

Maternal exposure to outdoor air pollution associated with low birth weights worldwide

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Mothers who are exposed to particulate air pollution of the type emitted by vehicles, urban heating and coal power plants are significantly more likely to bear children of low birth weight, according to an international study led by co-principal investigator Tracey J. Woodruff, PhD, MPH, professor of obstetrics and gynecology and reproductive sciences at UC San Francisco along with Jennifer Parker, PhD, of the National Center for Health Statistics, Centers for Disease Control and Prevention.

The study, the largest of its kind ever performed, analyzed data collected from more than three million births in nine nations at 14 sites in North America, South America, Europe, Asia and Australia.

The researchers found that at sites worldwide, the higher the pollution rate, the greater the rate of low birth weight.

[Low birth weight](#) (a weight below 2500 grams or 5.5 pounds) is associated with serious health consequences, including increased risk of postnatal morbidity and mortality and [chronic health problems](#) in later life, noted lead author Payam Dadvand, MD, PhD, of the Centre for Research in Environmental Epidemiology (CREAL) in Barcelona, Spain.

In the study, published on February 6th, 2013 in the journal [Environmental Health Perspectives](#), the team assessed data collected from research centers in the International Collaboration on Air Pollution and [Pregnancy Outcomes](#), an international research collaborative established in 2007 to study the effects of pollution on pregnancy

outcomes. Most of the data assessed was collected during the mid-1990s to the late 2000s, and in some cases, earlier.

"What's significant is that these are [air pollution levels](#) to which practically everyone in the world is commonly exposed," said Woodruff. "These [microscopic particles](#), which are smaller than the width of a human hair, are in the air that we all breathe."

Woodruff noted that nations with tighter regulations on particulate air pollution have lower levels of these air pollutants. "In the United States, we have shown over the last several decades that the benefits to health and wellbeing from reducing air pollution are far greater than the costs," said Woodruff. "This is a lesson that all nations can learn from."

Particulate air pollution is measured in size (microns) and weight (micrograms per cubic meter). In the United States, federal regulations require that the yearly average concentration in the air to be no more than 12 $\mu\text{g}/\text{m}^3$ of particles measuring less than 2.5 microns. In the European Union, the limit is 25 $\mu\text{g}/\text{m}^3$, and regulatory agencies there are currently debating whether to lower it.

"This study comes at the right time to bring the issue to the attention of policy makers," said study co-author Mark Nieuwenhuijsen, PhD, of CREAL.

Nieuwenhuijsen observed that particulate [air pollution](#) in Beijing, China has recently been measured higher than 700 $\mu\text{g}/\text{m}^3$.

"From the perspective of world health, levels like this are obviously completely unsustainable," he said.

Whether these pregnancy exposures can have effects later in life, currently is under investigation through an epidemiological follow-up of

some of the children included in these studies.

Provided by University of California, San Francisco

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