National, regional, and worldwide estimates of stillbirth rates

Stillbirths, a problem addressed in the April 16 issue, have been erratically and inconsistently measured in the past, especially in poor countries with weak health systems. This poor measurement casts doubt on the ability to manufacture credible estimates of stillbirths, much less reproduce historical trends.

Of the 193 countries covered in their study (April 16, p 1319),[1] Simon Cousens and colleagues were able to use actual, reported data for only 33. To produce the estimates for the other 160 countries, and to project the figures backwards to 1995, the researchers created a statistical model.

Lacking data from poor countries on stillbirths, Cousens and colleagues sought to predict them with other indicators that bear a close logical and causal resemblance to stillbirths. They chose neonatal mortality. However, only in digging into the methods section of the paper does one discover that the data for neonatal mortality are *also* based on a model (wherein the main predictor is mortality of children younger than 5 years) rather than actual data.

Many will argue that modelled numbers (or in this case, twice-modelled numbers) are better than no numbers at all. To this we ask, better for what, and for whom? We question the wisdom of creating policy based on figures with such a tenuous basis in reality. Could the irresponsible lowering of standards on data possibly reflect an advocacy agenda rather than a scientific agenda, or is it just a coincidence that Save the Children is featured among the authors of the new data?

We declare that we have no conflicts of interest.

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1 Cousens S, Blencowe H, Stanton C, et al. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. *Lancet* 2011; **377:** 1319–30.

Simon Cousens and colleagues' paper on comparisons of worldwide stillbirth rates in 1995 and 2009[1] is important. However, the situation in China needs deep consideration. Although the two-thirds stillbirth reduction seen in China since 1995 is especially impressive,[2] stillbirth is still a problem in our country because of factors such as poverty, environmental pollution, stress, parents' educational background, and limited access to antenatal care and skilled attendance at birth in some areas.

In China, the reported estimates of stillbirth rates have shown quite a large variation and solid data are scarce.[3] In most high-income countries, the data source for stillbirth is from the routine vital registration system. In China, this system is available only in hospitals, and not in smaller clinics. The actual data for stillbirth have been underestimated because some unregistered antepartum or intrapartum stillbirths might have occurred in illegal private clinics or at home where the conditions did not meet the basic obstetric requirements.

The reasons why people tend to give birth to their children in these places can be summarised as follows. First, some parents try to hide their pregnancy to escape from the punishment of the one-child policy.[4] Second, owing to low income, many households cannot afford medical treatment, so they choose to give birth in the cheap private sector. Third, in traditional Chinese culture it is shameful for unmarried women to conceive a baby, and such pregnancies are therefore likely to be hidden.

We declare that we have no conflicts of interest.

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1 Cousens S, Blencowe H, Stanton C, et al. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. *Lancet* 2011; **377:** 1319–30.
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Authors' reply

We estimated a global total of 2·6 million stillbirths in 2009 (uncertainty range 2·1–3·8). Are these figures credible or an irresponsible exercise in advocacy, as suggested by William Easterly and Laura Freschi?

Easterly and Freschi suggest that it would be better to have no numbers than to use modelling. Unfortunately, the countries where most deaths occur have the least reliable information. Maternal, neonatal, and child mortality estimates all rely on modelling for some countries. Most experts and agencies agree that improving data quality and quantity is a high priority but that in the meantime modelling is indispensable.

Crucial issues in such exercises are the rigour and transparency of the methods and that countries be involved in a dialogue about their own data and estimates. Our stillbirth estimates followed recommendations for global estimates in having the methods peer-reviewed, providing access to the input data, and undertaking a country consultation to verify the input data and obtain feedback on the methods. The country consultation is part of an ongoing dialogue with countries to improve data collection and its quality so that the data can be used appropriately for policy and programmatic changes.


Xie baosheng/AP/Press Association

For the **Stillbirths Series** see http://www.thelancet.com/series/stillbirth

It is misleading of Easterly and Freschi to suggest that we used data from only 33 countries. In fact, data from 129 countries met criteria for inclusion in the input dataset. The source, coverage, and representativeness of these data and the methods used in their collection were assessed to understand any inherent biases or limitations. Nevertheless, we agree absolutely that the quality of the input data remains a concern. Even for high-income countries, comparable rates are difficult to obtain.

