonatal deaths without specifically targeting the sick and small (either preterm, small for gestational age, or both) baby for extra care.

Evaluation

Overview

Our overall assessment of progress in coverage of care and in newborn survival is “red”, in view of the fact that coverage of some aspects of care has improved but is poorly tracked, and rates and numbers of neonatal deaths and stillbirths are decreasing, although progress is substantially slower than for older children and highly variable across countries (figure 2, appendix).

Coverage of care

In 2005, we reported88 that scaling up of 16 proven interventions in the context of maternal and child health programmes to universal (99%) coverage could avert an estimated 41–72% of neonatal deaths worldwide. A decade later, however, population-based data are available for only five of the 16 specific interventions, and trend data for just one (figure 5). How to measure several others is better understood, but the rest still do not have agreed indicators that are routinely measured across countries.89 Postnatal care is now tracked by the WHO independent Expert Review Group and Countdown to 2015.90 However, data are only available for about 38 countries, and only 17 countries measure postnatal care of newborn babies specifically, although this number is increasing.91,92 An estimated 44% of mothers and 30% of newborn babies receive postnatal care within 48 h in these countries. The Newborn Indicators Technical Working Group has achieved consensus on indicators for care of the newborn baby that can be collected through household surveys (ie, drying, delayed bathing, and cutting the cord with a clean instrument) and on testing of two further indicators (immediate skin-to-skin care and applications to the umbilical cord).93

Maternal tetanus toxoid immunisation rates increased from 65% in 2000, to 85% in 2010 (figure 5), with corresponding reductions in newborn deaths attributable to tetanus (93% reduction globally since 1988) and elimination in 25 countries as of December, 2013,94,95 with credit to the UNICEF and WHO Maternal Neonatal Tetanus Elimination Initiative.96 Rates of intermittent preventive treatment of malaria in pregnancy have increased from 25% in 2005, to 41% in 2010, fuelled by a successful single-issue programme.97 Skilled birth attendance has also increased from 55% in 2000 to 62·5% in 2010, probably because of a complex interplay between various factors, including girls’ education.98,99 Most of the increase in coverage of skilled care at birth has occurred in countries in the two highest mortality bands (neonatal mortality rate [NMR] 15 to ≤30 deaths per 1000 livebirths: annual rate of change 1·9%; NMR ≥30 deaths per 1000 livebirths: annual rate of change 1·8%; table). Although this correlation is to be expected, in view of the fact that coverage of skilled care is already very high (>90%) in countries where NMR is less than 15 deaths per 1000 livebirths, it indicates that improvements are reaching settings where the need is greatest. Moreover, countries with faster increases in coverage of skilled birth attendance have also tended to reduce inequalities.100

