

# Benefits of hypothetical air pollution reduction interventions on non-communicable diseases in Belgium

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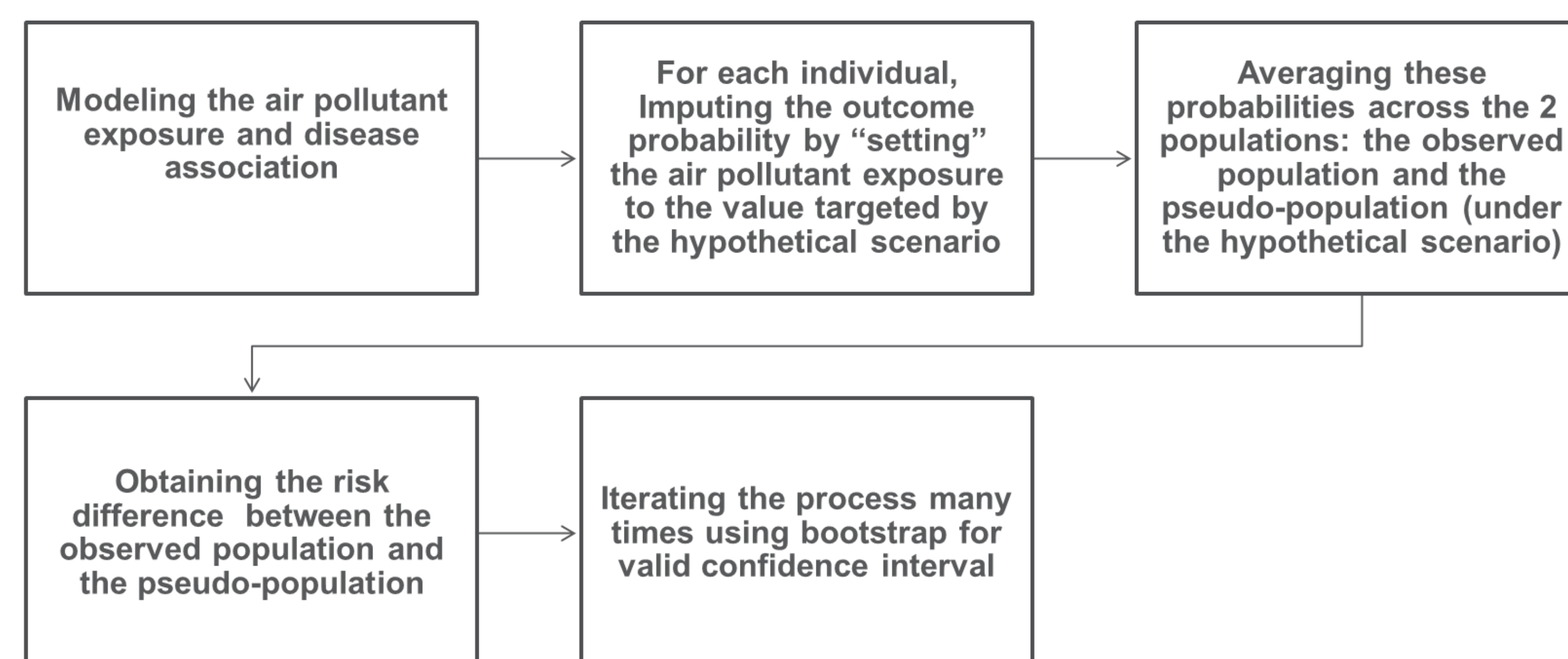
- Air pollution reduction interventions could effectively decrease the prevalence of asthma, stroke, and multimorbidity in Belgium
- The g-computation approach to assess potential impact fractions of interventions represents a straightforward approach for drawing causal inferences from observational data

The adverse health impact of air pollution on non-communicable diseases (NCDs) is well documented, yet methodological tools for assessing the potential health benefits of interventions are lacking. This study uses a parametric g-computation approach to evaluate the impact of hypothetical interventions targeting long-term air pollution exposure on reducing NCDs and multimorbidity prevalence in Belgium

## Methods

- National Health Interview Surveys data (BHIS 2008-2013-2018, n = 27,536) linked to environmental data at participants' residential addresses
- G-computation approach used to calculate the potential impact fractions of air quality interventions on several NCDs and multimorbidity

Fig. 1. Steps of the G-computation approach



- Regression models adjusted for socio-economic, environmental and lifestyle factors
- Hypothetical scenarios involved
  - reducing individual long-term air pollution exposure to WHO air quality guideline levels (AQG)
  - investigating dose-response functions through various percentage reductions in air pollution exposure

