

Technical Note

Supporting document to the 2013 SUN Progress Report

17/01/14

1. Definition of data and indicators

1.1 Demographic data for population groups

Data	Definition
National population	The total population of a given country based on the UN Population Division estimates
Children under 5	The total population of children less than 5 years in a given country based on the UN Population Division estimates
Adolescent Girls	The total female population between 15 and 19 years in a given country based on the UN Population Division estimates
Average Number of Births	The annual average number of newborn children in a given country based on the UN Population Division estimates
Population Growth Rate	The rate at which the number of individuals in a population increases in a given time period as a fraction of the initial total population.

Data Source:

World Population Prospects: The 2012 Revision, 2013, Population Division of the United Nations Department of Economic and Social Affairs of the United Nations Secretariat.

The 2012 Revision of the World Population Prospects is the twenty-third round of global demographic estimates and projections undertaken by the Population Division of the United Nations Department of Economic and Social Affairs of the United Nations Secretariat. The world population prospects are used widely throughout the United Nations and by many international organizations, research centers, academic researchers and the media.

1.2 World Health Assembly nutrition targets (WHA 65.6)

Indicator	Definition	WHA target
Low Birth Weight	Percentage of live births that weighed less than 2,500 grams at birth.	30% reduction in low birth weight by 2025
Exclusive breastfeeding	Percentage of infants 0-5 months who were exclusively breastfed.	Increase exclusive breastfeeding rate in the first 6 months up to at least 50% by 2025
U5 stunting	Percentage of children 0-59 months who are below minus two (moderate and severe) and below minus three (severe) standard deviations from median height for age of the WHO Child Growth Standards.	40% reduction in the number of children under 5 who are stunted by 2025
U5 wasting	Percentage of children 0-59 months who are below minus two (moderate and severe) and below minus three (severe) standard deviations from median weight for height of the WHO Child Growth Standards.	Reduce and maintain childhood wasting to less than 5% by 2025
U5 overweight	Percentage of children 0-59 months who are above two (moderate and severe) standard deviations from median weight for age of the WHO Child Growth Standards.	No increase in childhood overweight through 2025

Note:

- 1) Due to the data limitation, the indicator ‘anaemia in women of reproductive age’ has not been included in this report.

Link to the website: http://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/

- 2) Methodologies and underlying processes for the UNICEF-WHO-The World Bank joint estimates are outlined in the [2012 Joint Child Malnutrition Estimates](#), further updated with the [2013 release](#). Nationally representative anthropometry estimates, following the vetting process by each agency and once collectively agreed upon, are included in the regularly updated [Joint Dataset](#).

- 3) In an effort to maintain a consistent time series of internationally comparable anthropometric data, part of this harmonization process for calculating regional and global averages and conducting trend analyses requires all anthropometric-related prevalence estimates to be re-calculated using a standard algorithm. This algorithm was programmed into the WHO Anthro software and macros, reviewed by MEASURE DHS and UNICEF. In addition, other institutions (e.g. US CDC) have incorporated the standard algorithm in their nutritional survey analytic process. In countries where the anthropometric data are collected as part of a Demographic and Health Survey (DHS) or Multiple Indicator Cluster Survey (MICS), either the raw data are publicly available and/or the survey data processing programs already incorporate the WHO algorithm. In countries where anthropometric data are collected by a national nutrition survey (or another type of survey) that are analyzed using a different algorithm, a re-calculation of anthropometry-related prevalence is often necessary in order to make estimates comparable across countries and over time.

1.3 Infant and young child feeding practice

Indicator	Definition	Relevance
Minimum acceptable diet and minimum diet	Percentage of young children 6-23 months who receive the 3 key Infant and Young Child Feeding	Apart from breast-milk, an acceptable diet is achieved when there is the minimum dietary diversity and meal

