Ending preventable stillbirths 2

Stillbirths: rates, risk factors, and acceleration towards 2030

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An estimated 2·6 million third trimester stillbirths occurred in 2015 (uncertainty range 2·4–3·0 million). The number of stillbirths has reduced more slowly than has maternal mortality or mortality in children younger than 5 years, which were explicitly targeted in the Millennium Development Goals. The Every Newborn Action Plan has the target of 12 or fewer stillbirths per 1000 births in every country by 2030. 94 mainly high-income countries and upper middle-income countries have already met this target, although with noticeable disparities. At least 56 countries, particularly in Africa and in areas affected by conflict, will have to more than double present progress to reach this target. Most (98%) stillbirths are in low-income and middle-income countries. Improved care at birth is essential to prevent 1·3 million (uncertainty range 1·2–1·6 million) intrapartum stillbirths, end preventable maternal and neonatal deaths, and improve child development. Estimates for stillbirth causation are impeded by various classification systems, but for 18 countries with reliable data, congenital abnormalities account for a median of only 7·4% of stillbirths. Many disorders associated with stillbirths are potentially modifiable and often coexist, such as maternal infections (population attributable fraction: malaria 8·0% and syphilis 7·7%), non-communicable diseases, nutrition and lifestyle factors (each about 10%), and maternal age older than 35 years (6·7%). Prolonged pregnancies contribute to 14·0% of stillbirths. Causal pathways for stillbirth frequently involve impaired placental function, either with fetal growth restriction or preterm labour, or both. Two-thirds of newborns have their births registered. However, less than 5% of neonatal deaths and even fewer stillbirths have death registration. Records and registrations of all births, stillbirths, neonatal, and maternal deaths in a health facility would substantially increase data availability. Improved data alone will not save lives but provide a way to target interventions to reach more than 7000 women every day worldwide who experience the reality of stillbirth.

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Introduction

The Millennium Development Goals (MDGs) showed the value of health outcome targets to drive change. Maternal mortality (MDG 5) and mortality in children younger than 5 years (MDG 4) have been halved, with progress still accelerating, most notably for mortality in children younger than 5 years, with the average annual rate of reduction (ARR) improving from 1·2% (1990–1995) to 4% (2005–2013).[1] The world's 2·7 million neonatal deaths (classed as death within first 28 days after birth) have increased in prominence in national and global agendas, mainly because these deaths account for 45% of the deaths of children under 5 years worldwide.[1] Attention was not driven by millions of newborn deaths, but by recognition that neonatal mortality, accounted for almost half of deaths in children younger than 5 years and hence was essential for progress towards MDG 4.[2,3] By contrast, stillbirths (panel 1 for definitions) were not included in the MDGs and are not tracked by either the UN or the Global Burden of Disease,[7] both of which count burden only after a livebirth.[1,8] Despite previous estimates showing large numbers of stillbirths (2·6 million [uncertainty range 2·1–3·8 million] in 2009),[9] global attention for this issue is low. Analyses of development aid show how rarely stillbirths were mentioned by donors—only four times in more than 2 million disbursements totalling US$1599 billion (constant 2013 US dollar) from 2002–13.[10,11]

The mortality focus during the MDG era (from 2000 to 2015) has also stimulated investments in data improvement. For example, child mortality data have increased through nationally representative surveys, the largest source for mortality data in children younger than 5 years in low-income and lower middle-income countries. Many middle-income countries have strengthened reporting of child death in routine systems, including vital registration. The frequency and visibility of estimates for maternal, children younger than 5 years, and neonatal mortality have increased, with inclusion of neonatal mortality into annual UNICEF reports since 2011.[12] By contrast, stillbirth rate (SBR) data, although available in more than 100 countries through civil registration and vital statistics systems or registry data, have not been routinely collated. Nor has investment been made to improve stillbirth data through household surveys, which are the main SBR data source for most high burden countries. So far, only one set of national SBR estimates has been undertaken with WHO.[9] Hence, stillbirths have been without a high profile target or accountability loop, as emphasised in several MDG reports.[13–15]

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For **mortality data in children younger than 5 years** see http://www.childinfo.org

Key messages

What is happening to stillbirth rates?
At the end of the Millennium Development Goal era, 2·6 million (uncertainty range 2·4–3·0 million) third trimester stillbirths occurred annually. Stillbirth rates have declined more slowly since 2000 than either maternal mortality or mortality in children younger than 5 years. Better data are essential to accelerate progress towards the target of 12 or fewer stillbirths per 1000 births in every country by 2030.

Where geographically to focus attention?
Ten countries account for two-thirds of stillbirths and most neonatal (62%) and maternal (58%) deaths estimated in 2015. 56 countries, many of these in Africa, need to at least double present progress in the reduction of stillbirths. The highest stillbirth rates are in conflict and emergency areas. About 60% of stillbirths are in rural areas. Marked disparities remain between and within countries.

When and where in the health system to focus attention?
In 2015, an estimated 1·3 million intrapartum stillbirths (deaths during labour) occurred, despite two-thirds of births worldwide now being in health facilities. High coverage of good quality care during labour and birth gives a quadruple return on investment by preventing maternal and neonatal deaths and also stillbirths and disability with improvements in child development. Improved quality of antenatal care and family planning are also important to maximise maternal and fetal wellbeing.

What to focus on to end preventable stillbirths?
The opinion that most stillbirths are inevitable is a myth. Congenital abnormalities account for a median of only 7·4% of all stillbirths, some of which are also preventable, notably neural tube defects. Modifiable disorders with the highest estimated population attributable fraction (PAF) at a global level include: maternal age of older than 35 years (PAF 6·7%), maternal infections (malaria 8·2% and syphilis 7·7%), non-communicable diseases, nutrition and lifestyle factors, such as obesity (many of which coexist, each contributing to about 10%), and prolonged pregnancy (14·0%).

Which priority data are required to accelerate progress towards 2030?
Two-thirds of the world's newborns have a birth certificate but death and stillbirth certificate coverage is much lower, with many missed opportunities, especially in health facilities. Ending preventable stillbirths, as well as neonatal and maternal deaths, needs ambitious milestones and investment for data improvement, notably for counting births and deaths, tracking programme coverage and quality, and advancing accountability—eg, through audit.

The Every Newborn Action Plan (ENAP) launched in mid-2014 with a World Health Assembly resolution, endorsed by all countries and supported by more than 80 partners,[16] supports the UN Secretary General's global initiative of Every Woman Every Child, linking with Ending Preventable Maternal Mortality[17] and A Promise Renewed for children. During consultations for ENAP development, country representatives repeatedly stated that a target for stillbirths was needed to ensure accountability.[3,16] Analyses for targets to end preventable neonatal deaths and stillbirths in every country by 2030 are outlined in the *Lancet* Every Newborn Series.[3,16]

For more on **A Promise Renewed** see http://www.apromiserenewed.org

Objectives

This Series paper reviews the status of stillbirths worldwide and the progress since the *Lancet* Stillbirths Series in 2011.[7] We have undertaken new analyses with the aim of informing action to meet the ENAP target of 12 or fewer stillbirths per 1000 total births in all countries by 2030. These analyses include: (1) Progress and projections for SBRs in 195 countries with new estimates and trends from 2000 to 2015 to evaluate national SBR reductions needed to reach 2030 stillbirth targets. (2) Identification of priority action areas to accelerate progress towards the prevention of stillbirths, notably where and when to focus attention, including the first published global comparative risk factor analysis of potentially modifiable demographic, infectious, non-communicable disease, and lifestyle factors associated with stillbirth. (3) Details of the improvements that have been made in national stillbirth data since the *Lancet* Stillbirths Series in 2011 and remaining gaps.

