Air pollution linked to postpartum depression in large Southern California cohort

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Research led by the University of California, Irvine, has found a significant association between long-term antepartum and postpartum air pollution exposure and higher risks of postpartum depression (PPD).

In their paper, "Association of Antepartum and Postpartum Air Pollution Exposure With Postpartum Depression in Southern California," published in *JAMA Network Open*, the team used ambient air pollution exposures based on maternal residential addresses of 340,679 participants.

Using monthly averages of particulate matter, nitrogen dioxide, and ozone, the researchers looked for trends resulting in PPD. Increases were found in antepartum and postpartum exposures to ozone and particulate matter but not with nitrogen dioxide.

PPD risks were mainly associated with small particulate organic matter and black carbon exposure during early pregnancy and postpartum periods. Higher PPD risk was also associated with ozone during the entire pregnancy and postpartum periods.

The findings suggest that air pollution, while associated with adverse outcomes, is a potentially modifiable environmental risk factor for PPD. Identifying critical exposure time windows for certain types of air pollution can inform interventions to improve maternal mental health.

Unclear from the paper are any additional trends related to the participants' demographics. Non-Hispanic white and wealthy participants were more likely to receive a PPD diagnosis, which could be a reflection of health care access as this group is typically the least likely to live in areas of higher pollution.

Areas of higher pollution in relation to demographics are not explicitly highlighted in the study, so any associations between wealth demographics could not be addressed. Continued research in different regions and demographic populations is needed to better understand the relationship between air pollution and PPD and its impact on public health.

The authors note that there are other unmeasured or residual covariates, such as psychiatric history, adverse life events, and marital status, which could affect mental health and potentially bias the estimates.

Even with the limitations of collecting more nuanced data from the participants, the robust sample size significantly underscores the importance of considering air pollution as a risk factor for postpartum depression and the need for targeted interventions to mitigate its effects, particularly in vulnerable populations.

More information: Yi Sun et al, Association of Antepartum and Postpartum Air Pollution Exposure With Postpartum Depression in Southern California, *JAMA Network Open* (2023). DOI: 10.1001/jamanetworkopen.2023.38315