

# Time Trends in Human Exposure to Mercury from 1960 to 2015: Data Issues and Findings

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## Review article

An overview of worldwide and regional time trends in total mercury levels in human blood and breast milk from 1966 to 2015 and their associations with health effects



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# Goals of the Study

- Provide an overview of **mercury time trends** in
  - human blood
  - cord blood
  - human milk
- Cover as many regions of the world as possible

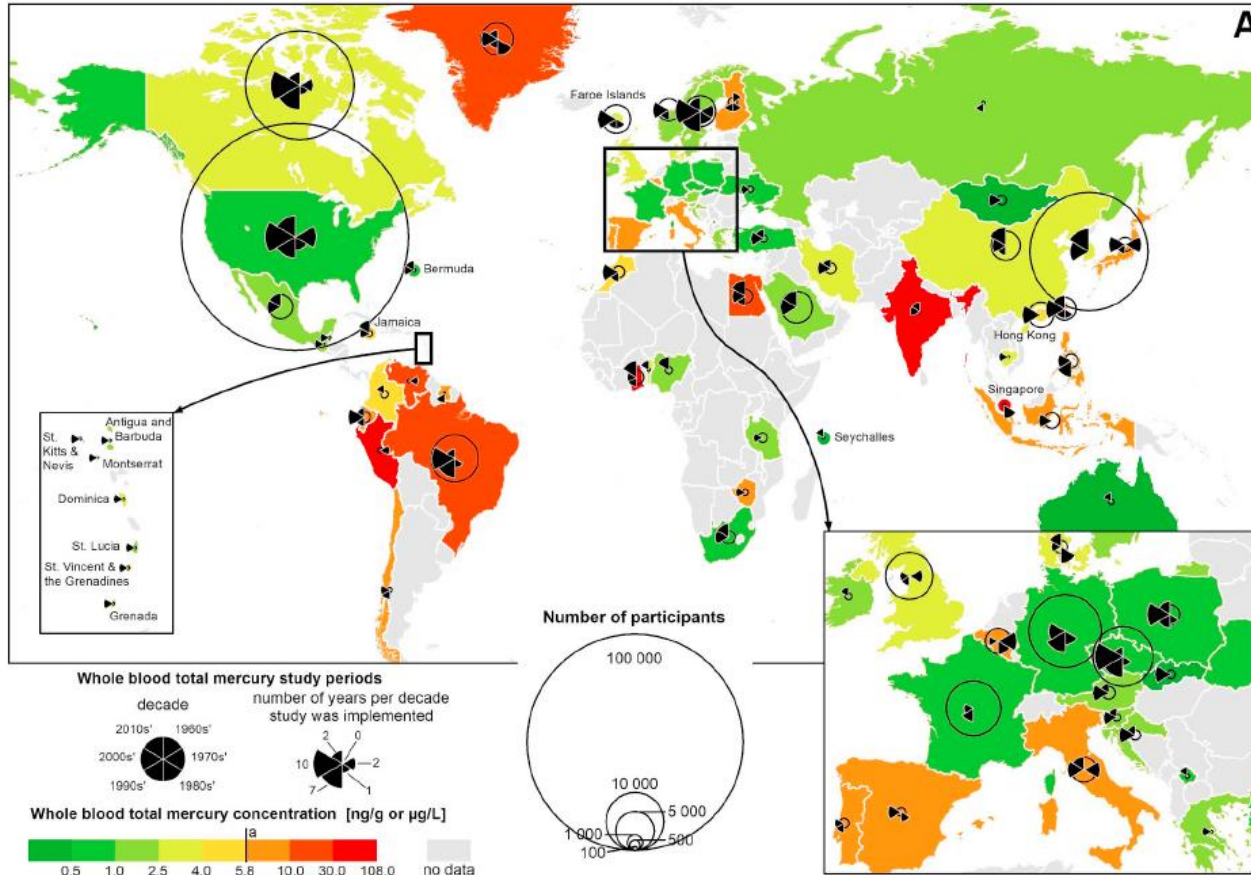
# Identification of Data Sources

- Extensive database search
- 736 peer-reviewed studies and reports initially identified
- Excluded studies with insufficient information
- Data extracted from **558 studies**, covering more than **5 decades**

