Commentary: Monitoring trends in under-5 mortality: better believe it’s true

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Together with the proportion of people whose income is less than one US dollar a day, the under-5 mortality rate is one of the most closely watched indicators of human development. In September 2000, in the United Nations Millennium Declaration, 189 nations committed themselves to reducing this indicator of human suffering by two-thirds over the period 1990–2015. Next year, 2005, will see a major stock-take of progress made towards this and the other Millennium Development Goals. The article in the present volume by Korenromp et al. 2 is therefore a timely check on the adequacy of one of the major sources of information on under-5 mortality.

It is easy to forget just how complex is the estimation of under-5 mortality levels. The problem arises from the fact that vital registration systems tend to be most flawed in exactly the places where the need is greatest. As previously noted by Morris et al. 3 there are virtually no countries in the world that have under-5 mortality rates >25 per 1000 live births and complete coverage of vital registration (95% of all deaths captured), yet only an insignificant proportion of all deaths of children under 5 occur in countries with mortality rates of <25 per 1000. Great importance is therefore attached to alternative sources of mortality information, of which the Demographic and Health Surveys (DHS) are the most comprehensive. As Korenromp and colleagues have noted, other important sources include UNICEF's Multi-Indicator Cluster Surveys, and national censuses.

Whether the DHS have sufficient statistical power to detect changes in under-5 mortality of a magnitude consistent with the Millennium Development Goal of a two-thirds reduction by 2015 is thus a critical question that does not seem to have been raised previously. In part, this may because the analysis required to answer the question is daunting. Korenromp and colleagues have found an admirable solution to this problem by using a regression framework to relate the observed sampling error of reported estimates of under-5 mortality rates to key characteristics of the study populations and survey designs that gave rise to these estimates. However, because they have based their analysis exclusively on data from Africa, it should not be assumed the same results will hold in all cases; their estimation dataset, for example, contains no population with a total fertility rate lower than 4.0, and none with an under-5 mortality rate <70 per 1000. Furthermore, because they used least squares regression in this part of their analysis, a few extreme values, such as two surveys with design effects of around 2.0, may have exerted excessive influence over the final result. Their findings, however, are convincing, and their conclusion—that most country survey series do have sufficiently large sample sizes to detect as statistically significant survey-to-survey reductions in child mortality of around 15%—is reassuring.

The authors of the article are perhaps conservative in thinking that assessments of trends will only happen once every 5 years. Thirty-four low-income countries have now developed Poverty Reduction Strategies, 4 and many of these include the under-5 mortality rate as a key progress indicator to be monitored. Monitoring reports for this process are produced every year, and countries may find that their access to concessional loans and grants from bilateral donors is curtailed if progress is thought to be inadequate. It is unclear how most countries could possibly obtain such up-to-date data, particularly since, as Korenromp et al. have pointed out, even the latest DHS results refer to a period 2.5 years before the survey date. The best estimates of current mortality levels are likely to be forward extrapolations from previous data points, which of course would not reflect any recent achievements arising from intensive investments in public health systems.

Given the seriousness of the consequences that these numbers may have for entire national development processes, it is worrying that we do not have any indication of the ‘uncertainty bounds’ around the estimates of under-5 mortality that are provided by UNICEF (these estimates are derived from all available data sources, weighted according to their supposed relative validity 5). Korenromp et al. point out that ‘error estimates are typically not available for ... indirect mortality estimates’. While this is true, other UN agencies confronting similar problems, such as UNAIDS, have set an excellent example in presenting indicative uncertainty bounds together with their best estimates.

Korenromp et al. point out that current DHS sample sizes are not likely to support disaggregated analysis by sub-national areas. The same conclusion presumably also applies to other kinds of disaggregated analysis, such as those that examine changes in the mortality experience of different socioeconomic or ethnic groups. Designing effective public health strategies depends crucially on being able to determine which specific population groups are being left behind, and not being able to identify this with any reasonable level of statistical confidence in the results must surely be considered a major impediment to progress. With so many donor agencies now professing an interest in equity as well as in average levels of development across the board, there should perhaps be a serious consideration of the need to expand sample sizes in the DHS at least for the most demanding modules, as the authors suggest.

One point that Korenromp and colleagues have not touched on is why most data users do not seem to care very much about the statistical significance of trends in under-5 mortality? It would seem that both national governments and donor
agencies have strong institutional incentives to believe reported mortality reductions, even if the evidence for them is at best shaky. The international public health community perhaps has an important role to play in raising the demand for high quality statistics in the health sector.

References


