



**New low birthweight  
and preterm birth estimates:  
Know what they are  
and how to use them**



**Save the Children**



# The burden of born too soon or too small

Children born too soon or too small are at the highest risk of dying in utero, during birth and in the neonatal period, and also have increased health and development risks throughout their lifetime. Of the 2.5 million neonatal deaths in 2018, over 80% were born too small--of which two thirds were preterm and one third were small for gestational age (SGA).<sup>1</sup> To understand the full burden of children born too soon or too small, *The Lancet Global Health* has published two sets of estimates – for preterm birth (PTB)<sup>2</sup> and low birthweight (LBW).<sup>3</sup> This brief presents the new global estimates and outlines why and how they can be used.

## What are the new estimates?

### Low birthweight



14.6% of live births resulting in 20.5 million newborns born too small

- **Definition:** “Born too small” or LBW refers to newborns weighing less than 2500 grams at birth. LBW rate is the number of newborns weighing less than 2500 grams at birth per 100 live births.
- **Burden:** Globally, 20.5 million LBW infants were born in 2015 (uncertainty range 17.4–24.0 million) – a total of 14.6% of live births (uncertainty range 12.4–17.1). 91% were in low-and-middle income countries, mainly southern Asia (48%) and sub-Saharan Africa (24%).
- **Trend:** The annual rate of reduction in LBW globally from 2000 to 2015 was 1.23%; however, reductions varied widely by region.
- **Countries with estimates:** 148 countries have national estimates (57 include time series data); 47 countries had no data meeting inclusion criteria, and therefore there are no modelled national-level estimate for these countries.
- **Global Commitments:** LBW is included as a WHO core indicator for tracking health outcomes. The Sustainable Development Goals (SDGs) and Global Nutrition Plan include the ambitious goal to reduce LBW by 30% by 2025, although new trend data suggest very limited progress to date.

### Preterm birth



10.6% of live births resulting in 14.8 million babies born too soon

- **Definition:** “Born too soon”, or preterm, refers to newborns born at less than 37 weeks’ gestation. The preterm birth rate is the number of newborns born at less than 37 weeks’ gestation per 100 live births.
- **Burden:** Globally, 14.8 million infants were born preterm in 2014 (uncertainty range 9.0–12.0) – a total of 10.6% of live births (uncertainty range 12.65 million–16.73 million). 81% of preterm births occur in Asia and sub-Saharan Africa. Approximately 15% of preterm newborns were born before 32 weeks of gestation and require special inpatient care.
- **Trend:** Rates of preterm birth are increasing in selected high-income and high-middle-income countries where there is data.
- **Countries with estimates:** 80 countries have PTB rate estimates generated from this model. For the remaining 103 countries, the corresponding regional estimates were provided.
- **Global Commitments:** Improved counting of preterm births, and related outcomes, is a priority of the Every Newborn Action Plan, led by UNICEF and WHO, and will be crucial to achieving SDG target 3.2

## Why are new estimates needed?

Quantifying the full burden of affected children born too soon or too small or both is critical for informing a country's health system response and planning. Estimates are generated from direct data available, and then adjusted for bias and missing data. Multiple data sources for one country may be used within a controlled, tested model; this allows for a more accurate estimate than from one source alone. Estimates of the global, regional and national burden of preterm birth and LBW are especially needed because data for both are sparse and incomplete in many countries.<sup>2-5</sup>

Reasons for generating global health estimates include:<sup>6</sup>

- Completeness: to fill data gaps and ensure completeness of information for all countries;
- Comparability: to enable comparability of data over time and across countries;
- Currency: to produce data of immediate or current relevance;
- Cost: to generate the needed data in an inexpensive and rapid way; and
- Objectivity: to ensure independence and objectivity of the country statistics

## How to use these estimates?

Estimates allow health system stakeholders, policies, and programs to be better informed, enabling more precise targeting of interventions. The estimates allow for comparison of rates between countries or between countries and regions. Estimates can also be used to raise awareness of the issues as global public health priorities, and can help mobilize resources for research and maternal and child health programs.

AbouZahr and colleagues have clearly outlined how estimates can be used at global and national levels.<sup>6</sup>

Ways to use the estimates **globally**:

- Tracking progress towards health goals and targets.
- Benchmarking progress against performance of socioeconomic or regional 'peers'.
- Informing results-based resource allocation.
- Reporting program performance to international agencies, donors, and foundations.
- Identifying emerging international health priorities.
- Generating interest in and advocating for program.
- Providing comprehensive, comparable, internally consistent estimates of the burden of disease

Ways to use the estimates in **countries**:

- Identify emerging health trends
- Benchmarking progress and performance
- Draw attention to data gaps
- Challenge of government statistics by opposition, civil society or media
- Use in planning and monitoring



## What not to do when using the estimates?

### **Do not compare or add together the preterm birth and low birthweight estimates.**

Both sets of estimates were generated using statistical models, but the inputs, predictors and methods varied (Table 1). Additionally, the nature of the indicators prevent combining the estimates since there may be an overlap. A proportion of LBW babies will be preterm; a proportion of preterm babies will be LBW, and a proportion of babies will be both. As such, one cannot add these estimates together.