# Scope of Studies Included

- **human blood:** 472 studies, 260'000 participants from 67 countries
- **cord blood:** 124 studies, 26'000 participants from 31 countries
- **human milk:** 61 studies, 7'500 participants from 34 countries

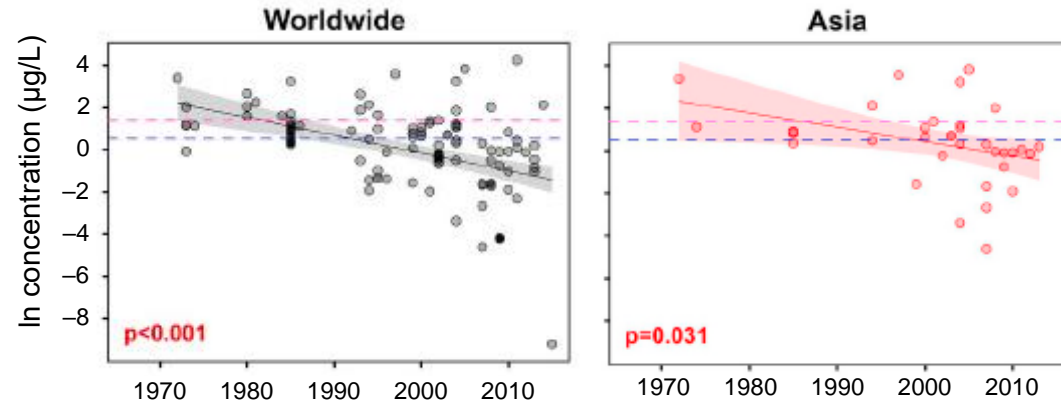
# Illustration of Geographical Scope



# Data Issues

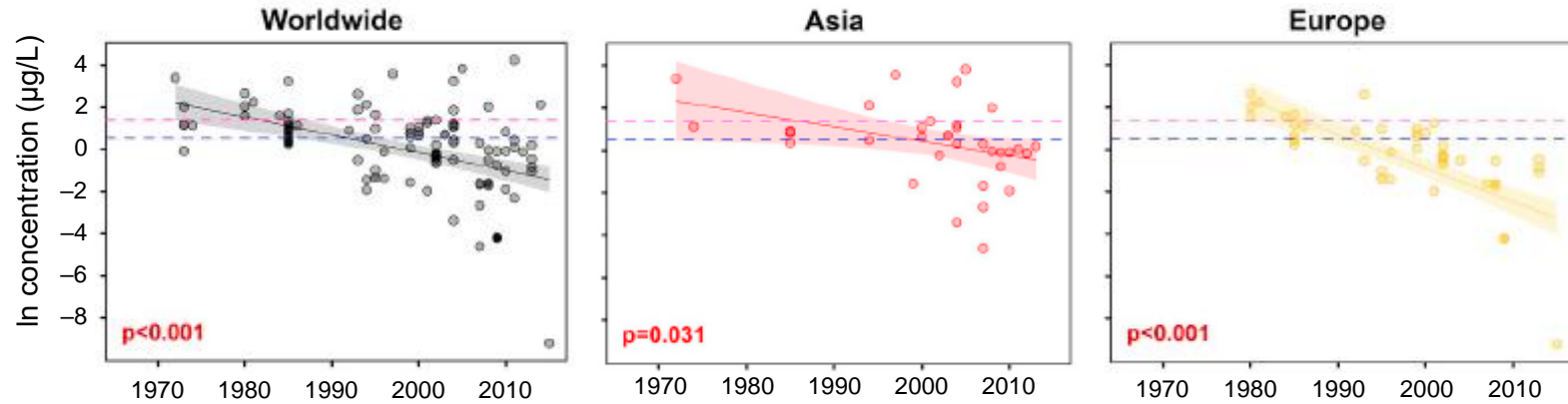
- **data imbalance:** more than 50% of the data for 2009–2015
- **data inconsistency:** different limits of quantification and analytical treatments over the 5 decades; different units: ppb, ng/g,  $\mu\text{g/L}$
- **data inhomogeneity:** certain groups, regions etc. may be over- or underrepresented

