



UNITED NATIONS SYSTEM
STANDING COMMITTEE ON
NUTRITION

Task Force on Assessment, Monitoring, and Evaluation

Fact sheets on Food and Nutrition Security Indicators/Measures:

Mid-Upper Arm Circumference (MUAC)

Notes

- The template aims at providing a standard framework for compiling key information on food and nutrition security indicators or measures. It starts by listing characteristics most useful for decision-makers (rows 1 to 5). More technical features follow.
- AME = assessment, monitoring and evaluation
- For decision-makers/managers, a table selecting rows 1 to 6 could be extracted.
- For technical/programme staff, the whole table would be relevant

Characteristics	Explanation
1. What does the indicator evaluate?	<p><i>What is the meaning of the indicator?</i></p> <p>MUAC is a good indicator of muscle mass¹ and can be used as a proxy of wasting. It is also a very good predictor of the risk of death.</p>
2. Which are the target population groups for the indicator?	<p><i>For which population group(s) is the indicator relevant?</i></p> <p>MUAC is mainly measured on children aged 6 to 59 months.</p> <p>There is no agreement for the measurement and interpretation of MUAC values in children less than 6 months and in adults.</p> <p>However, MUAC has also been recommended for targeting intervention to pregnant women at risk of poor pregnancy outcome.² Cut-off values may be population specific.</p>
3. For which purpose is the indicator collected?	<p><i>What use is made of the indicator at different levels (individual, household, community, district, national, regional, global)?</i></p> <p>MUAC is one anthropometric parameter for analysis of nutritional status.</p> <p>MUAC is mainly used for detecting individuals in need of treatment rather than</p>

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	<p>for measuring population trend data.</p> <p>In children 6-59 month old, MUAC < 110 mm is recommended as a criterion of admission to therapeutic feeding programmes.³ It is particularly recommended for the detection of severe malnourished 6-59 month-old children at community-level.</p> <p>MUAC is also sometimes used to detect moderately malnourished children and as a criterion of admission to supplementary feeding centres. Cut-offs used for these purposes are generally 120 mm or 125 mm. However, there is no international agreement on the use of MUAC and on cut-offs for detection of moderately malnourished children and admission to supplementary feeding centres.</p>
<p>4. What is the relevance of the indicator for nutrition and food security AME?</p>	<p><i>To what extent does the indicator reflect nutritional status, food security, the health and care situation and their evolution?</i></p> <p>MUAC is a good predictor of the risk of death in 6-59 month old children,³ probably because of its relationship with the muscle mass.^{4,5} It is therefore a very successful screening tool that rapidly identifies children likely to die unless provided with nutritional and medical treatment.</p>
<p>5. What is the relevance of the indicator for poverty AME?</p>	<p><i>To what extent does the indicator reflect the socio-economic situation and its evolution?</i></p> <p>Malnutrition is associated with poverty. Children with low MUAC tend to be found among the poorest segments of the population.</p>
<p>6. What is the relevance of the indicator for MDGs AME?</p>	<p><i>To what extent does the indicator reflect progress made towards the achievement of the MDGs?</i></p> <p>MUAC is a good predictor of the risk of death in children. Therefore it is related to MDG 4: Reduce child mortality.</p>
<p>7. How is the indicator constructed?</p>	<p><i>Which data are required for the indicator</i></p> <p>MUAC is measured to the nearest mm and can be reported either in mm or cm. MUAC is measured on one arm and quoted directly, without the use of any reference.</p> <p>Although MUAC values vary slightly between 6 and 59 months, it has been proven that MUAC is a good predictor of death in these children, without adjustment for age.</p> <p>The cut-off of 110 mm for admission to therapeutic feeding centres has been determined according to the relationship between MUAC values and risk of deaths reported by several studies.</p>
<p>8. Which reference(s) is(are) used to interpret the indicator?</p>	<p><i>Against which reference, standard or threshold is the indicator compared in order to interpret it at individual and at population levels?</i></p> <p>There is no need to use a reference as a single cut-off value of the measurement can be used whatever the age of the child between 6 and 59 months.</p>

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9. Which type of analysis should be conducted with the indicator?	<p><i>Which cross-tabulations and other causal analyses are appropriate in conjunction with the indicator to assist with its interpretation and use?</i></p> <p>Underlying factors of malnutrition, such as health status and food security, should be assessed as explanatory elements.</p>
10. What are the practical requirements to use the indicator?	<p><i>Which equipment, staff, skills and other resources are required to collect the data and interpret the indicator?</i></p> <p>A MUAC measurement tape is needed. Colored measurement tapes can be used by low-skilled staff. Training of staff is required.⁶</p>
11. What are the main limitations of the indicator?	<p><i>What are the main weaknesses in and constraints to using the indicator?</i></p> <p>The MUAC cut-off value to identify children who would benefit from supplementary feeding has not yet been agreed upon.</p>
12. What are the main strengths of the indicator?	<p><i>What are the main positive qualities of the indicator?</i></p> <p>MUAC is a good predictor of death and is valuable for detecting 6-59 month-old children requiring therapeutic feeding. It is easy to measure, does not require heavy material nor does it need to be interpreted against references. It is, in practical terms, the best screening tool in use for severely malnourished children. It is especially suitable for use in the community by low-skilled workers/volunteers.</p>
13. In which context is the indicator most appropriate?	<p><i>In which type of situation (sudden onset crisis, slow onset crisis, post-crisis, 'stable' situation) is the indicator most suitable?</i></p> <p>MUAC can be used in emergency and non-emergency contexts for detecting children requiring therapeutic feeding. It might also be especially useful at the onset of a crisis to quickly determine the need for nutrition programmes.</p>
14. Where can data and results on this indicator be found?	<p><i>From which sources, websites, reports etc. can data and results on the indicator be found?</i></p> <p>MUAC is generally not collected routinely in nutrition surveys, especially in non-emergency situations. Data on MUAC in emergency situations can be found in the SCN database: http://www.unsystem.org/scn/Publications/RNIS/rniscountry_database.html</p>
15. Which guidance can be consulted on the indicator?	<p><i>Which reference documents exist on the collection, interpretation and use of the indicator?</i></p> <p>¹ Trowbridge FL, Hiner CD, and Robertson DA. Arm muscle indicators and creatinine excretion in children. 1982. <i>Am J Clin Nutr.</i> 36: 691-6.</p> <p>² WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Technical Report Series No. 854. Available at: http://whqlibdoc.who.int/trs/WHO_TRS_854_(chp3).pdf</p>

Characteristics	Explanation
	<p>³ United Nations University Press/ United Nations System Standing Committee on Nutrition. SCN Nutrition Policy Paper No 21. WHO, UNICEF, and SCN informal consultation on community-based management of severe malnutrition in children. Food and Nutrition Bulletin (sup). 27;3. September 2006. Available at: http://www.unu.edu/unupress/food/FNB_v27n3_suppl.pdf</p> <p>⁴ Briend A, Garenne M, Maire B, Fontaine O, and Dieng K. Nutritional status, age and survival: the muscle mass hypothesis. 1989. <i>Eur J Clin Nutr.</i> 43: 715-26</p> <p>⁵ Wolfe RR. The underappreciated role of muscle in health and disease. 2006 <i>Am J Clin Nutr.</i> 84: 475-82.</p> <p>⁶ Valid International. Community-based Therapeutic Care (CTC). A field Manual. 2006. Available at: http://www.validinternational.org/docs/CTC%20Field%20Manual%20First%20Edition.%2020065.pdf</p>

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