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Abstract

This study has two objectives. First, to analyse the respective roles of parental BMI and the wider environment on children's BMI across childhood, using a counterfactual analysis. Second, to determine if the correlations between parents and offspring BMI are partly environmental.

We used data on 4437 girls and 4337 boys born in 2000-2001 in the UK and included in the Millennium Cohort Study. Children's BMI were measured at age 3y, 5y, 7y, 11y. We described the environment using social class and behaviours within the family. At the age of 3, there was no link between the environment and children's BMI. In contrast, there was a clear link between the environment and BMI slopes between 3 and 11 years of age. At the age of 11, we calculated that if all children had the most favourable environment, mean BMI would be reduced by 0.91kg/m^2 (95% CI: 0.57-1.26) for boys and by 1.65 kg/m^2 (95% CI: 1.28-2.02) for girls. Associations between parents' and offspring BMI remained unchanged after adjustment for environmental variables. Conversely, the link between the environment and children's BMI is partly reduced after adjustment for parental BMI. This confirms that parental BMI is partly a broad proxy of the environment.

We highlighted that if every child's environment was at its most favourable, the mean BMI would be significantly reduced. Thus, the recent rise is likely to be reversible.

Word count: 228 words

Keywords: BMI; childhood; environment; counterfactual analysis; parental BMI; public health