

# SDG indicator metadata

(Harmonized metadata template - format version 1.1)

## 0. Indicator information (SDG\_INDICATOR\_INFO)

### 0.a. Goal (SDG\_GOAL)

Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

### 0.b. Target (SDG\_TARGET)

Target 2.2: by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons

### 0.c. Indicator (SDG\_INDICATOR)

Indicator 2.2.2: Prevalence of malnutrition (weight for height  $>+2$  or  $<-2$  standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)

### 0.d. Series (SDG\_SERIES\_DESCR)

Proportion of children moderately or severely wasted (%) SH\_STA\_WAST

Children moderately or severely wasted (thousands) SH\_STA\_WASTN

### 0.e. Metadata update (META\_LAST\_UPDATE)

2023-05-15

### 0.f. Related indicators (SDG\_RELATED\_INDICATORS)

Good nutrition lays the foundation for achieving many of the SDGs with improvements in nutrition directly supporting the achievement of SDG3 (ensuring healthy lives), while also playing a role in ending poverty (SDG1), ensuring quality education (SDG4), achieving gender equality (SDG5), promoting economic growth (SDG8), and reducing inequalities (SDG10). In this way, nutrition is the lifeblood of sustainable development, and drives the changes needed for a more sustainable and prosperous future.

### 0.g. International organisations(s) responsible for global monitoring

(SDG\_CUSTODIAN\_AGENCIES)

United Nations Children's Fund (UNICEF)

World Health Organization (WHO)

World Bank (WB)

## 1. Data reporter (CONTACT)

### 1.a. Organisation (CONTACT\_ORGANISATION)

United Nations Children's Fund (UNICEF)

World Health Organization (WHO)

World Bank (WB)

## 2. Definition, concepts, and classifications (IND\_DEF\_CON\_CLASS)

### 2.a. Definition and concepts (STAT\_CONC\_DEF)

**Definition:**

Prevalence of wasting (weight for height  $< -2$  standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.

(French: pourcentage de émaciation (i.e. poids pour longueur/taillle  $< -2$  écarts-types par rapport à la médiane des normes de croissance de l'enfant de l'Organisation Mondiale de la Santé (OMS)) chez les enfants de moins de cinq ans; Spanish: porcentaje de emaciación (i.e. peso para longitud/estatura  $< -2$  desviaciones estándar de la mediana de los estándares de crecimiento infantil de la Organización Mundial de la Salud (OMS)) en niños y niñas menores de cinco años de edad.)

**Concepts:**

The official SDG indicator is wasting as assessed using weight for height. Wasting can however also be assessed with mid upper arm circumference (MUAC). Estimates of wasting based on MUAC are not considered for the JME joint database. In addition, while wasting constitutes the major form of moderate acute malnutrition (MAM), there are acutely malnourished children who would not be picked up with weight-for-height or MUAC, namely those presenting bilateral pitting oedema (characterized by swollen feet, face and limbs). For surveys that report wasting including oedema cases, these are included in the prevalence of low weight-for-height in the JME database unless raw data are available for re-analysis.

**2.b. Unit of measure** (UNIT\_MEASURE)

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Proportion

**2.c. Classifications** (CLASS\_SYSTEM)

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The WHO Multicentre Growth Reference Study (MGRS) ([WHO 2006](#)) was undertaken to generate a growth standard for assessing the growth and development of infants and young children around the world. The MGRS collected primary growth data and related information from children from widely different ethnic backgrounds and cultural settings (Brazil, Ghana, India, Norway, Oman, and the USA). The resulting growth standard can be applied to all children everywhere, regardless of ethnicity, socioeconomic status and type of feeding. The indicator refers to those moderately or severely wasted, that is with a z-score below  $-2$  standard deviations from the median weight-for-length/height of the growth standard.

**3. Data source type and data collection method** (SRC\_TYPE\_COLL\_METHOD)**3.a. Data sources** (SOURCE\_TYPE)

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For the majority of countries, nationally representative household surveys constitute the data source. For a limited number of countries data from surveillance systems is used if sufficient population coverage is documented (about 80%). For both data sources, the child's length/height and weight measurements have to be collected following recommended standard measuring techniques ([WHO/UNICEF 2019](#)).

**3.b. Data collection method** (COLL\_METHOD)

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UNICEF, WHO and the World Bank group jointly review new data sources to update the country level estimates. Each agency uses their existing mechanisms for obtaining data.

