

Do definitions of anaemia based on haemoglobin or haematocrit yield the same prevalence of anaemia in peri-pubertal children?

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Anaemia can be defined using a cutoff level for haemoglobin (Hb) or a cutoff level for haematocrit (Hct). The World Health Organisation has defined cutoffs for both parameters, and slightly different cutoffs of both parameters are used to define anaemia in the United States. In view of the international focus on micronutrient deficiency at present, we compared the prevalence of anaemia obtained when the WHO and US cutoffs are used for each of the two parameters.

Data were used from the Aboriginal Birth Cohort study. Children were seen when aged 8–14 years in 1999–2001. At this time, growth and markers of chronic disease were assessed and venous blood was collected for estimation of biochemical and haematological indices. No biochemical tests of iron deficiency were done. The blood films were also examined but no child had macrocytosis.

Children were defined as being anaemic using the WHO criteria if their Hb was below 11.5 g/dL for those aged 11 years or less or if Hb was below 12.0 g/dL for those aged 12 years and older. They were defined as being anaemic if their Hct was below 34% or 36% respectively (1). Using the US criteria, children aged 11 years or less were classed as anaemic if Hb was below 12.0 g/dL, boys aged 12 and older if Hb was below 12.6 g/dL and girls aged 12 years and over, if Hb was below 11.9 g/dL. Using Hct as the basis of the definition, children were classed as anaemic if their values were below 35.5%, 37.4% and 35.8% respectively. Six children aged eight or 14 years were excluded leaving 518 in the analysis.

The table shows the prevalence of anaemia using the different definitions. As haemoglobin and haematocrit measure slightly different things, it is not surprising that there are some differences in prevalence. The overall difference between the WHO and US criteria can be explained by the fact that the US cutoffs were set at the 5th centile of their population distribution (2) and the WHO criteria appear to be based on a lower level for this age group, although this is not true of all age groups (1,2). However the more than two-fold discrepancy in prevalence using the two WHO criteria may be due to the use of a conventional conversion factor to derive the Hct cutoff from the Hb value (1) rather than deriving the Hct cutoff from the population distribution of Hct values.

These results suggest that the prevalence of anaemia cannot be compared between locations that have used different WHO indices, even though these are presented as being interchangeable (1).

	Prevalence of anaemia (%)	95% CI
WHO cutoffs		
Haemoglobin	13.1	10.2–16.0
Haematocrit	6.0	3.9–8.0
US cutoffs		
Haemoglobin	24.1	20.4–27.8
Haematocrit	19.5	16.7–22.9

References

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