Definitions

The International Classification of Diseases (ICD) and WHO recommendations are now widely recognised and used for reporting of stillbirth rates (panel 1),[18] enabling comparisons between countries whilst recognising other definitions might be applied for internal use. Variability in definitions occurs mainly among the high-income countries with a range from 20 weeks of gestational age and or more, with many countries reducing the gestational age for reporting because of the increasing survival at earlier gestational ages with neonatal intensive care.[7,19]

However, as more countries report stillbirth data, issues with respect to the application of the ICD stillbirth classification are now clearer. The ICD was developed before reporting of gestational age became the standard and prioritises birthweight over gestational age, incorrectly assuming equivalence between birthweight and gestational age (panel 1).[4] A cutoff based on gestational age is more appropriate, as a better predictor

Panel 1: Definitions of stillbirth and intrapartum stillbirth

International Classification of Diseases 10th revision (ICD 10) definitions

(note birthweight was given priority over gestational age)

- Late fetal death 1000 g or more or 28 weeks or more or 35 cm or more
- Early fetal death 500 g or more or 22 weeks or more or 25 cm or more
- Miscarriage as a pregnancy loss before 22 completed weeks of gestational age

WHO definitions

For international comparison, WHO uses stillbirth to mean the ICD definitions of late fetal deaths (ie, birthweight of 1000 g or more with an assumed equivalent of 28 weeks gestation).

However, the birthweight and gestational age thresholds do not give equivalent results. For example in the USA, if stillbirths were defined by the birthweight of 500 g or more definition, the stillbirth rate is reduced by 40% compared with the definition of 22 weeks, and if the definition is a birthweight of 1000 g or more then the proportion of stillbirths is reduced by 21% compared with the definition of 28 weeks.[4] Hence the definition should be based on only one parameter and we propose that a gestational age threshold is most appropriate because this factor is a better predictor of viability than birthweight and information about gestational age is more widely available than birthweight for many stillbirths. In many low-income and middle-income countries, gestational age is mainly based on the last menstrual period, and improvement to gestational age accuracy in these settings will need additional innovation but is more feasible than weighing all stillbirths at home.

For these stillbirth rate estimates, we use the 28 weeks or more definition, which represents third trimester stillbirths and hence undercounts the true burden if early stillbirths were included. We use the term stillbirth to refer to all early and late fetal deaths because the ICD and many countries do count early stillbirths, mostly from 22 weeks.

Intrapartum stillbirth

An intrapartum stillbirth is a death which occurs after the onset of labour but before birth. Diagnosis of intrapartum stillbirth needs confirmation of the presence of a fetal heart rate at the onset of labour. In settings where fetal heart rate monitoring is not available, assessment of the skin appearance is frequently used to estimate the timing of the stillbirth. Signs of skin maceration begin at 6–12 h after fetal death and therefore a fresh appearance of the skin with no signs of maceration is judged as a surrogate measure for intrapartum stillbirth.[5] However, this assessment might be unreliable and can underestimate intrapartum stillbirth, especially when fetal death during labour occurs at home, and delays in access to care are more than 6–12 h.[6] The intrapartum or fresh stillbirth rate is a useful marker of stillbirths preventable through because of improved care during labour. For programmatic action, where possible, the intrapartum stillbirth rate should be calculated, excluding those with severe congenital abnormalities because antenatal diagnosis of these conditions will affect the level of intervention during labour.

See appendix p 3 and 4 for details of relevant time periods and definitions of related birth outcomes.

of maturity and hence viability, than birthweight.[20] We propose that for international comparison, the definition should focus on a gestational age threshold for stillbirths rather than birthweight and that this change be included in ICD 11. In this Series, we use the 28 weeks or more definition for epidemiological estimates of stillbirth.[4]

An intrapartum stillbirth is a stillbirth occurring after the onset of labour but before birth. Fresh appearance of the skin is often used as surrogate marker for intrapartum stillbirth (panel 1).[21] Antepartum stillbirths occur before the onset of labour.

Data inputs and analyses

Panel 2 and the appendix summarise the data inputs and analyses. SBR data were available from 157 of 195 countries, with high quality civil registration and vital statistics systems data from 45 countries.[4] SBR estimates were developed with the UN including a presentation at a WHO meeting (February, 2015), at a meeting of the UN Inter-agency Group for Mortality Estimation (June, 2015),[4] and through a WHO consultation process with national statistical offices.

Data for timing of stillbirths (antepartum or intrapartum) are not available for most countries, with 130 having no useable data (panel 2, appendix). Although intrapartum SBR data should be available from most birth registers in health facilities, these data are infrequently collated at a national level, even in high-income countries. The analyses of causes, notably congenital abnormalities, and risk factors are summarised in panel 2, and the appendix.

Progress in the reduction of stillbirths and meeting 2030 targets

In 2015, an estimated 2·6 million babies (uncertainty range 2·4–3·0 million) died before birth during the last trimester of pregnancy, a worldwide rate of 18·4 stillbirths per 1000 total births (uncertainty range 16·7–21·0; figure 1A).[4] In 2000, the estimated worldwide SBR was 24·7, implying an ARR of 2·0% between 2000 and 2015. Thus, although some progress has been made, this reduction has been slower than for maternal (ARR 3·0%), neonatal (3·1%), and post-neonatal mortality of children younger than 5 years

See Online for appendix

Panel 2: Overview of data inputs and methods

Stillbirth rates

Inputs

Stillbirth rate (SBR) data were identified through web-based searches of National Statistical Office and Ministry of Health websites of all countries. For countries outside the developed Millennium Development Goal region, systematic searches were undertaken, covering the medical published literature and all Demographic and Reproductive Health Surveys. A Stillbirth Epidemiology Investigator Group was created, with calls for data distributed through relevant groups and email listserves and individual principal investigators approached.[4] Data were assessed with specified inclusion criteria and were adjusted to the 28 week or more definition where required. 157 countries in total contributed data. High quality civil registration and vital statistics data were available from 45 countries, lower quality civil registration and vital statistics systems or health management information systems data from 65 countries. Data were available from 127 retrospective household surveys from 57 countries (127 surveys). Additionally, 329 studies were included.

Stillbirth estimation

For 39 countries, with a complete time series of high quality national data from the country's own reported rates, adjusted where necessary, data were smoothed with LOcally WEighted Scatter-plot Smoother (known as LOESS) regression to produce estimated trends for 2000–15. For 156 countries without high quality time-series civil registration and vital statistics systems data, a regression model using national predictor covariates was developed to predict national SBR. The final model included ln(neonatal mortality rate), ln(gross national income), ln(low birthweight rate) mean years of adult female education, the context of the study, and the region as the main variables for prediction purposes. Details of the model and trend estimates are given in the accompanying methods paper.[4]

Projections to 2030 at national level were estimated on the basis of trends for SBR 2000–15, assuming the same national average annual rate of reduction, and combining with UN Population Division medium birth cohort projections by country and year. Annual rate of reduction is calculated with the formula:

$$\left(\frac{\text{Rate in endline year}}{\text{Rate in baseline year}}^{\frac{1}{\text{endline year} - \text{baseline year}}} - 1 \right) \times 100$$

Uncertainty

We derived uncertainty estimates with a bootstrap approach by drawing 1000 bootstrap samples with replacement from the input data, rerunning the model to produce estimates, and taking the 2·5th and 97·5th percentile values for each cause as the uncertainty bounds. For countries with high quality time-series data, in which reported rates were used, we assumed a Poisson distribution.[4]

Intrapartum stillbirth rates

Inputs

Data on intrapartum stillbirths were identified through web-based searches of National Statistical Office and Ministry of Health websites and systematic literature searches for all countries. Further data were requested from the Stillbirth Epidemiology Investigator Group. Data were assessed using specified inclusion/exclusion criteria. Where civil registration and vital statistics systems and routine data were available for more than 1 year, the latest full year of data availability was used. Data were included from 65 countries (41 outside the developed region as defined by the Millennium Development Goal regions; appendix). This included 173 datapoints covering over 37 million births with 1·1 million stillbirths.