For UNICEF, the cadre of dedicated data and monitoring specialists working at national, regional and international levels in 190 countries routinely provide technical support for the collection and analysis of nutrition data. UNICEF also relies on a data source catalogue that is regularly updated using data sources from catalogues of other international organizations and national statistics offices. This data collection is done in close collaboration with UNICEF regional offices with the purpose of ensuring that UNICEF global databases contain updated and internationally comparable data. The regional office staff work with country offices and local counterparts to ensure all relevant data are shared.

WHO data gathering strongly relies on the organization's structure and network established over the past 30 years, since the creation of its global database, the WHO Global Database on Child Growth and Malnutrition, in the late 1980's ([de Onis et al. 2004](#)).

The World Bank Group provides estimates available through the Living Standard Measurement Surveys (LSMS) which usually requires re-analysis of datasets given that the LSMS reports often do not tabulate the child malnutrition data.

### 3.c. Data collection calendar (FREQ\_COLL)

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Data collection is carried out by the three-agency group regularly throughout the year so that data are available for the SDG report and database.

### 3.d. Data release calendar (REL\_CAL\_POLICY)

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The UNICEF-WHO-WB Joint Child Malnutrition (JME) group releases country, regional and worldwide estimates at the end of March every other years so that data are available for the SDG report and database. The JME group also maintain a database of primary data sources (e.g., household surveys), which is updated every six months, and used to generate the JME global and regional estimates.

### 3.e. Data providers (DATA\_SOURCE)

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The majority of the data sources used are nationally representative household surveys (e.g., Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and National Nutrition Surveys (NNS)). Some data come from other sources (e.g., administrative, sentinel systems or national information systems).

Data providers vary and most commonly are ministries of health, national offices of statistics or national institutes of nutrition.

### 3.f. Data compilers (COMPILING\_ORG)

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UNICEF, WHO and the World Bank group

### 3.g. Institutional mandate (INST\_MANDATE)

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UNICEF is responsible for global monitoring and reporting on the wellbeing of children. UNICEF actively supports countries in data collection and analysis for reporting on child malnutrition indicators primarily through high-quality MICS surveys, as well as providing technical and financial support to other surveys. UNICEF not only supports household surveys but also works with global partners to define technical standards for the collection and analysis of anthropometric data. UNICEF also compiles statistics on child

nutrition with the goal of making internationally comparable estimates and databases publicly available. In-depth analyses of the data on child malnutrition, which are included in relevant data-driven publications, including in its flagship publication, *The State of the World's Children*, and the *Child Nutrition Report* are also conducted by UNICEF.

WHO has an established role in the monitoring of child growth and malnutrition since the late 1980's and had the mandate to develop the WHO Child Growth Standards, launched in 2006, and adopted by more than 160 countries. WHO has published several peer-reviewed articles with regional and global estimates until 2012, when they joined forces with UNICEF and the World Bank, with the objective of harmonizing child malnutrition estimates. WHO has the mandate to monitor and report progress on the six global nutrition targets, endorsed in 2012 by the World Health Assembly, amongst them, three on child malnutrition, namely stunting, overweight and wasting (SDG 2.2.1, 2.2.2 (1) and 2.2.2 (2)).

## 4. Other methodological considerations (OTHER\_METHOD)

### 4.a. Rationale (RATIONALE)

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Child growth is an internationally accepted outcome reflecting child nutritional status and well-being. Child wasting refers to a child who is too thin for his or her height and is the result of recent rapid weight loss or the failure to gain weight. A child who is moderately or severely wasted has an increased risk of death, but treatment is possible. Child wasting is one of the World Health Assembly nutrition target indicators.

### 4.b. Comment and limitations (REC\_USE\_LIM)

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Survey estimates have uncertainty due to both sampling error and non-sampling error (e.g., measurement technical error, recording error etc.). While non-sampling error cannot be accounted for or reviewed in full, when available, a data quality review of weight, height and age [measurements data](#) from household surveys supports compilation of a time series that is comparable across countries and over time. None of the two sources of errors have been fully taken into account for deriving estimates neither at country nor at regional or worldwide levels.

Surveys are carried out in a specific period of the year, usually over a few months. However, this indicator can be affected by seasonality, factors related to food availability (e.g., pre-harvest periods), disease (e.g., rainy season and diarrhoea, malaria, etc.), and natural disasters and conflicts. Hence, country-year estimates may not necessarily be comparable over time. Consequently, only latest estimates are provided.

