

## Causes of child deaths: looking to the future



The work of the Child Health Epidemiology Resource Group (CHERG), formed more than 10 years ago, has changed what we know about causes of death among young children. Their regular publications, culminating in the report by Li Liu and colleagues<sup>1</sup> in *The Lancet*, have compiled high-quality data from many countries and derived national, regional, and global estimates for causes of death. Their modelling process is complex, but the authors' effort towards full transparency should be commended. For example, all the input data and analysis codes are being made available on the internet at the time of publication.<sup>1</sup>

Up to the turn of the millennium, uncoordinated estimates of causes of death were produced by disease-specific or intervention-specific working groups. This approach led to unavoidable conflicts of interest, as larger numbers of deaths were expected to attract more funding. Indeed, the sum of these different estimates could exceed the total number of child deaths.<sup>2-4</sup> Thus CHERG was set up as an independent scientific group, affiliated with WHO but outside the influence of other WHO departments. In an early controversy, the initial CHERG estimate of measles deaths was substantially lower than the official WHO figure.<sup>5</sup> CHERG was a cornerstone of the 2003 *Lancet* Child Survival Series<sup>5</sup> that led to the establishment of Countdown to 2015 as an independent, multistakeholder initiative to monitor Millennium Development Goals 4 and 5.<sup>6</sup> The CHERG signature cause-of-death pie charts became standard features of the Countdown report,<sup>7</sup> as well as of many other publications on global child health.

CHERG estimates start with a so-called envelope, defined as the total number of deaths of children younger than 5 years based on vital statistics and demographic surveys, estimated by the UN Interagency Group for Child Mortality Estimation.<sup>8</sup> Causes of death are then attributed in accordance with a compilation of vital statistics and rigorous field studies. As a frequent contributor of data to CHERG, I have always been impressed by their detailed requests for information on our studies' methods and analyses.

For about a decade, CHERG was the sole source of global estimates of causes of child deaths. This situation changed when the Institute for Health Metrics and Evaluation (IHME)<sup>9</sup> produced alternative sets of

estimates, building on their own mortality estimates. A comparison of the IHME<sup>9</sup> and CHERG<sup>10</sup> estimates for 2010 showed some important differences; for example, CHERG estimated a larger number of deaths from pneumonia, whereas the IHME attributed more deaths to malaria. These discrepancies are attributable, among other factors, to more stringent criteria for data quality used by CHERG for the inclusion of study findings, differences in data processing and modelling approaches, and contrasting approaches to the allocation of neonatal deaths. The enhanced transparency of the report by Liu and colleagues,<sup>1</sup> including the public availability of datasets and codes, has set a new standard for reporting that will hopefully be followed by IHME.

Working at the country level, I see much confusion about the parallel existence of different estimates of mortality and its causes. Politicians and health managers are likely to be confused about which sets of results they should be using. Debate and controversy are how science moves ahead,<sup>11</sup> but at country level, a single set of estimates is needed to guide policy and planning. Because CHERG was initially linked to WHO, its estimates are perceived as being credible by countries. Allied with their greater transparency, it is likely that the CHERG estimates will continue to be the international standard.

The main message of Liu and colleagues' report<sup>1</sup> is one of good news. Reductions in pneumonia,

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For Countdown to 2015  
see <http://www.countdown2015mnch.org/>

For the UN Interagency Working Group on Child Mortality Estimation see <http://www.childmortality.org/>



A woman and her baby wait to be seen at the baby nutrient clinic of the Bayamah Health Outpost in Sierra Leone

diarrhoea, and measles were jointly responsible for half of the 3.6 million fewer deaths recorded in 2013 compared with 2000. Measles and neonatal tetanus led in terms of annual reduction rates, undoubtedly because of high immunisation coverage in most countries. HIV came third, perhaps surprisingly in view of the need for costly diagnosis and treatment, relative to other infectious diseases; this finding shows that concentrated efforts and substantial funding can make a difference. Next came diarrhoea, meningitis, pneumonia, and malaria, with annual reductions of 4.5–6.5%, although faster rates of reduction are certainly possible with sufficient investments.

With the fall in infections, neonatal conditions became relatively more important, particularly complications of preterm birth, which in 2013 accounted for 15.4% of all deaths, and intrapartum complications (10.5%). This new pattern draws attention to the importance of further integration of women's (more specifically, maternal) and child health. Family planning, as well as preconception, antenatal, delivery, and early postnatal care will probably move to centre stage in the near future. Unlike some of the vertical interventions used to control infectious diseases, these interventions require well functioning health services. Lastly, the CHERG analyses show that deaths in children younger than 5 years are increasingly concentrated in Africa—the proportion will grow from 50% in 2013 to 60% in 2030 if present trends continue.<sup>1</sup> The Ebola crisis shows that unless major investments are made in building health systems, child deaths might well end up more concentrated in this continent than predicted by CHERG.

Estimates of causes of death are likely to become even more relevant after 2015. As it currently stands, subgoal 3.2 of the provisional Sustainable Development Goals

is to end preventable deaths of newborn babies and children younger than 5 years by 2030.<sup>12</sup> Defining what proportion of a given cause of death is preventable is not an easy task. Nevertheless, this goal will certainly lead to an even greater demand for high-quality, transparent, and regular estimates of how causes of death are changing over time.

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I declare no competing interests.

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