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Climate and mortality changes due to reductions in household cooking emissions

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Household cooking is a significant cause for health and environmental problems in the developing countries. There are more than 3 billion people who use biomass for fuel in cooking stoves in their daily life. These cooking stoves use inadequate ventilation and expose especially women and children to indoor smoke. To reduce problems of the biomass burning, India launched an initiative to provide affordable and clean energy solutions for the poorest households by providing clean next-generation cooking stoves. The improved cooking stoves are expected to improve outdoor air quality and to reduce the climate-active pollutants, thus simultaneously slowing the climate change.

Previous research has shown that the emissions of black carbon can be decreased substantially, as much as 90 % by applying better technology in cooking stoves. We have implemented reasonable (50% decrease) and best case (90% decrease) scenarios of the reductions in black and organic carbon due to improved cooking stoves in India into ECHAM-HAMMOZ aerosol-climate model. The global simulations of the scenarios will be used to study how the reductions of emissions in India affect the pollutant concentrations and radiation. The simulated reductions in particulate concentrations will also be used to estimate the decrease in mortality rates. Furthermore, we will study how the emission reductions would affect the global climate and mortality if a similar initiative would be applied in other developing countries.