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## Influence of different BMI classification systems on ethnic-specific variation in prevalence of overweight and obesity

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There is currently no consensus in the UK on which BMI classification system should be used to define overweight and obesity in children. Furthermore, it is known that the sensitivity and specificity of these cut-offs varies, leading to different prevalence rates both in boys and girls<sup>(1)</sup>. Whether there is a differential impact of using various cut-offs on prevalence rates for children from diverse ethnic groups is unknown. The present study compared the prevalence of overweight and obesity using three classification systems in Caucasian (C), South Asian (SA) and Afro-Caribbean (AC) children.

A total of 3967 children aged between 4 and 16 years were selected for analysis in the study. Height and weight were measured and BMI calculated. BMI was converted to a standard deviation score based on the current UK 1990 BMI reference data<sup>(2)</sup>. The percentage of children exceeding the UK 1990 (91st and 98th centiles), the International Obesity Task Force (IOTF) cut-offs and the 85th and 95th cut-offs for overweight and obesity were calculated<sup>(3)</sup>. Prevalence of overweight, obesity and overweight and obesity combined was determined.

Generally, prevalence levels for overweight and obesity were greatest in AC and lowest in SA children. In girls overweight and obesity combined was greatest when using the 85th centile and lowest when using the 91st centile, with the IOTF cut-off falling in between for all ethnic groups. In boys again the 85th centile resulted in the highest prevalence, but unlike in girls it was the IOTF cut-off that resulted in the lowest prevalence irrespective of ethnic group. When examining overweight alone levels were greatest using the IOTF cut-offs in boys and girls of all ethnic groups. For obesity alone the percentage was greatest using the 95th centile and lowest using IOTF cut-off in all ethnic groups. The magnitude of difference in overweight and obesity levels between the cut-offs was not consistent between ethnic groups, it being greatest in AC boys and least in SA girls.

Ethnic group	n	Percentage of overweight and obesity combined (%)					
		Boys			Girls		
		IOTF cut-off	>91st centile	>85th centile	IOTF cut-off	>91st centile	>85th centile
C	1130	21.8	23.9	28.9	25.0	20.0	26.5
SA	1461	19.8	20.7	25.2	18.8	16.4	21.2
AC	1461	23.2	25.5	32.4	31.4	27.2	34.6

The present study indicates that the percentage of children classified as overweight and obese differed for the various cut-offs. This finding would be expected given the differential locations of the cut-offs in relation to the reference population. However, the magnitude of difference between systems did not vary consistently between all ethnic groups, with boys from an AC background being most affected and girls from an SA background appearing to be affected the least. These findings may partly be explained by the position of the IOTF cut-off, which lies on or above the 91st centile for boys, whereas for girls it lies consistently below the 91st centile. However, it is equally possible that these observations are not ethnicity related, but simply a result of the initial variation in prevalence between the groups. Hence, caution should be exercised when making similar comparisons using different classification systems.

1. Reilly JJ, Dorosty AR, Emmett PM *et al.* (2000) *Int J Obesity (Lond)* **24**, 1623–1627.

2. Cole TJ, Freeman JV & Preece MA (1995) *Arch Dis Child* **73**, 25–29.

3. Cole TJ, Bellizzi MC, Flegal KM *et al.* (2000) *Br Med J* **320**, 1240–1243.