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**Title:** Do changes in body mass index explain temporal trends in prevalence of wheeze and asthma?

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**Body:** Aims The reported associations between asthma and obesity, and the increasing prevalence of both conditions over time suggest that changes in body mass index (BMI) might help explaining the increase in prevalence of wheeze in children. We tested this hypothesis in two population-based cohort studies conducted 8 years apart with identical methodology. Methods We assessed prevalence of wheeze in two cohorts of 1-4 year old white children in 1990 (N=1153) and 1998 (N=2089) respectively, using identical questionnaires. Height and weight were measured independently by health visitors. We used multivariable logistic regression to calculate odds ratios (OR) for trends in current wheeze (CW) and doctor diagnosed asthma (DDA), controlling for confounders, with and without adjustment for BMI z-scores (WHO child growth standards) Results Between 1990 and 1998 BMI z-scores increased slightly (-0.07 to 0.10, p<0.001). The prevalence of CW increased from 12% to 26% (p<0.001), prevalence of DDA from 11% to 18% (p<0.001). Comparing 1998 to 1990, the OR (95% CI) of CW was 2.6 (2.2-3.3) before and 2.7 (2.1-3.4) after adjustment for BMI z-score. For DDA, unadjusted and adjusted ORs were 1.79 (1.44-2.24) and 1.77 (1.40-2.24) respectively. Adjustment for confounders (age, sex, pre- and postnatal ETS exposure, pets, gas cooking, nursery care, parental education and crowding) did not alter the conclusions, nor did sensitivity analyses done for alternative outcomes (severe wheeze, different phenotypes, asthma medication). Conclusions In our study, trends in BMI did not help to explain the marked increase in prevalence of asthma and wheezing illness. Funding SNF PDFMP3-123162; SNF 32003B-144068; Asthma UK 07/048.