Estimation

We attempted various strategies to fit a regression model to estimate the national intrapartum stillbirth rate, including approaches to predict intrapartum stillbirth rate, the proportion of all stillbirths that are intrapartum, and the log odds of stillbirth (appendix). In view of limitations in the quantity and quality of available data, identification of a satisfactory model was not possible. Therefore to estimate the intrapartum stillbirth rate for each country, we first calculated the median proportion of stillbirths that are intrapartum from all data inputs from a certain region. We estimated the intrapartum stillbirth rate by applying the regional median proportion of stillbirths that are intrapartum to the country estimated stillbirth rate for 2015.

Uncertainty

We derived uncertainty estimates for the proportion of stillbirths that are intrapartum by the use of regional interquartile range for regions with more than ten data inputs. For regions with ten or fewer datapoints, we used the upper and lower datapoints. We simulated uncertainty estimates for intrapartum stillbirth rates with 1000 independent random draws of the uncertainty around the total stillbirth estimated for the proportion of total stillbirths that were intrapartum.

Congenital disorders associated with stillbirth

Inputs

We undertook a web-based search of National Statistical Office and Ministry of Health websites of all countries to identify databases and reports providing data for cause of death of stillbirths. National data were available from 22 countries. We excluded data when countries reported with an early stillbirth definition (20 weeks or older, or 22 weeks or older) and included terminations of pregnancy or did not

(Panel 2 continues on next page)

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provide consistent data on all stillbirths. For example, Italy had data for less than 50% of stillbirths and more than 25% were garbage codes (deaths assigned to ill-defined causes that are not compatible with the International Classification of Diseases cause of death attribution); and the Philippines reported on only the top ten causes of stillbirth (which included 74% of all stillbirths). We abstracted data for the stillbirth definition used, the proportion of stillbirths with congenital abnormality given as the cause of death, and the proportion of stillbirths with no cause recorded. We extracted data for the present status of screening and the legal status of termination of pregnancy for congenital abnormalities from these reports and supplemented by web-based searches where necessary.

Risk factor analyses for stillbirth

Inputs

We reviewed the literature to identify potentially modifiable risk factors associated with stillbirths reported in the medical literature. We grouped these risk factors into the two categories: maternal (demographic and fertility related, infection, nutrition, lifestyle, non-communicable diseases, and environmental); and fetal (table 3). We included risk factors with strong evidence of an association with stillbirth and available prevalence data for all countries worldwide. We searched recent systematic reviews (published 2010–15) for data to inform the risk associations. We included studies with median data collection from 1995, restricting to more recent data where possible. We searched data for the population prevalence of the risk factor by country from publically available databases (appendix). For risk factors for stillbirth that were potentially modifiable and where prevalence data were available but with no risk association data from recent systematic reviews, we undertook new systematic reviews of the medical literature (appendix).

Estimation process

For included disorders, we calculated the proportion of cases in the whole population that might be attributed to the exposure to a risk (population attributable fraction [PAF]). PAF is the proportional reduction in stillbirth that would occur if exposure to a risk factor was reduced to an alternative ideal comparative scenario (ie, the counterfactual, such as no active syphilis in pregnancy). However, as stillbirths might be caused by various risk factors, and individual risk factors might interact in their effect on overall risk of stillbirth, PAFs for individual risk factors overlap. This calculation assumes causality and complete control of possible confounding factors and hence will probably overestimate the true PAF.

Uncertainty

We quantified uncertainty around these estimates by taking 1000 random draws of the national number of stillbirths and the risk associated with the disorder, and the prevalence of the risk factor (where available), assuming a normal distribution with mean equal to the point estimate of the parameter and the standard deviation equal to the estimated standard error. We summed these data at the regional level for each draw and present the 2·5th and 97·5th percentiles of the resulting distributions as the uncertainty range.

See the appendix for more details of inputs and methods.

(4·5%) over the same period.[1,22] For every country to reach the ENAP stillbirth target of 12 or less by 2030 (figure 1A),[16] a global average ARR of 4·2% will be required from 2015, more than double the present ARR of 2·0%. Yet this worldwide average hides regional variation.

Despite slow progress overall, some countries within every region in figure 1B are reducing stillbirths faster than their neighbours. In Bangladesh, where the SBR ARR is 3·4%, the total fertility rate has halved since 2000 and coverage of key maternal–newborn interventions has increased over the same period, including at least four antenatal care visits (annual rate of change [ARC] 6·5%, regional median 3·1%) and birth with a skilled attendant (ARC 7·1%, regional median 2·9%).[23] Births by caesarean section increased from less than 5% to 10–20% of all births, however reductions in the proportion of those non-medically indicated is crucial to maintain progress.[23] Rwanda (SBR ARR 2·9%), although still with a high total fertility rate, has increased coverage of care (at least four antenatal care visits: ARC 3·8%, regional median 2·5%) and skilled birth attendants (ARC 3·7%, regional median 2·0%). Similar improvements are noted in Cambodia, SBR ARR 3·6% (at least four antenatal care visits: ARC 8·5%, regional median 1·6%; skilled birth attendants: ARC 2·9%, regional median 0·6%). Nevertheless, two-thirds of women in Bangladesh and Rwanda still do not have access to at least four antenatal care visits and more than half of women in Bangladesh and a third of women in Rwanda and Cambodia give birth without a skilled attendant (appendix). In 2000, Peru, one of the fastest progressing countries in Latin America (SBR ARR 2·8%), had substantially lower coverage than its neighbouring countries but through strategic investment in maternal and newborn health, including national financial protection, the country now has almost universal coverage of at least four antenatal care visits and skilled birth attendance.[24] Even in high-income countries, such as the Netherlands, progress is possible with improvements in antenatal care and care at birth, a wide-scale perinatal audit, coupled with a focus on women's health before and during pregnancy.[19]