# Trends in Human Milk

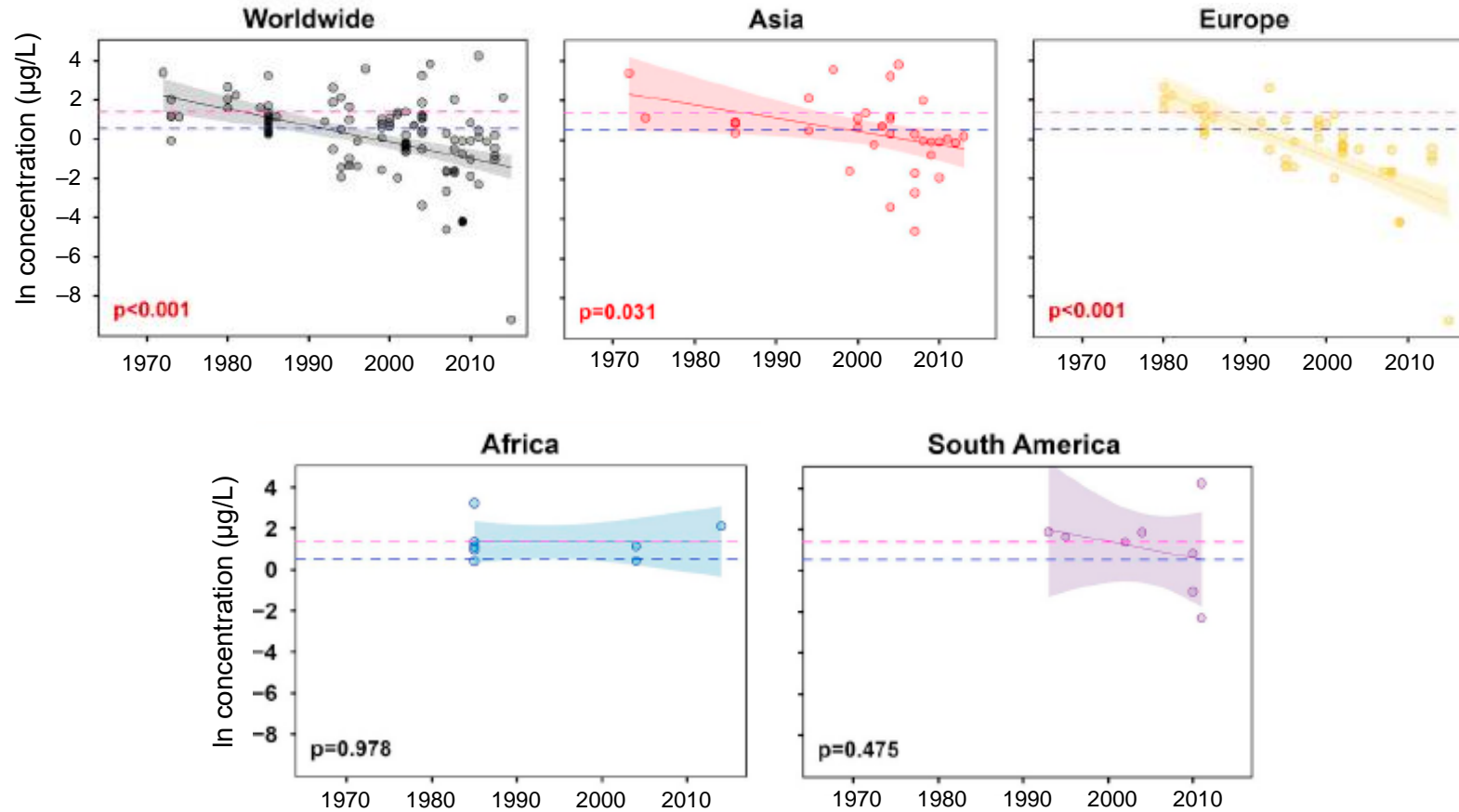




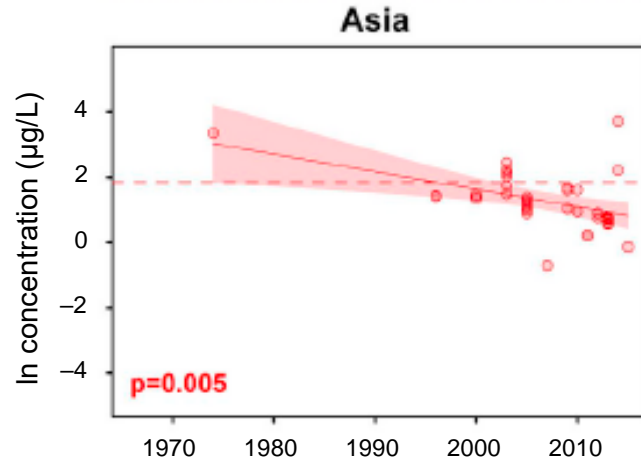
