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1) Reference of your publication:

Han L, Zhou W, Li W, and Qian Y, 2017. Global population exposed to fine particulate pollution by population increase and pollution expansion. *Air Quality, Atmosphere & Health*, 10, 1221-1226.

2) Hyperlink to the publication:

<https://link.springer.com/article/10.1007/s11869-017-0506-8>

3) Abstract:

Ambient fine particulate (PM_{2.5}) pollution threatens public health. Previous studies have primarily focused on PM_{2.5} estimation, with the quantitative analysis of public exposure and the reason for increased risk receiving limited attention. Quantitative information is essential for environmental risk estimation. Thus, we collected PM_{2.5} data and population records to illustrate the spatiotemporal patterns of PM_{2.5} pollution and to quantify public vulnerability and the cause of increased exposure at global, regional, and country scales from 2000 to 2010, following the air quality standards of the World Health Organization. We found that 11.0×10^6 km² (8%) of the global terrestrial area was exposed to PM_{2.5} pollution ($> 35 \mu\text{g}/\text{m}^3$) in 2010, an addition of 4.3×10^6 km² since 2000. Furthermore, by 2010, 1.94 billion (30%) people worldwide were exposed to PM_{2.5} pollution, including 966 and 778 million in Eastern and Southern Asia, respectively, comprising 962 million in China and 543 million in India. After 2000, the vulnerability of 698 million people to PM_{2.5} pollution increased, including 356 and 280 million in Southern and Eastern Asia, respectively, accounting for 279 million in China and 253 million in India. Moreover, 25% of the global vulnerability increase was from local population growth, and 75% was due to pollution expansion. Specifically, 26 and 16% of the increase in public vulnerability in Southern and Eastern Asia (22 and 16% in India and China), respectively, were from local population growth. We suggest that countries in which migration has contributed to an increase in public vulnerability should balance pollutant emission reduction and migration control to reduce vulnerability. In addition, cooperation between the government and public could help mitigate global pollution as well as environmental and human health risks.

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