



# Improving adolescent undernutrition in Ethiopia: A rapid review

## THE PROBLEM

The nutritional status of adolescents (aged 10-19 years) can have profound and multiple impacts on their immediate and future health<sup>1</sup>. Adolescence is a critical time because nutrient requirements increase during this period of rapid physical growth<sup>2</sup>. Healthy diet and eating practices during adolescence can rectify nutritional deficits during the first ten years of life and may curb harmful behaviors contributing to the rise of non-communicable diseases (NCDs) in adulthood<sup>3,4</sup>. Because of these unique windows of opportunities in this age group, investing in adolescent health can bring triple returns: better health during adolescence, adult life, and their potential future children<sup>5</sup>.

Adolescent undernutrition manifested as wasting, stunting, thinness or underweight, and deficiencies in vitamins and minerals<sup>6</sup> is a serious public health problem globally<sup>2</sup>. The implications of undernutrition are manifold: stunting often results in delayed mental development, poor school performance, and reduced intellectual capacity, affecting future economic productivity. Wasting impairs the immune system leading to an increased risk of infections and death<sup>6</sup>. As a result, nutrition is considered a leading contributor to major causes of adolescent deaths<sup>2</sup>.

## METHODOLOGY

This rapid review brings together global research evidence (from systematic reviews) and local evidence to inform deliberations/decision makers about improving adolescent undernutrition in Ethiopia. We searched for relevant evidence describing the problem, and possible options for addressing the problem, from systematic reviews.



Photo credit: UNICEF Ethiopia/2021/Mulugeta Ayene

Historically, despite the importance and magnitude of adolescent health, it has received limited attention<sup>7</sup>. Increased attention to every aspect of adolescent health will deliver significant future dividends at both the individual and societal levels<sup>4</sup>. To break the intergenerational cycle of growth failure, more research is needed to bridge the significant knowledge gap in adolescent nutrition and evaluate interventions to help growth and development<sup>2</sup>.

During a priority setting exercise on nutrition-related problems in Ethiopia in 2019, adolescent undernutrition was identified as one of the priority areas that required an immediate response<sup>8</sup>. Therefore, this rapid review aims to summarize the best available evidence describing the problem of adolescent undernutrition in Ethiopia as well as potential solutions for addressing the problem.

## SIZE OF THE PROBLEM

Ethiopian children aged 5 to 19 years had one of the lowest mean Body Mass Index (BMI) in the world in 2016 for both sexes: 16.8kgs/m<sup>2</sup> for girls and 15.5 Kg/m<sup>2</sup> for boys<sup>9</sup>. A systematic review that involved 17,854 participants across 22 studies reported that 20.7% of adolescents are stunted, and 27% are wasted<sup>10</sup>. In 2016, the prevalence of stunting in Ethiopia among adolescents ages 15-19 was 20.7%, more than double the sub-Saharan Africa average (9%)<sup>11</sup>. Ethiopia also has the world's highest prevalence of thinness in

1. UNICEF. Progress for children: A report card on adolescents. New York, USA: United Nations Children's Fund (UNICEF); 2012.  
2. Christian P, Smith ER. Adolescent undernutrition: Global burden, physiology, and nutritional risks. *Ann Nutr Metab* 2018;72(4):316-328.  
3. Prentice AM, Ward KA, Goldberg GR, Jarjou LM, Moore SE, Fulford AJ, Prentice A. Critical windows for nutritional interventions against stunting. *Am J Clin Nutr* 2013;97(5):911-8.  
4. Sawyer SM, Afifi RA, Bearinger LH, Blakemore S-J, Dick B, Ezeah AC, Patton GC. Adolescence: a foundation for future health. *The Lancet* 2012;379(9826):1630-1640.  
5. WHO. Guideline: Implementing effective actions for improving adolescent nutrition. Geneva: World Health Organization; 2018.  
6. WHO. 2022. Malnutrition in children. World Health Organization  
7. WHO. Global accelerated action for the health of adolescents (AA-HAI): Guidance to support country implementation. Geneva: World Health Organization; 2017.  
8. Zelalem M, Sinamo S, Maru Y. 2020. Meeting the health and nutrition needs of adolescents and youth in Ethiopia. In

boys, at 28%. Additionally, sub-national differences in undernutrition exist.

## CAUSES OF THE PROBLEM

The immediate causes of undernutrition are inadequate dietary intake and diseases<sup>12</sup>. The underlying causes of undernutrition and diseases are food insecurity, inadequate care for women, and children, insufficient health services, and unhygienic environments, which in turn are propelled by more fundamental causes like conflicts, inadequate education, poverty, gender inequality, insufficient infrastructure, and other basic issues<sup>12</sup>. Various underlying and basic causes of adolescent undernutrition are reported in Ethiopia. A study that used data from four demographic and health surveys (2000-2016) on late adolescent girls (15-19 years) found

that girls with higher education were 4.4 times more likely to be undernourished than those without education<sup>13</sup>. The chances of undernutrition in girls living in rural areas were 3 times higher than in those living in urban areas.

