

The Grand Divergence in Global Child Health Confronting Data Requirements in Areas of Conflict and Chronic Political Instability

Paul H. Wise, MD, MPH; Gary L. Darmstadt, MD, MS

There is something deeply troubling about a death that goes unnoticed. Beyond the humane impulse to provide solace through collective acknowledgment and community support



Related article

lies the recognition that an unnoticed death implies an unnoticed life. There can be no doubt that the accurate counting and causal attribution of morbidity and mortality provide technical information that is essential for public health planning, evaluation, and improvement in program performance. However, there is also a justice imperative inherent in counting and attribution—an imperative that transcends the practical and touches on the moral basis of global health and its commitment to the rights and societal claims of those whose health and well-being have for too long gone unnoticed.

At a global level, available data demonstrate that dramatic reductions in child mortality have occurred in many low- and middle-income countries. Moreover, long-standing disparities in survival between materially wealthy and poorer regions of the world are dissipating. If sustained, this historic record of reduced mortality inequality could drive a “grand convergence” in life expectancy during the next 2 decades.¹ This prospect has been used constructively to advocate for a continued global commitment to economic development and the provision of effective health interventions.

On closer examination, however, it is apparent that the trends toward convergence have not been universal. Some countries are being left behind. These countries have experienced stagnant or, in some arenas, worsening child health outcomes. Indeed, these countries could be described as contributing to a “grand divergence” in life expectancies, in which their health indicators fall increasingly behind those of other low- and middle-income countries.²

The article by the Global Burden of Disease (GBD) Pediatrics Collaboration in this issue of *JAMA Pediatrics* represents an important contribution to the field of global health and provides troubling evidence of the diverging trends in child health and well-being.³ What is now evident from even a cursory examination of presented child mortality trends is that the countries making the least progress in child survival and well-being, particularly since 2000, are those most likely to be plagued by chronic civil conflict, political instability, and weak governance. Nigeria and the Democratic Republic of the Congo, which together account for more than a third of all child deaths in sub-Saharan Africa, experienced annual child mortality de-

clines of 2.2% and 1.8%, respectively (eTable 9 in their Supplement). It is useful to note that during this same period among the most rapid annual declines were those recorded in China (6.01%), Iran (5.97%), and Bangladesh (5.24%).

Using data from the GBD 2013 study, the article presents detailed child mortality and morbidity trends for the 50 countries with the largest child and adolescent populations in the world, information that will prove essential for programmatic evaluation and planning. Of special note is the estimation of the specific causes of mortality and morbidity patterns in the countries under study. Many readers who care about global child health but who are not directly engaged in the generation of global child health data may not fully recognize just how difficult it is to create the numbers presented in this article. Most high-income areas of the world possess well-functioning vital registration systems that enumerate births and deaths with general accuracy and regularly conduct national health surveys that include information on child illness and injury. However, many areas of the world, particularly those experiencing the highest burden of childhood illness and death, have no such systems. The figures presented in the GBD 2013 study article for these countries therefore do not represent population-based tallies of actual recorded events. Rather, they represent estimates generated by sophisticated models based on demographic patterns from areas with relatively good data that are then applied to whatever child mortality and morbidity data could be gleaned from published reports or other data sources for a particular country or region. The tabulations presented in the GBD 2013 reports therefore represent a remarkable combination of statistical expertise and data-mining grunt work. Indeed, the collaborative infrastructure of the GBD initiative has proven to be one of the most important analytic advances in global health in recent decades.

It is useful to briefly review the major data sources available for the GBD 2013 study and other estimates of child morbidity and mortality. Globally, only about half of all births are registered and fewer than half of all deaths are actually captured by well-functioning civil registration and vital statistics.⁴ As in most high-mortality, sub-Saharan countries, Nigeria, the Democratic Republic of the Congo, and Angola record fewer than 10% of deaths in formal systems and data on stillbirths are essentially missing. The GBD 2013 initiative must therefore rely on a series of alternative sources of data for countries of greatest concern. Among the most important of these

