

# Continuing Large-Scale Global Trade and Illegal Trade of Highly Hazardous Chemicals

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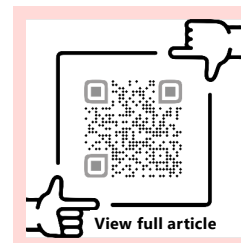
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## Introduction

- ✓ Chemical pollution, along with climate change and biodiversity loss, is causing in the triple planetary crisis.
- ✓ To complement national/regional frameworks on chemicals, the **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade** has been established.
- ✓ For each listed chemical, all parties are required to make a decision as to whether they will allow future import of the chemical. Then, it is illegal to export the chemicals to a party that has decided not to further import them. However, the Convention does not have a formal mechanism to evaluate its effectiveness.
- ✓ This study aims to capture an up-to-date, accurate, comprehensive **overview of the global trade of highly hazardous chemicals listed under the Convention** from 2004, when it entered into force, to 2019, to shed light on the Convention's impacts on the global trade of hazardous chemicals and provide insights on areas for improvement.



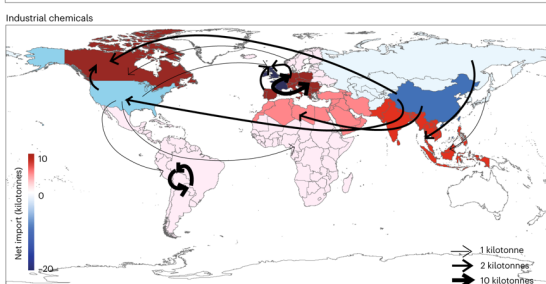
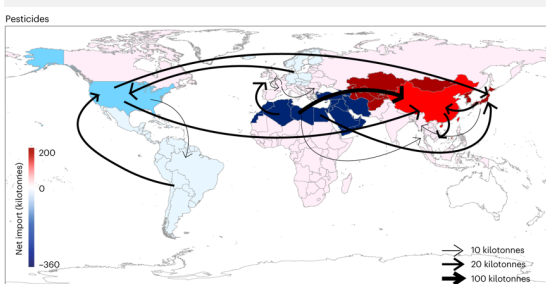
## Methods

- ✓ We develop and use a **novel workflow of analysing trade records from the UN Comtrade database** (79,194 entries), providing a minimum scenario of the global trade and illegal trade of 46 highly hazardous chemicals listed under the Convention. The workflow included:
  - ✓ an **outlier analysis** using clustering and statistical methods to identify erroneous trade records, and
  - ✓ a subsequent **mirror analysis** to reconcile asymmetric bilateral transactions.

## Main Findings

### Continuing large-scale global trade of hazardous chemicals

- ✓ The cumulative global trade of the 46 listed chemicals among all countries reached 64.5 megatonnes in 2004–2019. The highly hazardous pesticides and formulations had lower trade volumes (2.4 megatonnes), dominated by pentachlorophenol and its salts and esters (see Fig. 1, left).
- ✓ It is an especially pressing problem for developing countries and countries with economies in transition (see Fig. 1, right).



**Fig. 2** Global transfer of the listed highly hazardous chemicals

### Prevalent illegal trade of hazardous chemicals (see Figure 3)

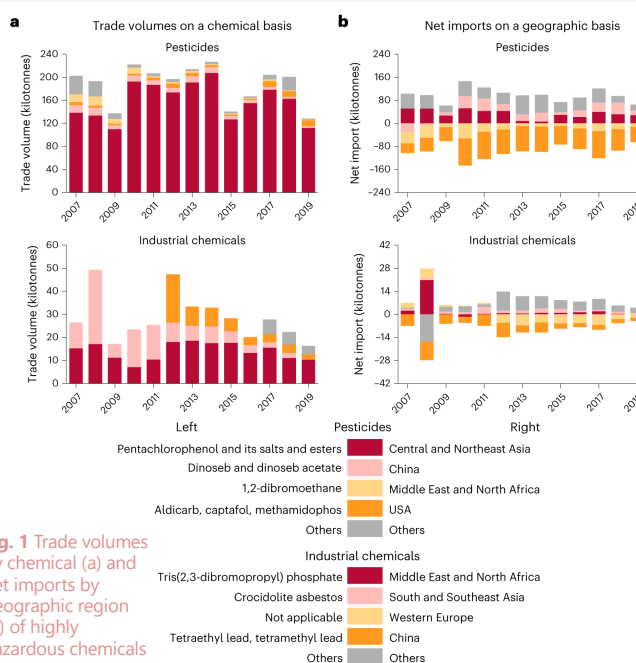
- ✓ Defaulting was prevalent all over the world, especially in Central, Western and Southern Europe, South and Southeast Asia, and the Middle East.
- ✓ In total, they accounted for 40% of the total trade volume (25.7 of 64.5 megatonnes), underlining insufficient effectiveness of the Convention.
- ✓ The defaulting counts are seemingly on the rise over time.

### Tackling the global trade of highly hazardous chemicals

- ✓ expanding the Convention's geographical coverage
- ✓ enabling swifter listing of chemicals under the Convention
- ✓ enhancing data availability, quality and accessibility
- ✓ Understanding and addressing the "lock-in" of hazardous chemicals

## Acknowledgements

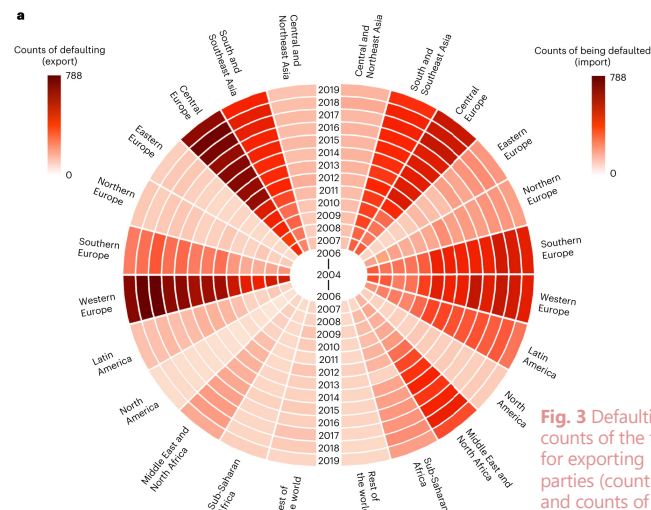
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**Fig. 1** Trade volumes by chemical (a) and net imports by geographic region (b) of highly hazardous chemicals

### Complex geographical distributions of the global trade (see Figure 2)

- ✓ Most of Asia were the major importers of pesticides chemicals, while U.S. and Middle East were the major exporters. Central and Western Europe were not only major importers but also big exporters of industrial chemicals.



**Fig. 3** Defaulting counts of the trade for exporting parties (countries) and counts of being defaulted for importing parties