2 **Stillbirths: Progress and Unfinished Business**

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Abstract

This first paper of *The Lancet Ending Preventable Stillbirth Series* reviews progress in critical areas, identified in the 2011 call to action for stillbirth prevention, to inform the integrated post-2015 maternal and newborn health agenda. Global attention to babies who die in stillbirth is rapidly expanding, from integration within the new *Global Strategy for Women's, Children's, and Adolescent's Health*, to country policies inspired by the *Every Newborn Action Plan*. Supportive new guidance and metrics including stillbirth as a core health indicator and measure of quality of care are emerging. Ensuring integration of action for prenatal health - the biological foundation of life-long health - within the continuum of care for maternal and newborn health is becoming a key priority. Still, specific actions for stillbirths remain needed for advocacy, policy formulation, monitoring and research, including remedying the dearth of data on effective coverage of proven interventions for prenatal survival. Stronger leadership is needed globally and in countries, and institutions with a mandate to lead global efforts for mothers and their babies must assert their leadership to reduce stillbirths by promoting healthy and safe pregnancies.

Keywords

Stillbirth, Maternal health, Newborn health, Prenatal health, Prevention, Antenatal care, Care at birth, Health priorities, Health policy, Health information systems, Indicators, Research priorities

The 2011 call to action for stillbirth

The past 15 years saw historic achievements for women's and children's health¹. Yet, 2.7 million women experience the death of their babies in stillbirth in the last trimester of pregnancy or during labour²⁻⁵.

In 2011, *the Lancet Stillbirth Series* (LSS) reviewed the status of stillbirths^{2,6} and evidence for cost effective interventions that could save 1.1 million babies annually^{7,8} and provide triple return on investments by preventing newborn and maternal deaths⁹. The call to action covered critical activities for stillbirth reduction¹⁰: international and country prevention targets, improved monitoring of stillbirth, their causes and disparities, inclusion of stillbirth prevention in maternal and newborn health (MNH) plans and research, and action against stigma which adds burden to families and hampers societal engagement.

That series received wide press coverage, reaching almost one billion people and generating significant response not just from academia and organisations, but also from the public¹¹. Yet, unlike efforts for maternal and newborn survival^{1,12,13}, no systematic progress monitoring followed. Global health policy changes are typically observed over many years^{14,15}, but despite limited time for change, an update on progress, potential solutions, and priority actions is critical to underpin operationalization of the United Nations (UN) Sustainable Development Goals (SDG)¹⁶, the Global Strategy for Women's, Children's and Adolescent's Health (Global Strategy)¹⁷, and its supporting Global Financing Facility (GFF)¹⁸. Our findings in this series inform a renewed call to action¹⁹.

In this first paper of *the Lancet Ending Preventable Stillbirths Series*^{4,19-21}, the objective is to review progress in critical areas identified in the 2011 call to action¹⁰. We adopted a heuristic approach to policy analysis used in MNH¹⁵ to learn from how other initiatives created change^{15,22-25}, supplemented with a framework of determinants of global health political priority, to explore why stillbirths are prioritized, or why not²² (figure 1). We review five domains: moving stillbirth onto the global MNH agenda, formulating global and national policies, funding and implementing programs,

developing capacity for monitoring and research, and the role of leadership and partnerships. For the latter, we draw on a global health network framework previously applied to newborn mortality^{26,27}. Data sources are presented in panel 1, with detailed methods and additional results in the web-appendix.

Agenda setting and prioritization

The LSS exposed a gulf between the stillbirth burden and its invisibility on the global MNH agenda^{2,6}, and called on the international community to include stillbirths in all relevant health reports and initiatives¹⁰. Agenda setting is crucial, as demonstrated by country actions for MNH that followed the policy norms advanced by the Millennium Development Goals (MDGs) and the 2010 Global Strategy for Women's and Children's Health^{1,12,27-29}. The LSS addressed "Issue characteristics" and "Ideas" that hampered prioritization of stillbirth, and called on stakeholders to address barriers in "Political context" and "Actor power" (figure 1)^{2,10}.

Key messages in the LSS on "Issue characteristics" presented stillbirth rate and cause estimates as credible indicators of burden^{3,6,30}, and evidence for simple and cost-effective preventive interventions to integrate in health systems⁷⁻⁹. "Ideas" included portrayal of stillbirths as a neglected issue, with devastating and stigmatizing losses of babies for mothers and fathers that need to be counted. Aligned with the emerging norm of an integrated continuum of care for the inextricably linked mother and baby³¹, stillbirths were recognized as babies dying of preventable causes, especially intrapartum, which were inseparable from major causes of maternal and newborn deaths. The LSS added rate, cause, and intervention effectiveness estimates into the Lives Saved Tool (*LiST*)³², to report a triple return on investments for integrated stillbirth, maternal and newborn mortality prevention (figure 1, table 1)⁷.

To assess evidence of adoption of "Ideas" and "Issue characteristics" presented in the LSS in the activities and new initiatives of global MNH agencies, commissions and partnerships, a comprehensive document review was completed (panel 1 and web-appendix). The integrated

continuum of quality care for the interlinked mother and baby remains a widely adopted theme, particularly present in new initiatives. While all documents including stillbirth did so in a broader MNH context, these themes had little correlation with stillbirth priority, neither in qualitative or quantitative analyses. Of all “Ideas”, the “triple return on investment”, implicitly acknowledging the burden, lives lost, and interlinked causes and solutions, was most frequently adopted. All subsequent MNH documents using investment cases include stillbirths averted, even when this was the only mention of stillbirth¹⁸. Additional common themes include presentation of cost-effective preventability, and rates and burden of stillbirth. We find this irrespective of any explicit priority for stillbirth prevention, indicating that these themes may be beneficial, but are insufficient by themselves to create priority. None addressed stigma associated with stillbirths.