Mortality

Since 2000, 13 countries have reduced their NMR by more than 50%, including one country from sub-Saharan Africa: Rwanda. Moreover, 102 countries achieved reductions in NMR of 25–50% from 2000–12, and 17 of these are in Africa.101,102 The average annual rate of reduction (ARR) in global NMR was 1·3% from 1990–2000. Between 2000 and 2010, post-neonatal child mortality between 1 and 59 months reduced by 4·5% per year, whereas neonatal mortality reduced at a slower rate of 2·8% per year—still more than double the ARR for NMR for the preceding decade.103 As a result, the proportion of under-5 deaths that occur in the neonatal period increased from 36% in 2000, to 44% in 2012, and now exceeds 50% in five developing regions.104 An analysis of factors associated with changes in NMR showed that, when adequate data were available outside developed regions (ie, north Africa, Asia, central Asia, Caucasus, Latin America), countries with high total fertility rates
<table>
<thead>
<tr>
<th>Series</th>
<th>16 interventions included in The Lancet Neonatal Survival Series (2005) (unshaded rows)</th>
<th>Changes in the approach</th>
<th>Is the indicator agreed and tracked?</th>
<th>Coverage for 75 Countdown countries, median (IQR; number of surveys)</th>
<th>2000</th>
<th>Most recent since 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconception</td>
<td>Folic acid supplementation</td>
<td>Shift from supplementation to fortification of foodstuffs</td>
<td>No coverage data</td>
<td>43 countries have mandated fortification of at least one grain; 17 countries planning. 3 countries voluntary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal care</td>
<td>At least one antenatal care visit during pregnancy</td>
<td>At least four antenatal care visits during pregnancy</td>
<td>Yes, Countdown UNICEF, WHO Included in most HMIS</td>
<td>75.3 (IQR 62.1–87.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal screening and treatment (percent of women being tested for syphilis at first antenatal care visit)</td>
<td>Rapid diagnostics and more focus on health-system approaches</td>
<td>Yes, in high-prevalence countries (DHS)</td>
<td>No coverage data</td>
<td>64.1 (IQR 54.4–78.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal care</td>
<td>Calcium supplementation to prevent pre-eclampsia and eclampsia</td>
<td>Trials still in process and limited policy cohesion</td>
<td>No coverage data</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal care</td>
<td>Corticosteroids for preterm labour (betamethasone)</td>
<td>Present focus on dexamethasone, cheaper, available and on Essential Medicines List, while awaiting comparison trials</td>
<td>No coverage data</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrapartum</td>
<td>Detection and management of breech (caesarean section)</td>
<td>Shift to EMoC and appropriate caesarean section—not for breech included in most HMIS</td>
<td>No coverage data</td>
<td>5.9 (IQR 3.4–8.8; 57 countries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled birth attendance</td>
<td>Labour surveillance (including partograph)</td>
<td>Some small-scale innovations for electronic monitoring and documentation aids, fetal heart rate monitoring, perinatal audit</td>
<td>No coverage data</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled birth attendance</td>
<td>Clean delivery practices</td>
<td>Including chlorhexidine cord cleansing where appropriate</td>
<td>No coverage data</td>
<td>&lt;10 countries with data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled birth attendance</td>
<td>Resuscitation of newborn</td>
<td>Innovations in simplified algorithms, devices and investment through private-public partnerships</td>
<td>No coverage data</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postnatal</td>
<td>Within the first 24 h of life, day 3, and day 7</td>
<td>Indicator reflects the first visit within 48 h with available questions to obtain more detailed indicators</td>
<td>Inconsistent coverage data</td>
<td>Women 64% (38 countries); baby 30% (37 countries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postnatal care visit</td>
<td>Early initiation of breastfeeding</td>
<td>Opportunity to scale-up, through antenatal and postnatal home visit packages for women and newborns and improved care at birth</td>
<td>Yes, in DHS, Countdown UNICEF, WHO</td>
<td>51.4 (IQR 41.4–57.9) (42 countries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postnatal care visit</td>
<td>Prevention and management of hypothermia</td>
<td>More attention on skin-to-skin care for all babies, delayed bathing, maintaining the warm chain</td>
<td>Various indicators agreed, few collected routinely</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency newborn care</td>
<td>Kangaroo mother care (low birthweight babies in health facilities)</td>
<td>More convincing mortality RCT evidence for facility KMC and wide-scale experience of scale-up</td>
<td>No coverage data</td>
<td>No coverage data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency newborn care</td>
<td>Case management of neonatal infections including community-based pneumonia case management</td>
<td>Simplified antibiotic trials allowing for outpatient or home-based treatment of neonatal sepsis</td>
<td>Possible to analyse in DHS but small numbers and low sensitivity and specificity</td>
<td>Possible to track in HMIS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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had slower declines in NMR,\textsuperscript{22} emphasising the importance of linking of newborn health and family-planning programmes.

Examination of progress shows important shifts in the numbers of countries (table) and movement of populations from high to low neonatal mortality settings between 2000 and 2012 (appendix). The highest mortality countries, however, have had the lowest ARRs for NMR and for stillbirths, and ARRs for stillbirths are slower than for neonatal deaths across all mortality bands. The adage “what gets measured gets done” is important—where attention has been prioritised and indicators tracked, coverage of key interventions has improved. The focus of the independent Expert Review Group on 11 indicators across RMNCH is not to provide the level of detail necessary to accelerate progress in countries for specific programmes. Moreover, many important newborn health, and indeed maternal care, indicators are not measured (eg, kangaroo mother care) or cannot be measured through large household surveys, such as demographic health surveys and multiple indicator cluster surveys (eg, newborn resuscitation, antenatal corticosteroids), and require incorporation in routine health information systems. Coverage for kangaroo mother care and antenatal corticosteroids are examples of highly effective interventions for which assessment, policy formulation and adoption, and programme implementation have lagged (appendix).\textsuperscript{10,19} Monitoring of quality childbirth care is crucial to advance maternal and newborn health, and especially to reduce intrapartum stillbirths.

**Conclusion**

During the past decade, progress has been made in each category of the heuristic policy process (figure 2). Remarkably, rapid progress occurred in agenda setting, and newborn babies have shifted from being almost invisible on the global health agenda in the 1990s to being a central element in the RMNCH continuum of care in several countries. However, in view of the size of the burden (almost 10% of the Global Burden of Disease 2010, without including 2.6 million stillbirths),\textsuperscript{22} the potential for major and rapid change, and synergies with

