Health Impacts and Economic Costs of Air Pollution in the Metropolitan Area of Skopje

Urban outdoor air pollution, especially particulate matter, remains a major environmental health problem in Skopje, the capital of the former Yugoslav Republic of Macedonia. Despite the documented high levels of pollution in the city, the published evidence on its health impacts is as yet scarce. We obtained, cleaned, and validated Particulate Matter (PM) concentration data from five air quality monitoring stations in the Skopje metropolitan area, applied relevant concentration-response functions, and evaluated health impacts against two theoretical policy scenarios. We then calculated the burden of disease attributable to PM and calculated the societal cost due to attributable mortality. In 2012, long-term exposure to PM2.5 (49.2 μg/m³) caused an estimated 1199 premature deaths (CI95% 821-1519). The social cost of the predicted premature mortality in 2012 due to air pollution was estimated at between 570 and 1470 million euros. Moreover, PM2.5 was also estimated to be responsible for 547 hospital admissions (CI95% 104-977) from cardiovascular diseases, and 937 admissions (CI95% 937-1869) for respiratory disease that year. Reducing PM2.5 levels to the EU limit (25 μg/m³) could have averted an estimated 45% of PM-attributable mortality, while achieving the WHO Air Quality Guidelines (10 μg/m³) could have averted an estimated 77% of PM-attributable mortality. Both scenarios would also attain significant reductions in attributable respiratory and cardiovascular hospital admissions. Besides its health impacts in terms of increased premature mortality and hospitalizations, air pollution entails significant economic costs to the population of Skopje. Reductions in PM2.5 concentrations could provide substantial health and economic gains to the city.

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