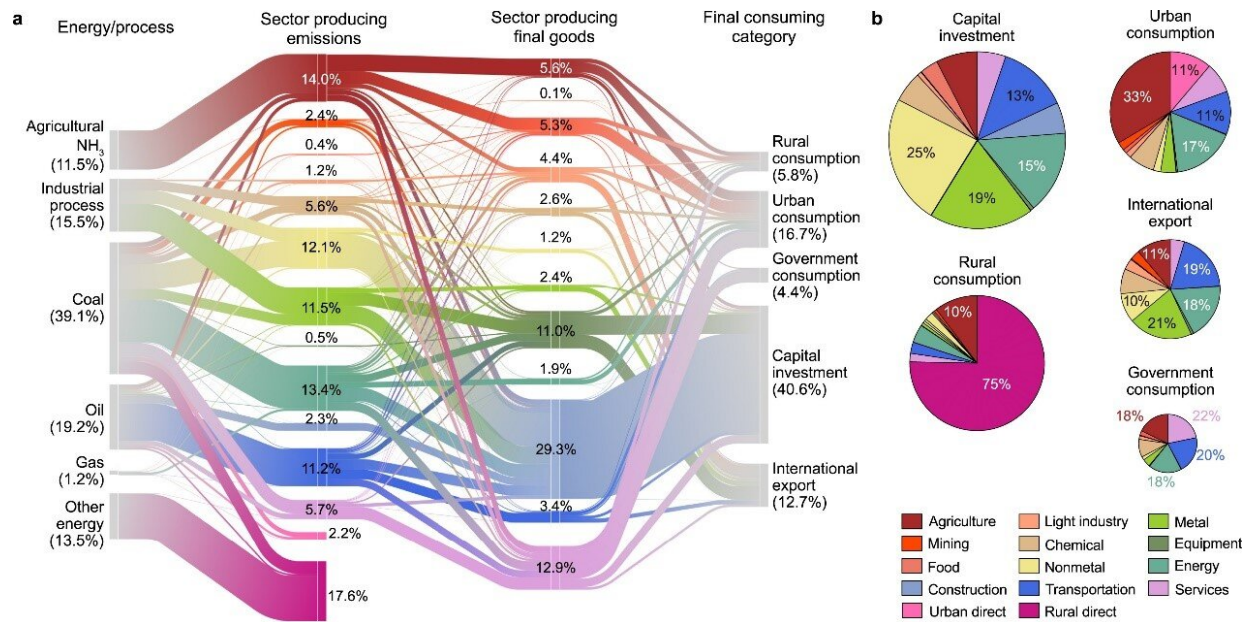


New study maps impact of interprovincial trade on pollution-related mortality in China

June 16 2023



The energy/process specifies combusted energy types and processes generating related emissions, and these processes are then mapped to the specific industrial sectors encompassing the process. These production sectors are then mapped to the sectors producing the final goods or services and further to the final demand categories those consuming the final goods or services. The width of the lines and labeled percentages indicate the relative contributions to the anthropogenic PM_{2.5}-related premature deaths in China in 2017 (1.32 million). The rural and urban consumption-related values also include those attributed to rural and urban direct energy consumption. Credit: *Environmental Science and Ecotechnology* (2023). DOI: 10.1016/j.es.2023.100264

In a new study published in the journal *Environmental Science and Ecotechnology*, researchers from Beijing Normal University bring together five state-of-the-art models from the fields of physics, economics, and epidemiology, tracing the intricate web of supply chains tied to fine particle pollution (PM_{2.5}) and their linked premature mortality across the nation.

This arrives against a backdrop of China's rapid economic expansion and urbanization, leading to high energy consumption and severe atmospheric pollution. Although these factors contribute to over a million [premature deaths](#) annually, significant mitigation efforts from the Chinese government have seen a gradual decline in PM_{2.5} concentration. However, the journey to further pollution reduction presents notable technical and [economic challenges](#), underscoring the importance of novel approaches.

Unpacking the complex dynamics of pollution redistribution, the study reveals that product trade plays a pivotal role in shifting pollution and its associated health burdens across sectors and regions. Particularly, consumption-based effects from sectors, such as food, light industry, equipment, construction, and services, caused significantly higher deaths than those from a production perspective, making up 63% of the national total.

Furthermore, interprovincial trade is a key player in this issue, with 25.7% of China's PM_{2.5}-related deaths attributable to such exchanges. Remarkably, the greatest transfer of air pollution occurs from the central and [northern regions](#) to the economically robust east coast provinces, where [capital investment](#) extensively involves equipment and construction products.

Highlights

- Anthropogenic PM_{2.5} pollution deaths driven by trade within China were evaluated in great detail.
- Food, light industry, equipment, construction, and services caused 2–22 times more deaths from a [supply chain](#) perspective.
- Capital investment contributed 56% of the pollution deaths relocation among provinces.
- 66% of the pollution deaths transferred among regions originated from agricultural, nonmetal, metal, and energy sectors.

The insights from this study significantly broaden our understanding of pollution transfer through trade chains and provide an encompassing quantification of PM_{2.5}-related health burdens across regions and sectors. To secure future gains, the study advocates for increased focus on the sustainable development of high-quality industries, promoting a green consumption pattern, especially during the urbanization process, and implementing joint control actions across regions.

Future research should aim to hone the cost-effectiveness analysis of technology transfer and cooperation among regions and sectors to ensure better-coordinated pollution mitigation efforts.

More information: Hongyan Zhao et al, Air pollution health burden embodied in China's supply chains, *Environmental Science and Ecotechnology* (2023). [DOI: 10.1016/j.ese.2023.100264](https://doi.org/10.1016/j.ese.2023.100264)

Provided by Chinese Society for Environmental Sciences

Citation: New study maps impact of interprovincial trade on pollution-related mortality in China (2023, June 16) retrieved 29 April 2024 from <https://phys.org/news/2023-06-impact-interprovincial-pollution-related-mortality-china.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.