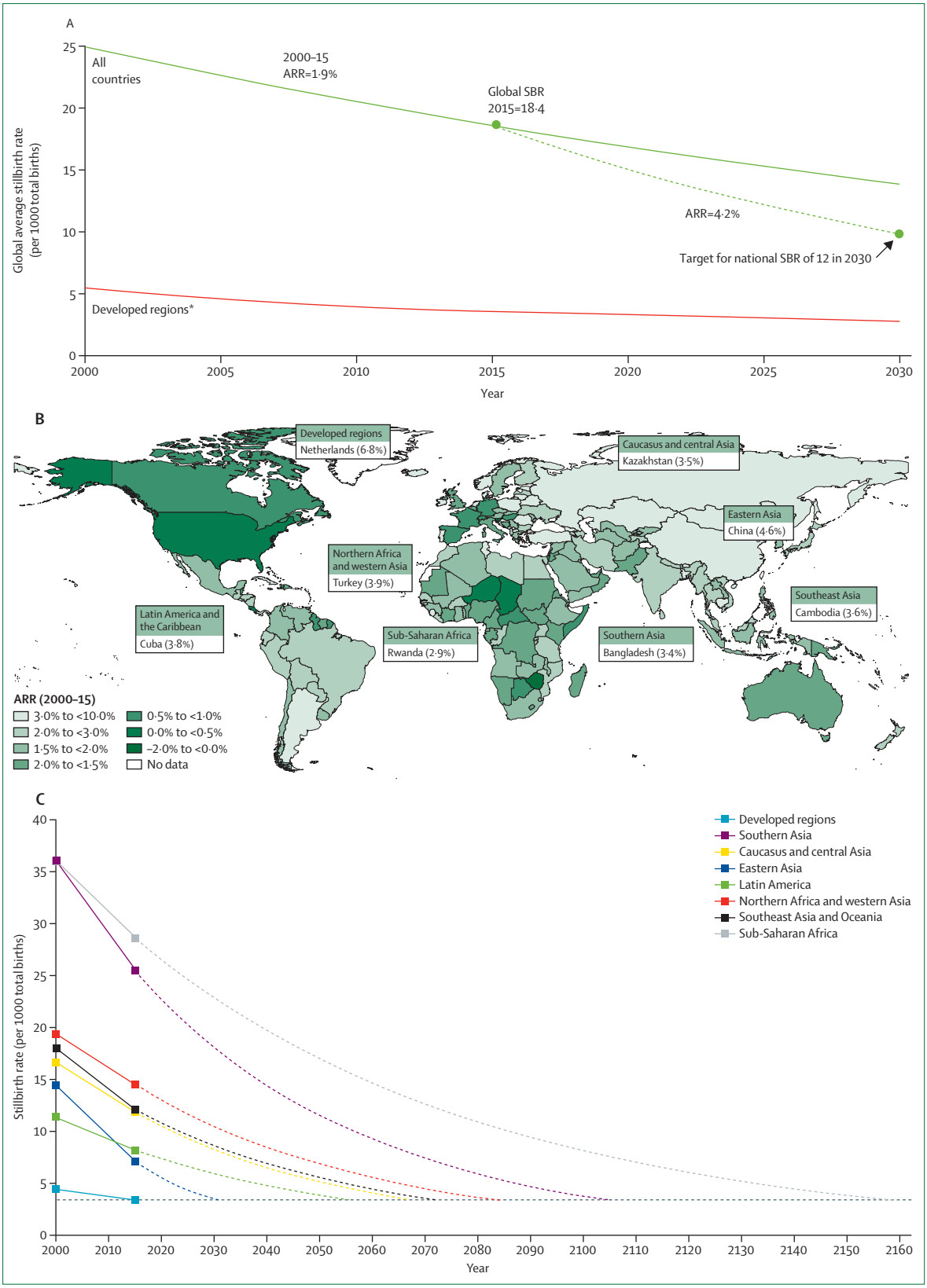


Figure 1: **Trends in and projections of progress for stillbirth rates at global and regional level**

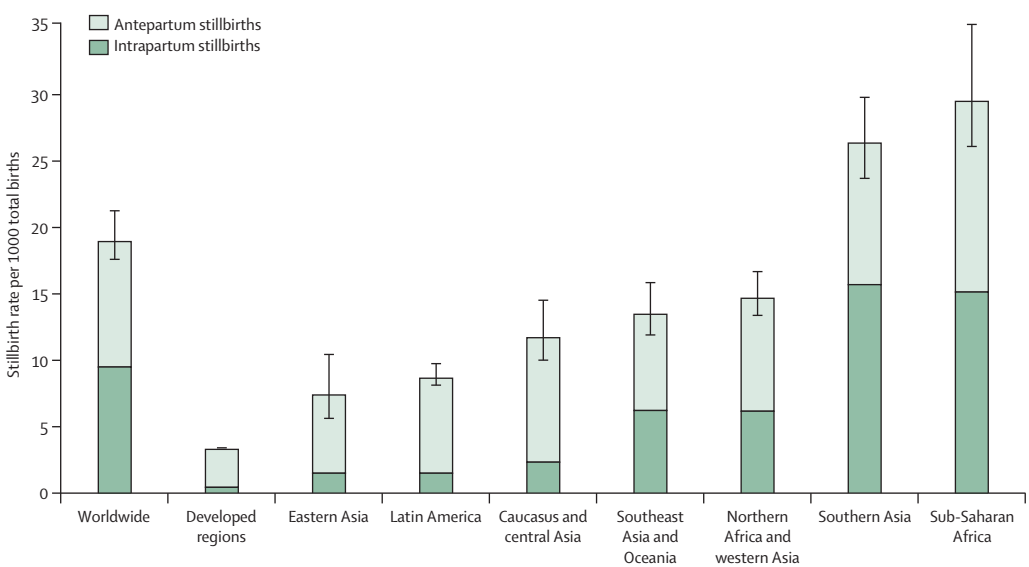
(A) Trends in global average stillbirth rates up to 2015 and projections to 2030 for the worldwide stillbirth rate targets of 12 or fewer per 1000 total births, as set in the Every Newborn Action Plan. The dotted line represents the worldwide ARR needed to reach this target. (B) Variation in ARR of stillbirth rates (2000–15), showing the fastest progressing country in each Millennium Development Goal region (excluding sub-Saharan Africa, see appendix). The boundaries on this map do not imply any opinion on the legal boundaries of any country or territory. See appendix and Blencowe and colleagues[4] for details of stillbirth rate estimates. (C) Time for each region to reach the same stillbirth rate as developed countries in 2015 (dotted line), based on ARR from 2000–15. ARR=average annual rate of reduction. *Developed regions are defined by the Millennium Development Goals.

Priorities for action to accelerate progress to prevent stillbirths

Where geographically to focus on to close the gap?

For many countries, accomplishment of the SBR target by 2030 will need concerted efforts. At least 56 countries will need to more than double their present stillbirth ARR. In comparison, 30 countries need to double their ARR to reach the mortality target for children younger than 5 years and 42 countries to reach the neonatal mortality target.[1] Sub-Saharan Africa has the highest SBRs and the slowest rates of progress worldwide, especially in countries with conflicts and emergencies (figure 1B, appendix). Thus at the present rates of progress, over 160 years will pass before the average pregnant woman in sub-Saharan Africa has the same chance of her baby being born alive as does a woman nowadays in a high-income country (figure 1C), and even longer for women in the countries making the slowest progress, such as Zimbabwe. Although the Sustainable Development Goals (SDGs) aim for convergence within a generation, with women and babies in all countries having the same chance of survival, equity gaps between regions and countries will widen over time unless present SBR trends change. This pattern is true even for high-income countries, which have an average SBR of 3·4 per 1000 total births but with substantial variation between countries, from 1·3 (Finland) to 8·8 (Ukraine).