are the Demographic and Health Surveys, which are nationally representative household surveys conducted intermittently in a variety of countries.⁵ Also, UNICEF implements Multiple Indicator Cluster Surveys, which generate data on the health and well-being of women and children in many low- and middle-income areas of the world.⁶ While extremely useful, these surveys are not conducted annually and may leave large temporal gaps in national or regional trend data. For example, in Guatemala, a country with relatively high levels of child malnutrition and mortality, no Demographic and Health Survey was conducted between 1999 and 2015 and no Multiple Indicator Cluster Survey has yet been performed. In addition, these surveys rarely provide accurate subnational estimates, a weakness of some importance in large countries that are plagued by regional conflicts or traditional inequalities, such as Nigeria or the Democratic Republic of the Congo. Published data sources are also used, including verbal autopsy series, which conduct detailed assessments of the circumstances of selected deaths; sibling histories, which are useful for documenting mortality among adolescent and adult populations; and diverse studies that include some form of mortality data. Although crucial sources of data, these studies can be highly heterogeneous in both purview and methods. The GBD 2013 study investigators are, of course, acutely aware of the problems generated by the lack of accurate source data. Indeed, the GBD 2013 study's methodological innovations have been developed precisely to address this issue.

The GBD 2013 study's reliance on what are often inadequate data sources should therefore instill some caution as to how the tabulations are interpreted, particularly when age- and cause-specific estimates are provided for individual countries. In addition, GBD estimates do not always conform to estimates generated by other global health analytic consortia. For example, in another major global health technical initiative, the Maternal and Child Epidemiology Estimation group and the World Health Organization have also generated widely used estimates of child mortality and morbidity. Recent discussions have helped elucidate where the GBD and Maternal and Child Epidemiology Estimation group estimates diverge and potential differences in data sources and modeling approaches that could account for these differences.^{7,8} Of particular concern are discrepancies in mortality estimates for the 5- to 14-year-old group, certain neonatal causes, and country-specific causal groupings.⁹ While the GBD collaboration and the Maternal and Child Epidemiology Estimation group each advocates for its own technical approach and the ultimate utility of its findings, the discrepancies between the estimates produced by these 2 highly capable analytic organizations do nevertheless provide an important cautionary context for the interpretation of current age- and cause-specific child mortality and morbidity estimates for countries or regions without accurate reporting infrastructures.

While these disagreements may take the form of a technical spat over different estimation protocols, they are at a deeper level reflective of a much more profound problem: the failed global commitment to generate and use accurate child mortality and morbidity data in all regions of the world. One would not need elaborate modeling strategies if there existed

reliable and representative data for the areas of greatest concern. There will always be one more technical tactic that is designed to turn inadequate or nonexistent data into somewhat more accurate estimates. However, this approach will prove increasingly inadequate as the need for more detailed cause and trend data heightens. At some point the need for improved health data in the countries with the worst child health outcomes will need to be addressed directly.

The need for improved health data systems is clearly linked to the need for improved health delivery systems in these same areas. This linkage is both a practical and ethical concern. It is a practical challenge in that population-based health data collection is best integrated into primary health care infrastructures. However, any effort to construct a system designed to merely assess preventable deaths without also trying to do something about them would be ethically suspect. Calls to strengthen health systems in traditionally underserved areas have received enhanced recent attention, particularly in response to the Ebola virus disease outbreak in West Africa. However, the global incentives to create strong surveillance and outbreak response capacities may not directly translate into a sustained commitment to comprehensive health system strengthening in high-mortality areas of the world. An integrated data collection and service provision agenda will require purposeful attention and an unrelenting guarantee of adequate funding.

The dynamic nature of global health has also underscored the urgency of integrated data and service responses in areas of catastrophic civil conflict and war. There are clear humanitarian relief requirements, of course, for both displaced populations and communities trapped by active fighting. However, there are also important analytic requirements, particularly when the nature and scale of suffering have not attracted the attention they deserve. Moreover, there is a need for accountability, a commitment to document with unblinking fidelity the human impact of political and military decisions. An accounting of the direct effects of civilian injuries and deaths due to active combat operations is always essential. However, so too are the "indirect" effects of elevated illness and mortality due to the destruction of critical civilian infrastructure, such as hospitals, electrical systems, and water and food supplies. Too often, global health systems are not capable or willing to assess the indirect effects of military conflict or related political mechanisms of state aggression, such as sanctions. The full effects of the intentional destruction of the Iraqi electrical grid during the 1991 Gulf War, the Oil-for-Food sanction regime in Iraq between 1995 and 2003, and the continued conflict in Iraq remain unclear despite a series of quantitative attempts.^{10,11} It is important to note that these analyses have generally been conducted with substantial technical sophistication. However, their ad hoc nature and diverse analytic approaches have made these analyses controversial, a vulnerability that almost always surrounds isolated analytic accountings of heavily politicized decisions to initiate military action.

