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Health Benefits of Meeting 2-degree Warming Scenario in India

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Anthropogenic emissions are responsible for deteriorated air quality and accelerated climate change in developing countries like India. The current trajectory of emissions is expected to further degrade air quality, potentially leading to increased warming levels by the end of the century, posing severe consequences for public health. In this study, we analyzed two scenarios using the GAINS-model framework - the business-as-usual (BAU), relying on existing air pollution control policies and measures, and the sustainable development scenario (SDS), integrating advanced air pollution control policies and measures, aiming to contain the global temperature increase below 2°C by 2100. We estimated the health burden attributable to ambient air pollution in BAU and SDS scenarios, segregated into regional and sectoral emissions in India for the years 2030 and 2050. Under the BAU scenario, premature mortality and disability-adjusted life-years (DALYs) are projected to increase from 0.72 million (95% CI: 0.53-0.89) and 24.8 million (15.4-30.5) in 2015 by 9.7% and 2.4% in 2030, respectively. In 2050, mortality and DALYs are projected to further increase to 0.88 million (0.75-1.01) and 26.2 million (22.8-29.6). At the sub-national level, states with a low Socio-demographic Index (SDI) are expected to possess majority (49-53%) of the health burden. However, if India follows the SDS scenario, 0.16 million (0.14-0.18) lives and 3.7 million (3.2-4.3) DALYs can be avoided in 2030. The corresponding benefits in 2050 will be 0.34 million (0.29-0.39) lives and 8.4 million (7.1-9.7) DALYs, respectively, relative to the BAU scenario. Our results reveal that states with a high SDI would experience the most significant benefits (15% and 26% for mortality & 26% and 44% for DALYs in 2030 and 2050), as compared to middle and low SDI states. The findings underscore the importance of immediate adoption of cost-effective and advanced technologies driven by sustainable development policies is imperative to mitigate air pollution and climate change simultaneously. A stronger mandate to revise the environmental standards and health policies is necessary to maximize health benefits in India.