In initiatives with explicit calls for stillbirth prevention or targets, two correlated portrayals stand out. First, stillbirths are humanized as *babies* that die, rather than only enumerating them as stillbirths. Second, prenatal and newborn health is presented as an inseparable continuum, whether in pathology (shared pathophysiology with preterm birth, low birth weight and newborn deaths) or health (prenatal biological potential for health). These must be reinforced to overcome pervasive barriers identified in the LSS: the stigma that impedes women’s voice, and the fatalism that stillbirths, as previously for newborn deaths²⁷, are not amenable to prevention, and are lesser losses than newborn deaths^{2,12,21}.

Figure 2 illustrates the “Political context” in which recent global MNH reports have been written: The MDG targets for maternal and child deaths reflecting the dominating “supernorm” shaping policy attention kept stillbirths barely visible²⁹. The major UN agencies pursued a joint mission to “*ensure that health plans are MDG-driven and performance-based*”³³. The reports’ objectives were to convey efforts to achieve the MDGs, and compliance with recommendations to support these goals. In the MDG race, there was little opportunity to include stillbirths which did not directly count towards the targets, unlike newborns. Only the “unfinished business” stillbirth theme was related to the MDGs (web-appendix).

The LSS influenced discussions for the post-2015 agenda, onto which stillbirth rapidly emerged. *“Born Too Soon”* (2012), the multi-stakeholder global action report on preterm birth, highlighted the stillbirth burden presented in LSS, and the shared nature of causes and solutions with preterm births³⁴. Global agencies, donors and MNH organizations, led by UNICEF and WHO, presented *“Every newborn: an action plan to end preventable deaths”* (ENAP) to the WHO Executive Board in 2014³⁵, integrating intrapartum stillbirth prevention³⁶. Countries, individuals, professional associations and non-governmental organizations engaged strongly in consultations, and countries specifically requested stillbirth prevention targets³⁷. The World Health Assembly (WHA) endorsed ENAP, requesting progress reports towards targets, and urged member states to implement these policies and strengthen monitoring³⁸. In parallel, the independent Expert Review Group, a UN initiative monitoring accountability for women and children, called to integrate stillbirth in the post-2015 agenda^{12,39}. It requested a Global Investment Framework for Women’s and Children’s Health, the precursor of the GFF to support the Global Strategy, both incorporating stillbirths in their investment cases based on *LiST*^{18,40}. The UNFPA’s 2014 State of the World’s Midwifery and The Lancet Midwifery Series underlined midwifery’s role in preventing stillbirths^{41,42}, which was reiterated in the Strategies towards Ending Preventable Maternal Mortality (EPMM), endorsed by the global agencies, donors and professional organizations, calling for stillbirth monitoring, and setting *“to protect and support the mother-baby dyad”* as a guiding principle for action⁴³. ENAP and EPMM subsequently promoted integrated strategies covering the full continuum of care⁴⁴. The 2015 progress report for the 2010 Global Strategy for Women’s and Children’s Health, identified stillbirths as a neglected area for future priority action²⁸.

Many aspects of the LSS’ framing of stillbirth have thus resonated with global MNH initiatives, reflected by firm integration of stillbirth in the 15 scoping papers for the Global Strategy⁴⁴⁻⁴⁶. Many organizations have endorsed new initiatives reflecting a shift towards priority for stillbirth, compared with their previous activity reports (web-appendix). The Global Strategy has been subjected to wide country and public consultations, coordinated by The Partnership for Maternal, Newborn and Child

Health (PMNCH), a global partnership of UN agencies, donors, professional and civil society organizations. It envisions “*An end to preventable maternal, newborn, child and adolescent deaths and stillbirths*”, presents the stillbirth burden among key “*Child health challenges*”, humanizes stillbirth as “*2.6 million babies [who] die*”, lists essential interventions for prevention, and takes a life-course approach recognizing that “*Everyone is conceived with a unique biological potential for health*”¹⁷.

Similar themes were reflected in interviews of representatives of 33 organizations working in MNH, including the need for integration within the broader MNH agenda, integrated quality care for MNH, clear and sensitive messaging to counter stigma associated with stillbirths, and framing stillbirth prevention in a continuum with newborn health (web-appendix). While our document review found that evidence presented in the LSS has been widely adopted by global MNH initiatives, agencies, commissions and partnerships, respondents raised concerns that insufficient evidence and information on rates, causes and cost-effective solutions are available in low and middle income countries (LMIC) to support country-level prioritization – themes identified in the LSS as key to overcome perceived futility of prevention². Supporting the appropriateness of a global discourse humanizing babies that die, none presented concerns for stillbirth prevention being in conflict with reproductive rights when asked for key challenges to the community working on stillbirths – in accordance with the LSS findings that abortion issues were unrelated to stillbirth priorities in LMIC².

The shift in priority for stillbirth globally from a prolonged period of stability (largely driven by the MDGs), is taking a form seen in several other global health issues¹⁴; a disruptive burst of rapid transformation by a new policy conceptualization in the presence of a policy venue (the processes toward the Global Strategy). Yet, many opportunities have been missed for integration of stillbirth in new MNH initiatives, including acknowledging the burden, promoting essential interventions, and call for monitoring of stillbirth (web-appendix). This new priority will only matter if followed by policies, funding, and country adoption, but as this transformation is just barely completed, limited policy formulation and program implementation should be expected.

