

New Study: Heavy traffic congestion linked to lower infant birthweight

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An Oregon State University study finds that traffic congestion is linked to decreased birthweight for full-term babies born to parents living near areas of heavy traffic, such as highways and freeways.

Though the decrease was relatively small, researchers say the cumulative effect of stop-and-go traffic on top of baseline air pollution from cars and other environmental contaminants could have significant consequences at the population level, affecting up to 1.3 million babies per year based on location.

The researchers found birthweights were an average of 29 grams, or about 1 ounce, lower for babies in the group with the highest exposure compared with babies with the lowest exposure.

“We’ve had all these models to predict pollution, but they can’t measure congestion. With 10,000 vehicles on a road, if those 10,000 vehicles are doing stop-and-go traffic, there’s a lot more pollution that’s coming from cars,” said co-author Perry Hystad, an associate professor in OSU’s College of Public Health and Human

Sciences. “There are health impacts specific from congestion that are not included in any environmental risk assessment or cost-benefit analysis, and those should start to be included.”

Low birthweight can lead to a variety of problems for infants, including trouble breathing and neurological issues, but at a population level, researchers are looking more at long-term effects.

“There’s a higher risk of cardiovascular disease, cognitive impacts, premature mortality; a lot of long-term, life-course impacts,” Hystad said. “It’s not necessarily the acute events that happen during birth.”

The study, published in the journal *Science Advances*, looked at 579,122 full-term births from 2015-2016 in Texas and matched maternal addresses with data from the Texas’ Most Congested Roadways database to map out proximity to heavy traffic areas.

Specifically, researchers examined “traffic delay,” defined as the total person-hours of delay on the roadway multiplied by the length of each road segment in the buffer distances around maternal residences. Using traffic delay, they were able to calculate congestion emissions to learn the total pounds of carbon dioxide emitted by the cars in those areas.

After adjusting for sociodemographic factors and environmental co-exposures, results showed that traffic delay within 500 meters of maternal residence was associated with an average birthweight decrease of 9 grams when comparing the highest- and lowest-exposure groups. Babies born to parents who lived 300 and 100 meters from roadways experienced slightly larger impacts.

To put that in perspective, Hystad said, prior research has found that maternal smoking leads to a roughly 150-gram decrease in birthweight, which is 5.3 ounces. An average full-term baby in the U.S. weighs about 3,300 grams, which is 7.3 pounds.

Based on roadway proximity to residential areas throughout the country, the researchers estimate that 1.3 million babies are born each year in regions close enough to be affected by pollution from congestion, roughly 27% of all births in the U.S.

“A 9-gram decrease alone isn’t clinically significant, but this is sort of an indicator of the biological impacts that are happening, which will push some babies into a clinically relevant adverse impact,” Hystad said. “Often we’ll see this with air pollution — we’ll see a 2-3% increase in some impact, like mortality or cardiovascular disease — but when you multiply that by 27% of all births, that does translate into a substantial potential impact.”

Furthermore, researchers estimate that 260,000 babies born at full term each year live in the highest-exposure zones where they observed the largest magnitude of impact from congestion.

Now that they can measure congestion, Hystad said, it is important to include these findings in policy and regulation discussions, especially because the highest-traffic areas tend to be concentrated near socioeconomically deprived neighborhoods and disproportionately affect minoritized populations.

Unlike tailpipe emissions which are largely regulated at the federal level, traffic congestion is something that can be addressed in the context of local programs and policies, he said.

“How do you target methods to reduce exposures that happen in very localized areas? It can be as simple as putting up sound barriers or vegetation barriers, or using zoning approaches and saying you can’t build a school or a daycare within 500 meters of a highway,” he said. “One thing we wanted to be very cognizant about is that we’re not promoting this idea of ‘We need bigger highways.’ That’s not going to solve the problem.”

An upcoming paper from the same research team will dive deeper into the socioeconomic and racial disparities in birthweight impacts from traffic congestion, Hystad said.

Lead author on the current study was Mary Willis, a recent postdoctoral scholar at OSU who now works at Boston University. The study was published Oct. 28.

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