

PREVALENCE OF STUNTING IN CHILDREN AGED 0-4 YEARS	
GENERAL CONSIDERATIONS	
<i>Issues</i>	Perinatal diseases
<i>Type of indicator</i>	Action
<i>Rationale</i>	<p>Long-term action to reduce the prevalence of low birthweight requires attention to the factors that lead to intrauterine growth retardation (e.g. maternal undernutrition, infection during gestation, maternal smoking). Because low birthweight has long-lasting impacts upon children's (and adults') health, however, action is also needed to redress the effects of children who are born underweight. These might include targeted assistance in terms of nutritional support and education, as well as monitoring of those who are most at risk.</p> <p>One measure of the success of these <i>post hoc</i> interventions is the prevalence of stunting later in life. Stunting is defined as having a height (or length)-for-age more than two standard deviations below the median of the NCHS/WHO growth reference (WHO, 1995). It is calculated, therefore, by taking body measurements of height or length. Other data needed are age and gender. These data are relatively simple to collect, and measurements are non-invasive and at low cost.</p>
<i>Issues in indicator design</i>	<p>Stunting is a well-established child health indicator for chronic malnutrition related to environmental and socio-economic circumstances (WHO, 1995; WHO, 1996). Stunting prevalence data on national levels are readily available and are being continuously collected in a standardized way by WHO. This systematic standardization allows the derivation of trends (ACC/SCN 2000, de Onis, 2000) and regional cross-country comparisons of malnutrition levels (WHO1997). The WHO definition, cut-off and reference population used to calculate the indicator has been widely accepted since the 1980s. Special software programmes for calculation of individual z-scores and population prevalence are available free of charge by WHO and CDC (i.e. ANTHRO and EpilInfo).</p> <p>Height-for-age represents the linear growth achieved at the age of measurement, taken in the standing position. Length refers to measurement in recumbent position, and is recommended for children below 2 years of age.</p> <p>An age range of 0-4 years is used for the indicator because action needs to be taken early in life to reduce long-term adverse effects.</p>
SPECIFICATION	
<i>Definition</i>	Percentage (or number) of children aged 0-4 years who are stunted, by gender.
<i>Terms and concepts</i>	Stunting: having a height (or length)-for-age more than 2 SD below the median of the NCHS/WHO international reference.
<i>Data needs</i>	Number of children aged 0-4 years who are stunted. Total number of children aged 0-4 years.
<i>Data sources, availability and quality</i>	<p>Data on height (or length)-for age are available from many nutritional and other household surveys. Following standardization and quality checking, many of these data are incorporated in the WHO Global Database on Child Growth and Malnutrition. This database is accessible on-line, free of charge (http://www.who.int/nutgrowthdb/) and is updated on a continual basis.</p> <p>Internationally, there are also several other survey programmes that provide anthropometric data, including the Demographic and Health Surveys funded by USAID, the PAPCHILD surveys funded by the Pan-Arab League and UNFPA, and the LSMS and SDA surveys in sub-Saharan Africa, funded by</p>