Policy formulation and program implementation

The LSS recommended interventions for integration into policies and programs for prenatal health across the continuum of care^{7,8}, as well as systems approaches such as perinatal audits, birth planning and transportation^{9,10}, and actions to reduce stigma^{2,4,5,10,19}.

New policies are emerging. Partly based on the failure of previous policies to prevent stillbirths⁴⁷⁻⁴⁹, the WHO is revising guidance for antenatal care, including antepartum stillbirth as a quality of care indicator, based on 57 systematic reviews including stillbirth among key outcomes of interventions and care models. The WHO recently published a framework for quality of care in MNH⁵⁰, and is preparing standards and indicators which will include antepartum and intrapartum stillbirths as core indicators for high quality antenatal care and care at birth, respectively. Also, the WHO is preparing guidance for audits to assess causes and preventability of stillbirths and newborn deaths. All are expected in 2016.

Some countries' policies for stillbirth have changed rapidly, mostly driven by ENAP providing programmatic guidance³⁶. In ten months (March 2015), 39 LMIC had provided commitments to it⁵¹. In India, the adoption of key themes from the LSS, global advocacy, national leadership and champions, and allies in MNH providing evidence for feasibility of national monitoring and prevention were all instrumental for implementation (Panel 3). Among the ten countries contributing 65% of stillbirths globally⁴, five have, by August 2015, written or are writing "sharpened" MNH plans inspired by ENAP, with four including stillbirth reduction targets (web-appendix). Enforcement and funding associated with these plans vary, and many devolve implementation to sub-national levels. Of the remaining five countries, only one included a stillbirth target in their most recent MNH plan. The targets set by the five countries, if met, would represent a reduction of stillbirths globally by one fourth. Yet, some countries specifically omit stillbirth from their newborn action plans, due to cultural norms of stillbirth as a lesser concern than newborn deaths (personal communications).

Among the 67 LMIC for which health plans were available, only 15 mentioned stillbirths, seven more recently than 2011 (web-appendix). Interventions recommended by the LSS were modestly addressed: 12% mentioned folic acid supplementation, 26% syphilis detection and treatment, 66% caesarean sections and comprehensive emergency obstetric care and 24% MgSO₄ for eclampsia.

Community actions, such as birth planning and transportation, social and bereavement support, and addressing stigma, have only been captured if preceded by concerted national policy. So while our findings underestimate community action, hardly any health plans promoted such activities. None responded to the LSS calls to act against stigma and provide bereavement support. The LSS called for empowerment of women and families, but while acknowledging that stigma can prevent women from realizing their reproductive rights, none of the key UN entities working for the empowerment and rights of women address stigma, taboos and abuse after stillbirth or newborn death⁵²⁻⁵⁵, and global efforts to promote better mental health have no focus on such topics⁵⁶.

Being outside the MDG norms, hardly any funding from donors reporting to the Organization for Economic Cooperation and Development's database has targeted stillbirth prevention. Funding to women's and children's health has increased substantially under the MDGs, and compared with the US\$9.5 billion disbursed in 2013 alone⁵⁷, only four projects mentioned stillbirth in the entire 12-year funding period (2002-13) and only two of them funded program implementation – for a total of US\$10.6 million. Over that same period, more than 80 projects on malaria in pregnancy, and 35 on syphilis, were also funded, but their impacts on stillbirth remained unstated.

Monitoring and research

For the global MNH community to coalesce effectively around stillbirth prevention, lessons from maternal and newborn mortality²²⁻²⁵ indicate the need for agreement on credible measures of burden and causes, a classification to present them, and evidence for simple and cost effective interventions with indicators for monitoring (figure 1).

While stillbirths have not been on the agenda, strengthening of civil registration and vital events systems has²⁸. Data sources for the new global estimates of stillbirths, the first since 2011, demonstrate improvement in availability of country level data with 38 having no data compared with 68 in 2009⁵. Further improvements are expected with stillbirths recently included in the WHO 100 Core Health Indicators⁵⁸ and the UN Inter-agency Group for Child Mortality Estimation's monitoring program⁵¹. At the 2015 WHA, the slow reduction of stillbirths was reported with the MDGs for the first time, due to reporting requirements for ENAP^{38,51,59,60}. While the LSS came in time to influence the Global Strategy, selection of the SDG targets, starting in 2012, was guided by political recommitment to the MDGs¹⁶. The SDGs likewise have targets for maternal and child mortality, not stillbirth¹⁶. The Global Strategy and GFF, politically committed to support the SDGs, therefore do not include stillbirth targets^{17,18}.

Dissimilar stillbirth definitions continue to hamper head-to-head comparisons^{4,5}. A full 41% of data in the global estimates rely on definitions other than the WHO's⁵. Rights and care in pregnancy rely on gestational age while the WHO's stillbirth definition relies on birth weight⁶¹. This does not fit national legislation or data, and WHO refrained from using their definition for the global stillbirth rates, targets, and 100 Core Health Indicators^{5,36,58}. Disaggregated data are scarce. Only 36% of countries reported intrapartum mortality rates, and fewer still, causes of death^{4,5,62,63}. Subsequent to the LSS call for a global classification^{2,6,8,10}, the WHO collaborated with scientific groups to inform a new approach to perinatal mortality classification⁶²⁻⁶⁴ using the International Classification of Disease (ICD PM), modelled on the maternal mortality classification (ICD MM)⁶⁵ and expected for publication in 2016⁶⁶. The LSS reported that ICD-10 does not capture important fetal and placental categories for stillbirths⁶, and the 2018 revision of ICD-11 must address this underlying weakness. Capacity to identify causes of death may have been weakened. While the 2007 WHO Verbal Autopsy Tool adequately defined newborn deaths and stillbirths by time of death, with multiple causes, the 2012 revision requires reporting stillbirth as the cause of stillbirth ("*fresh*" or "*macerated*")^{67,68}. With this guidance, verbal autopsies cannot inform ICD PM appropriately.