### **Do not assume all country estimates are of the same quality. Availability of data inputs varied considerably by country.**

The utility of estimates and the relative importance of each depends on the extent and quality of available country data (Table 1). The dataset for the LBW estimates included 1447 country-years of birthweight data (281 million births) for 148 countries. Half of all data points (48%) were from high-income countries, and 47 countries had insufficient data to generate a national estimate, mostly LMICs. For the PTB estimates, the dataset included 1241 data points from 107 countries, mostly high-income or upper middle-income countries (90%). No preterm birth data were available from 78 of the 196 UN member states. In addition, the national estimates should not be assumed to be representative of the entire country; there will be sub-national variations and/or sub-population variations (e.g. wealth quintiles, ethnic groups).

### **Do not compare the previously published the preterm birth and low birthweight estimates.**

The models and input data used to generate these two sets of estimates vary from previous publications. One should not compare estimates published previously with these new estimate.



**Table 1: Comparison of the preterm birth and LBW estimate definitions, models and outputs**

Estimates	Definition	Model, predictors and data inputs	Number of countries with estimates
Preterm birth estimates	all births before 37 completed weeks of gestation, or fewer than 259 days from the first date of a woman's last menstrual period	Model: A linear Bayesian model Covariates included in the final model were: (1) Human Development Index, (2) low birthweight proportion, (3) definition of preterm used in data source, (4) birth population used (livebirths or all births), (5) whether singleton or multiple births were included, or both, and (6) data source. Dataset included 1241 data points from 107 countries	80 countries have PTB rate estimates generated from this model. For the remaining 103 countries, they only present the corresponding regional estimate
Low birthweight	a birthweight below 2500 g regardless of gestational age and is usually applied to livebirths only. LBW includes both appropriately grown preterm neonates (<37 completed weeks of gestation) and term and preterm growth-restricted neonates (<10th centile of weight for gestational age and sex)	Model: A new method for survey adjustment was developed and used. For 57 countries with higher quality time-series data, they used B-spline regression. For all other countries, they used a restricted maximum likelihood approach with country-level random effects. Covariates included in the final model were: (1) logarithm of neonatal mortality rate, (2) the proportion of children underweight, (3) data type, (4) UN region, and (5) a country-specific random effect. Many other covariates were considered and tested. All data on predication analysis in supplement. Dataset included 1447 country-years of birthweight data (281 million births) for 148 countries	148 countries have national estimates (57 include time series data). The modelled national-level estimate generated is not shown for 47 countries without any input data.



## Why we need estimates?

Estimates of the global, regional and national burden of preterm birth and LBW are needed to understand the global epidemiology because data for both are sparse and incomplete in many countries. Estimates allow health system stakeholders, policies, and programs to be better informed, enabling more precise targeting of interventions. Estimates can also raise awareness of preterm birth and LBW as a global public health issue, and can help mobilize resources for research and maternal and child health programs.

LBW data is normally captured through administrative data or representative household surveys. National administrative data are defined as data from national systems including Civil Registration and Vital Statistics (CRVS) systems, national Health Management Information Systems (HMISs), and birth registries. Nationally representative household surveys include Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), and other national surveys. However, nearly half of births do not have a recorded birthweight globally (48%) due to ill-equipped health facilities, weak health information systems and births taking place outside of the health facility.

Data for the prevalence of preterm birth are not routinely collected or reported in many countries. The accuracy of different methods to determine gestational age vary greatly. PTB data can be captured through CRVS; however not all countries have a CRVS system. Where countries had no or limited CRVS preterm birth data, data can be extracted from research studies (whether representative of the national population or not) and population-representative household surveys.

## How to improve future estimates?

There is an urgent need to greatly improve the quality and availability of both LBW and PTB data. Both papers emphasize the need to improve measurement of gestational age as well as measurement and documentation of birthweight. This includes increasing the coverage of weighing at birth, including the need to count and weigh all babies (livebirths and stillbirths), improving the accuracy of gestational age measurement and documentation, and strengthening existing data and health systems overall. Yet achieving this practically, especially in emergency settings or weak health systems, remains a challenge.

Strengthening national data systems and ensuring countries are empowered to be equal partners in global efforts to improve our understanding of health and development at global, national, and local levels will be priority for improving future estimates.

For more details about the estimates, please access these articles:

- **Preterm birth:** Chawanpaiboon S, Vogel JP, Moller A-B, et al. Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. *Lancet Glob Health* 2018; published online Oct 29. [http://dx.doi.org/10.1016/S2214-109X\(18\)30451-0](http://dx.doi.org/10.1016/S2214-109X(18)30451-0).
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- **Low birth weight (LBW):** Blencowe H, Krusevec J, de Onis M et al. National, regional, and worldwide estimates of low birthweight in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2019; (published online May 15.) [http://dx.doi.org/10.1016/S2214-109X\(18\)30565-5](http://dx.doi.org/10.1016/S2214-109X(18)30565-5).
  - Available at: [www.healthynewbornnetwork.org/resource/national-regional-and-worldwide-estimates-of-low-birthweight-in-2015-with-trends-from-2000-a-systematic-analysis/](http://www.healthynewbornnetwork.org/resource/national-regional-and-worldwide-estimates-of-low-birthweight-in-2015-with-trends-from-2000-a-systematic-analysis/)

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1. WHO, UNICEF. *Survive and Thrive: Transforming care for every small and sick newborn*. Geneva: World Health Organization, 2019.s
2. Chawanpaiboon S, Vogel JP, Moller AB, et al. Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. *The Lancet Global health* 2019;7(1):e37-e46. doi: 10.1016/S2214-109X(18)30451-0
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6. AbouZahr C, Boerma T, Hogan D. Global estimates of country health indicators: useful, unnecessary, inevitable? *Glob Health Action* 2017;10(sup1):1290370. doi: 10.1080/16549716.2017.1290370

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