Indicator	Definition	Relevance
diversity (3 IYCF)	<p>practices during the previous day in line with the World Health Organization guidelines¹:</p> <p>For breastfed children:</p> <ul style="list-style-type: none"> • Feeding infants 6-8 months \geq two times and young children 9-23 months \geq three times with solid, semi-solid or soft foods • Feeding with foods from four or more out of seven food groups <p>For non-breastfed children:</p> <ul style="list-style-type: none"> • \geq two milk feeds \geq four times with solid, semi-solid or soft foods or milk feeds • Feeding with foods from four or more out of six food groups 	<p>frequency (as well as minimum milk feeds for non-breastfed children).</p> <p>An acceptable diet is essential to ensure appropriate growth and development of a young child in the critical time between 6 and 23 months when they are most vulnerable to malnutrition, morbidity and mortality.</p> <p>There is strong evidence that appropriate complementary feeding reduces the incidence of stunting.²</p> <p>The evidence reviewed in the 2013 Lancet Series found significant effects of <i>nutrition education targeted to food secure population</i>: increased height gain (SMD 0.35, 95% CI 0.08-0.62), height-for-age (RR 0.34, 95% CI 0.21-0.54) and weight gain (SMD 0.40, 95% CI 0.02-0.78). <i>Nutrition education targeted to food insecure population</i> had significant effects on: stunting reduction (RR 0.68, 95% CI 0.60-0.76), increased height-for-age (SMD 0.25, 95% CI 0.09-0.42) and increased weight-for-age (SMD 0.26, 95% CI 0.12-0.41).</p> <p><i>Complementary food provision with or without education in food insecure populations</i> had significant effects on: increased height-for-age (SMD 0.39, 95% CI 0.05-0.73) and increased weight-for-age (SMD 0.26, 95% CI 0.04-0.41) but not on stunting reduction.³</p>
Complementary feeding with foods from at least four groups (6-23 months)	<p>Percentage of children 6-23 months who receive food from four or more out of seven food groups.</p> <p><i>Note</i>: few countries are still using ‘at least three or more food groups’ as the minimum.</p>	

¹ WHO, Nutrition Landscape Information System: Country Profile Indicators, (Interpretation Guide) 2010. p.18

² Bhutta Z. et al, Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? Maternal and Child Nutrition 2, June 2013. p.22

³ Bhutta Z. et al., p.47

1.4 Programs for vitamin and mineral deficiencies

Indicator	Definition	Relevance
Zinc Supplementation for Diarrhea (U5 Children)	<p>Percentage of children under 5 years with acute diarrhea who were given supplements of 20 mg zinc daily for 10–14 days or 10 mg zinc daily for infants under 6 months⁴.</p> <p>Note: There are no internationally accepted indicators or tools for data collection and compilation for zinc treatment of children with diarrhea⁵.</p>	<p>Diarrheal diseases account for nearly 2 million deaths a year among children under 5, making them the second most common cause of child death worldwide. Studies have consistently shown that diarrhea is the most important infectious disease determinant of stunting of linear growth. A pooled analysis of nine community-based studies in low-income countries found that the odds of stunting at 24 months of age increased multiplicatively with each diarrhea episode or day of diarrhea before that age. The proportion of stunting attributed to five previous episodes of diarrhea was 25% (95% CI 8-38%).⁶</p> <p>Zinc supplementation is recommended as safe and effective during the management of diarrhea. Specifically, zinc supplements given during an episode of acute diarrhea reduce the duration and severity of the episode and giving zinc supplements for 10–14 days lowers the incidence of diarrhea in the following 2–3 months.⁷</p> <p>The evidence reviewed in the 2013 Lancet Series found significant effects of zinc supplementation for diarrhea on: all-cause mortality reduced by 46% (95% CI 12-68), diarrhea-related admissions to hospital reduced by 23% (95% CI 15-31), duration of acute diarrhea reduced by 0.5 days and persistent diarrhea reduced by 0.68 days.⁸</p>

⁴ WHO, Nutrition Landscape Information System, p. 10-11

⁵ WHO, Nutrition Landscape Information System, p. 11

⁶ Bhutta Z. et al., p.22

⁷ WHO and the United Nations Children's Fund (UNICEF) recommend for prevention and management of acute diarrhea: exclusive breastfeeding, vitamin A supplementation, improved hygiene, better access to cleaner sources of drinking water and sanitation facilities, vaccination against rotavirus and also the use of zinc, which is safe and effective. Specifically, zinc supplements given during an episode of acute diarrhea in the clinical management of acute diarrhea

