A collaboration of researchers from Oregon State University and the University of Rochester worked together to examine the effect of living within proximity to oil and gas drilling sites and its potential effect on the birth weight of newborns in Texas. Texas generates roughly 24% of U.S. natural gas, and between 1985 and 2019 there were a total of 356,527 drilling sites within that state.

Previous research has indicated that oil and gas drilling emits toxic air pollutants, including particulate matter (PM), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and other pollutants such as methane or glycol. The existing research indicates that air pollution from oil and gas extraction is concentrated within 1 km (0.6 miles) of the site and generally lessens at 3 km (1.8 miles) from the site. Previous research has also indicated that fetuses are more sensitive to environmental toxicants. This research showed an association between exposure to air and water pollution and adverse reproductive health outcomes, such as term birth weight and small for gestational age (SGA). Although previous research has not always been able to explain the reasoning for this correlation, we know that these pollutants can cause chronic inflammation and oxidative stress in the mother that can increase the risk of adverse birth outcomes.

A difference-in-differences (DiD) study compares changes in outcomes over time between one population (i.e., the treatment group) and another population (the comparison group). In this case, the researchers used birth registry data from 1996-2009 to compare term birth weight and SGA between births of mothers living within 3 km of a drilling site prior to birth and those living further than 3 km from drilling.

The study found that infants of mothers living within 1 km of a drilling site at the time of delivery had an average birth weight that was 30g lower in comparison to infants born prior to drilling activity. The study also found that infants of mothers living 3-10 km from a drilling site had an average birth weight that was 14g lower in comparison to infants born prior to drilling activity. The study concluded that, overall, the difference between birth weight in relation to drilling activity was 16g.

Term SGA, however, was 0.2% higher during drilling activity in comparison to before drilling activity for mothers living within 1 km of a site. For mothers living within 3-10 km of a site, the term SGA was 0.1% higher during drilling activity in comparison to before drilling activity.

This study supported the hypothesis that oil and gas activity may increase the risks of adverse birth outcomes. Specifically, mothers living closer to active drilling sites delivered infants with lower term birth weights, with an estimated mean decrease of -7.3g for infants born to mothers living within 1 km compared to those living within 3-10 km. On the other hand, this study showed little evidence of any association between the term SGA and living close to a drilling site.