

Sources, Trends and Health Impacts of Air Pollution in China: An Overview of Results from the Air Quality in Asia Project

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Abstract

Air pollution exposure is a leading public health problem in China. In our work we have used a combination of air pollution measurements, atmospheric chemistry and Earth system models, and machine learning techniques, to improve our understanding of the sources, trends, and public health impacts of air pollution in China over the past decade and into the future. We found that between 2012 and 2020, successful implementation of emission controls reduced PM_{2.5} pollution by 36% and the associated mortality burden by 9%, avoiding around 190,000 premature deaths per year. The reduction in PM_{2.5} exposure and the associated public health benefits were mainly due to reductions in industrial (58%) and residential (29%) emissions. However, despite these reductions, levels of PM_{2.5} exposure and the associated mortality burden remain high, and our recent analyses of measurement data shows declines have not continued post-2020. Furthermore, ground-level ozone pollution has increased by around 3% per year between 2015 and 2019. To improve air quality in China, further reductions in emissions from the residential and industrial sectors will be required, combined with more effective control of emissions from non-traditional air pollution sources such as agricultural processes. Future implementation of the best air pollution emission reduction technologies alongside climate mitigation in China could reduce PM_{2.5} by 36% and the associated mortality burden by 16% in 2050, compared to continuing with current legislation. However, if implementation of climate mitigation is inadequate, future climate change could have a detrimental impact on the air pollution mortality burden over China by further increasing population exposure to ozone and PM_{2.5} pollution.

Early Career Scientist

NO, I am not an early career scientist.

IGAC Activities

BBURNED: Biomass Burning Uncertainty: ReactionNs, Emissions and Dynamics, CCMi: Chemistry Climate Model Initiative