⁸ Bhutta Z. et al, p.49

Indicator	Definition	Relevance
Pregnant Women Attending 4 or more Antenatal Care Visits	Percentage of women 15-49 years old who received antenatal care at least four times during pregnancy by any provider (skilled or unskilled) for reasons related to the pregnancy ⁹ .	<p>To achieve the full life-saving potential that ANC promises for women and babies, four visits providing essential evidence-based interventions – a package often called focused antenatal care – are required.</p> <p>This indicator is used as a proxy for access to Iron and Folic Acid Supplementation. The World Health Organization recommends daily oral Iron and Folic Acid supplementation as part of the antenatal care.</p> <p>The evidence reviewed in the 2013 Lancet Series found significant effects of Iron and Folic Acid Supplementation on: birth-weight (MD 57.7 g, 95% CI 7.66-107.79), anaemia at term (RR 0.34, 95% CI 0.21-0.54) and serum hemoglobin concentration at term (MD 16.13 g/l, 95% CI 12.74-19.52).¹⁰</p>
Vitamin A supplementation	<p>Proportion of children aged 6–59 months who received two high-dose vitamin A supplements within a given year¹¹.</p> <p>The recommended doses are 100,000 IU for children aged 6–11 months and 200,000 IU for children aged 12–59 months.</p>	<p>The Global Vitamin A Alliance defines full coverage of VAS as the percentage of children 6-59 months old who received two doses about 4-6 months apart during a given calendar year. National estimates are collected globally and reported annually based on administrative data by UNICEF. Of particular limitation to VAS estimates reported based on HH survey data is the inability to provide a two-dose estimate for any given year; lack of consideration for national campaigns, distribution mechanisms, and timing when estimating VAS coverage.</p> <p>UNICEF maintains a database on this indicator at: http://www.childinfo.org/vitamina.html</p>

⁹ The Partnership for Maternal, Newborn and Child Health. Opportunities for Africa's Newborns, Chapter 2: Antenatal Care. WHO, 2006. p. 51

¹⁰ Bhutta Z. et al., p.44

¹¹ WHO, Nutrition Landscape Information System, p.9

Indicator	Definition	Relevance
<p>Presence of Iodized Salt in the House</p>	<p>Percentage of households consuming adequately iodized salt, defined as salt containing 15–40 parts per million of iodine¹².</p>	<p>Iodine deficiency is most commonly and visibly associated with thyroid problems but takes its greatest toll in impaired mental growth and development, which contributes to poor school performance, reduced intellectual ability and impaired work performance.</p> <p>The evidence reviewed in the 2013 Lancet Series found significant effects on pregnant women: birth-weight 3.82-6.30% higher, reduced cretinism at 4 years of age (RR 0.27, 95% CI 0.12-0.60) and developmental scores 10-20% higher in young children.¹³</p> <p>To achieve the Universal Salt Iodization target, the proportion of households consuming adequately iodized salt should be greater than 90%.</p>

¹² WHO, Nutrition Landscape Information System, pp. 15-16

¹³ Bhutta Z. et al., p.44

1.5 Women's Empowerment

Indicator	Definition	Relevance
Female Literacy	Percentage of women able to demonstrate their ability to read all or part of a simple sentence in any of the major language groups of the country ¹⁴ .	<p>The ability to read is an important personal asset allowing women increased opportunities in life.</p> <p>An analysis of 19 datasets from the Demographic and Health Survey (collected since 1999) showed that the risk of stunting is significantly lower among mothers with at least some primary schooling (odds ratio [OR] 0.89, 95% CI 0.85-0.93) and even lower ($p < 0.001$) among mothers with some secondary schooling (0.75, 0.71-0.79). Paternal education at both the primary and secondary levels also reduced the risk of stunting although the respective ORs are smaller than for maternal schooling. Despite the overall association, there is appreciable heterogeneity in effect sizes in individual countries, probably indicative of differences in both quality of education and quality of data.¹⁵</p>
Female Employment Rate ¹⁶	Employment rates are calculated as the ratio of the employed to the working age population. Working age is generally defined as persons in the 15 to 64 age bracket although in some countries working age is defined as 16 to 64 ¹⁷ .	<p>Women are increasingly entering the labor force, and mothers are required to fit their child-care and domestic responsibilities around their hours of work, often leaving little time for themselves. On the other hand, income from wage work may offer health benefits to women by allowing them to purchase basic necessities such as housing and food.</p> <p>Women's work has been found to improve dietary intake and to influence fertility. Women's autonomy and well-being are enhanced by income earned from work outside the home, thereby reducing their social dependence on a male partner.</p>