### 4.c. Method of computation (DATA\_COMP)

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Survey estimates are based on standardized methodology using the WHO Child Growth Standards as described in *Recommendations for data collection, analysis and reporting on anthropometric indicators in children under 5 years old* ([WHO/UNICEF 2019](#)) and WHO Anthro Survey Analyser ([WHO, 2019](#)). Worldwide and regional estimates are based on methodology described in UNICEF-WHO-The World Bank: Joint child malnutrition estimates - Levels and trends ([UNICEF/WHO/WB 2012](#)).

### 4.d. Validation (DATA\_VALIDATION)

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UNICEF, WHO and the World Bank undertake a joint review for each potential data source (e.g., household survey). The group conducts a review when (at minimum) a final report with full methodological details and results is available, as well as (ideally) a data quality assessment flagging potential limitations. When the raw data are available, they are analysed using the Anthro Survey Analyzer software to produce a standard set of results and data quality outputs against which the review is conducted. Comments are documented in a standard review template extracting methodological details (e.g., sampling procedures, description of anthropometrical equipment), data quality outputs (e.g., weight and height distributions, percentage of cases that were flagged as implausible according to the WHO Child Growth Standards) and the malnutrition prevalence estimates from the data source under review generated based on the standard recommended methodology. These estimates are compared against the reported values, as well as against those from other data sources already included in the JME database, to assess the plausibility of the trend before including the new point. Reports that are preliminary, or that lack key details on methodology or results, cannot be reviewed and are left pending until full information is available. Country consultations with SDG 2.2 focal points are also held every two years before finalizing and disseminating each edition of the JME estimates. The purpose of the country consultations is to ensure the wasting estimates included all recent and relevant country data and to engage with and receive feedback from national governments on the estimates.

#### 4.e. Adjustments (ADJUSTMENT)

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Adjustments to reported values are made in cases where raw data are not available for re-analysis and it is known from the report that the estimates were derived based on indicators that do not adhere to the standard definition used for monitoring of the SDGs (e.g., they are based on different growth references). The three types of adjustments that have been applied to the JME country dataset include adjustments to standardize for: (i) area of residence, specifically for data sources that were only nationally representative at the rural level; (ii) growth reference, specifically for data sources that used the 1977 NCHS/WHO Growth Reference instead of the 2006 WHO Growth Standards to generate the child malnutrition estimates; and (iii) age, specifically for data sources that did not include the full 0–59-month age group (e.g., data sources reporting on 2–4-year-olds). These three types of adjustments are described further in this section.

##### **i. Adjustment from national rural to national**

A number of surveys cover only rural areas, and, while they have been sampled to be nationally representative for the rural parts of the country, they did not sample any urban areas. Given that malnutrition prevalence generally varies between urban and rural areas (i.e., stunting prevalence was reported to be two times higher in rural areas compared to urban areas at the global level (5)), a rural-only survey would not be comparable with a national survey that are representative of both urban and rural areas. To improve comparability of the rural-only data sources for the specific country, it is necessary to account for urban populations in estimates from these surveys.

The adjustment method used by the JME group is to apply the relative proportions of malnutrition prevalence for each urban and rural area from the closest survey in the country's JME dataset includes disaggregated estimates by area of residence, to the survey that covers only rural areas. This is done under the assumption that the urban:rural population ratio remains the same as the survey with the disaggregations available (e.g., the proportion of children living in rural areas in the country is the same in the survey year used for the adjustment as in the survey year being adjusted) and also that relative prevalence of malnutrition across urban-rural areas in the survey with the missing data is the same as in the survey with full information used for the adjustment.

##### **ii. Adjustment to use the 2006 WHO Growth Standard (converted estimates):**

The indicators of stunting, wasting and overweight used to track SDG Target 2.2 require a standard deviation (SD) score (z-score) to be calculated for each child who is measured for a data source; and the z-score requires a growth reference against which it can be calculated. Prior to the release of the WHO Child Growth Standards in 2006, the 1977 NCHS/WHO reference was recommended for international comparisons. The WHO Growth Standard results in estimates of stunting and wasting prevalence that are higher as well as estimates of overweight that are lower than estimates generated using the NCHS/WHO growth reference (6). It was therefore necessary to account for these differences and standardize estimates across data sources. As such, data sources published prior to the release of the new growth standard in 2006 had to be re-analysed using the 2006 growth standards to obtain comparable estimates across time and location. When raw data were not available, a standard algorithm was applied to convert estimates from surveys based on the NCHS reference to estimates based on the WHO Growth Standards (7).

