Air Pollution and Short-term Mortality in Beijing

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Abstract

Little empirical evidence exists on the health costs of air pollution in China. Unsurprisingly, the lack of reliable data on pollution levels and health outcomes impede research, including analysis of the recent "crazy bad" pollution levels reported by the US Embassy in Beijing during January 2013. Because the pollution-health relationship is likely non-linear, it is difficult to extrapolate from existing high quality studies in developed countries to ascertain health costs.

We address this deficiency by obtaining new data on Beijing's daily mortality April 2008-April 2013 from the Chinese Center for Disease Control and Prevention. We combine these data with daily pollution measures from the US Embassy in Beijing, which records particulate matter of 2.5 microns or less in width (PM 2.5). We find that after controlling for weather conditions, year, month, and day of week fixed effects, PM2.5 indeed predicts mortality, particularly deaths from heart disease. A one standard deviation increase in pollution is associated with a roughly 15% increase of a standard deviation in daily deaths. Notably, the relationship is robust to controlling for the official measure of Beijing's air pollution, the average daily air pollution index (API), despite the fact that PM2.5 is measured by 1 monitor at the US embassy whereas API (and mortality) combine data from across the Beijing metropolitan area. Indeed, Beijing's API does not have a significant relationship to mortality once PM2.5 at the Embassy is accounted for. Our finding supports previous research arguing for measuring PM 2.5 and reporting it promptly to the public. Finally, demographic information on the decedent indicates that deaths among better-educated and non-agricultural workers show a weaker relationship to PM2.5 levels.