Monitoring effective interventions with population-based data remains an immense gap. Contact with care providers does not equal having received any of the interventions LSS recommended, nor signal functions of basic and comprehensive emergency obstetric care, which constitute effective coverage of quality care^{7,69}. Current estimates are largely based on household surveys with few indicators on effective coverage beyond intermittent prevention of malaria in pregnancy, insecticide treated bed-nets, and caesarean section rates (table 2), and only a subset of LMIC (54%, 58% and 10%, respectively) have had a national survey including these indicators after 2011.

Better metrics are coming. The ENAP Metrics group is developing a metrics action plan including indicators, tools, and institutionalization in national and global metrics architecture⁷⁰. A direct response to the LSS and the accountability agenda was an initiative by the WHO and Norwegian Institute of Public Health to strengthen health information systems, specifically electronic health registries tracking women and children across the continuum of care^{71,72}. This “eRegistries” framework integrates process and outcome indicators⁷³, including stillbirth, for screening and management of *Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health*, as well as guidance for electronic solutions⁷⁴, and ethical governance of data⁷⁵. Sustainable electronic health information systems are now widespread across LMIC⁷⁶ with 27 having written eHealth strategies, half specifically in support of women’s and children’s health⁷⁷. Electronic solutions create unprecedented opportunities^{72,76,78,79}, potentially combining health records for care providers with a back-end registry for public health monitoring and targeting^{71,72}.

According to a survey of public health officials from LMIC, four of five responders report that they are registering data on pregnancy, birth and child health – three quarters in transition using both paper and electronic reporting⁷². The new global roadmap for Measurement and Accountability for Results in Health specifically commits to closing the gaps in MNH data for effective coverage and accountability for every baby. First, civil registration should register all births, and second, health information should be collected electronically in real-time where they are created, in communities

and facilities, including integrated maternal and perinatal surveillance and response – in all countries by 2030^{80,81}.

The LSS identified research priorities, but standard search functions proved inefficient to assess alignment with them, as many were complex combinations and subsets of ideas¹⁰. Qualitative analysis tools found only 11% of abstracts related to stillbirth to be potentially linked to LSS priorities, but with significantly greater concordance in LMIC (web-appendix). Although the stillbirth research volume increased three-fold since 2000, the level is only 20% of research relating to newborns which increased similarly. The greatest relative increase on stillbirth research was in LMIC. The annual number of registered trials for MNH including terms relating to stillbirth increased by 26%. Total funding for stillbirth-focused research from eleven of the largest research funders amounted to \$50m between 2012 and 2014, constituting only 3% of overall MNH research funding. Compared to average annual funding over 2006-10, research funding for MNH has remained flat while stillbirth-focused research increased by 22%, suggesting a potential increased focus by funders since 2011 (web-appendix).

Leadership and partnerships

Strong leadership and partnerships are needed to ensure change for prenatal health and survival (“Actor power”, figure 1). Global health network studies find that the emergence and effectiveness of leaders and networks is shaped by issue characteristics and political context²⁶. Stillbirth has severe consequences and is tractable, issue characteristics (Table 1) that typically strengthen networks, as does the policy environment of potentially strong allies with interests that align. Simultaneously, funding gaps and exclusion of stillbirths from the policy “supernorms” advanced by the MDGs have hampered the effectiveness of a global stillbirth network²⁶. A moment of opportunity to influence decision makers was essential to create priority for maternal mortality^{22,29}, as may now exist for stillbirth with the Global Strategy. Four key features from a new framework for understanding global

health networks are drawn upon to explore the stillbirth network: leadership, governance, composition, and framing strategies²⁶.

The 2011 LSS originated from an initiative by the leadership in the International Stillbirth Alliance, an advocacy and knowledge group creating a network of parental and scientific organizations, and the then WHO Department for Making Pregnancy Safer. With leadership from *The Lancet's* Editor, a group of individual scientists was assembled to develop the series, including scholars in global MNH policy. These previously disconnected groups, together with donors and others specifically approached to support the development and dissemination of the LSS, created the core of the current global stillbirth network of 33 organizations working in MNH assessed by an organizational network analysis presented in this series¹⁹. The context of publishing deadlines for the LSS forced the emerging network of parental, scientific, and policy groups to coalesce rapidly on the framing strategies and themes published in the LSS (table 1).

The network appears to be expanding. The organizational network analysis identified the most highly connected organizations in the network in terms of stillbirth work¹⁹. Yet, on a formal organizational level, several had paid only minor attention to stillbirths prior to the policy opportunity of the Global Strategy, according to their activity reports. Insufficient organizational commitment to stillbirth issues was a key theme in the qualitative interviews with organization representatives, as the network continues to be generally dependent on a small group of committed individuals rather than their overall organizations. Respondents also reported a lack of strong political voice and individual advocates in the public domain; in particular, they wished for a stronger presence of parental groups and voices in the broader stillbirth network (web-appendix).