# Trends in Human Milk



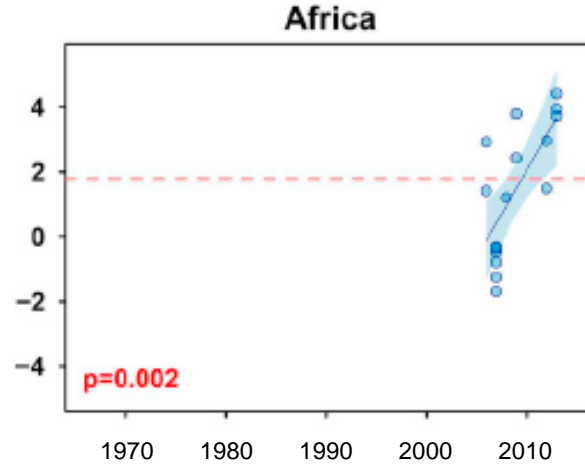
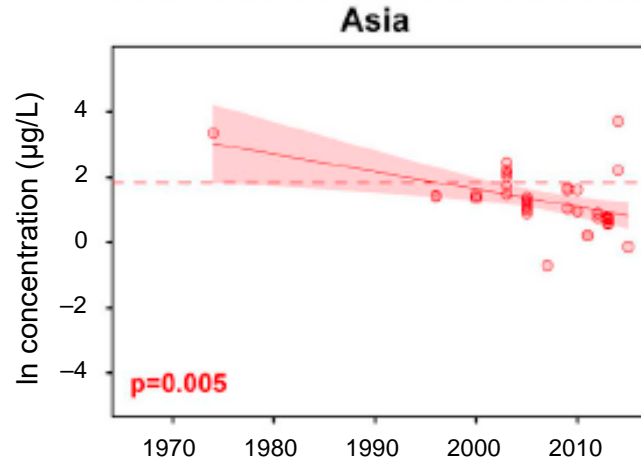
# Trends in Human Milk