### iii. Age-adjustment

Some surveys do not cover the entire age interval 0 to 59 months and thus are not aligned with the standard definition for the child malnutrition indicators (e.g., 0-5 or 0-12 months not covered). To incorporate these surveys, we ran a linear mixed model on the difference between the 0-59-month prevalence estimate and the estimates at 0-5-, 6-11-, 12-23-, 24-35-, 36-47- and 48-59-month age-groups, using data from surveys with both the 0-59-month prevalence and separate age-group prevalence values. Specifically, this difference was modeled as a function of the full prevalence, regional grouping, age-group, and a full prevalence by age-group interaction.

Model diagnostics showed that the linearity assumption was upheld. With the estimated mixed model, the data for missing age groups were then imputed using the data from the observed age groups. The prevalence estimate for the full age range was then aggregated using the estimated and observed age-group prevalence rates, for sources with at least one missing age group.

## 4.f. Treatment of missing values (i) at country level and (ii) at regional level

(IMPUTATION)

- **At country level**  
No imputation methodology is applied to derive estimates for countries or years where no data are available.
- **At regional and worldwide levels**  
Countries and years are treated as missing randomly following a multilevel modelling approach ([de Onis et al. 2004](#)).

## 4.g. Regional aggregations (REG\_AGG)

Regional aggregates are available for the following classifications: UN, SDG, UNICEF, WHO, The World Bank regions and income groups.

## 4.h. Methods and guidance available to countries for the compilation of the data at the national level (DOC\_METHOD)

Methods and guidance:

[Recommendations for data collection, analysis and reporting on anthropometric indicators in children under 5 years of age \(WHO/UNICEF, 2019\)](#)

[UNICEF-WHO-World Bank 2020. Technical notes from the country consultation on SDG Indicators 2.2.1 on stunting, 2.2.2a on wasting and 2.2.2b on overweight](#)

Analysis tool: [WHO Anthro Survey Analyser \(shinyapps.io\)](#)

#### 4.i. Quality management (QUALITY\_MGMNT)

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The JME working group, which was formed in 2011 with representatives from UNICEF, WHO and the World Bank, is responsible for management of the processes used to develop regular updates of the JME estimates. This includes the regular update of the country database of surveys used to generate the JME global estimates, for which regular communication with regional and country teams allows the JME working group to secure microdata for re-analysis according to the standard method. The JME working group also continuously review methods and considers and tests different methodologies to improve the estimates as necessary. Additionally, a Technical Expert Advisory Group on Nutrition Monitoring (TEAM), jointly established by UNICEF and WHO, provides advice on nutrition monitoring methods and processes, including on the JME.

#### 4.j Quality assurance (QUALITY\_ASSURE)

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The quality criteria established in the 2019 UNICEF/WHO guidance ([WHO/UNICEF, 2019](#)) were used to update the JME primary data source review form. The JME review form is used to abstract key information including methodological details (e.g., sampling procedures, description of anthropometrical equipment), data quality outputs (e.g., response rates, weight and height distributions, percentage of cases that were flagged as having implausible anthropometry outcomes according to the WHO Child Growth Standards) and the malnutrition prevalence estimates from each primary data source (e.g., household survey) under review. One JME working group member fills in the review form for each data source and when information is missing or further details are required, the country teams are contacted. Once all information is available and the JME primary data source review form is **completed, each data source is reviewed** by the three agencies which form the JME working group. This allows for a thorough and efficient standard joint review of each data source by the three agencies which form the JME working group prior to inclusion in the JME country database of primary sources (e.g., household surveys).

#### 4.k Quality assessment (QUALITY\_ASSMNT)

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Data consistency and quality checks described above are conducted for each potential primary data source (e.g., household survey) before inclusion in the JME country database of primary sources. Country consultations with SDG 2.2 focal points also provide an overall evaluation of the estimates and help to ensure that all recent and relevant country data are included.