¹⁴ Mukuria et al., The Context of Women's Health: Results from the Demographic and Health Surveys, 1994-2001, DHS Comparative Reports No. 11, ORC Macro, December 2005. p. 23.

¹⁵ Ruel M. et al., Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? Maternal and Child Nutrition 3, June 2013. p.66

¹⁶ Mukuria et al., p. 27

¹⁷ OECD, OECD Employment Outlook, 2006

Indicator	Definition	Relevance
		<p>However, economic pressures on women living in poverty draw them into agricultural work, and women’s nutritional status and health may be diminished by the long hours and heavy work required.</p>
<p>15-19 years women already mother or with first child</p>	<p>Percentage of women 20-24 years old who gave birth before age 18¹⁸.</p>	<p>Pregnancies in adolescents have a higher risk of complications and mortality in mothers and children and poorer birth outcomes than pregnancies in older women. Furthermore, pregnancy in adolescence will slow and stunt a girl’s growth. In some countries as many as half of adolescents are stunted, increasing the risk of poor birth outcomes.¹⁹</p> <p>Births to young women between 15-19 years are strongly associated with health risks for both the mothers and the infants. Many of these risks are also associated with giving birth for the first time. Because adolescent mothers are usually also first-time mothers, it is difficult to separate these risks. The rate of death of adolescents in childbirth is disproportionately high. In many countries, the risk for dying from pregnancy-related causes is twice as high for adolescents aged 15-19 years as for older women²⁰.</p>
<p>Median age at first marriage²¹</p>	<p>The mean age of women at first marriage if subject throughout their lives to the age-specific marriage rates of</p>	<p>Age of first intercourse, first marriage, and first birth provide a picture of initial influences on fertility that is suggestive of fertility-related outcomes. In most countries, marriage is a primary indication of the exposure of a woman to the risk of pregnancy and therefore is important in understanding fertility.</p>

¹⁸ WHO, Help Topic: Women 15-19 years who are mothers or pregnant with their first child

¹⁹ Black R. et al, Maternal and child undernutrition and overweight in low-income and middle-income countries, Maternal and Child Nutrition 1, June 2013 p.17

²⁰ WHO, Nutrition Landscape Information System, p.20

²¹ Mukuria et al., pp.35-36

Indicator	Definition	Relevance
	first marriages only in a given year ²² .	Populations in which the age at first marriage is low tend to have early childbearing and high fertility; therefore, it is important to examine trends in age at first marriage. Data on age at first sexual intercourse are a more direct measure of the beginning of exposure to pregnancy. The age at which childbearing begins is associated with the number of children a woman bears during her reproductive period in the absence of any active fertility control.
Fertility Rate ²³	Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates ²⁴ .	<p>This indicator is used as a proxy for child birth space.</p> <p>In countries, and among groups, where the fertility rate is high, there is a correlation with poor maternal health and nutrition.</p> <p>Short inter-pregnancy intervals increase the risk of low birth-weight (OR 1.65, 95% CI 1.27-2.14) and pre-term births (OR 1.45, 95% CI 1.30-1.61). Repeated pregnancies and advanced maternal age are also found to have an impact on low-birth weight (RR 1.61, 95% CI 1.16-2.24). These findings emphasize the need to optimize age at first pregnancy, family size and inter-pregnancy intervals²⁵.</p>
Access to Skilled Birth Attendant ²⁶	Percentage of live births attended by skilled health personnel (doctors, nurses or midwives).	Skilled attendance at all births is considered to be the single most critical intervention for ensuring safe motherhood, because it hastens the timely delivery of emergency obstetric and newborn care when life-threatening complications arise ²⁷ .