# Trends in Blood, Children

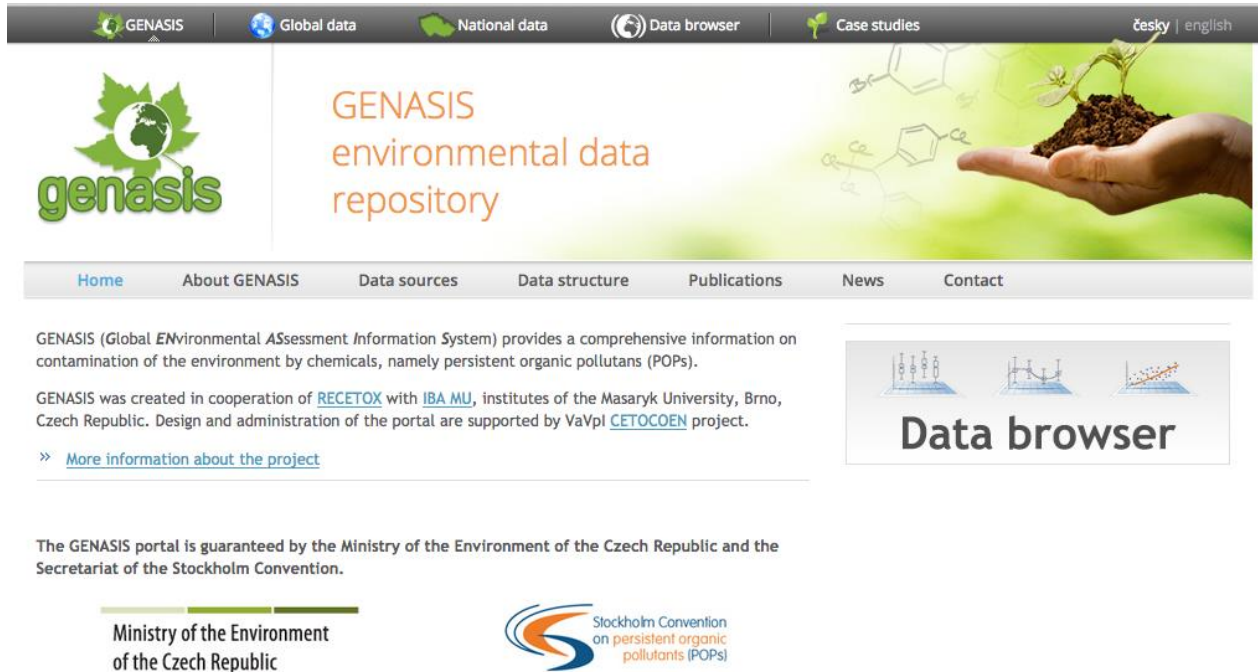


# Trends in Blood, Children



# Data Availability

- Transfer of data into GENASIS ongoing



The screenshot shows the GENASIS website homepage. At the top, there is a navigation bar with links for GENASIS, Global data, National data, Data browser, and Case studies, along with language options for 'česky' and 'english'. The main header features the GENASIS logo (a green leaf with a globe) and the text 'GENASIS environmental data repository'. Below this is a secondary navigation bar with links for Home, About GENASIS, Data sources, Data structure, Publications, News, and Contact. The main content area contains a paragraph describing GENASIS as a comprehensive information system for environmental contamination by chemicals, specifically persistent organic pollutants (POPs). It mentions that GENASIS was created in cooperation with RECETOX and IBA MU, and is supported by the VaVpI CETOCOEN project. A link is provided for 'More information about the project'. To the right, there is a 'Data browser' section with a graphic of three charts. At the bottom, there are logos for the Ministry of the Environment of the Czech Republic and the Stockholm Convention on persistent organic pollutants (POPs).

GENASIS (Global *ENV*ironmental *AS*essment *IN*formation *S*ystem) provides a comprehensive information on contamination of the environment by chemicals, namely persistent organic pollutants (POPs).

GENASIS was created in cooperation of [RECETOX](#) with [IBA MU](#), institutes of the Masaryk University, Brno, Czech Republic. Design and administration of the portal are supported by VaVpI [CETOCOEN](#) project.

>> [More information about the project](#)

The GENASIS portal is guaranteed by the Ministry of the Environment of the Czech Republic and the Secretariat of the Stockholm Convention.

Ministry of the Environment  
of the Czech Republic

Stockholm Convention  
on persistent organic  
pollutants (POPs)

# Conclusions

- Always try to avoid data inconsistency:
  - format, units
  - measurement methods
- Small data sets are ruined by data inconsistency
- It is normally very hard to try to make inconsistent data consistent (by conversion factors etc.)
- Coordination and collaboration essential