P13 Using WRF-Chem to study health impacts of aerosol: The influence of residential combustion emissions in China.

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In rural China, solid fuel cookstoves, used for both residential cooking and heating purposes, significantly contribute to regional emissions of pollutants such as carbon monoxide, volatile organic compounds, and oxides of nitrogen, and particulate matter (PM). These emissions have serious consequences for household air pollution, ambient air quality, tropospheric ozone formation, and the resulting population health and climate impacts. Potential methods to mitigate these emissions include installation of improved cookstoves in rural China, but it is currently unclear how effective these new technologies are or what benefits this may have for China's air quality and public health. We conducted a series of sensitivity studies using the Weather Research and Forecasting model with Chemistry (WRF-Chem) to investigate how changes in residential emissions, distinguishing between heating and cooking sources, impact ambient pollutant concentrations in China. Model output was evaluated against surface air quality measurements across China, with the results used to assess the accuracy of available emission estimates. Finally, using available exposure—response relationships for PM2.5 and cardiopulmonary health outcomes, we estimate potential health benefits from future emission mitigation scenarios associated with household energy interventions.