Yan Li and colleagues raise the important issue of under-reporting of stillbirths in the context of China, and this is likely to be a wider problem in low-income and middle-income countries, as we discussed in our paper in relation to Demographic and Health Surveys. Indeed, previous exercises in stillbirth estimation have applied post-modelling adjustments to address concerns of stillbirth under-reporting.[1,2] We specifically refrained from any such adjustments and hence our estimates are lower than the previous ones.

We hope, as we imagine Easterly and Freschi do, that stillbirths, and also maternal, neonatal, and child deaths, will one day be accurately counted in national data systems, and that in the meantime more will be done to reduce these deaths using the data that are available.

We declare we have no conflicts of interest.

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1 WHO. Neonatal and perinatal mortality for the year 2000: country, regional and global estimates. Geneva: World Health Organization, 2006. http://whqlibdoc.who.int/publications/2006/9241563206_eng.pdf (accessed Jan 11, 2011).

2 Stanton C, Lawn JE, Rahman H, Wilczynska-Ketende K, Hill K. Stillbirth rates: delivering estimates in 190 countries. *Lancet* 2006; **367:** 1487–94.

Stillbirth in high-income countries

In circumstances such as fetal and neonatal death, autopsy findings can provide a cause of death, or an explanation of any congenital abnormalities, and help define the risk of recurrence. In this context, Vicki Flenady and colleagues (May 14, p 1703)[1] rightfully advocate for high-quality autopsy and placental histopathology in the work-up for stillbirth. We would like to go a step further, since the main obstacle to autopsy remains its acceptance by parents.

The virtual autopsy project[2] is an attempt to revise the technical procedures for standard autopsy towards a minimally invasive approach, by means of radiological imaging. Indeed, published studies on perinatal death[3-5] show the growing role of such alternative methods for autopsy. Even if conventional autopsy remains the gold standard for investigating fetal death, evidence is accumulating that an examination based on post-mortem MRI by a paediatric radiologist, external examination by a specialist perinatal pathologist, and ancillary investigations including placental histology, radiographical skeletal survey, or CT scan and cytogenetics, can provide equivalent information when parents decline conventional autopsy. MRI is particularly efficient in assessing the fetal central nervous system in situ, which often proves difficult at autopsy.

These data, combined with *The Lancet*'s Series on stillbirths, must help us convince public health administrations to fund a research project specifically on imaging-directed biopsies to clarify whether minimally invasive autopsy is a realistic alternative for both parents and clinicians. We believe that it is.

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1 Flenady V, Middleton P, Smith GC, et al, for *The Lancet*'s Stillbirths Series steering committee. Stillbirths: the way forward in high-income countries. *Lancet* 2011; **377:** 1703–17.

2 Aghayev E, Staub L, Dirnhofer R, et al. Virtopsy—the concept of a centralized database in forensic medicine for analysis and comparison of radiological and autopsy data. *J Forensic Leg Med* 2008; **15:** 135–40.

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4 Thayyil S, Chitty LS, Robertson NJ, Taylor AM, Sebire NJ. Minimally invasive fetal postmortem examination using magnetic resonance imaging and computerised tomography: current evidence and practical issues. *Prenat Diagn* 2010; **30:** 713–18.

5 Thayyil S, Chandrasekaran M, Chitty LS, et al. Diagnostic accuracy of post-mortem magnetic resonance imaging in fetuses, children and adults: a systematic review. *Eur J Radiol* 2010; **75:** e142–48.

The UK seems to have the highest stillbirth rate of 14 high-income countries from Vicki Flenady and colleagues' paper.[1] This makes uncomfortable reading and will undoubtedly raise questions about the quality, veracity, and comparability of these data. Points of contention might include the use of different limits for birthweight and gestation and the differential inclusion of pregnancy terminations and cases affected by congenital malformations. We have therefore reanalysed the UK data from the Centre for Maternal and Child Enquiries to examine the relative contribution of these factors to UK stillbirth rates (figure).

Flenady and colleagues' data excluded infants born before 28 weeks of gestation but did not use standardised approaches to birthweight limits or include congenital malformations and terminations of pregnancy. Application of birthweight limits (500 g and 1000 g) and exclusion of congenital malformations and terminations lowers the UK rate by about 1 per 1000 births