The diverse composition of the network created opportunities²⁶, but the predominant composition of scientists and professionals, with insufficient inclusion of political and civil society actors, is a weakness hampering progress for country implementation of action, similar to newborns²⁷.

Additionally, the organizations do not exploit the network efficiently. Among 33 organizations

surveyed, on average each organization only interacted (for example communications, meetings, or joint action) with one fifth of potential partners on stillbirth-related issues. Maternal and newborn-related interactions between these same organizations exhibited three times the number of connections on average¹⁹.

This network created for the LSS was not a concerted effort by the global MNH community that should have had ownership of the issue. Without a formal governance structure, leadership is currently shared by individuals, mostly not the top leadership of organizations. The LSS was not based on commitments from the leadership of UN agencies, nor did it call for them to assume their global governance responsibility¹⁰. A key challenge reported by the organizations' representatives was that agencies such as WHO had not yet assumed the leadership role seen for the rest of the MNH field. But the policy environment is in flux, both in norms and allies. With stillbirths integrated in the Global Strategy, and the reporting requirements ENAP, the UN now has mechanisms for holding its agencies accountable for leadership and governance for stillbirth.

Progress and unfinished business

We find clear progress in agenda setting and prioritization (table 1). While leadership for stillbirth has been too weak to overcome the barrier of the MDG supernorm, the shift of norms and integration in the Global Strategy may be a turning point for the neglect of stillbirth. Uptake of themes from the LSS in the global discourse helps explain why stillbirths have ascended on the agenda, but also points to themes with insufficient adoption, such as recognition that stillbirths are babies that die, and that prenatal health is the biological foundation of life-long health for every newborn. This suggests a communication concern for political priority. Sources reviewed strongly emphasized effective integration of stillbirth within existing MNH priorities and programs, as did the LSS^{2,9,10}, and our interview respondents. Currently, the global MNH discourse, naturally, is predominantly about health, not death (Figure 2). All new initiatives go beyond survival. They are “... *for maternal health*”, “... *for newborns to survive and thrive*”. Stillbirth appears hard to fit in the positive health discourse,

and is relegated to mortality sections – often as a literal appendix: “... *maternal and newborn mortality*” (... “*and stillbirth*”). This potential misconception of a poorly integrated “add-on” matters. Stillbirth prevention calls for integrated action for prenatal health and survival from periconception through pregnancy and childbirth^{2,7-10}. Concerted communication that stillbirth prevention *is* promotion of prenatal health is needed: prenatal health relates to stillbirth exactly as neonatal and maternal health relate to neonatal and maternal death. Supporting prenatal health through high quality antenatal and intrapartum care protects and supports the mother-baby dyad^{43,50,82}, and represents a quadruple return on investments, saving mothers and newborns, and preventing stillbirths and child disabilities^{40,46}.

We find progress in global policies and program guidance, and crucially, the Global Strategy combines the policies of ENAP and EPMM^{17,44,46} with action for the continuum of prenatal health to include prevention of the antepartum majority of stillbirths; without it, the global targets^{19,36} cannot be met even by reducing intrapartum deaths by two thirds^{4,5}. While integration is the only way forward for health systems, clients and providers, the country implementation of ENAP-inspired policies, both as a successful vehicle to introduce stillbirth reduction targets, and conversely, with examples of specific omission of stillbirths, exemplifies that coordinated but specific action for stillbirths remains needed for advocacy, policy formulation, monitoring and research. Women’s rights and mental health groups should be engaged. Cultural mores of indifference towards stillbirth must be countered: prenatal health matters for the entire life-course, stillbirth prevention *is* prenatal health promotion, and to mothers, stillbirths are not numbers, but babies that die. The assumption that stillbirth mortality will automatically decline in parallel with maternal and neonatal mortality without focus is false; the annual reduction rate for stillbirths (1.8%) the last 15 years is significantly smaller than for newborn (3.1%) and maternal (3.4%) mortality⁴.

Notably, many interventions recommended by the LSS are not yet standard. Few countries have adopted perinatal audit which can reduce perinatal mortality if conducted appropriately⁸³⁻⁸⁵. There is no action against stigma or for support of affected families.

The mortality impact of interventions shown with *LiST* in this series²¹ exemplifies the need for cause of death data to allow policy makers to develop investment and action plans⁸⁶. Conversely, the exclusion of stillbirths in the Global Burden of Disease, Disability-Adjusted Life Years and Quality-Adjusted Life Years, restricts cost-effectiveness analyses and impedes the generation of evidence for investment in MNH⁸⁶.

Stillbirth is included in MNH investment cases, but so far with no accountability: no funding of substance has materialized. An increased traction of the “triple return on investment” within country level policies is plausible as GFF financing of programs requires an investment case¹⁸, and the UN-recommended OneHealth Tool incorporates *LiST* calculations for stillbirth¹⁸.

Progress exists in metrics for monitoring and research of stillbirth, but there is still far too little and infrequent monitoring and evaluation to support country advocacy for priority and action³¹. A universally adopted definition of stillbirth is needed, as well as a global repository to access such data. The ongoing revision of ICD 10 to ICD 11 should be an opportunity to formally revise the WHO definition.

Stillbirth prevention through high quality care needs strengthened health systems, effective coverage, and health information systems^{7,9,10,19,50,87}. Countries monitoring stillbirth rates for progress towards targets will benefit from uniquely specific, sensitive, measurable, and actionable indicators of effective coverage - antepartum stillbirth for antenatal care and health promotion, and intrapartum stillbirth for care at birth^{7,88,89}. The call to action for Measurement and Accountability for Results in Health sees health information systems as an integrated part of health systems, and health information flowing seamlessly at all levels of the health system as critical for quality of care. Care should be taken to select indicators which support countries’ efforts to build sustainable actionable health information systems at point of care, rather than undermining them with indicators only available through household surveys^{50,71}.

