

## **Children Exposed to Air Pollution at School May Be at Greater Risk of Overweight and Obesity**

*2,660 schoolchildren from 39 schools in Barcelona participated in the study*

*Barcelona, 31 January 2019-* **Exposure to air pollution, particularly at school, could be associated with a higher risk of overweight and obesity during childhood.** This is the conclusion of a study by the Barcelona Institute for Global Health ([ISGlobal](#)), an institution supported by "la Caixa", performed with 2,660 children between 7 and 10 years of age from 39 schools in Barcelona.

**A few studies have associated exposure to air pollution with a higher risk of child obesity and overweight.** However, these studies focused mainly on exposure at home, without considering the school environment.

The [study](#), published in *Environment International* and performed under the [BREATHE project](#), assessed for the first time the relation between obesity and overweight risk and air pollution levels **at school and home**, the two microenvironments where schoolchildren spend most of their time.

On one hand, the research team collected data on the **children's weight and height** and calculated their body mass index and obesity and overweight status. On the other hand, they used **sensors in the schoolyard** to measure the levels of outdoor pollution – nitrogen dioxide (NO<sub>2</sub>), elemental carbon (EC), particle matter (PM<sub>2.5</sub>) and ultrafine particles – during one week in summer and another week in winter. They also estimated exposure levels to NO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and PM<sub>coarse</sub> at the home address.

“We observed that **children exposed to medium or high levels of air pollution at school** –ultrafine particles, NO<sub>2</sub>, PM<sub>2.5</sub> and EC- had a **higher risk of obesity and overweight** as compared to those exposed to lower levels”, concludes first author **Jeroen de Bont**, researcher at ISGlobal and IDIAP Jordi Gol. Exposure to high levels of PM<sub>10</sub> at home was also associated with higher risk of obesity or overweight during childhood, although in this case the analysis was done with estimates of exposure levels.

“The study has however **some limitations**, which means that the results are to be cautiously interpreted”, says **Martine Vrijheid**, ISGlobal researcher and study coordinator. “Being a cross-sectional study, we only have **data at one time-point**, and we do not have enough data to establish the nature of the association. To draw more solid conclusions, we need **new longitudinal studies** that follow the study participants over time”, she adds.

Regarding the mechanisms linking air pollution and overweight, some animal studies suggest that pollution can induce **oxidative stress, insulin resistance and systemic inflammation**, factors that are known to contribute to obesity”, explains de Bont.

**Most children were exposed to air pollution levels above those recommended** by the World Health Organisation (WHO), both at school and home. Specifically, **over 75%** were exposed to PM<sub>2.5</sub> levels above those recommended (10µg/m<sub>3</sub>) and more than 50% breathed NO<sub>2</sub> levels above those considered as safe (40µg/m<sub>3</sub>).

## Reference

Jeroen de Bont, Maribel Casas, Jose Barrera-Gómez, Marta Cirach, Ioar Rivas, Damaskini Valvi, Mar Álvarez, Payam Dadvand, Jordi Sunyer, Martine Vrijheid. Ambient air pollution and overweight and obesity in school-aged children in Barcelona, Spain. *Environment International*. <https://doi.org/10.1016/j.envint.2019.01.048>. January 2019.

## About ISGlobal

The Barcelona Institute for Global Health, ISGlobal, is the fruit of an innovative alliance between "la Caixa" and academic and government institutions to contribute to the efforts undertaken by the international community to address the challenges in global health. ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute's Education and Policy and Global Development departments. ISGlobal a member of the CERCA programme of the Generalitat de Catalunya.

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