How Ambient Air Pollution Exposure Relates to Sociodemographic Variables in Pregnant Coloradan Women

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Background

- Exposure to environmental pollutants has been linked to negative health outcomes
- Underprivileged populations tend to experience higher rates of air pollution, particularly in North America
- The fetal programming hypothesis proposes that maternal experiences during pregnancy, including air pollution exposure, could impact her offspring later in life
- Hypothesized that women of lower socioeconomic status will experience higher rates of air pollution

Objective

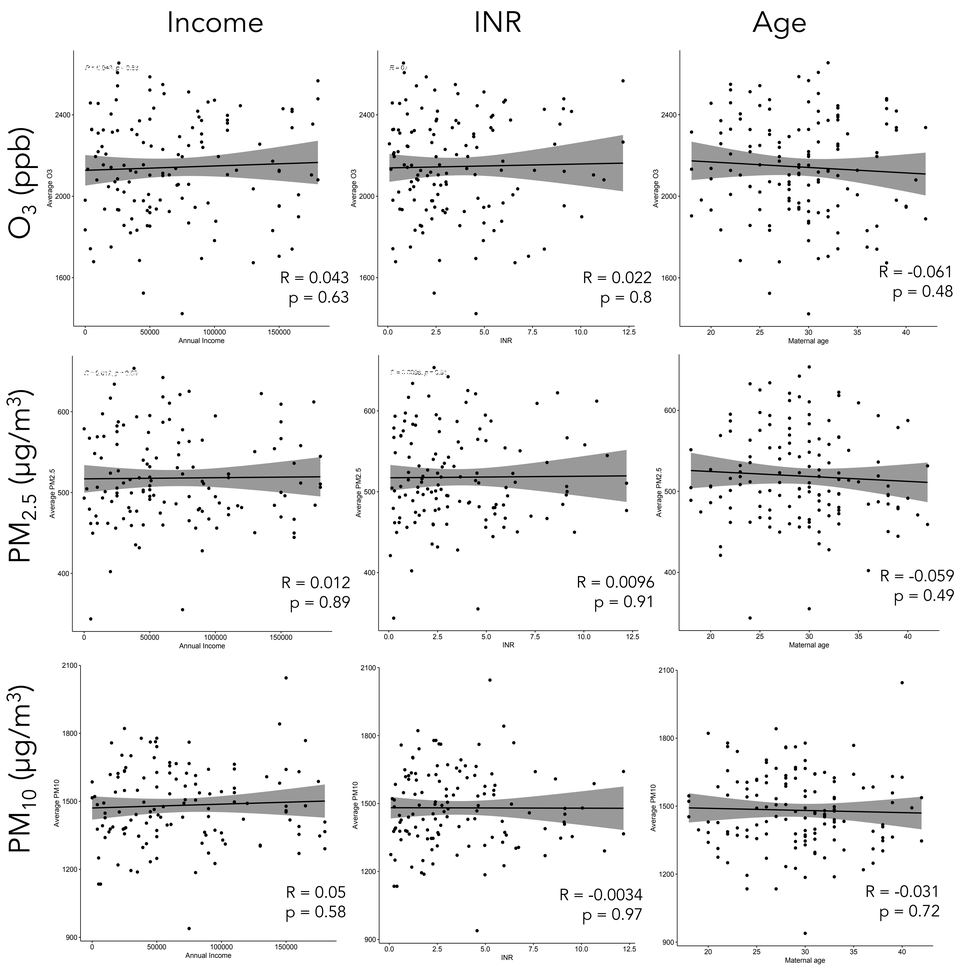
- Analyze how exposure to air pollutants relates to the sociodemographic variables of pregnant Coloradan women.

Methods

- Data regarding maternal age, income, income-to-need ratio, race, ethnicity, and education level were collected through the CARE project (n = 135).

Maternal Characteristics	Mean (SD) or N(%)
Age	29.21 (5.6)
Income	$70,201 (53,735)
Income-to-need ratio	3.66 (3.34)
Race	
White/Caucasian	89 (65.9%)
Black/African American	22 (16.3%)
Asian	6 (4.4%)
American Indian/Alaska Native	9 (6.7%)
More than one race	9 (6.7%
Ethnicity	
Latina	30 (22.2%)
Bachelor's degree or higher	64 (47.5%)

- Air quality reports for ozone (O_3), particulate matter 2.5 micrometers or less in diameter ($PM_{2.5}$), and particulate matter 10 micrometers or less in diameter (PM_{10}) were collected from the Colorado's Department of Public Health & Environment website
- Using inverse distance weighting approaches, a database was created for each participant outlining her average exposure to each pollutant over the duration of her pregnancy
  - Five closest monitoring sites and daily readings of O_3, $PM_{2.5}$, and PM_{10}
- Pearson correlations and one-way ANOVA tests were conducted to look for significant relationships between participants' sociodemographic variables and average pollution exposure during pregnancy



Results

- No significant correlations or trends were found between average pollutant exposure and income, INR, and maternal age.
- No significant differences were found in average pollutant exposure between those of different education levels

Factor	Dependent Variable	One-way ANOVA
Education Level	O_3	F(4,130) = 1.774, p =0.138
	$PM_{2.5}$	F(4,130) = 0.916, p = 0.457
	PM_{10}	F(4, 130) = 0.748, p = 0.561

Discussion

- Many possible explanations for why there were no significant relationships
  - Colorado's unique topography could account for why the usual trends in pollution exposure are not seen in this sample
  - Much of the sample lived in the same area and thus, would experience similar levels of exposure.
- Future research should incorporate participants from across Colorado and investigate how air pollution exposure could lead to intergenerational health consequences (e.g., birth outcomes)
- Identifying any discrepancies in air pollution exposure and how those could impact intergenerational health will further support the push for improved environmental regulations

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