Technical Note 9

Data Gaps for Low Birth Weight

Holly Newby
United Nations Children's Fund

Infants with a low weight at birth are at an increased risk of morbidity and mortality. Low birth weight is defined as weight at birth of less than 2,500 grams. The target of reducing low birth weight incidence by 30 percent between 2010 and 2025 was endorsed by the World Health Assembly (WHA) in 2012.[1] Monitoring progress toward that target, however, will be challenging because worldwide data on low birth weight are sparse and inconsistent.

Globally, approximately half of babies are not weighed at birth (48 percent excluding births in China, based on data collected during the period 2008–2012).[2] Empirical data that do exist come from two main sources: administrative records and household surveys. For industrialized countries, data come from birth registration systems. For nonindustrialized countries, low birth weight estimates are primarily derived from national household survey data, although some middle-income countries also have reliable data from routine reporting systems. In a recent review of the United Nations Children's Fund (UNICEF) low birth weight global database,[3] more than half of data points came from the Demographic and Health Surveys (DHSs) and Multiple Indicator Cluster Surveys (MICSs). Other national surveys, whether household or facility based, accounted for approximately one-third of data points and administrative sources for approximately one-fifth. Each of these sources can have methodological limitations.

DHSs and MICSs employ a similar methodological approach to collecting data on low birth weight. All sampled women of reproductive age with at least one birth in the last 2–5 years are asked both for their subjective assessment of the baby's size at birth (very small, smaller than average, average, and so forth) as well as whether or not their child was weighed at birth. If the child was weighed at birth, either the weight is recorded directly from a health card, if it exists, or the mother is asked to recall the birth weight. UNICEF takes these pieces of information to calculate an adjusted estimate of the rate of low birth weight. Adjustments are made for the following:

- **Heaping on 2,500 grams** for those with a reported birth weight in grams, by allocating one quarter of those exactly 2,500 grams to the category of low birth weight
- **Live births with missing birth weights** by combining information for children with complete data available on child's size at birth together with recorded birth weights and extrapolating this to the unweighed cases to generate an estimate of those who likely weighed less than 2,500 grams.[4]

It is notable that across DHSs and MICSs conducted since 2008, the proportion of infants weighed at birth ranged from a high of 99 percent in Belarus to a low of 3 percent in Ethiopia, indicating that the degree and type of adjustments vary widely between countries.

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[1] http://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/, accessed July 20, 2014.
[2] http://data.unicef.org/nutrition/low-birthweight, accessed July 20, 2014.
[3] For more information on UNICEF's global databases, please see Murray C, Newby H. Data resource profile: United Nations Children's Fund (UNICEF). *International Journal of Epidemiology* 2012;41:1595–1601. doi:10.1093/ije/dys1851595.
[4] A detailed description of these methods can be found in Blanc AK, Wardlaw T. Monitoring low birth weight: an evaluation of international estimates and updated estimation procedure. *Bulletin of the World Health Organization* March 2005;83(3):161–240; and on http://data.unicef.org/nutrition/low-birthweight.

Deriving low birth weight estimates from national surveys that are not DHS or MICS can be even more problematic due to inconsistent data collection methods, incomplete or missing documentation, lack of raw data, or a combination of these. China provides an example of the challenges of working with nonstandardized national survey data. The National Health Services Survey provides an estimate of 2.8 percent for 2008, which can be considered implausibly low. Notably, data were collected only for ever-married women; furthermore, adherence to other facets of the standard definition are unclear, such as whether all births, regardless of gestational age, were included in the analysis.

Low birth weight data derived from vital statistics can be robust only in countries with a high proportion of weighed births. Although estimates that are comparable across time and across countries must be based on a single definition, this is often not the case for data coming from routine information systems. In some cases, the denominator, which should be the number of all live births[5] with a recorded birth weight, is not clearly defined in existing documentation. In other cases, there is a clear bias in the denominator, but lack of access to raw data makes it impossible to adjust the estimates. For example, available administrative data from Belarus for the years 1989–2005 exclude newborns with a birth weight of less than 1,000 grams. Insufficient documentation is available publicly for data from 2006 onward to determine whether or not newborns less than 1,000 grams are included in the denominator. Such nonstandard local definitions can lead to an underestimatation of the problem.

To address these methodological issues and strengthen reporting for the WHA target, UNICEF, Johns Hopkins University, and the London School of Hygiene and Tropical Medicine will be reviewing existing data and the currently employed adjustment methods detailed above over the coming months. As a result of this review, new estimation methods may be proposed, resulting in a new time series.

[5] A live birth meaning the birth of an infant, irrespective of the duration of gestation, irrespective of their birth weight or birth length, that exhibits any signs of life such as respiration, heartbeat, umbilical pulsation, or movement of voluntary muscles.