

# Perinatal exposure to ambient air pollution and greenness, and the incidence of paediatric diabetes

Michael Elten, Jessy Donelle, Scott Weichental, Richard Burnett, David Stieb, Perry Hystad, Aaron van Donkelaar, Hong Chen, Daniel Crouse, Paul Villeneuve, Eric Crighton, Jeffrey Brook, Randall Martin, Éric Lavigne

## Background

- Ambient air pollution has been recently found to be associated with diabetes incidence in children
- Little is known regarding critical exposure windows and on potential modifying factors such as greenness, or maternal diabetes

## Objective

- This study assessed the relationship between selected air pollutants (NO<sub>2</sub>, PM<sub>2.5</sub>) and paediatric diabetes

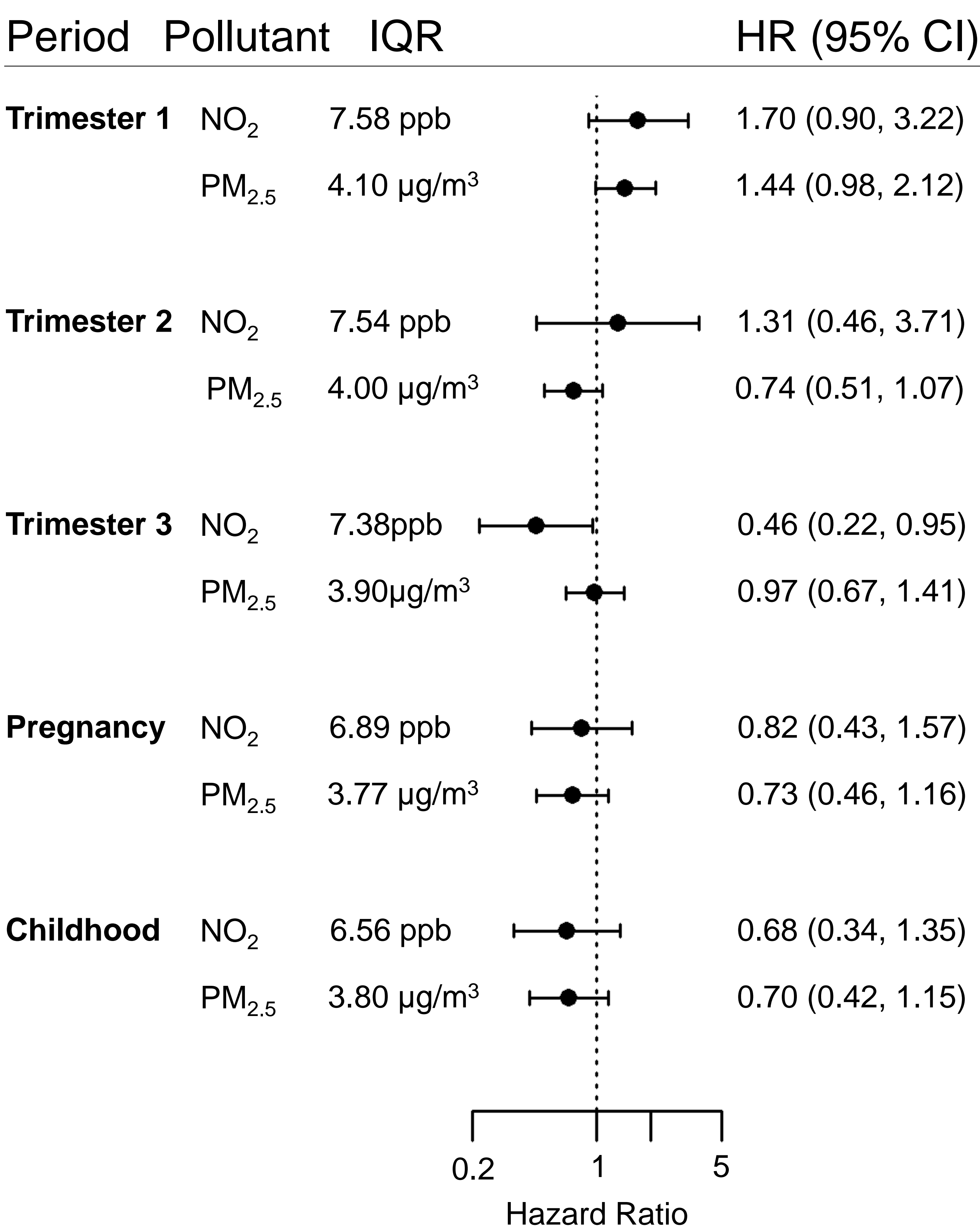
## Methods

- A retrospective cohort of all registered births in Ontario from 2006-2012 was created
- Monthly exposure estimates were obtained for NO<sub>2</sub> and PM<sub>2.5</sub> and assigned via 6-digit postal codes using satellite and land-use regression techniques
- Diabetes incidence was ascertained using health administrative data with a validated algorithm
- Mutually adjusted, single pollutant Cox regression models were used for 5 different exposure periods

## Results

- Out of 754,698 births included in this study, 1,094 (0.14%) were identified as having diabetes
- Residential greenness did not seem to significantly modify the effect of the pollutants in single pollutant models

## Results (continued)



**Figure 1.** Forest plot depicting the pollutant specific hazard ratios for various exposure periods. Displayed results were obtained from adjusted models controlling for maternal age at delivery, infant sex, parity, maternal smoking during pregnancy, gestational age, birth weight, residential greenness, various socio-economic factors, and either pregnancy averaged exposures or cumulative childhood exposure (time-varying).

IQR = interquartile range, HR= hazard ratio, CI = confidence interval

## Conclusion

- This study did not reveal a strong association between modelled exposure to NO<sub>2</sub> or PM<sub>2.5</sub>, and incidence of paediatric diabetes
- Further studies using more sophisticated exposure assessment methods may be needed