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**Source:** Jerrett, M., McConnell, R., Wolch, J. *et al*. (2014). Traffic-related air pollution and obesity formation in children: a longitudinal, multilevel analysis. *Environmental Health*. 13:49. DOI: 10.1186/1476-069X-13-49. This study is free to view at: www.ehjournal.net/content/13/1/49/abstract

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# Science for Environment Policy

## Childhood obesity linked to traffic pollution

**Traffic pollution** contributes to childhood obesity, a recent study concludes. In the US investigation of over 4 500 children, the researchers estimated that air pollution increased the body mass index (BMI) of 10-year olds in the most polluted areas of study by 0.4 units, compared to those in the least polluted areas. It is thought that pollution may have slowed the children's metabolism.

**The global increase** in rates of childhood obesity has serious public health implications: overweight children are at increased risk of developing conditions such as cancer, diabetes and heart disease. Of course, diet plays a significant role in this obesity trend, but diet alone cannot explain why the rise is so rapid. Many scientists believe that the environment also has an influence.

Air pollution is considered to be one of many possible environmental influences on weight. It causes inflammation, which may affect metabolism and hence weight gain. Animal research supports this theory: lab mice exposed to air pollution have been found to develop more fat than mice on the same diet but breathing purified air.

Previous research has also found that children living in areas of high traffic have higher BMIs (measured as weight in kilograms divided by height in metres). However, it was not clear what it was about traffic that increased their weight. Could it have been the pollution, or were the children more inactive, owing to their parents' fears about walking and cycling in a neighbourhood with more traffic? To explore this theme further, the researchers of this study monitored the BMI of 4 550 children in California over four years.

They used data on traffic and pollution levels near each child's home, as well as information on over 50 other influencing factors on weight. These included physical activity levels, health, diet, poverty rates, and access to parks and food outlets. Using statistical models, the researchers calculated the influence of each of these factors on BMI.

The average BMI at the start of the study, when the children were aged 5-7, was 16.79. After four years, it had risen by 2.6 units to 19.35, on average. Fifteen per cent of these children were classified as obese, and a further 14.4% as overweight.

Air pollution was estimated to be responsible for a 0.4 unit difference between the BMIs of children aged 10 in the top 10% of traffic pollution exposure and the BMIs of 10-year olds in the bottom 10% of exposure. This translates into 13.6% increase in the annual rate of BMI growth for those in the most polluted areas. At the start of the study, there was no difference in pollution's effects on BMI between these two groups. However, it accumulated as the children grew older.

The study concludes that pollution had a significant effect on BMI, and it likely plays a role in obesity epidemics. The findings, which support efforts to reduce traffic emissions, are consistent with the theory that pollution affects metabolism, particularly because the differences in BMI accumulated over time. They are supported by studies that have found higher rates of other metabolic disorders, such as diabetes, in polluted areas.