Almost all stillbirths occur in low-income and middle-income countries (98%) with three-quarters in sub-Saharan Africa and south Asia (figure 2). The ten countries with the most stillbirths worldwide account for 53% of all livebirths, 65% of all stillbirths, 58% of maternal deaths, and 62% neonatal deaths (table 1).[4,22] Population size is an important factor, but the rankings of countries with the most stillbirths also shift with changes in mortality risk and fertility. For example, Brazil no longer ranks in the ten countries with highest neonatal deaths and stillbirths, this progress has been achieved through dramatic falls in fertility and risk of stillbirth. By contrast, several sub-Saharan African countries with continuing high fertility and SBRs are now among the ten countries with the most stillbirths, notably Tanzania and Niger. Tanzania met MDG 4 for



	Worldwide	Developed regions	Eastern Asia	Latin America	Caucasus and central Asia	Southeast Asia and Oceania	Northern Africa and western Asia	Southern Asia	Sub-Saharan Africa
Estimated stillbirth rate per 1000 total births (uncertainty range)	18·4 (16·6–21·0)	3·4 (3·4–3·5)	7·2 (5·6–9·7)	8·2 (7·5–9·2)	11·9 (9·8–15·6)	12·2 (10·7–14·6)	14·5 (12·9–17·6)	25·5 (22·5–29·1)	28·7 (25·1–34·2)
Number of stillbirths	2 620 000	46 700	129 000	91 000	23 400	154 900	148 300	966 600	1 059 700
Estimated intrapartum stillbirths	49·6%	10·0%	19·9%	16·8%	19·9%	45·7%	42·0%	59·3%	51·1%
Stillbirths in rural areas*	58·9%	23·0%	43·8%	24·9%	58·9%	54·5%	41·8%	65·5%	61·8%
Stillbirths born in health facilities*	61·2%	99·4%	99·5%	89·3%	97·1%	79·6%	81·5%	58·8%	49·0%

***Figure 2*: Regional variation in estimated stillbirth rates, showing uncertainty ranges, and the proportion of intrapartum stillbirths for 2015**
See appendix and Blencowe and colleagues[4] for details of stillbirth rate estimates. *Based on urban and rural birth cohorts with national stillbirth rates so the values might underestimate rural stillbirth rates, which are expected to be higher than urban rates. Facility and home stillbirth rates are differential, the direction of increased stillbirth rates is unpredictable because the values might be lower at home if high-risk cases are in facilities, or higher at home if very low access to care.

	Rank for stillbirth numbers in 2015 (rank in 2000)*	Number of stillbirths in 2015 (ARR†)	Rank for numbers of neonatal deaths in 2015*	Number of neonatal deaths in 2015 (ARR†)	Rank for numbers of maternal deaths in 2015*	Number of maternal deaths in 2015 (ARR†)	General fertility rate in 2015 (ARR†)
India	1 (1)	592 100 (2·4)	1	695 900 (3·2)	2	45 000 (5·0)	0·08 (1·9)
Nigeria	2 (2)	313 700 (1·3)	3	240 100 (2·3)	1	58 100 (2·4)	0·18 (0·3)
Pakistan	3 (3)	242 600 (1·4)	2	244 700 (1·9)	5	5500 (3·6)	0·09 (2·5)
China	4 (4)	122 300 (4·6)	5	93 400 (8·6)	18	4400 (5·0)	0·05 (–0·5)
Ethiopia	5 (6)	96 500 (1·8)	6	87 400 (3·7)	4	11 200 (6·0)	0·13 (2·7)
Democratic Republic of the Congo	6 (8)	87 800 (1·5)	4	94 300 (1·7)	3	22 300 (1·5)	0·18 (1·2)
Bangladesh	7 (5)	83 100 (3·4)	7	74 400 (3·9)	10	5500 (5·3)	0·07 (3·1)
Indonesia	8 (7)	73 400 (1·9)	8	73 900 (3·3)	8	6400 (4·8)	0·07 (1·0)
Tanzania	9 (10)	47 100 (2·3)	10	38 600 (3·5)	6	8200 (4·9)	0·17 (0·6)
Niger	10 (22)	36 200 (0·4)	21	25 500 (3·2)	11	5400 (2·4)	0·24 (0·2)
Total	NA	1·7 million (2·0); 65% world total	NA	1·7 million (3·7); 62% world total	NA	176 200 (3·3); 58% world total	NA

See appendix and Blencowe and colleagues[4] for details of stillbirth rate estimates.[1,22] ARR=average annual rate of reduction, see panel 2 for details of methods used. NA=not applicable. *Rank 1 shows the highest number of deaths in 2015. †ARR for years 2000–15.

Table 1: **Top ten countries for absolute numbers of stillbirths and maternal and neonatal deaths in 2015**

reducing mortality in children younger than 5 years but reductions in maternal and neonatal mortality, and especially stillbirths, have been slower.[25] Challenging the myth that SBR or neonatal mortality rate reduction results in population growth, in many countries, the reductions in neonatal mortality rate and SBR coincided with a substantial reduction in fertility levels, including Cuba and Bangladesh (appendix).[26]

When to focus?

We estimate that worldwide in 2015, about half of stillbirths, 1·3 million (range 1·2–1·6 million), occurred during labour (figure 2). The proportion of stillbirths that are intrapartum varies from 10·0% (range 5·5–18·4%) in developed regions to 59·3% (range 32·0–84·0%) in south Asia (appendix). Most intrapartum stillbirths occur in countries with low coverage of timely, high quality care around the time of birth. More than 40 million women give birth unattended at home each year. Improvements in access to high quality intrapartum care are essential for the reduction of preventable stillbirths, with the added benefits of a reduction in the 46% of maternal deaths during labour and 1 million neonatal deaths occurring on the day of birth, a reduction in long-term disability for the woman and child, as well as an enhancement in child development.[3]

Where in the health system?

Two-thirds of births worldwide occur in health facilities.[27] Hence high quality facility care along with investments, including community demand and birth planning, should be the first focus for stillbirth prevention. Despite increasing urbanisation with most of the world now residing in cities, in south Asia and especially in sub-Saharan Africa, about 60% of stillbirths are still rural (figure 2). Rural families are often the poorest people, with restricted access to midwifery care, family planning services, and emergency obstetric care, including caesarean section, resulting in high birth rates and high risk of stillbirth.[23] Additionally, SBR can be higher for rural areas in high-income countries.[28] Even short delays in access to appropriate care can result in death or disability for newborns and women.[29,30] The three delays model developed for maternal deaths is relevant for stillbirths, including delays in: danger sign recognition; care-seeking due to social or economic barriers, or distance and lack of transport; and receiving high quality health facility care.[25] Intrapartum stillbirth is a sensitive marker of delay and low quality of care, reflecting scarcity of intrapartum monitoring and delays in the rapid delivery of a compromised fetus. Much debate exists as to whether these factors, whilst averting the intrapartum stillbirth, could result in a compromised neonate with neonatal encephalopathy and potential long-term associated disability. Disability is less likely when timely action is taken and high quality neonatal care is available. However, tracking of these longer term outcomes is needed as intrapartum and neonatal intensive care are scaled up.[31] Additionally, a woman who has a stillbirth is at risk of an obstetric fistula or death. An estimated 78–96% of women with obstetric fistula also have had a stillbirth.[32,33]

National SBRs show a strong ecological association with coverage of care (appendix). Higher national coverage of antenatal care is strongly associated with lower antepartum SBRs (appendix). Although WHO

recommends a four-visit antenatal care model for low-risk populations, these policies are being reviewed.[34] Similarly, higher coverage of birth with a skilled attendant is strongly associated with lower intrapartum SBRs. The median intrapartum SBR is high for those countries with caesarean section rates below 10% (appendix). In countries with caesarean section rates of more than 10%, a strong correlation with SBR does not seem to exist (appendix). This finding is consistent with a systematic review[35] that failed to detect any improvement in maternal or newborn health with caesarean section rates of more than 10–15%.[35,36] In countries with higher caesarean section rates, some caesareans might be inappropriate, contributing to higher preterm birth rates[37] and are associated with an increased risk in subsequent pregnancies for mothers and an increased risk of mortality and morbidity for these offspring.[38–40] Policies should encourage appropriate caesarean sections but more research is needed to track and disincentivise non-medically indicated intervention.[41] In low-income and middle-income countries, much of the caesarean section epidemic is in the private sector, with rates of more than 50% in private hospitals, many of which are not medically indicated.[23] However, the global challenge is that the women who most need caesarean sections to save their own or their babies' lives are least likely to get them.[42] In many poor communities, even if women are able to access emergency caesarean sections if needed, they might not get them in time and frequently have to pay for them out-of-pocket.[42]

Why do stillbirths occur?

