

Topic: air pollution and birthweight

Title: Differences in birth weight associated with the 2008 Beijing Olympics air pollution reduction: results from a natural experiment.

Conclusion: Short-term decreases in air pollution late in pregnancy in Beijing during the 2008 Summer Olympics, a normally heavily polluted city, were associated with higher birth weight.

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Abstract: Background. Previous studies have reported decreased birth weight associated with increased air pollutant concentrations during pregnancy. However, it is not clear when during pregnancy increases in air pollution are associated with the largest differences in birth weight. Objectives. Using the natural experiment of air pollution declines during the 2008 Beijing Olympics, we evaluated whether having specific months of pregnancy (i.e., 1st...8th) during the 2008 Olympics period was associated with larger birth weights, compared with pregnancies during the same dates in 2007 or 2009. Methods. Using n = 83,672 term births to mothers residing in four urban districts of Beijing, we estimated the difference in birth weight associated with having individual months of pregnancy during the 2008 Olympics (8 August-24 September 2008) compared with the same dates in 2007 and 2009. We also estimated the difference in birth weight associated with interquartile range (IQR) increases in mean ambient particulate matter $\leq 2.5 \mu\text{m}$ in aerodynamic diameter ($\text{PM}_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations during each pregnancy month. Results. Babies whose 8th month of gestation occurred during the 2008 Olympics were, on average, 23 g larger (95% CI: 5 g, 40 g) than babies whose 8th month occurred during the same calendar dates in 2007 or 2009. IQR increases in $\text{PM}_{2.5}$ ($19.8 \mu\text{g}/\text{m}^3$), CO (0.3 ppm), SO_2 (1.8 ppb), and NO_2 (13.6 ppb) concentrations during the 8th month of pregnancy were associated with 18 g (95% CI: -32 g, -3 g), 17 g (95% CI: -28 g, -6 g), 23 g (95% CI: -36 g, -10 g), and 34 g (95% CI: -70 g, 3 g) decreases in birth weight, respectively. We did not see significant associations for months 1-7. Conclusions. Short-term decreases in air pollution late in pregnancy in Beijing during the 2008 Summer Olympics, a normally heavily polluted city, were associated with higher birth weight.

Keywords: air pollution, infant, birthweight