

Monetary Burden of the Health Effects of Air Pollution in Mumbai: Implications for Poverty, Equity and Public Health

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Abstract

Mumbai is home to more than 12 Million people, more than half of whom dwell in slums. The city is experiencing acute air pollution on account of population growth, commercial activity, construction boom and vehicular traffic. Examining the health effects of air pollution in Mumbai is, thus, necessary from the point of view of public health, productivity and better quality of life for its residents. This study is undertaken to investigate the link between air pollution and morbidity impacts for Mumbai and estimate their monetary burden. For this purpose, cross-section data collected by the Environmental Pollution Research Centre (EPRC) at King Edward Memorial (KEM) Hospital in Mumbai is used. Information on monetary costs of illness is obtained through the household survey and interviews of medical practitioners carried out by the researchers. We apply logistic regression to the EPRC dataset and find evidence of a significant relationship between air pollution and respiratory and cardiovascular symptoms and diseases. Particulate Matter (PM₁₀) and Nitrogen Oxides (NO_x) emerge as the critical pollutants in Mumbai with health effects ranging from acute respiratory symptoms like cough, breathlessness and wheezing to chronic diseases like chronic obstructive pulmonary disease (COPD). The monetary burden of the health impacts is estimated by using the cost of illness approach. The cost estimates developed in the study show the massive monetary burden of INR 4522.96 Million or US \$ 113.08 Million on account of an increase in PM₁₀ and INR 8723.59 Million or US \$ 218.10 Million due to an increase in NO_x concentrations in the city. Most of this monetary burden comprises out-of-pocket expenses of the residents. The findings of this empirical study have implications for public health policies and programmes in Mumbai, particularly from the perspective of the accessibility and affordability of healthcare for poor households living in its slums.