### 5. Data availability and disaggregation (COVERAGE)

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#### **Data availability:**

The JME global estimates from 2000 to 2022 for wasting were released for 157~~5~~ countries that had at least one primary data source (e.g., from household survey) included in the 2023~~1~~ JME country database.



**Time series:**

At country level, data are provided for the years where primary data sources are included in the JME database. Data source years range from 1983 to the year before the JME release. Worldwide and regional estimates are provided only for the year before the JME release (e.g., wasting estimates released in 2021 were provided only for the year 2020).

**Disaggregation:**

Worldwide and regional estimates refer to the age group of children under 5 years, sexes combined. A disaggregated dataset of national primary sources with sub national and stratified estimates (e.g., sex, age groups, wealth, mothers' education, residence) is available.

## 6. Comparability / deviation from international standards (COMPARABILITY)

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**Sources of discrepancies:**

For the survey estimates included in the JME joint database, re-analysis based on standardized methodology using the WHO Child Growth Standards as described in Recommendations for data collection, analysis and reporting on anthropometric indicators in children under 5 years old ([WHO/UNICEF 2019](#)) and WHO Anthro Survey Analyser ([WHO, 2019](#)) is applied whenever microdata are available, for enhancing comparability across the time series. Country teams are encouraged to use the WHO Anthro Survey Analyser ([WHO, 2019](#)) to undertake survey analysis and harmonize with the global standard analysis methods.

For the inclusion of survey estimates into the JME database, the inter-agency group applies a set of survey quality assessment criteria.

When there is insufficient documentation, the survey is not included until information becomes available. Discrepancies between results from the standard methodology and those reported may occur for various reasons, for example, the use of different standards for z-score calculations, imputation of the day of birth when missing, the use of rounded age in months, the use of different flagging systems for data exclusion. For surveys based on the previous NCHS/WHO references, and for which raw data are not available, a method for converting the z-scores to be based on the WHO Child Growth Standards is applied ([Yang and de Onis, 2008](#)). In addition, when surveys do not cover the age interval 0-59 months, or are only representative of the rural areas, an adjustment based on other surveys for the same country, is performed. Any adjustment or conversion is transparently stated in the annotated joint data set.

## 7. References and Documentation (OTHER\_DOC)

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**URL:**

[data.unicef.org/nutrition/malnutrition.html](http://data.unicef.org/nutrition/malnutrition.html);  
<https://www.who.int/data/gho/data/themes/topics/joint-child-malnutrition-estimates-unicef-who-wb>;  
<http://datatopics.worldbank.org/child-malnutrition>;

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de Onis M, Blössner M, Borghi E, et al. (2004), Methodology for estimating regional and global trends of childhood malnutrition. *Int J Epidemiol*, 33(6):1260-70. <<https://pubmed.ncbi.nlm.nih.gov/15542535/>>

de Onis, M., Onyango, A., Borghi, E., Garza, C., and Yang, H. (2006). Comparison of the World Health Organization (WHO) Child Growth Standards and the National Center for Health Statistics/WHO



international growth reference: Implications for child health programmes. Public Health Nutrition, 9(7), 942-947. doi:10.1017/PHN20062005  
<[https://www.who.int/childgrowth/publications/Comparison\\_implications.pdf](https://www.who.int/childgrowth/publications/Comparison_implications.pdf)>

United Nations Children's Fund, World Health Organization, The World Bank (2012). UNICEFWHO-World Bank Joint Child Malnutrition Estimates. (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012). <[https://www.who.int/docs/default-source/child-growth/jme-brochure2012.pdf?sfvrsn=ca20d895\\_2](https://www.who.int/docs/default-source/child-growth/jme-brochure2012.pdf?sfvrsn=ca20d895_2)>

UNICEF-WHO-World Bank (2020). Technical notes from the country consultation on SDG Indicators 2.2.1 on stunting, 2.2.2a on wasting and 2.2.2b on overweight <<https://data.unicef.org/resources/jme-2021-country-consultations/>>

WHO (2006). WHO Multicentre Growth Reference Study (MGRS) <<https://www.who.int/tools/child-growth-standards/who-multicentre-growth-reference-study>>

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WHO. WHO Anthro Survey Analyser (2019). Available at <https://www.who.int/tools/child-growth-standards/software>.

Yang H and de Onis M (2008). Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards. BMC Pediatrics 2008, 8:19 (05 May 2008) <<http://www.biomedcentral.com/1471-2431/8/19>>.