

More preemies born in neighborhoods with heavy pollution from cars, trucks

Women exposed to air pollution from freeways and congested roads are much more likely to give birth to premature babies and suffer from preeclampsia, according to a study by California scientists published Wednesday. The findings, based on births in the Long Beach/Orange County region, add to the growing evidence that car and truck exhaust can jeopardize the health of babies while they are in the womb.

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The findings, based on pregnant women in the Long Beach/Orange County region of Southern California, add to the growing evidence that car and truck exhaust can jeopardize the health of babies while they are in the womb.

Reviewing the birth records of more than 81,000 infants, researchers found that the risk of having a baby born before 30 weeks of gestation increased 128 percent for women who live near the worst traffic-generated air pollution.

In addition, preeclampsia increased 42 percent for women who lived in those areas, according to the study, published online in the scientific journal *Environmental Health Perspectives*. Preeclampsia, a serious illness that involves high blood pressure, can endanger the baby and the mother.

The team of scientists from UCLA and University of California, Irvine studied babies born in Long Beach, near the Ports of Los Angeles and Long Beach, and in adjacent Orange County. Those areas are traversed by several major freeways used by commuters as well as heavy-duty trucks delivering goods to and from the ports.

The infants' birth records were matched with their addresses and then compared with traffic patterns and estimates of two pollutants—particulates and nitrogen oxides—from vehicles near the mothers' homes.

The study was unique in that the researchers constructed a database estimating what the pregnant women breathed in their own neighborhoods--within three kilometers, or less than two miles, of their homes. Previous studies have used general air pollution measurements, which is a less accurate estimate of what people are exposed to.

Only traffic-generated emissions were included in the study, not pollutants from factories and other sources.

Fetuses “are in a very sensitive stage of development” that could be vulnerable to the toxic substances inhaled by their mothers, said Jun Wu, an assistant professor of epidemiology at UC Irvine and the study's lead author.

Other recent studies have linked air pollutants to preterm births and low birth weights. But until now, “no study

has associated air pollution with preeclampsia. This is the first one,” Wu said.

Tracey Woodruff, director of University of California, San Francisco’s Program on Reproductive Health and the Environment, said the research offers a relatively “new twist on air pollution,” since most scientists have focused on respiratory and cardiovascular diseases.

“This is just one more piece of the scientific evidence that air pollution can have effects on adverse pregnancy outcomes,” said Woodruff, who was not involved in the research.

The babies in the study were born between 1997 and 2006 at four hospitals: Long Beach Memorial and three in Orange County--Anaheim Memorial, Orange Coast Memorial in Fountain Valley and Saddleback Memorial in Laguna Hills.

Maria Gugerty, a Long Beach resident, said she always has wondered what might have caused her son, Will, to be born premature, at 31 weeks. Her son was likely one of the preemies reviewed in the study since he was born at Long Beach Memorial in 1997.

“My pregnancy was completely fine, but all of a sudden my water broke. It seemed completely random and the doctors were never able to determine any physical reason for it,” she said. “I was so careful during my pregnancy. No alcohol, no smoking and a good diet. So I’ve always wondered if it was something in the environment, not necessarily air pollution but the environment in general.”

Another Long Beach mother, Susan Taylor, said her doctor thought a gum infection most likely was the cause of her daughter, Maddy, being born early, also at 31 weeks. But, she said, “we did live near a very busy, noisy intersection.”

Like most women, Gugerty and Taylor didn't know there was a connection between air pollution and pregnancies. But Gugerty said that she “absolutely” worries about the potential health effects of the pollution around her home in Long Beach. Her son, now 12, has asthma.

About half of the babies included in the study were born in Long Beach. Air pollution experts have said that people living in that area faced a variety of increased health risks, including cancer and reduced lung function, due to heavy traffic and other sources of air pollution related to the ports and freeways.

Every year, more than half a million infants are born prematurely in the United States. In the study, 8 percent of the 81,186 babies were preterm, including 1 percent that were “very preterm,” or under 30 weeks of gestation.

The link to air pollution was strongest for the “very preterm” babies, who often weigh less than three pounds and have the greatest risk of serious health problems. The researchers compared women who lived in areas with the most traffic-related pollution with women who lived in areas with the least traffic pollution. Those in the polluted areas were 128 percent more likely to deliver “very preterm” babies.

The risk of less severe preterm babies—those born between 30 and 37 weeks--was about 30 percent higher for women living in the areas with a lot of traffic emissions.

About 3 percent of the study’s pregnant women had preeclampsia, which can result in premature babies. Its causes are unknown, although doctors think it is related to abnormal growth of the placenta.

The new study focused on “an important area of research, since there are a lot of reasons to believe that there is something happening with environmental chemicals and preeclampsia,” Woodruff said. “Women with preeclampsia have high blood pressure, and some air pollutants can increase blood pressure. This is a serious condition, and these women are at risk of adverse pregnancy outcomes.”

Scientists are uncertain how air pollutants might trigger premature babies. The chemicals may interfere with placental development, which would impair the nutrients and oxygen delivered to the fetus. Or they could trigger oxidative stress—when cells are overwhelmed and DNA is damaged by reactive compounds in the environment called free radicals.

Wu said it is likely that other pollutants are to blame, not the fine particles and nitrogen oxides. Instead, those two pollutants could be an indicator of other toxic compounds in vehicle exhaust, such as polycyclic aromatic compounds. A recent study of babies in New York City linked those compounds, called PAHs, to preterm and low-weight babies.

Wu said doctors should warn pregnant women about air pollution because “they should be aware of these issues.” While most can’t move to avoid traffic emissions, Wu said they might be able to take precautions, such as reducing their commutes or closing their windows in cars and homes.

But avoiding air pollution is virtually impossible, Woodruff said, so “pregnant women should be aware of the risks and advocate for the kinds of [government] actions that reduce overall exposure to air pollution.”

The authors said a major limitation of their research is that it only looked at where the women lived when their babies were born, not where they lived or worked during their pregnancies, or whether they had long commutes in heavily polluted areas. Still, they said by using neighborhood data, they were probably more accurate in estimating the women’s exposures than past researchers have been.

Beate Ritz, an epidemiology professor at UCLA’s School of Public Health, was the study’s senior author. Her research has focused on using geographic information to map people’s exposure to pollutants and chemicals and search for links to chronic diseases such as Parkinson's and cancer.

Woodruff said many researchers are starting to use such data, which only has been available in recent years, because it can provide “reasonable estimates of what people are exposed to.”

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