Many countries, particularly high-income countries and middle-income countries, collate data for disorders associated with stillbirths. However, in view of the more than 55 active classification systems, consistent estimation of stillbirth causation is difficult even across high-income countries.[10,43] In the 2011 *Lancet* Stillbirths Series, we called for a simplified classification system that could be applied in low-income countries onto which more detailed categories recorded in other settings could be mapped.[7] Since 2005, national estimates have been available for all UN member states for neonatal cause of death,[43,44] but the absence of similar information for stillbirths restricts our ability to

	Year(s) of data collection	Stillbirth definition	Stillbirth rate	Specific rate of stillbirths attributed to congenital disorders	Percentage of all stillbirths attributed to congenital disorders	Status of screening for congenital disorders	Legal status of termination of pregnancy for congenital disorders
Australia	2011	≥28 weeks	2·9	0·3	10·0%	Widely available	Legal in most regions
Colombia	2013	≥28 weeks	8·0	0·7	8·3%	Moderate availability	Legal (severe only)
Kuwait	2012	≥28 weeks	5·9	0·4	7·3%	Widely available	Legal
Suriname	2010–11	≥28 weeks	22·4	1·5	6·7%	Limited availability	Not permitted
Argentina	2012	≥1000 g	5·2	0·3	6·0%	Widely available	Not permitted
Panama	2013	≥7 months	5·0	0·4	7·0%	Limited availability	Not permitted
Wales	2013	≥24 weeks	4·2	0·3	7·1%	Widely available	Legal
UK	2009	≥24 weeks	5·2	0·4	7·4%	Widely available	Legal
Portugal	2012	≥22 weeks	3·6	0·3	8·0%	Widely available	Legal
Lithuania	2013	≥22 weeks	4·8	0·5	9·7%	Widely available	Legal
Costa Rica	2013	≥22 weeks	6·8	0·4	6·4%	Widely available	Legal
Canada	2010	≥500 g	3·8	0·4	11·4%	Widely available	Legal
Ireland	2012	≥500 g	3·9	0·8	21·0%	Widely available	Not permitted
Scotland	2012	≥500 g	4·7	0·5	11·0%	Widely available	Legal
Guatemala*	2013	≥20 weeks	8·6	0·5	5·4%	Limited availability	Not permitted
Mexico*	2012	All fetal deaths	8·7	0·6	7·3%	Variable	Not permitted
Ecuador*	2013	All fetal deaths	7·4	0·5	6·4%	Not known	Not permitted
Qatar*	2009	Not stated	6·7	0·8	11·4%	Widely available	Legal (before 5th month)
Subnational							
South Africa: non-tertiary hospitals†	2012–13	≥1000 g	14	0·4	2·5%	Very limited availability	Legal
South Africa: tertiary referral†	2012–13	≥1000 g	27·2	2·1	7·7%	Limited availability	Legal

See panel 2 for details of methods used and appendix for full details of the sources. *Stillbirth ascertainment at <22 weeks probably low in these settings. †Perinatal Problem Identification Programme covered 73% of all births nationally in these years.

Table 2: **Proportion of all stillbirths reported to be associated with congenital abnormalities in 18 national reports and subnational reports in South Africa showing status of screening and legality of termination of pregnancy**

	Prevalence data	Risk data	Comment
Maternal factors			
Maternal age >35 years	✓	✓	NA
Maternal age <16 years	X	X	Data only available for girls aged 15–19 years, suggesting no increased risk but likely to be higher risk for younger age group
Primiparity	X	X	NA
Short interpregnancy interval	X	X	NA
Assisted reproductive therapy	X	X	NA
Syphilis	✓	✓	NA
HIV	✓	✓	NA
Malaria	✓	✓	NA
Rubella	X	X	NA
Varicella	X	X	NA
Parvovirus	X	X	NA
Toxoplasmosis	X	X	NA
Cytomegalovirus	X	X	NA
Tuberculosis	✓	X	NA
Influenza	X	X	NA
Hepatitis	X	X	NA
Chorioamnionitis	X	X	NA
Overweight	✓	✓	NA
Obesity	✓	✓	NA
Short maternal stature	X	X	NA
Undernutrition	✓	X	No studies showing convincing risk when confounding considered
Maternal anaemia	Limited	X	One study—no adjustment for potential confounders
Maternal diabetes (pre-existing)	✓	✓	Prevalence data for adult women
Gestational diabetes	X	✓	NA
Maternal hypertensive disorders:			
Pre-existing	✓	✓	Prevalence data based on adult women's hypertension
Pregnancy-induced	X	✓	NA
Pre-eclampsia	✓	✓	NA
Eclampsia	✓	✓	NA
Untreated thyroid disease	X	X	NA
Obstetric cholestasis	X	X	NA
Maternal mental health disorders	X	X	Studies report non-standard exposures and close association with substance abuse
Maternal sickle cell disease	✓	✓	NA
Tobacco	✓	✓	Prevalence data for adult women
Alcohol	✓	X	Prevalence data for adult women
Illicit drug use	X	✓	NA
Violence against women	✓	✓	NA
Indoor air pollution	✓	✓	NA
Fetal factors			
Male sex	✓	✓	Not modifiable
Post-term pregnancy	✓	✓	NA
Small for gestational age	Only for low-income and middle-income countries	X	Causal association with many of the risk factors
Congenital abnormalities	X	X	Deemed to be a direct cause
Rhesus disease	✓	✓	NA

See appendix for details of prevalence and risk data. ✓=data available. X=no data available. NA=not available.

Table 3: **Disorders associated with stillbirth reviewed for risk factor analysis**

inform programmatic action. Even if a new classification system is agreed, a time lag of potentially up to a decade is possible before comparable national estimates for the major disorders associated with stillbirth are realised.

Congenital abnormalities are reported more consistently across many stillbirth classification systems. Myths persist that stillbirths are inevitable and mostly due to non-preventable congenital abnormalities. Yet in most national reports, congenital abnormalities account for less than 10% all stillbirths after 22 weeks of gestation, with a median of 7·4% and a median rate of 0·4 per 1000 births (table 2). In settings with restricted diagnostics, low ascertainment of congenital causes is likely, for example in non-tertiary hospitals in South Africa (2·5%). Conversely with good diagnostics and where termination of pregnancy is illegal, a higher proportion of congenital abnormalities is reported (eg, 21% in Ireland). Furthermore, not all congenital abnormalities are inevitable, for example most neural tube defects are preventable with folic acid supplementation or fortification.

