

A systematic review and meta-analysis of sex differences in undernutrition

Research snapshot¹

Despite considerable research into childhood sex differences in neonatal and infant health, different disciplines tend to hold surprisingly contrary views and findings on the relative vulnerability of male and female children. Sex differences within nutrition programmes have not been explored in detail but there is a commonly held belief that girls are more vulnerable to undernutrition from a gender perspective. This paper explores the evidence on male/female differences in undernutrition in children under five years of age.

Seventy-four studies were identified with measures of male/female wasting, stunting and underweight prevalence estimates and 44 were included in the meta-analysis. In the 20 studies that examined

wasting, 17 (85%) found that wasting was more prevalent in boys than girls, with boys having a higher odds ratio (OR) of being wasted (pooled OR 1.26, 95% CI 1.13 to 1.40). In the 38 studies that examined stunting, 32 (85%) studies showed stunting to be more prevalent in boys than girls with a higher pooled OR of 1.29 (95% CI 1.22 to 1.37). In the 23 studies exploring underweight, 18 (78.2%) studies indicated that underweight was more prevalent in boys than girls with a pooled OR of 1.14 (95% CI 1.02 to 1.26).

When analysed by region, the odds of being malnourished were nearly always higher for boys than for girls for all three manifestations of undernutrition although there was some evidence

that female advantage, in terms of lower risk of stunting and underweight, was weaker in South Asia than other regions. When analysed by age, the odds of boys being wasted, stunted or underweight were higher than girls in all age categories.

Forty-three studies (58%) offered potential explanations for the differences although the reasons provided tended to be varied and often conjectural. Six studies noted biological factors (including immune and endocrine differences), 21 studies noted social reasons (including gender dynamics and preferential feeding practices) and 16 studies noted a combination of the two. The findings suggest that sex differences in undernutrition should be further explored in research, policy and programming.

¹ Thurstans S, Opondo C, Seal A, *et al.*, (2020). Boys are more likely to be undernourished than girls: a systematic review and meta-analysis of sex differences in undernutrition. *BMJ Global Health* 2020;0:e004030. doi:10.1136/bmjgh-2020-004030

Adolescent nutrition mapping study: A global stakeholder survey of policies, research, interventions and data gaps

Research snapshot¹

Nutrition in school-aged children and adolescents can significantly impact lifelong health and wellbeing as well as the growth, development and long-term health of future generations. Considerable evidence exists for the importance of nutrition in the first 1,000 days, however less focus has been placed on understanding or improving the nutritional status of older children and adolescents.

While evidence and programme experience in this area have been growing, we need greater consensus and information-sharing on the burden, indicators and successful interventions to tackle malnutrition in adolescents and school-age children (5-19 years). Using an online survey, this research mapped the activities and experiences of stakeholders across 1) research and

data, 2) policies, strategies and guidelines and 3) interventions and programmes. Questions focused on micronutrient deficiencies, undernutrition (including wasting, thinness and stunting), overweight and obesity and dietary behaviours. The analysis included 133 responses with representation from 42 countries. Most of the work described by the respondents was conducted in low- and middle-income countries (LMICs) in Africa and Asia.

The results showed that research efforts have predominantly focused on the burden of malnutrition with nutrition indicators and the consequences of malnutrition during the adolescent period receiving less attention. More studies were reported on undernutrition, micronutrient deficiencies and diets in this age group than on overweight and obesity. This is a worrying omission considering the rising tide of overnutrition globally. The majority of adolescent nutrition programmes and interventions described by the respondents were provided through the health, nutrition and education sectors. Many of the large-scale and successful programmes described target micronutrient deficiencies, especially iron-deficiency anaemia. Other large-scale programmes described included social media campaigns and school-based peer education programmes to influence dietary practices.

The survey also identified a lack of agreement as to how the adolescent period is defined leading to difficulties in providing representative and comparable data. Other important data and policy gaps identified include the lack of national and international nutrition targets for this age group, lack of standardised definitions of mal-

nutrition, lack of data on current and optimal diets, lack of inclusion and/or disaggregation of adolescent data within national surveys, lack of data on adolescent sub-groups (e.g., males, refugees, out-of-school adolescents), lack of evidence on effective interventions and the lack of inclusion of adolescent voices within research.

Given these findings, the authors recommend:

- Adoption of a universal definition of adolescence. To date, the most commonly used definition is 10-19 years.
- Adolescent-specific nutrition targets that go beyond anaemia in women of reproductive age are needed, both nationally and internationally.
- Routine national surveys are age-disaggregated to represent the adolescent population.
- More research and agreement on effective interventions, particularly for dietary patterns and overweight/obesity, the nutritional needs of particular sub-groups (male adolescents, those out-of-school and adolescents in humanitarian contexts), the most useful indicators to identify and classify malnutrition and how best to reach adolescents (e.g., using social media platforms).
- Greater attention and funding from donor agencies to address the research and programmatic gaps identified in this review and to ultimately improve adolescent outcomes.

¹ Zakari Ali, Natasha Lelijveld, Stephanie Wrottesley and Emily Mates (2020). Adolescent nutrition mapping study: A global stakeholder survey of policies, research, interventions and data gaps. www.ennonline.net/adolescentnutritionmappingstudy



Students attend a nutrition education session