## Results

- Significant associations between air pollution exposure and asthma, stroke, and multimorbidity
- In Belgium, adhering to WHO AQG would reduce the risk of:
  - **Stroke** from 1.3% to 0.5% for PM<sub>2.5</sub> and to 0.99% for NO<sub>2</sub>, preventing 63% and 22% of cases, respectively
  - **Asthma**, from 5.3% to 3.9% for PM<sub>2.5</sub> and to 4.5% for NO<sub>2</sub>, preventing 27% and 16% of cases, respectively
  - **Multimorbidity**, from 46.2% to 43% for PM<sub>2.5</sub> and to 45.8% for NO<sub>2</sub>, preventing 7% and 0.4% of cases, respectively
- Clear **dose-response association** between air pollution reduction and the prevalence of stroke, asthma, multimorbidity

Fig. 2. Dose-response association between air pollution reduction and the potential impact fractions on stroke in Belgium. Error bars represent the 95% CI

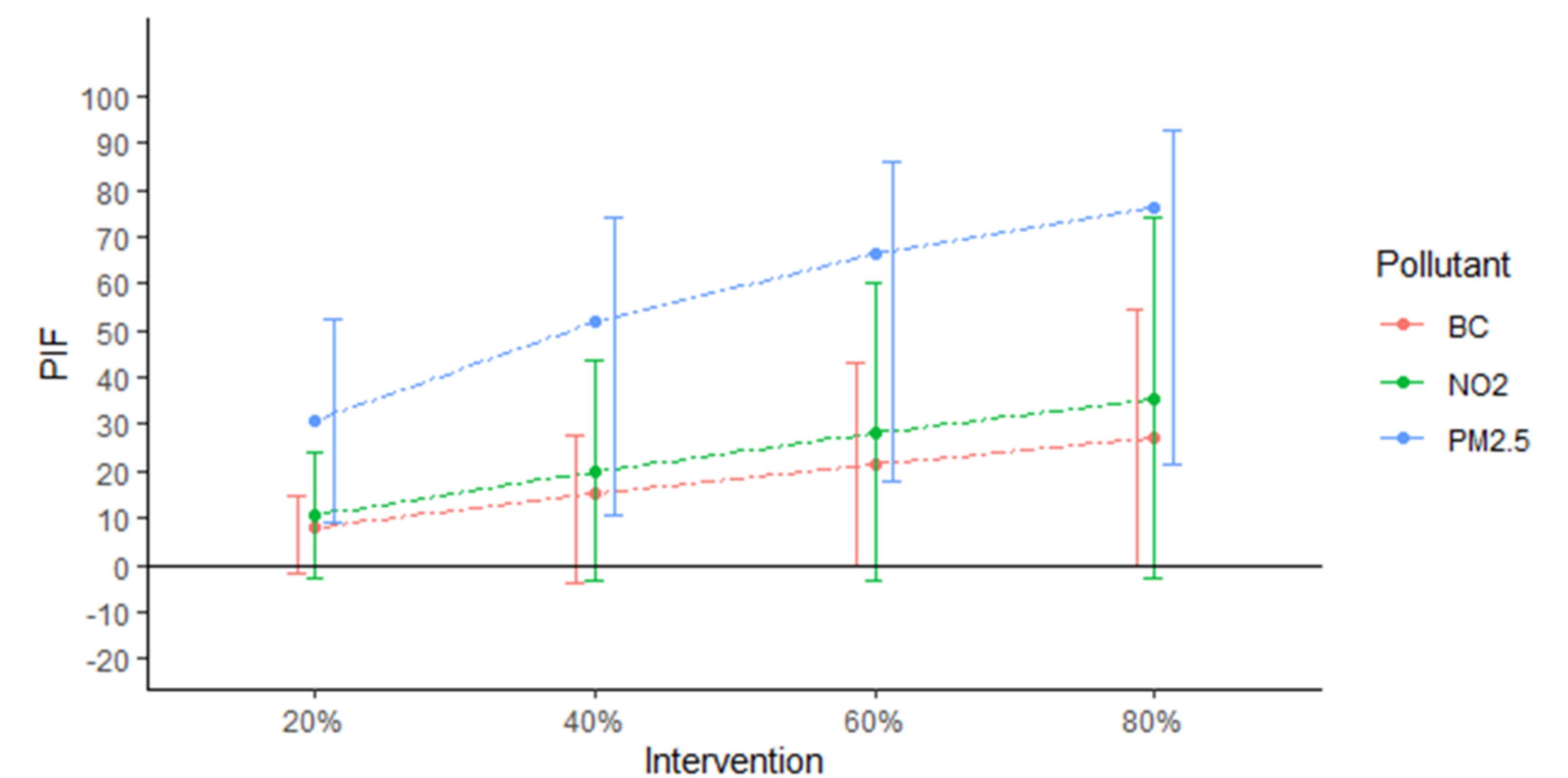


Fig. 3. Dose-response association between air pollution reduction and the potential impact fractions on asthma in Belgium. Error bars represent the 95% CI