Our findings on the status of research are promising, including stronger growth of research activities, and better alignment with research priorities in LMIC. Nonetheless funding for stillbirth research remains incommensurate with burden.

The global stillbirth network emerged with the LSS, but leadership still needs purposeful development, in particular to ensure country uptake. Institutions with the mandate to lead global efforts for MNH are not as central as desired, and organizations must commit strongly, not rely on committed individuals. Until now, the core global governance structure of the UN and partnerships for MNH have mostly been followers for stillbirth prevention. Under the Global Strategy they must seize this potentially historic opportunity to strengthen healthy lives and promote well-being for all, at all ages, through better prenatal health and survival^{19,90}.

Contributors

JFF drafted the manuscript and led the review and analysis of reports and initiatives with IKF and SHL. IKF led the review and analysis of health plans, survey instruments, and research efforts and funding with CP. LF led the organizational network analysis and interviews. CP led the review and analysis of donor funding. AK, LD, NA, and NR compiled and reported the implementation of INAP. All authors commented and contributed to the content of the report, and read and approved the final version. JFF had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

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Panels

Panel 1: Summary of materials and methods (See web-appendix for full details)

Policy domains	Related Call to Action Topics LSS 2011	Methods and data sources
Agenda setting and prioritization	Include stillbirths in all relevant MNH international reports; Include stillbirth reduction in all relevant MNH initiatives	Review of annual reports for global health agencies, partnerships, commissions or other platforms to support <i>Every Woman, Every Child</i> ; Themes from the 2011 LSS key messages were manually identified, coded and analysed in Nvivo; use of these themes was contextualized to the Political Priority Framework. Review of inaugural reports for new MNH initiatives. Themes from the 2011 LSS key messages were identified and coded in NVivo; use of these themes was contextualized to the Political Priority Framework. Interviews with organizational representatives working directly or indirectly on stillbirth issues, using mixed methods. Interviews were analysed for common themes. Organizational network analysis presented in ¹⁹ . Analysis of the number of implementation projects and total spending on stillbirth from the OECD Creditor reporting system database, 2002-2013.
Policy formulation and program implementation	Create a plan for stillbirth reduction; Audit stillbirths; Reduce stigma; Provide bereavement support; Ensure empowerment; Set up pregnancy improvement committees; Provide birth plans and transportation	Review of health plans, policies and strategies for high burden countries in public databases. 'Stillbirth' was searched for; available documents were assessed for 2011 LSS call to action topics. This was supplemented by approaching ten countries with the highest stillbirth burden for status of stillbirth in national planning, and combining these results with the ENAP Progress report from May 2015. Report on the review of stillbirth data and modelled results. Full details available in ^{4,5} .
Monitoring and Research	Report stillbirth rates and causes-of-death; Collect accurate data on stillbirth rates and causes of death; Create a universal classification system; Increase support; Increase capacity; assess disparities; include stillbirth as an outcome in relevant research	Coverage indicator levels were extracted from publicly available databases and sources. Health facility surveys were identified and the survey instruments evaluated for inclusion of questions on stillbirth related indicators. Systematic review of classification systems and Delphi of useful properties. Full details available in ^{63,64} . Analysis of research funding for MNH from publicly available databases of 11 not-for profit institutions. Search of Medline, EMBASE and PsycInfo for 'stillbirth'* literature between 2000 and 2014. Assessed total volume and time trends, comparing high burden and low burden country documents. Qualitative analysis using NVivo on titles and abstracts of stillbirth research, identifying articles reporting on 2011 LSS research priority topics.
Leadership and partnerships	Implement effective business model	All registered clinical trials within the WHO's Organizations International Clinical Trials Registry Platform were assessed for utilization of terms related to 'stillbirth'*. Themes noted in the reports and initiatives and identified by interview respondents were reassessed in light of a framework for understanding global health networks, specifically relating to leadership and partnerships; in this analysis, we acknowledge the limitations of our "insider" role while acting as observers.

* 'Stillbirth' indicates stillbirth and all synonyms. See web-appendix for details.

Panel 2: Key messages

Agenda setting and prioritization: Priority for stillbirth prevention has firmly emerged in the convergence of priorities for the mother and her baby, and is integrated in global initiatives such as *Every Newborn Action Plan* and the *Global Strategy for Women's, Children's and Adolescent's Health*.

Policy formulation: Policy and guidance that addresses the entire continuum of prenatal health and survival through high quality antenatal care and care at birth are being developed, but there is no progress in efforts to address stigma and taboos, or in support to affected women and families.

Program implementation: Countries responding to the *Every Newborn Action Plan* are in the process of implementing programs and targets that, if achieved, would prevent one in four stillbirths globally. Still, in most countries, implementation of the recommended community actions and health interventions for prenatal health is generally low. Hardly any funding has been disbursed.

Monitoring and accountability: Routine data on stillbirths are improving, but accountability for high quality antenatal care and care at birth requires antepartum and intrapartum stillbirth be core indicators. Health information systems and indicator development show promise, but currently minimal data is available on effective coverage of the essential interventions.

Research priorities: There is progress in research efforts for high-burden settings, but, relative to the burden they represent, stillbirth research continues to be under-developed and under-financed.

Leadership and partnerships: The network of organizations addressing stillbirth is expanding, but underutilized and reliant on individuals rather than the core global governance structure of UN agencies and partnerships. They must seize this historic opportunity to partner for prenatal health and survival.