Babies at greatest risk of death

Male babies are at a 10% higher risk of stillbirth than female babies.[45] The probable mechanisms include X-linked congenital conditions, increased risk of preterm labour, and poor fetal growth for male babies. The latter two disorders might be related to a higher incidence of placental vascular conditions, including pre-eclampsia.[46]

The smallest babies, in terms of birthweight and gestational age are at the highest risk of death. About 20 million livebirths are estimated to have low birthweight (<2500 g) worldwide, but this simplistic, dichotomous cutoff fails to differentiate between fetal growth restriction and preterm labour, or a combination of the two.[47] A higher risk of both antepartum and intrapartum stillbirth exists for those babies with fetal growth restriction than those without. Stillbirths are often the result of a causal network in which an already compromised fetus is more susceptible to infection or hypoxic effects.[48] For example, the risk of death is higher for those who have had a hypoxic injury against a background of fetal growth restriction and infection, and this risk applies for stillbirths and liveborn babies who die or develop neonatal encephalopathy.[49]

Where high quality obstetric and neonatal care is available, intrapartum stillbirth is now rare and hence most stillbirths are antepartum and many are associated with fetal growth restriction. In these settings, fetal growth restriction or placental disorders are more likely to be detected and the balance of risks might favour early induction or caesarean section, hence increasing the preterm birth rate.[50] However, early detection of fetal growth restriction is still a challenge even in high-income countries.[19]

Modifiable factors associated with stillbirth

We reviewed potential risk factors for stillbirths, including 38 maternal factors consisting of demographic, environmental, nutritional, and lifestyle factors, maternal infections and non-communicable diseases, and fetal factors (table 3). We did not include distal determinants of stillbirth such as poverty and inequity, which affect underlying maternal health and

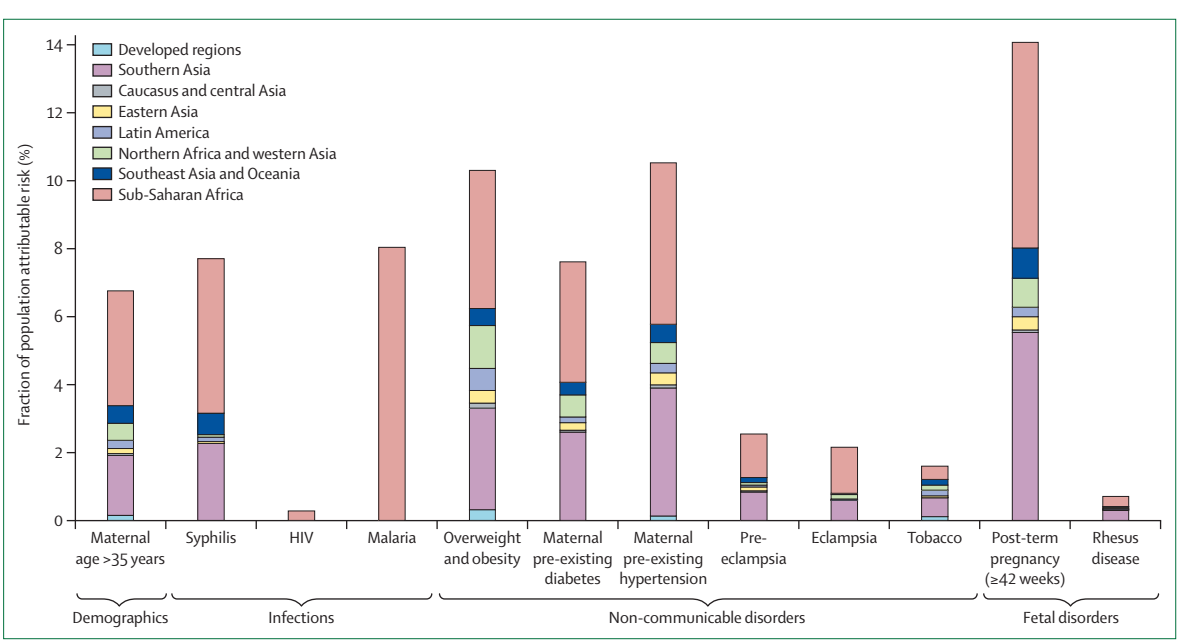


Figure 3: **Regional variation in population attributable risk of stillbirth for factors with adequate risk data and appropriate prevalence data**
Regions defined by the same categories as the Millennium Development Goal region. Note that these factors are not mutually exclusive and some, particularly older age, non-communicable disorders, and lifestyle factors might coincide. See table 3 for disorders that we considered and appendix (p 26) for more details.

access to quality care. Although these factors are very important, data were not available to quantify the risk. Fetal growth restriction and preterm labour are frequently a final factor in the causal pathway leading to stillbirth; however, in this comparative risk factor analysis, we focus on the biological risks.

Risk ratio data were available for 12 potentially modifiable factors associated with stillbirth, with prevalence data available for all countries (figure 3, appendix). These risk factors are not mutually exclusive and many might coincide in the same woman so the sum of the population attributable risks exceeds 100%. However, comparison of categories with the greatest overall effect on stillbirth risk still provides a useful guide for programmatic priorities towards ending preventable stillbirths.

Worldwide, 6·7% (uncertainty 6·3–7·3%) of stillbirths are attributable to older maternal age (older than 35 years). Adolescent pregnancy is also associated with increased risk, especially in those younger than 16 years.[51] We were unable to quantify this risk due to lack of robust age-specific risk data. However, because of a lower number of pregnancies in this group compared with women older than 35 years, the population attributable contribution to stillbirth is relatively small. Family planning programmes might not have a clear message with respect to pregnancy risks at older ages, notably subfertility, severe maternal morbidity or death, stillbirth, preterm birth, low birthweight, and neonatal death.[52] Such messages must be coupled with access to methods of family planning that are acceptable to the woman and with empowerment for informed choices.[53] Short interpregnancy interval is another important risk associated with other poor perinatal outcomes, modifiable with family planning, but the effect on stillbirth is yet to be quantified.[54]

Infections during pregnancy are important preventable factors, especially in sub-Saharan Africa, although few studies report useable risk data. Improvements in prevention and treatment of malaria in pregnancy (estimated to be attributable for about 20% of stillbirths in sub-Saharan Africa), and syphilis (7·7% [uncertainty range 4·6–12·0%] of stillbirths worldwide and 11·2% [6·8–17·3%] in sub-Saharan Africa), should be an important first step to prevent stillbirths in weak health systems.[55,56] Of note, the campaigns for management of malaria and syphilis in pregnant women have tended to focus on neonatal deaths, despite the much higher associated stillbirth burden. Data to assess the burden of stillbirths attributable to HIV and AIDS are scarce. On the basis of data from the South African Perinatal Problem Identification Programme,[57] we estimate that 0·7% (0·6–0·8% uncertainty range) of stillbirths in sub-Saharan Africa might be attributable to HIV infection. The risk might be higher in settings without widespread availability of antiretroviral therapy (appendix).

The global epidemics of obesity and non-communicable diseases, notably hypertension and diabetes, are affecting pregnancies in all regions,[58] especially when combined with advanced maternal age. Our estimates suggest that about 10% of stillbirths are attributable to these disorders (figure 3). Improvements to outcomes will need efforts aimed at primary prevention and improved detection and management of affected women where possible before pregnancy. Tobacco has a relatively small population attributable risk (figure 3) due to a low increased risk of stillbirth compared with non-smokers and also a low prevalence of smoking, even in south Asia where smoking has risen dramatically over the past two decades.

More than 200 000 stillbirths are attributable to pre-eclampsia and eclampsia (combined fraction of population attributable risk 4·7%) with the highest burden in sub-Saharan Africa and south Asia. Many of these deaths could be averted with detection and appropriate management in antenatal care, and improved intrapartum care.[59]

Pregnancy lasting longer than 42 weeks is associated with an increased risk of stillbirth, accounting for an estimated 14·0% of stillbirths worldwide. Most high-income countries have introduced policies of induction of labour before 42 weeks, with some ecological analyses suggesting a substantial effect on the proportion of stillbirths.[60] This policy could be extended to middle-income countries where accurate dating of pregnancies through early ultrasound, and emergency obstetric care, are widely available. Caution is needed in settings where these criteria cannot be met, especially for safe caesarean section, and a real potential exists for harm to women and their babies.[42]

For some other important factors, estimates of the attributable stillbirths were not possible because of a scarcity of prevalence or risk data (appendix). For example, with respect to violence against pregnant women, although studies show an increased risk of stillbirth[61,62] and 30% of ever-partnered women experience physical or sexual abuse in their lifetime, no specific prevalence estimates are available for pregnant women.[63] Other factors associated with an increased risk of stillbirth include: bacterial infections (eg, chorio-amnionitis), viral infections (eg, influenza and hepatitis),[64] other medical disorders (eg, thyroid disorders and liver disease),[65] and indoor air pollution (30% increased risk).[66,67]

High quality antenatal care could identify and address many of these disorders. More than half of pregnant women are estimated to attend at least four antenatal care visits.[68] However, optimisation of timing and quality of visits and attention to the marginalised, including those with mental health conditions, is essential.[69,70]

Although these biomedical disorders are important and must be addressed to improve fetal and maternal

health, especially in low-income and middle-income countries, the common factor underlying many stillbirths is the absence or low quality of intrapartum care, including access to timely referral.[71,72] This situation must be urgently addressed. Progress in preventing of stillbirths will clearly need collaboration between groups who focus on issues beyond maternal and newborn care, notably family planning, non-communicable diseases, nutrition, and malaria and other infections, as well as wider health systems change, strategies for women's education and empowerment, and community engagement involving men, mothers in law, and other societal gatekeepers.

