

## Identifying Critical Supply Chain Paths and Key Sectors for Mitigating PM2.5 Mortality in India

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Today, fine particulate matters (PM2.5) and these precursors are known as critical factors that affect adverse environmental impacts and human health. In recent years, India has been achieving remarkable economic growth and emitted a lot of air pollutants in the manufacturing processes, which led to 1 million deaths attributable to PM2.5 exposures in 2015. Especially, power sector has contributed to air pollution in India through increasing direct and indirect electricity demand due to industrialization. In order to discuss solutions for mitigating health impacts, it is necessary to clarify the economic activities in India and identify the key factors for the PM2.5 emissions from the power sector. In this study, we focused on the PM2.5 emissions from the power sector in India and calculate consumption-based health impacts due to the PM2.5 emissions from coal-fired power plants using the Eora multi-regional input-output database. Due to the lack of detail database that converts PM2.5 emissions including primary and secondary particles to premature deaths, we made a new health impact inventory database at sector level using atmospheric chemical transport model and existing epidemiological methods. Then we identified the critical supply chains in terms of PM2.5-induced health impacts using the structural path analysis (SPA). We linked the supply chain paths and transboundary atmospheric transport of air pollutants. The result shows that the total deaths attributable to PM2.5 emissions from power sector in India are 12 million, 10 million of which were resulted from domestic demand and 2 million was from other countries where the consumption from US contributed most. We also found that the path "US (drivers)-->India: Oil & Non-metallic mineral products-->India: Power (source)-->India (receptor)" had the biggest health impacts. The US demand on textile and apparel sector also indirectly induced the health impacts in India through the electricity production in India.