Panel 3: The Indian Newborn Action Plan

In September 2014, the Indian Ministry of Health and Family Welfare (MOHFW) adopted the Indian Newborn Action Plan (INAP) which includes a ‘single-digit’ stillbirth target for 2030 – the first national stillbirth prevention target. The plan is based on integrated interventions in antenatal care and care at birth for stillbirth prevention and newborn survival, linked to an ongoing roll-out of a national stillbirth monitoring scheme capturing rates and causes, and supported by a scientific coordinating center, and a Technical Advisory Committee under the leadership of the Joint Secretary of the MOHFW.

The convergence of three streams of scientific and public health work and advocacy were instrumental in this development: First, India committed to a 2011 WHO initiative for the elimination of mother-to-child-transmission of HIV and syphilis. To monitor and achieve the goals to eliminate congenital syphilis, it was acknowledged that stillbirth was a key indicator for mother-to-child transmission and information on cause-specific stillbirth rates were needed. With support from the WHO regional office for South-East Asia and the US Centers for Disease Control, 10 sentinel sites were organized for stillbirth monitoring, providing data on the burden and causes of stillbirth. Second, mortality statistics demonstrated that 56% of under-5 child mortality were newborns. To progress in reducing child mortality in India, this became a priority in professional communities. There was evidence from research and inconsistent national stillbirth estimates that a significant proportion of newborn deaths were reported as stillbirths rather than an unsuccessful neonatal resuscitation, and a strong sense emerged that stillbirths needed to be monitored together with newborn deaths to provide better data and indicators on care provision for babies and mothers to support further improvements. Third, advocacy by the 2011 Lancet Stillbirth Series and the WHO regional office increased awareness of stillbirth, and experts in obstetrics and gynecology became champions for stillbirth prevention in the national discussions. With the political endorsement and support for the Every Newborn Action Plan, ongoing efforts by professionals and scientists converged with political priority to include stillbirth targets and scale up monitoring under INAP.

Several elements were important in facilitating this development. Evidence emerged that the vast majority of stillbirths were preventable with simple interventions similar to those for the prevention of newborn mortality. There was national consensus that better data were needed on babies dying as newborns or in stillbirths, and that these data were important indicators of care, in particular in the setting of reduced maternal mortality ratios. There was consensus on definitions of early and late stillbirths, and on the use of an adapted CODAC classification of causes. The sentinel sites had proven the feasibility of stillbirth monitoring as a template for national scale up of monitoring that would support the ongoing national child screening program for birth defects, in particular given the increase of facility deliveries beyond 80% promoted by the MOHFW. And finally, the existence of national champions among professionals supporting global advocacy to create the political support for INAP stillbirth targets and monitoring.

Figures and tables

Figure 1: The *Lancet Stillbirth Series* call to action in a heuristic approach to policy analysis and determinants of priority

Figure legend: The heuristic approach to policy analysis¹⁵ (blue) linked to the 2011 *Lancet Stillbirth Series* call to action priorities¹⁰ (green) and the framework of determinants of global health political priority²² (dark blue).

Table 1: Progress and unfinished business for agenda setting and priority for stillbirth

	Themes	Progress	Unfinished Business
Ideas	<p>Stillbirths are portrayed as babies that die. Stillbirth prevention is part of a 'triple return on investment'.</p> <p>Better data on stillbirth is needed.</p> <p>Stillbirth prevention is part of an integrated continuum of care in MNH.</p> <p>Stillbirth is a loss to mothers and families.</p> <p>Stillbirth is associated with stigma.</p>	<p>Global organizations that refer to stillbirths as 'babies', and acknowledges the continuum from prenatal through newborn health, typically prioritize stillbirth prevention. Most groups include lives saved from stillbirth in their investment case.</p> <p>The Global Strategy promotes action on stillbirth prevention, supported by ENAP and EPMIM; stillbirth prevention is increasingly recognized as integral to quality in the continuum of care.</p>	<p>Humanizing stillborn babies and recognizing the importance of prenatal health has been insufficiently adopted – in particular in country level policies.</p> <p>Accountability to the investment cases is lacking – no funding for stillbirths has yet materialized.</p> <p>CRVS and health information systems need strengthening to systematically count stillbirths.</p> <p>Loss and stigma are not mentioned as key issues in any of the global policy documents assessed.</p>
Issue Characteristics	<p>Stillbirth is part of the mortality burden in MNH.</p> <p>Stillbirths are preventable.</p> <p>Antenatal care and care at birth can prevent stillbirth.</p> <p>Quality of care is important for stillbirth reduction.</p> <p>Perinatal audit is essential for stillbirth reduction.</p> <p>Cost-effective interventions to reduce stillbirths exist.</p>	<p>Stillbirth data is increasingly available, stillbirth is now a WHO core 100 indicator; and mortality rates will be monitored by the WHO and reported to the WHA.</p> <p>Preventability of stillbirths is widely recognized. Effective interventions to prevent stillbirth, and associated costs, have been included in <i>LIS</i>T and the OneHealth Tool.</p> <p>Feasibility of prevention is supported by WHO guidance for antenatal care, the broader quality of care in MNH, and for perinatal audit.</p>	<p>There is a dearth of data on intrapartum stillbirth and causes; coverage data for interventions are often not available in the highest burden countries; the variety of stillbirth definitions hamper comparisons; the exclusion of stillbirth from the Global Burden of Disease, DALYs and QALYs limits full consideration of stillbirth.</p> <p>Research and evidence supporting country level priority and implementation is lacking.</p>
Political Context	<p>Stillbirth is part of the unfinished agenda of the MDGs.</p> <p>Stillbirth should be included in the post-2015 agenda.</p> <p>The stillbirth rate is used as an indicator or a target for mortality reduction.</p>	<p>The global agenda has moved beyond the MDGs: The Global Strategy envisions an end to preventable stillbirths.</p> <p>The WHA is demanding accountability, monitoring and progress reports as part of ENAP.</p> <p>Targets set by the highest burden countries would, if met, reduce stillbirths globally by at least 25%.</p>	<p>Specific targets for stillbirth reduction are not in the Global Strategy or the Sustainable Development Goals, only in ENAP.</p> <p>Cultural mores surrounding babies dying in stillbirth, including stigma and lack of value, remain barriers to country adoption.</p>
Actor Power	<p>International organizations should explicitly call for and monitor stillbirth reduction.</p> <p>Parental organizations need better integration with global MNH organizations.</p>	<p>Organizations increasingly prioritize stillbirth prevention, compared with their previous activities. The UN agencies are accountable to the Global Strategy for ending preventable stillbirths.</p>	<p>Global leadership is too weak. Organizations interact around committed individuals rather than stillbirth specific mandates; political and country actors are lacking; parental groups need greater involvement in global advocacy.</p> <p>There is too little and infrequent monitoring and evaluation to support country advocacy.</p>