Counting stillbirths and making the data count

Some progress has been made in the measurement of stillbirths since the 2011 *Lancet* Stillbirths Series (appendix). Stillbirths are increasingly counted, which might be partly related to more visible estimates and rankings of SBR.[9] More data are available for SBRs than in 2011, with the number of countries with no data reduced from 68 in 2011 to 38 in 2015. However, among those with data, 81 do not have nationally representative figures and more do not have trend data. In many settings, stillbirths are infrequently weighed at birth, especially for births occurring outside of health facilities. Shifts in the stillbirth definition to one based on gestational age should further increase data quality and comparability, recognising that further advances are needed in accuracy of gestational age assessment (panel 1).

Although SBR data have increased, data gaps remain for intrapartum SBR and more than 130 countries are without any available data, despite such information being recorded in most routine labour ward registries. The fact that an estimated 1·3 million intrapartum stillbirths, most of which are preventable, are not collated into hospital or national information systems should be a scandal.

Data improvements will need investments in national health information systems, as promoted by the Measurement and Accountability for Results roadmap,[73] which relates to the whole health management information system, and the ENAP measurement improvement roadmap, which focuses on newborns, stillbirths, and quality of care.[74] As part of ENAP, WHO is developing perinatal audit as a means to assist in addressing modifiable factors,[75] and to link to a minimum perinatal dataset.[10] These initiatives provide opportunities to develop better methods that can be applied to address important research questions. However, investment is needed in high burden countries to operationalise this.

All babies should be registered at birth. Birth registration now covers two-thirds of the world's livebirths but less than 5% of stillbirths. Coverage of death registration is even lower, covering less than 5% of neonatal deaths and even fewer stillbirths. Recording of all facility births, stillbirths (especially intrapartum), and newborn, child, and maternal deaths with standard definitions is feasible, and linking these to birth registration would rapidly increase SBR data availability, even by 2020. The inclusion of gestational age, birthweight, and associated maternal disorders on death certificates would greatly increase the usefulness of data, allowing cross tabulation of maternal and perinatal disorders. Including these data on birth certificates would provide important intergenerational information on health, such as outcomes of non-communicable diseases.[10]

Accelerating progress to end preventable stillbirths requires improved data. Little investment has yet been made to increase coverage data for interventions that improve maternal and newborn health. This objective is an urgent priority and should include tracking content and quality of interventions specific to stillbirth prevention, particularly within antenatal care and intrapartum care.[76] For example, coverage data for syphilis detection and treatment, components of advanced antenatal care, and intrapartum monitoring are absent in most countries and in global tracking. Additionally, data are needed to assess stigma associated with stillbirths and to measure provision of bereavement care.[19]

The 2011 *Lancet* Stillbirths Series ranked research priorities for improving our understanding of stillbirth epidemiology (appendix).[7] The top five priorities centred on risk factors, and our review and analysis emphasise that little progress has been made on this knowledge base. Even for diseases such as malaria and HIV (and new ones, such as Ebola) with major investment, SBR, intrapartum SBR, or other pregnancy outcome data are rarely collected.

Household surveys, a potentially important source of data in countries without robust routine data collection systems, are problematic for SBR data capture, but no research to address this issue is in progress. Methodological research is needed to improve understanding of which survey-based methods (eg, birth history, pregnancy history, and truncated pregnancy history) maximise the capture of data for stillbirths and how these findings can be best implemented. Demographic surveillance sites, such as the INDEPTH network, provide a unique opportunity to test retrospective surveys against capture data for prospective pregnancies and also to assess the length of interviews, which is a major constraint in demographic and health surveys because the questionnaire already has long, complex questions.

For more on the **INDEPTH network** see http://www.indepth-network.org

With respect to the classification of the causes of stillbirth, the greatest challenge is the development of a practical standardised classification system with varying complexity of data from verbal autopsy to clinical assessment, made possible in basic facilities and centres with more extensive laboratory testing.[77] WHO is

working on this issue. Resource-limited settings rely on verbal autopsy, especially for births that are not in health facilities.[78,79] The frequently used WHO verbal autopsy guide,[80] although retaining questions on the timing of stillbirth (fresh or macerated skin), no longer includes other questions on the causes of stillbirth.

In each region of the world, the fastest progressing country for SBR (figure 1B, appendix) tended to make more progress than their neighbouring countries in data improvement. For example, Rwanda has increased birth registration and notably increased reporting of the baby's birthweight from less than a third to more than two-thirds (appendix).

Conclusion

After the transition from MDGs to SDGs, the global architecture for accountability for health outcomes is more complex. Ending preventable deaths of newborns and children younger than 5 years by 2030, as well as maternal mortality, are subtargets of SDG 3 (the only SDG health goal), with 16 other goals focused mainly on social and economic development and the environment. The discourse has shifted from health being essential for development, to development being necessary to improve health. Neonatal mortality now has an explicit SDG target. Many countries requested that WHO establish an explicit stillbirth target, which is why this goal was included in ENAP.[3]

Opportunities exist to meet this stillbirth target, with investment planned for national health information systems, including civil registration and vital statistics systems, and continuing calls for more use of data for accountability than at present. However, leadership is needed to include stillbirth data in these systems at a global level, especially in high burden countries.[10,81] Leadership is needed at all levels but technical skills will be crucial to improve and use programmatic data to close quality and equity gaps. This advancement will need intentional investment in effective data systems and skills-building in communities most affected by stillbirth, including affected women.[81] Household surveys have been strengthened to improve the capture of data for neonatal and child deaths; this data collection can also be done for stillbirths. At all health facilities, we call for systematic recording of stillbirths, especially intrapartum stillbirths, with collation and review of these data at both a local and national level, such as through a perinatal audit. Most stillbirths, particularly intrapartum stillbirths, are preventable and those due to syphilis and malaria should be deemed to be unacceptable even in the weakest health systems.

Improvements in data will not alone lead to change but provide accountability for targeting interventions, reaching the more than 7000 women every day worldwide who experience the reality of stillbirth. We call for a joint programmatic and measurement agenda that includes mothers, newborns, and stillbirths, to end all these preventable deaths.

Contributors

JEL and HB were responsible for the overall coordination, and stillbirth rate, intrapartum stillbirth rate, cause of death, and risk factor analyses. SC gave overall statistical advice. ZUQ was involved with intrapartum stillbirth rate and stillbirth rate data, and searches and extraction of medical published studies. SS reviewed registry data. CC reviewed and extracted data from intrapartum stillbirth rate combined databases and data for risk factors. All the authors reviewed and added input to the manuscript. The content of this Series paper does not necessarily indicate the view of the authors' organisations.

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We declare no competing interests.

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