<table>
<thead>
<tr>
<th>Birth outcomes</th>
<th>NMR group 1 (NMR &lt;5 deaths per 1000 livebirths)</th>
<th>NMR group 2 (NMR 5 to ≤15 deaths per 1000 livebirths)</th>
<th>NMR group 3 (NMR 15 to ≤30 deaths per 1000 livebirths)</th>
<th>NMR group 4 (NMR ≥30 deaths per 1000 livebirths)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMR ARR%</td>
<td>3·80%</td>
<td>3·10%</td>
<td>2·50%</td>
<td>1·30%</td>
</tr>
<tr>
<td>Maternal mortality ratio ARR%</td>
<td>1·54%</td>
<td>1·98%</td>
<td>3·52%</td>
<td>3·74%</td>
</tr>
<tr>
<td>Stillbirth rate ARR%</td>
<td>2·2%</td>
<td>1·4%</td>
<td>1·1%</td>
<td>0·6%</td>
</tr>
<tr>
<td>Contextual factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross national income per person ARCs (%)</td>
<td>0·04%</td>
<td>0·010%</td>
<td>0·033%</td>
<td>0·052%</td>
</tr>
<tr>
<td>Total fertility rate ARR%</td>
<td>0·68%</td>
<td>2·24%</td>
<td>1·65%</td>
<td>1·20%</td>
</tr>
<tr>
<td>Contraceptive prevalence rate ARR%</td>
<td>0·49%</td>
<td>1·08%</td>
<td>3·33%</td>
<td>3·60%</td>
</tr>
<tr>
<td>Change in coverage of skilled attendance at birth ARCs (%)</td>
<td>99·3% in 2000; 99·5% in 2012; 0·02%</td>
<td>89·6% in 2000; 95·2% in 2012; 0·54%</td>
<td>42·3% in 2000; 54·2% in 2012; 1·91%</td>
<td>40·6% in 2000; 50·3% in 2012; 1·81%</td>
</tr>
<tr>
<td>Donor funding official development assistance (US$ 2010)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of countries with ODA data in 2010</td>
<td>--</td>
<td>10</td>
<td>41</td>
<td>24</td>
</tr>
<tr>
<td>To maternal health per livebirth (median with IQR)</td>
<td>--</td>
<td>7·4 (1·8–14·7)</td>
<td>27·4 (14·7–37·4)</td>
<td>39·0 (19·3–48·6)</td>
</tr>
<tr>
<td>To child health per child (median with IQR)</td>
<td>--</td>
<td>3·6 (0·9–7·3)</td>
<td>17·7 (6·7–23·2)</td>
<td>20·3 (14·3–30·6)</td>
</tr>
<tr>
<td>Value of MNCH ODA with mention of newborn health as % of total MNCH ODA</td>
<td>--</td>
<td>6·5%</td>
<td>9·5%</td>
<td>13·8%</td>
</tr>
</tbody>
</table>

ARR=average annual rate of reduction. NMR=neonatal mortality rate. ODA=official development assistance in 2010 constant US$. MNCH=maternal, neonatal and child health. ECC=kangaroo mother care. ARR=annual rate of change. ARR is presented for negative changes and ARC presented for positive changes. For input data sources for this analysis see appendix—UN-IGME,\textsuperscript{13} WHO,\textsuperscript{109} Pitt and colleagues,\textsuperscript{75} and Hsu and colleagues\textsuperscript{76}—with special analysis for supplement. *The average rate of change (ARC) includes change from 2000–12; except data for stillbirth rate are only available until 2009.

Table: Changes in birth outcomes, context, and service provision in countries (n=194) between 2000 and 2012, according to four levels of neonatal mortality rates*
RMNCH, there has been disappointingly little investment and inadequate translation of attention into country policies, programmes, and evaluations. Progress at the country level has been erratic, with some making major advances despite many challenges, some making almost no progress, and some seeing newborn deaths increasing. As a result, neonatal mortality and stillbirths continue to decrease more slowly than does mortality in older children and maternal deaths.112

The 2005 Lancet Neonatal Survival Series called for health systems to change at community and facility level at a time when the global agenda was focused on more vertical, commodity-driven programmes. Recent advocacy for specific commodities (neonatal resuscitation equipment, antenatal corticosteroids, chlorhexidine for cord cleansing, simplified antibiotic regimens) and for kangaroo mother care seem to have gained traction.113 The myth persists that investment in maternal and child health will trickle down to improve newborn health in the absence of purposive investment in specific skills, commodities, and practices. Additionally, despite evidence of a large burden with feasible solutions, political prioritisation, increased investment, and concerted country action, especially in view of poor global leadership, coordination, and accountability. Clarity regarding who (which cadre of worker, which programme, or agency) was responsible for implementing newborn care was poor. Although some data have improved, this improvement has been slower for programme data—eg, improvement of the postnatal care coverage assessment modules in surveys took several years.

Leadership of an aligned group of champions and technical experts credited by Shiffman15 with putting newborn health onto the global agenda in the past decade cannot alone bring about the necessary change. Mobilisation of communities and civil society, parents, professional groups, private corporations, and increased leadership from the UN could help to bring rapid change, as was seen for HIV/AIDS in the early 2000s. ENAP could catalyse greater change, but must set clear priorities, address partner coordination, increase investment for implementation at scale, and ensure effective use of programme indicators and accountability for results. Above all, country leadership and technical capacity must be intentionally enabled.

To stop responsibility for newborn health from falling between organisations and programmes will necessitate active roles for many more global health stakeholders to stand with mothers and families in holding their babies. Collectively, we must ensure that gaps are closed between burden and investment, and between policy and action, to safeguard survival and health, reaching every woman and every newborn baby.

Contributors

GLD, MVK, and JEL wrote the first draft of the Series paper. All authors provided conceptual input and approved the final paper for submission.


