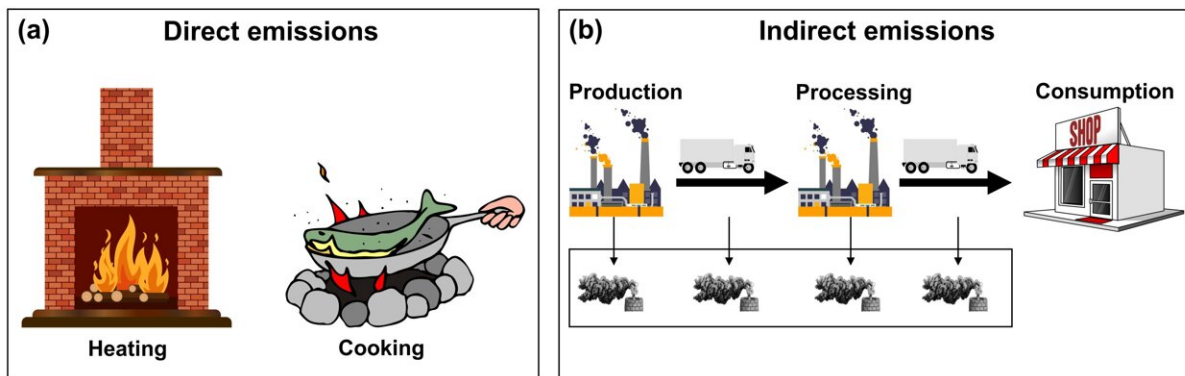


Direct and indirect consumption activities drive urban-rural inequalities in air pollution-related mortality in China

March 28 2024



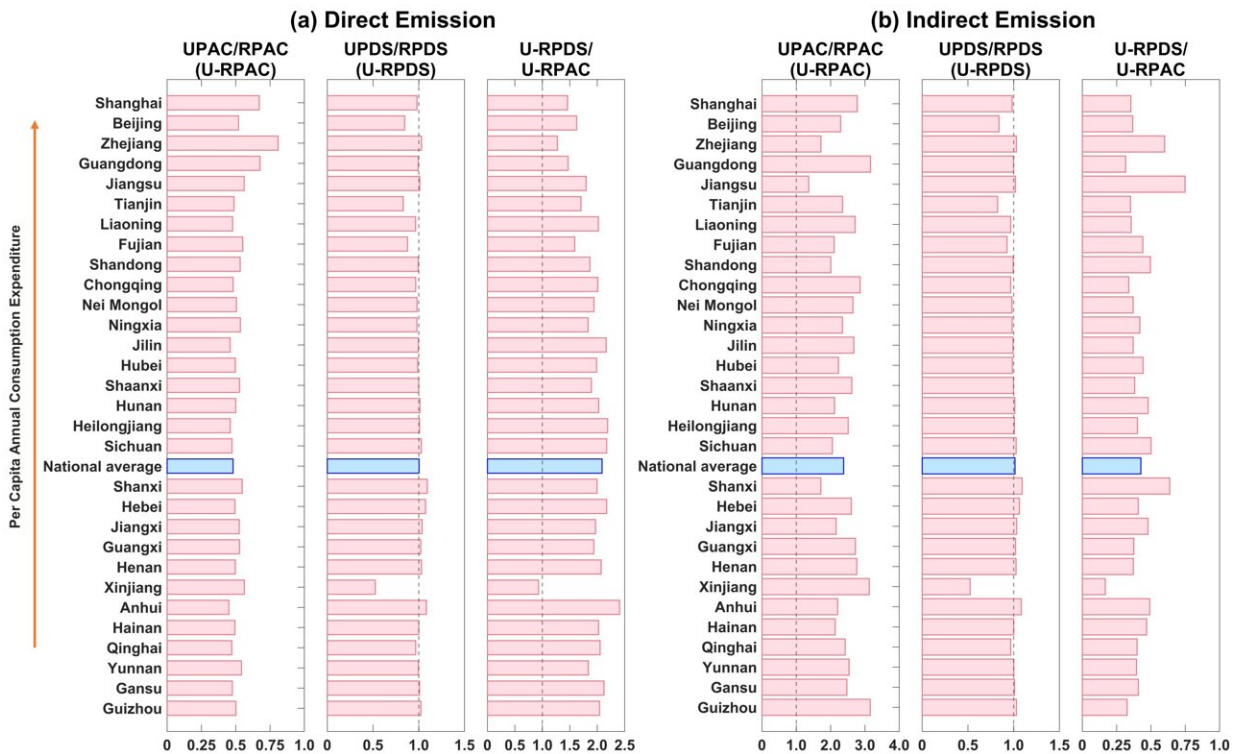
The subplot (a) and (b) shows household direct and indirect emissions respectively. Credit: Science China Press

Household consumption in China is associated with substantial $PM_{2.5}$ pollution through activities directly (i.e., fuel use) and/or indirectly (i.e., consumption of goods and services) causing pollutant emissions. Urban and rural households exhibit different consumption preferences and living areas; thus, their contributions to and suffering from air pollution could differ.

Assessing this contrast is crucial for comprehending the environmental

impacts of the nation's ongoing urbanization process. Here, researchers quantify Chinese urban and rural households' contributions to ambient $PM_{2.5}$ pollution and the [health risks](#) they suffer from by integrating economic, atmospheric, and health models and/or datasets.

The national [premature deaths](#) related to long-term exposure to $PM_{2.5}$ pollution contributed by total household consumption is estimated to be 1.1 million cases in 2015, among which 56% are urban households, and 44% are rural households. For pollution contributed indirectly, urban households, especially in developed provinces, tend to bear lower mortality risks compared with the portions of deaths or pollution they contribute. The opposite results are true for direct pollution.



PDS refers to per capita death suffering, that is, the proportion of deaths in the total population of a group. UPDS and RPDS refer to urban and rural PDS respectively. PAC refers to per capita consumption-based APE (i.e., air pollution

equivalent) contribution. UPAC and RPAC refer to urban and rural PAC respectively. Provinces are ranked according to their per capita annual consumption expenditure, reflecting provinces' affluence levels in this study. Credit: Science China Press

With China's rapid urbanization process, the increased indirect pollution-associated premature deaths could largely offset that avoided by reduced direct pollution, and the indirect pollution-associated urban-rural inequalities might become severe. Developing pollution mitigation strategies from both the production and consumption sides could help with reducing pollution-related mortality and associated urban-rural inequality.

The work is [published](#) in the journal *Science Bulletin*.

More information: Jingxu Wang et al, Direct and indirect consumption activities drive distinct urban-rural inequalities in air pollution-related mortality in China, *Science Bulletin* (2023). [DOI: 10.1016/j.scib.2023.12.023](https://doi.org/10.1016/j.scib.2023.12.023)

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