²² United Nations, World Fertility Report 2009

²³ Mukuria et al., p.38

²⁴ World Bank, Indicator Fertility rate, total (births per woman)

²⁵ Bhutta et al., p.43

²⁶ UNFPA, Skilled Attendance at Birth

²⁷ Black R. et al. Maternal and child undernutrition and overweight in low-income and middle-income countries, Maternal and Child Nutrition 3, June 2013

Indicator	Definition	Relevance
		Skilled attendance denotes not only the presence of midwives and others with midwifery skills (MOMS) but also the enabling environment they need in order to be able to perform capably. It also implies access to a more comprehensive level of obstetric care in case of complications requiring surgery or blood transfusions.

1.6 Other Nutrition Sensitive Indicators

Indicator	Definition	Relevance
Rate of Urbanization	Percentage of population living in urban areas as defined according to the national <i>definition</i> used in the most recent population census.	<p>Urban poverty is often overlooked and the children living in urban poverty are at risk of not being reached by development efforts. Increase in urban growth is likely to widen the gap in inequality and consequently escalate the needs of urban children, particularly in Urban Africa which is currently experiencing the highest urban growth rates with 200 million children living in urban areas while 60 percent of Africa's urban population lives in slum conditions²⁸.</p> <p>A regression analysis conducted by Save the Children to establish the relative and absolute importance of underlying and structural drivers of stunting in a dataset of 128 countries found that higher urban population and higher mean GDP per capita are significantly correlated with lower levels of stunting prevalence²⁹.</p>
Income share held by lowest 20%	Percentage share of income or consumption held by the	Income share of the poorest quintile of the population is an important driver of stunting among countries with high-burden of stunting – but not elsewhere ³¹ .

²⁸ Save The Children, Voices from Urban Africa, The Impact of Urban Growth on Children, November 2012. p. 8

²⁹ Save the Children, Global stunting reduction target: focus on the poorest or leave millions behind

Indicator	Definition	Relevance
	lowest 20% of the population indicated by quintiles ³⁰ .	

Studies have shown that there is a significant relationship between defecation, access to clean water and child's height. For more details see "The Water, Sanitation, and Children's Health" (Evidence from 172 DHS surveys)

<http://sanitationupdates.files.wordpress.com/2010/05/worldbank-dhs2010.pdf>

Indicator	Definition	Relevance
Open defecation	Percentage of population defecating in fields, forests, bushes, bodies of water and other open spaces.	Open defecation explained 54% of international variation in child height by contrast with GDP, which only explained 29%. A 20 percentage point reduction in open defecation was associated with a 0.1 SD increase in child height ³² .
Non-improved water supply	Percentage of population using unimproved drinking water sources including: Unprotected dug well, unprotected spring, small cart with tank/drum, tanker truck, surface water (river, dam, lake, pond, stream, channel, irrigation channel) or bottled water.	Access to adequate water supply is not only a fundamental need but also a human right. Access to water supply also has considerable health and economic benefits to households and individuals. Equitable access to improved drinking water and sanitation is of fundamental importance to health and will speed the achievement of all eight MDGs ²⁹ . The regression analysis conducted by Save the Children found that access to safe drinking water in rural areas was among the main drivers for reducing

³¹ Save the Children, Global stunting reduction target: focus on the poorest or leave millions behind

³⁰ World Bank, Development Research Group. Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments. Data for high-income economies are from the Luxembourg Income Study database. <http://iresearch.worldbank.org/PovcalNet/index.htm>

³²

Indicator	Definition	Relevance
		stunting ³³ . A Cochrane review of the effect of WASH interventions on nutrition outcomes placed emphasis on the improvement of the <i>quality</i> of the water (as well and above water supply) ³⁴ .

