

# Global definition 'overestimates India's child anamia burden'

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A young boy undergoes a medical examination. A new study indicates that Indian children may have lower haemoglobin cut-offs than WHO recommendations. Credit: Trinity Care Foundation (<https://flickr.com/photos/trinitycarefoundation/31407772265/>), CC BY-NC-ND 2.0 (<https://creativecommons.org/licenses/by-nc-nd/2.0/>)

Anemia rates among children and teenagers in India may be 20 percent lower than currently reported as diagnosis is based on ethnically

inappropriate blood count thresholds, a study argues.

The study of hemoglobin concentrations in healthy Indian [children](#) aged zero to 19 found that the hemoglobin thresholds—or cut-offs—used to define anemia were lower for both sexes and all ages than those recommended by the World Health Organization (WHO).

Anemia is a deficiency in the number of red blood cells or the hemoglobin concentration inside the cells, and is a serious global health problem. WHO estimated 42 percent of children under five and 40 of pregnant women worldwide are anemic. Common causes are nutritional deficiencies, genetic diseases of hemoglobin and infectious diseases.

For more than 15 years, experts have been calling for a re-evaluation of the WHO criteria for anemia.

"WHO's hemoglobin cut-offs to define anemia were based on five studies of predominantly White adult populations, done over 50 years ago," say the researchers.

The findings suggest that a single, global hemoglobin cut-off to define anemia may not be appropriate for all regions and ethnic populations. The authors urge WHO to re-examine its cut-offs to define anemia and issue updated guidelines based on recent evidence.

Published this month in *The Lancet Global Health*, the study assessed age-specific and sex-specific hemoglobin percentiles among healthy children and adolescents based on India's first nationally representative nutrition [survey](#) conducted between 2016 and 2018.

Using the WHO cut-offs resulted in a prevalence of anemia of 30 percent compared with only 10.8 percent using the study's cut-offs. Differences in prevalence were higher among children aged one to four

years and adolescents aged 15 to 19 years.

"The current use of WHO cut-offs which are Caucasian-based higher hemoglobin cut-offs to define anemia substantially overestimates the burden in Indian children creating avoidable national stigma, lack of progress and emphasis on multiple routes to provide [iron supplements](#) and fortification apart from diet, and are unlikely to bridge the gap and have the potential to cause adverse effects," says Harshpal Singh Sachdev, lead author of the study.

The study's cut-offs for hemoglobin were lower than the WHO cut-offs at all ages, with more pronounced differences in children aged between one and two, and in girls aged ten or above. Sachdev says that the onset of menstruation could be a contributing factor to the large difference in cut-offs for females above ten years.

"India should adopt these lower hemoglobin cut-offs instead of the present WHO cut-offs for diagnosing anemia," say the authors.

"These cut-offs might provide a closer estimate of the true burden of anemia in the country than that calculated by using WHO cut-offs, its grading as a public health problem (mild instead of severe), and its responsiveness to appropriate public health interventions."

Parminder S. Suchdev, associate director of the Emory Global Health Institute, who was not involved in the study, says that the authors used an approach that was similar to that of the WHO cut-offs, using the lowest five percent of hemoglobin distribution in a healthy sub-population without known risk factors for anemia.

"While these proposed thresholds may be more appropriate for the Indian population, it is difficult to assess the validity of lower thresholds that are based on statistical cut-offs not linked to specific physiologic or

[health](#) outcomes," Suchdev says.

He says the study had additional limitations, including not adjusting ferritin—the blood protein that carries iron—concentrations for inflammation, and not measuring an indicator of chronic inflammation known to affect hemoglobin concentrations.

"Despite these limitations, these findings address an important need to re-evaluate global thresholds to define anemia using data from diverse populations and multiple geographic regions," Suchdev says.

The WHO promised to review global guidelines on hemoglobin cut-offs to define anemia. Experts are going to present and discuss evidence on hemoglobin concentrations to define anemia especially among infants, children and adolescents this week at a virtual WHO meeting.

**More information:** Harshpal Singh Sachdev et al. Hemoglobin thresholds to define anemia in a national sample of healthy children and adolescents aged 1–19 years in India: a population-based study, *The Lancet Global Health* (2021). [DOI: 10.1016/S2214-109X\(21\)00077-2](https://doi.org/10.1016/S2214-109X(21)00077-2)

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