

# Global air pollution-related premature mortality

November 21st, 2013



Climate change affects surface concentrations of air pollutants, such as fine particulate matter (PM<sub>2.5</sub>, particulate matter  $\leq 2.5$   $\mu\text{m}$  in aerodynamic diameter) and ozone (O<sub>3</sub>), which are associated with increases in human morbidity and premature mortality. Exposure to PM<sub>2.5</sub> is associated with an increased relative risk of lung cancer, cardiopulmonary and all-cause mortalities while O<sub>3</sub> exposure is associated with increased incidence of cardiovascular, respiratory and all-cause mortality.

Research indicates that 21st century climate change (under the moderate SRES A1B climate change scenario) increases global all-cause premature mortalities associated with PM<sub>2.5</sub> by approximately 100,000 deaths and respiratory disease mortality associated with O<sub>3</sub> by 6,300 deaths annually. The relative change in premature mortality as the percent change between “present” and “future” simulations is about a 4 % increase in global all-cause mortality

associated with PM<sub>2.5</sub>, and less than a 1 % increase in respiratory disease mortality associated with O<sub>3</sub>.

In the northern hemisphere, surface PM<sub>2.5</sub> increases substantially near source regions (e.g., over East Asia, eastern United States, northern India, and Africa). These source regions are usually highly populated and hence, increases in PM<sub>2.5</sub> will adversely impact human health. With climate change, surface PM<sub>2.5</sub> concentrations decrease over western Brazil, parts of northern Europe, the Middle East and parts of North Africa, suggesting a potential “climate benefit” for air quality there.

Source: Fang et al., 2013. *Climatic Change* 121: 239–253.

Photo: Shirokazan ([www.flickr.com](http://www.flickr.com))