**Reassessing patterns and time trends in body mass index in Black African and South Asian children between 2007 and 2013: the National Child Measurement Programme**

**Abstract**

**Background/Aims**

High body fat (BF) levels in UK children are a major problem, with particular concerns about children of South Asian and Black (presumed African) origin. However, available national data are based on body mass index (BMI), which underestimates BF in South Asian children and overestimates BF in Black children. We reassessed childhood BF patterns and time trends between 2007-08 and 2012-13 using ethnicity-specific BMI adjustments to derive adjusted BMI levels (aBMI) that were related to BF in an equivalent way across South Asian, Black and White children.

**Methods**

Analyses were based on National Child Measurement Programme (NCMP) data from 2007-08 to 2012-13 in 3,195,323 aged 4-5 years and 2,962,673 children aged 10-11 years. aBMI values were derived for South Asian and Black children in a separate study, using body composition measured by the deuterium dilution method. These aBMI values related to BF similarly in South Asians, Blacks and Whites. To examine time trends in mean aBMI and in overweight-obesity prevalence by ethnicity, multiple linear regression and logistic regression analyses were used respectively.

**Results**

In the first year (2007-08), mean aBMIs in 10-11 year-olds (boys, girls) compared with Whites (18.64, 18.98 kg/m2) were higher in South Asians (20.08, 19.94 kg/m2; both P<0.001\*) and lower in Black boys but higher in Black girls (18.38, 19.21 kg/m2; both P<0.001\*). Mean 5-year changes in aBMI (boys, girls) compared with Whites (0.02, 0.11 kg/m2) were significantly higher in South Asians (0.16, 0.32 kg/m2; both P<0.001\*) and Black boys but not girls (0.13, 0.15 kg/m2; P=0.01, P=0.41\*). Among South Asians, both means and mean changes were greater among Bangladeshis and Pakistanis than Indians. Ethnic differences in mean aBMI levels were similar in younger children, but time trends were not as pronounced. Analyses examining overweight-obesity prevalence showed similar findings to those using mean aBMI. Parallel analyses in unadjusted BMI (the usual NCMP data presentation) showed similar time trends but different mean BMI patterns; Black children had highest mean unadjusted BMI values while White boys and South Asian girls had the lowest.

\*P-Value for difference from Whites

**Conclusion**

These analyses using aBMI data emphasize the particularly high (and rising) burden of BF among UK South Asians, compared with both White and Black children. These patterns are not adequately described by unadjusted BMI data, which tend to overestimate the BF burden in Black children and underestimate that in South Asians.