	the World Bank.
<i>Level of spatial aggregation</i>	Local to national
<i>Averaging period</i>	Instantaneous (i.e. at time of survey) – ideally ca. every 5 years
<i>Computation</i>	<p>The indicator can be calculated as a simple percentage, as follows:</p> $100 * (Cstunt / Ctot)$ <p>where: <i>Cstunt</i> is the number of children aged 0-4 years who are stunted (i.e. more than two SD below the reference height-for-age or length-for-age reference);</p> <p><i>Ctot</i> is the total number of children aged 0-4 years surveyed.</p>
<i>Units of measurement</i>	Percentage or number
<i>Worked example</i>	Assume that, from a survey of 5 500 children aged 0-4 years, 690 are defined as stunted. In this case, the value of the indicator is calculated as $100 * (690 / 5\ 500) = 12.5\%$
<i>Interpretation</i>	<p>In general terms, this indicator provides a measure of the success, or otherwise, of actions taken to combat problems of undernutrition and impaired physical development of children. Since low birthweight is one of the major precursors for impaired development, it thereby indicates the extent to which the adverse effects of intrauterine growth retardation have been assuaged.</p> <p>Interpretation nevertheless needs to be conducted with care. Problems in the reliability of data may exist, especially where surveys are small. Reduced growth is also, of course, not only a result of problems prior to, or immediately after, birth; it can also reflect problems of undernutrition, infection or other illnesses throughout the early years of life. In other words it is a consequence of a range of factors closely linked to the overall standard of living, the conditions of the environment and whether a population can meet its basic needs, such as access to food, housing and health care. Using stunting later in life (i.e. to age 4) as an indication of action also assumes that underweight children are surviving. Where rates of perinatal and infant mortality are high, this may not be the case. Ideally, therefore, the indicator needs to be applied and interpreted alongside other measures.</p>
<i>Variations and alternatives</i>	<p>Variations are possible in the way in which stunting is defined. Instead of using the -2 SD, for example, it may be based on -3 SD. Disaggregated prevalence data by level of severity are available on the web site of the WHO Global Database.</p> <p>Where data on height or length by age are not available, useful proxies are underweight prevalence (measured in terms of weight-for-age) and wasting prevalence (measured in terms of weight for height).</p>

<p><i>Examples</i></p>	<p>WHO <i>Catalogue of health indicators</i></p> <ul style="list-style-type: none"> • Stunting prevalence • Underweight prevalence • Wasting prevalence
<p><i>Useful references</i></p>	<p>ACC/SCN 2000 <i>The fourth report on the world nutrition situation: nutrition throughout the life cycle</i>. Geneva: Administrative Committee on Coordination, Subcommittee on Nutrition.</p> <p>Blanc, A.K. and Wardlaw, T. 2002 Survey data on low birthweight: an evaluation of recent international estimates and estimation procedures. <i>Annual Meeting of the Population Association of America, Atlanta, May 9-11, 2002</i>.</p> <p>de Onis, M., Frongillo, E.A. Jr. and Blössner, M. 2000 Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. <i>Bulletin of the World Health Organization</i> 78, 1222-33.</p> <p>Mosley, W.H. and Gray, R. 1993 Childhood precursors of adult mortality in developing countries: implications for health programs. In: Gribble, J. and Preston, S.H. <i>The Epidemiological Transition: Policy and Planning Implications for developing countries</i>. Washington: National Academy Press, Pp. 69-100.</p> <p>UNICEF 2000 <i>The state of the world's children, 2000</i>. (available at: http://www.unicef.org/sowc00/) UNICEF, Progress since the World Summit for Children: A statistical review. New York: United Nations Children's Fund, 2001.</p> <p>UNICEF website: http://www.childinfo.org/eddb/lbw/index.htm</p> <p>USAID MEASURE DHS+ <i>Demographic and health surveys</i>. (available at http://www.measuredhs.com/).</p> <p>WHO 1996 <i>Catalogue of Health Indicators: a selection of important health indicators recommended by WHO Programmes</i>. WHO/HST/SCI/96.8. Geneva: World Health Organization.</p> <p>WHO 1995 <i>Expert Committee Report: Physical status: the use and interpretation of anthropometry. Technical Report Series 854</i>. Geneva: World Health Organization.</p> <p>WHO 1997 <i>The WHO Global Database on Child Growth and Malnutrition</i>. WHO/NUT/97.4. Geneva: World Health Organization. (Available at http://www.who.int/nutgrowthdb/)</p> <p>Williams, R.L., Creasy, R.K., Cunningham, G.C., Hawes, W.E., Norris, F.D. and Tashiro, M. 1982 Fetal growth and perinatal viability in California. <i>Obstetrics and Gynecology</i> 59, 624-32.</p> <p>World Bank <i>Living standards measurement survey</i> website: http://www.worldbank.org/lsmstlook</p>