Family sizes (five or above) and mothers' educational status (no formal education) have been linked to adolescent undernutrition<sup>10</sup>. Furthermore, thinness among boys was more prevalent in rural areas than in urban areas<sup>11</sup>. Research also found that working adolescent girls have 40% less chance of being undernourished than those not working<sup>13</sup>. Other factors contributing to adolescent undernutrition include using unimproved latrines<sup>10,13</sup>, using unprotected drinking water sources, food insecurity, and low dietary diversity<sup>10</sup>.

## ACTIONS TO REDUCE THE HIGH BURDEN OF ADOLESCENT UNDERNUTRITION

### POLICY OPTION 1. MICRONUTRIENT SUPPLEMENTATION

A systematic review<sup>14</sup> which evaluated the impact of micronutrients (zinc, vitamin A, and multiple micronutrients) and protein supplementation for children aged 2-20 years old found that micronutrients and protein supplementation may have positive effects on growth. Iron supplementation, on the other hand, may increase hemoglobin levels and reduce the risk of anemia<sup>15</sup>. Calcium or vitamin D supplementation may improve vitamin D status, while calcium only and calcium and vitamin D supplementation may marginally improve total body bone mineral density<sup>16</sup>.

Since variations in micronutrient deficiencies, are common, contexts need to be considered to select the best intervention for a particular area. Therefore, research efforts should focus on interventions to increase the variety of foods and dietary quality and consider the specific requirements of different populations<sup>15</sup>.

**FURTHER INFORMATION:** The extended brief from which information for this brief was drawn from is available on the NIPN website (<http://www.nipn.epi.gov.et/>).

### POLICY OPTION 2. SCHOOL FEEDING

A systematic review of the impacts of school feeding on educational and health outcomes of school-age children and adolescents in low-and middle-income countries has reported that school feeding significantly increased the height and weight of students over 12 months of age<sup>16</sup>.

School feeding started in Ethiopia in 1994, targeting food insecure areas<sup>17</sup>, and is currently benefiting one million people across the country<sup>18</sup>. The Federal Ministry of Education could scale up the coverage of the school feeding program to address adolescent undernutrition in the country.

**AUTHORS:** Mamuye Hadis, Meron Girma, Masresha Tessema and Aregash Samuel

## NIPN ETHIOPIA

Ethiopian Public Health Institute | Addis Ababa | Email: [epi.nipn@gmail.com](mailto:epi.nipn@gmail.com) | <http://www.nipn.epi.gov.et/>

9. Abarca-Gómez L, Abdeen ZA, Hamid ZA, Abu-Rmelleh NM, Acosta-Cazares B, Aculin C, Adams RJ, Aekplakorn W, Afsana K, Agullar-Salinas CA and others. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. *The Lancet* 2017;390(10113):2627-2642.

10. Berhe K, Kidanemariam A, Gebremariam G, Gebremariam A. Prevalence and associated factors of adolescent undernutrition in Ethiopia: a systematic review and meta-analysis. *BMC Nutr* 2019;5:49.

11. Benedict RK, Allison S, Sorrel N. Adolescent nutrition 2000-2017: DHS data on adolescents age 15-19. Rockville, Maryland, USA: ICF; 2018.

12. Sablah M. Causes and impacts of undernutrition over the life course. UNICEF; 2019.

13. Dersah NM, Gelaye KA, Maluneh KG. Spatial patterns and determinants of undernutrition among late-adolescent girls in Ethiopia by using Ethiopian demographic and health surveys, 2000, 2005, 2011 and 2016: A spatial and multilevel analysis. *BMC Public Health* 2021;21(1):2005.

14. da Silva Lopes K, Yamaji N, Rahman MD, Suto M, Takemoto Y, Garcia-Casal MN, Ota E. Nutrition-specific interventions for preventing and controlling anaemia throughout the life cycle: an overview of systematic reviews. *Cochrane Database Syst Rev* 2021;9:CD013092.

15. Salam RA, Das JK, Ahmed W, Irfan D, Sheikh SS, Bhutta ZA. Effects of preventive nutrition interventions among adolescents on health and nutritional status in low- and middle-income countries: A systematic review and meta-analysis. *Nutrients* 2019;12(1).

16. Wang D, Shinde S, Young T, Fawzi WW. Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low- and middle-income countries: A systematic review and meta-analysis. *J Glob Health* 2021;11:04051.

17. WFP. Home-grown school feeding in Ethiopia. In: Programme WF, editor 2019.

18. Government of Ethiopia. School feeding programs benefiting 1 million students. Reliefweb 2020.