

## A Review of Fine Particulate Matter Health Effects in Beijing, China

Xiaohong Iris Xu and Lindsay Miller

Univ of Windsor, Univ of Windsor, Civil and Environmental Engineering, Windsor, Canada (xxu@uwindsor.ca)

Exposure to high levels of air contaminants has been proven to be detrimental to human health and can result in various carcinogenic and non-carcinogenic effects. Due to rapid economic growth, industrialization, and urbanization, China is experiencing severe air pollution. Of particular concern is atmospheric fine particulate matter (PM2.5) which has been linked to a number of adverse health effects. In Beijing, a city of 20 million residents, the two-year average PM2.5 concentration during 2013-2015 was  $83 \mu\text{g}/\text{m}^3$  (Batterman et al., 2016), far exceeding the World Health Organization guideline of  $10 \mu\text{g}/\text{m}^3$ . It has been estimated that annually 10,204 premature cardiovascular deaths and 1,228 lung cancer deaths are attributable to exposure to PM2.5 in Beijing (Lelieveld et al., 2013). The frequent high PM2.5 events and the large population exposed during these events have triggered concerns and have resulted in many recent studies of PM2.5 human health effects in China's capital. In this study, peer-reviewed journal papers published since 2001 are compiled and analysed. Discussion topics include spatial-temporal distribution of PM2.5 concentrations, major sources derived from source apportionment, methodology employed in health studies, health outcomes investigated, ranges of morbidity and mortality, impact of changes in energy sources, comparison with findings in other countries, and prioritizing future research.