A general child health readership should recognize the value of the GBD initiative, including the article by the GBD Pediatrics Collaboration in this issue, which provides impor-

tant insights into child health and mortality patterns around the world. However, there is a danger that for a general child health readership, the GBD 2013 study's sophisticated methods and beautifully produced, detailed tables will mask the underlying weakness of available data in areas of greatest concern. This risk is less one of misinterpretation than of complacency, a willingness to accept the status quo as adequate. This is not inherently a critique of the GBD 2013 study

effort. Rather, it is a critique of global systems that do not provide the GBD 2013 study investigators with the data they require to generate greater confidence in their estimates and analytic findings. This confidence will at some level reside in the technical guarantee that all lives are noticed and fundamentally valued, a guarantee that will increasingly prove essential to meeting the urgent health and justice demands of the neediest communities on earth.

ARTICLE INFORMATION

Author Affiliations: Division of Neonatology, Department of Pediatrics, Stanford University School of Medicine, Stanford, California; Freeman Spogli Institute for International Studies, Stanford University, Stanford, California.

Corresponding Author: Paul H. Wise, MD, MPH, Stanford University, Center for Health Policy/Center for Primary Care and Outcomes Research, 117 Encina Commons, Room 226, Stanford, CA 94304 (pwise@stanford.edu).

Published Online: January 25, 2016.
doi:10.1001/jamapediatrics.2015.4275.

Conflict of Interest Disclosures: None reported.

REFERENCES

- Jamison DT, Summers LH, Alleyne G, et al. Global health 2035: a world converging within a generation. *Lancet*. 2013;382(9908):1898-1955.
- You D, Hug L, Ejdemyr S, Beise J; United Nations Inter-agency Group for Child Mortality Estimation. *Levels and Trends in Child Mortality: Report 2015: Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation*. New York, NY: UNICEF; 2015.
- Global Burden of Disease Pediatrics Collaboration. Global and national burden of diseases and injuries among children and adolescents between 1990 and 2013: findings from the Global Burden of Disease 2013 study [published online January 25, 2016]. *JAMA Pediatr*. doi:10.1001/jamapediatrics.2015.4276.
- United Nations Statistics Division. Coverage of birth and death registration. http://unstats.un.org/unsd/demographic/CRV5/CR_coverage.htm. Accessed November 24, 2015.
- ICF International. Demographic and Health Surveys. <http://dhsprogram.com/>. Accessed November 24, 2015.
- UNICEF. Multiple Indicator Cluster Surveys. <http://mics.unicef.org/>. Accessed November 24, 2015.
- Liu L, Black RE, Cousens S, Mathers C, Lawn JE, Hogan DR. Causes of child death: comparison of MCEE and GBD 2013 estimates. *Lancet*. 2015;385(9986):2461-2462.
- Vos T, Barber R, Phillips DE, Lopez AD, Murray CJL. Causes of child death: comparison of MCEE and GBD 2013 estimates: authors' reply. *Lancet*. 2015;385(9986):2462-2464.
- Hill K, Zimmerman L, Jamison DT. Mortality risks in children aged 5-14 years in low-income and middle-income countries: a systematic empirical analysis. *Lancet Glob Health*. 2015;3(10):e609-e616.
- Gordon J. *Invisible War: The United States and the Iraq Sanctions*. Cambridge, MA: Harvard University Press; 2010.
- Tapp C, Burkle FM Jr, Wilson K, et al. Iraq War mortality estimates: a systematic review. *Confl Health*. 2008;2:1.