



Research Article

Ambient PM_{2.5} and productivity-adjusted life years lost in Brazil: a national population-based study

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HIGHLIGHTS

- The first study to evaluate mortality-related productivity burden caused by PM_{2.5}.
- Greater risk of PALYs lost was observed in males, younger adults and South region.
- Over half of the productivity burden could be prevented if the WHO AQG was met.

GRAPHICAL ABSTRACT



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ABSTRACT

Enormous health burden has been associated with air pollution and its effects continue to grow. However, the impact of air pollution on labour productivity at the population level is still unknown. This study assessed the association between premature death due to PM_{2.5} exposure and the loss of productivity-adjusted life years (PALYs), in Brazil. We applied a novel variant of the difference-in-difference (DID) approach to assess the association. Daily all-cause mortality data in Brazil were collected from 2000–2019. The PALYs lost increased by 5.11% (95% CI: 4.10–6.13%), for every 10 µg/m³ increase in the 2-day moving average of PM_{2.5}. A total of 9,219,995 (95% CI: 7,491,634–10,921,141) PALYs lost and US\$ 268.05 (95% CI: 217.82–317.50) billion economic costs were attributed to PM_{2.5} exposure, corresponding to 7.37% (95% CI: 5.99–8.73%) of the total PALYs

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