Table 2: Coverage of indicators of intervention for stillbirth prevention

Legend: Table includes all interventions recommended in the Lancet Stillbirth Series 2011 for stillbirth reduction, plus essential antenatal or childbirth interventions or

screening tools for maternal or prenatal health, and the contacts needed to deliver those interventions. Excluded are interventions for the benefit of the newborn or mother only after delivery. (NA Not available; - Not applicable or relevant))

¹ Refers to the number of surveys which collect this type of data; at least 51% of high-burden countries have conducted a nationally representative facility survey using one of the tools identified.

² Should include measurement of blood pressure, anemia, and identification of pre-eclampsia

³ Source: WHO Global observatory; 56 countries with Process indicator, 62 with outcome, 31 with coverage able to be estimated

⁴ Includes: calcium supplementation, low dose aspirin, and antihypertensive drugs

⁵ Included due to common misclassification of neonatal death as stillbirth

⁶ Bold indicates a proven impact on stillbirth, in some settings

⁷ Source: www.aidsinfoonline.org/devinfo/libraries.aspx/Home.aspx; modeled for 2013

⁸ Source: Data.unicef.org; Management indicator is Pediatric transmission rate

⁹ Caesarean section rates refer to proportion of all births for which a caesarean section was done, regardless of need.

¹⁰ Caesarean section serves as a process indicator for management following the use of partograph, while partograph is a screening indicator, at least partially for cesarean section.

		Population Data Indicators					Facility Data (Surveys) ¹			
		Screening		Management		Supplies Available	Staff trained	Ever performed		
		Process (coverage)	Outcome	Process (coverage)	Outcome					
Pre-pregnancy	Folic acid supplementation or fortification⁶	NA	NA	-	-	5 of 7	4 of 7	3 of 7		
	Family planning	NA	NA	31%	-	5 of 7	4 of 7	3 of 7		
Antenatal	Contact	NA	NA	84%	-	NA	NA	NA		
	Antenatal care visit (1+)	NA	NA	56%	-	NA	NA	NA		
	Antenatal care visit (4+)	-	-	-	-	4 of 7	4 of 7	3 of 7		
	Essential package ²	NA	NA	-	-	4 of 7	2 of 7	3 of 7		
	Iron and folic acid supplementation	NA	NA	-	-	4 of 7	2 of 7	3 of 7		
	Prevention of malaria with IPTp/ITN	NA	NA	27%/ 37%	-	4 of 7	4 of 7	4 of 7		
	Detection and management of syphilis³	43.8	2.4	37%	-	5 of 7	5 of 7	5 of 7		
	Detection and management of HIV (including PMTCT)	-	3% ⁷	67% ⁸	17% ⁸	6 of 7	4 of 7	6 of 7		
	Smoking cessation during pregnancy	-	-	-	-	0 of 7	0 of 7	0 of 7		
	Detection and management of fetal growth restriction	-	-	-	-	1 of 7	0 of 7	1 of 7		
Advanced	Detection and management of hypertensive disease⁴	-	-	-	-	3 of 7	0 of 7	1 of 7		
	Detection and management of diabetes mellitus	-	-	-	-	1 of 7	2 of 7	0 of 7		
	Induction at ≥ 41 weeks of gestation	-	-	-	-	0 of 7	0 of 7	1 of 7		
	Skilled attendant at birth	NA	NA	66%	-	NA	NA	NA		
	Facility delivery	NA	NA	63%	-	NA	NA	NA		
Intrapartum	Social support during childbirth	NA	NA	-	-	0 of 7	0 of 7	0 of 7		
	Anticonvulsants (i.e.. MgSO₄)	-	-	-	-	7 of 7	2 of 7	3 of 7		
	External cephalic version	-	-	-	-	0 of 7	0 of 7	0 of 7		
	Neonatal resuscitation ⁵	-	-	-	-	6 of 7	3 of 7	6 of 7		
	Cesarean section rates⁹	-	-	10%	-	3 of 7	2 of 7	4 of 7		
	Use of partograph	-	-	10% ¹⁰	-	4 of 7	1 of 7	1 of 7		