

PIH10: Estimating Economic Burden of CHILD Asthma Attributing to Exposure to PM2.5 in JAPAN

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Objective

- Exposure to ambient air pollutants such as fine particulate matter (PM_{2.5}) is associated with a number of adverse health outcomes, including development and exacerbation of asthma among children. Children are particularly vulnerable to the risk exposure because their respiratory and immune system are not fully developed. The objective of the study is to estimate economic burden of child asthma attributing to exposure to PM_{2.5} in Japan.

Methods

- Data on annual distribution of PM2.5 are obtained from Ministry of the Environment, Japan.
- The relative risk (RR) of a short-term increase in PM2.5 to children's hospital admissions and emergency department visit for asthma derive from a previous meta-analysis (1.048, 95% CI: 1.028-1.067). Then, RR and the prevalence of asthma are used to assess PM2.5 attributable child asthma.
- Direct medical costs of hospital admission and emergency department visit are obtained from National Health Insurance Data.

Results

- By analyzing data of health insurance records, direct medical costs of hospital admission and emergency department visit and outpatient visit per case (in 2016) were 352,314.61 JPY (95% CI: 186585.03-546410.63 JPY) and 9,928.67 JPY (95% CI: 7354.90-11563.98 JPY), respectively.
- Population attributable fraction of PM2.5 to child asthma is estimated to be 0.715% (95% CI: 0.198-1.115%).
- The overall economic burden of PM2.5-attributable asthma among children aged 0 to 14 years in 2016 is estimated to be 250,741,588 JPY (95% CI: 62,576,296 JPY – 492,521,679 JPY).

Conclusion

- To our knowledge, this will be the first study to estimate economic burden of PM_{2.5}-attributable child asthma in Japan. The results will suggest potential health and economic benefits to reduce PM_{2.5} exposure among children by environmental regulatory and public health interventions.