³³ Save the Children, Global stunting reduction target: focus on the poorest or leave millions behind

³⁴ Dangour et al. Interventions to improve water quality and supply, sanitation and hygiene practices and their effects on the nutritional status of children, *Cochrane Database Syst Rev* 2013. p. 27

2. Interpreting area graphs

2.1 Graph with stunting reduction target

WHA recommended an Average Annual Rate of Reduction (AARR) of 3.9% to meet the global target of a 40% reduction in the number of children in the world who are stunted by 2025. To identify the reduction achievement and the potential gap by 2025 under the current scenario, the European Commission Nutrition Advisory and the World Health Organization developed the Stunting Reduction Calculations Tool (SRCT), which estimates the projected number of stunted children in 2025 at the country level according to either the current or the desirable (i.e. 40% of the current number) trend in stunting reduction.

The calculations under the current scenario apply the current AARR to the latest available prevalence value which is transposed to the baseline year (i.e. 2012), while the desirable scenario starts from the estimation of the target number of stunted children in 2025, i.e. 40% less than the estimated number of stunted children at baseline. Therefore, calculations are based on this target in 2025, in number of children; and the corresponding prevalence is calculated by using demographic projections. Then the slope between the prevalence at the end line and the prevalence at the starting year (of any plan/program to reduce stunting), and the number of years between these two time points, are used to calculate the desirable (Target) AARR needed to reach the target prevalence.

In the analysis of the trend in the reduction of stunting prevalence among children under five in Uganda, the SRCT uses the AARR to quantify the rate of change of the prevalence from 1985 to 2012. The calculation was developed based on historical stunting prevalence from the WHO Global Health Observatory Data Repository and demographic data from the World Population Prospects, 2010.

Indicator	Definition	Relevance
Average Annual Rate of Reduction (AARR)	AARR is used for the analysis for monitoring and evaluation of the global trend in stunting prevalence	The global prevalence of stunting in children under the age of 5 has declined 36% over the past two decades – from an estimated 40% in 1990 to 26% in 2011. This is an average annual rate of reduction of 2.1% per year ³⁶ .

³⁶ UNICEF, Improving Child Nutrition: The achievable imperative for global progress, UNICEF, April 2013. p.8

Indicator	Definition	Relevance
	among children under five, to quantify the rate of change of the prevalence from baseline to the current year. If the prevalence is known and the annual rate of reduction is constant, then the prevalence of the next year can be calculated ³⁵ .	An Average Annual Rate of Reduction (AARR) is 3.9% to meet the global target of a 40% reduction in the number of children in the world who are stunted by 2025.

2.2 Trends and targets for stunting, wasting and exclusive breastfeeding

During the Nutrition for Growth event on June 8, 2013, in London, 15 Governments committed to increase their domestic resources for scaling up nutrition, and 12 Governments announced national stunting-reduction targets. These national targets are noted in individual country profiles accordingly.

Each graph indicates the stunting, wasting and exclusive breastfeeding prevalence for each available data point since 2000 based on household surveys. When available, the prevalence for the lowest income quintile and the prevalence for the highest income quintile are indicated. The dotted line explains the linear regression.

The Average Annual Reduction Rate is calculated only for stunting.

2.3 Distribution of stunting across wealth quintiles

The table of the distribution of stunting are showing the inequity of nutritional status across all wealth quintiles – lowest, second, middle, fourth and highest. The table uses the latest data point available from the national household survey.

³⁵ UNICEF, Technical Note: How to calculate Average Annual Rate of Reduction (AARR) of Underweight Prevalence

The national stunting prevalence average is indicated as well as the national target for stunting prevalence to show the difference in the stunting prevalence of each wealth quintiles.

The distribution of stunting across wealth quintiles is mostly available from DHS and MICS survey reports produced in the last few years.

3. Data Sources

The primary sources of nutrition indicators are the published national household surveys such as the Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS). In the absence of recently released DHS or MICS reports, national-level Standardized Monitoring and Assessment of Relief and Transition (SMART) surveys are utilized³⁷.

Additional data sources include: the World Bank database, the UN population estimates database, UNICEF Database of Vitamin A deficiency, and other data sources which are listed in the bibliography.

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A special thanks to our colleagues from the Department of Policy and Planning, Statistics and Monitoring Section, United Nations Children's Fund, whose inputs were critical and essential in finalizing this document.

³⁷ SMART surveys have been used as source of data for Senegal, Mauritania, and Sierra Leone.

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