A new study by researchers at NYU Langone Medical Center, published in the journal of Environmental Health Perspectives, has revealed that about 16,000 premature births are linked to air pollution and this theoretically costs the United States roughly $4.33 billion.

Of that amount, $760 million was calculated as having been spent on prolonged hospital stays and long-term use of medications, with $3.57 billion in lost economic productivity from the physical and mental disabilities as a result of preterm birth.

This research builds on previous epidemiological studies that have linked maternal exposure to air pollution to poor outcomes, such as fetal growth restriction, low birth weight, and preterm birth. The amount of exposure of a pregnant woman to air pollution has also been linked to preeclampsia (dangerously high blood pressure during pregnancy) and gestational hypertension (high blood pressure during pregnancy).

What the study focused on was data obtained from the Environmental Protection Agency, the Centers for Disease Control and Prevention, and the Institute of Medicine, where the number of premature births per county in the U.S. were calculated with concomitant average air pollution exposure. Based on those numbers, researchers extrapolated a price tag from earlier studies which had calculated costs incurred by early death, decreased IQ, work absences due to hospitalization and overall poor health, related to premature births.

“Air pollution comes with a tremendous cost, not only in terms of human life, but also in terms of the associated economic burden to society,” according to the study’s senior author Leonardo Trasande, MD, MPP, a professor at NYU Langone. “It is also important to note that this burden is preventable, and can be reduced by limiting emissions from automobiles and coal-fired plants.”
The data used by Dr. Trasande and his team are based on epidemiological studies, though valuable tools of investigation, are rarely able to prove cause. How the study was designed and executed, and analytical methods used, have to be factored in when evaluating the results of these studies.

For example, a previous study conducted in the Netherlands in 2012 looked into the exposure to air pollution during pregnancy and how this might affect the developing placenta, which could potentially lead to pregnancy complications. The study looked at levels of particulate matter measuring 10 micrometers or less and nitrogen dioxide levels (air pollutants) at different points in the pregnancy and measured various markers of placental growth.

Their results showed that exposures to these pollutants were associated with decreased levels of placental growth markers, but exposure to PM$_{10}$ and NO$_2$ were not consistently associated with poor placental blood flow and though they linked exposure to lower placental weight, there was no correlation to weight of placenta and neonatal birth weight. But researchers concluded that their results “suggest that maternal air pollution exposure may influence markers of placental growth and function” and they recommend future studies to confirm this – which is always a convenient recommendation to make at the end of any study.

The whole point of cost-of-illness studies is to help the government in shaping policies to address those diseases for which the greatest impact can be achieved through prevention or cure. In this case, the authors are arguing for improved air quality through limiting emissions.

We have some of the most stringent air quality controls in place already and research is already being done to improve alternative energy sources. Focusing on reducing emissions would be a wrong tactic because we are making assumptions of causality, whereas if we redirect spending to improve maternal/fetal care and increase access to healthcare – solid tactics proven to work – we would achieve reduced disease burden and a more effective strategy in tackling premature births.

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