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Mercury inventories: trends, highlights and lessons-learned

Jakob Maag, UNITAR – Istanbul, Turkey – 26 Mar 2019

Results – patterns observed

Source types present

Source types present	Bangla-desh	Guinea-Bissau	Maurita-nia	Mozam-bique	Samoa
Energy-related (oil, gas, etc.)	X	x	x	x	x
ASGM			X	X	
Industrial mining			X		
Cement klinker production	x			x	
Products	x	x	x	X	x
Open waste burning and dumping	x	X	x	X	X

Mercury inputs to society, kg Hg/(capita*y) – MA industrial gold div. by 3
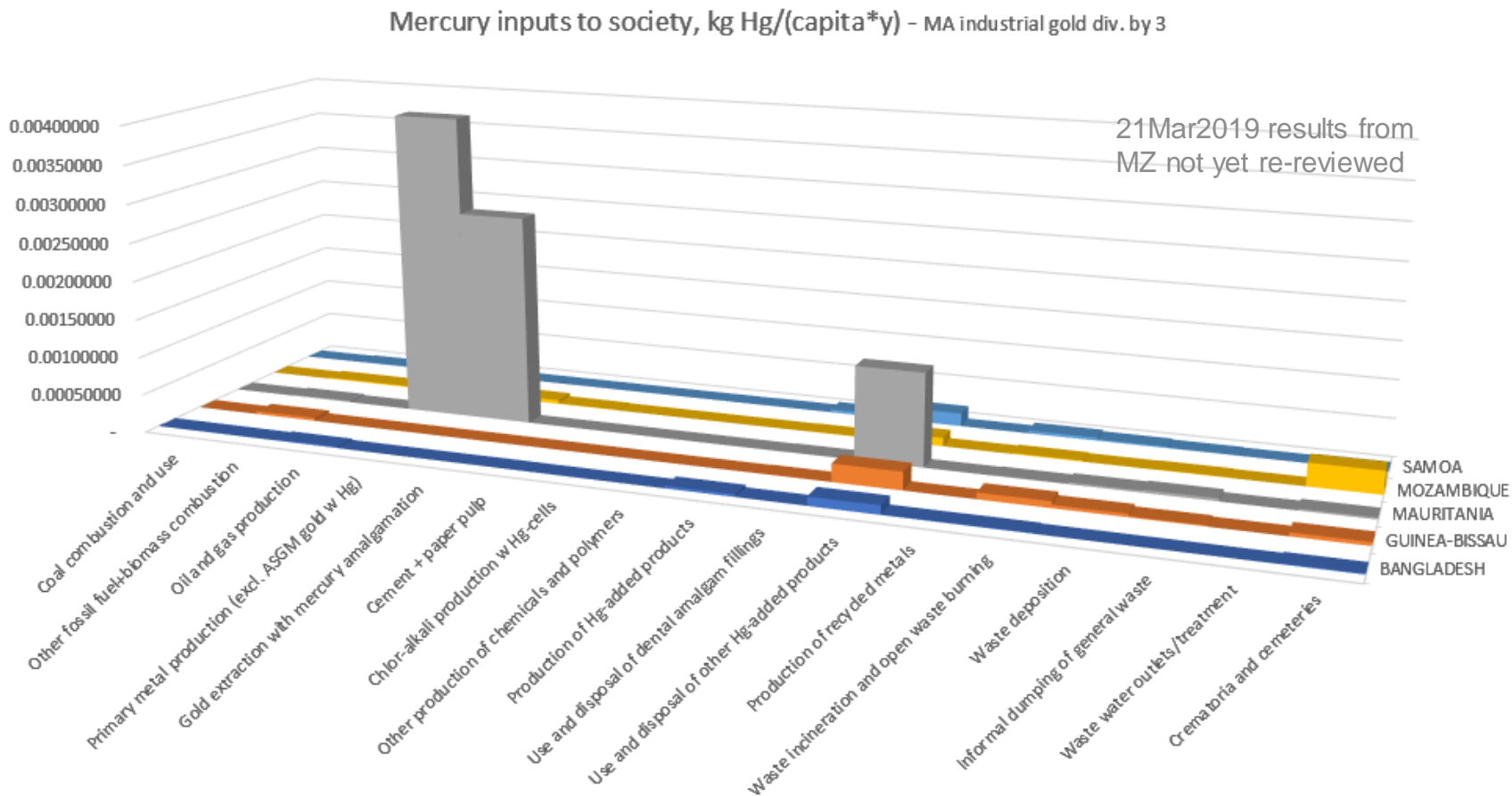
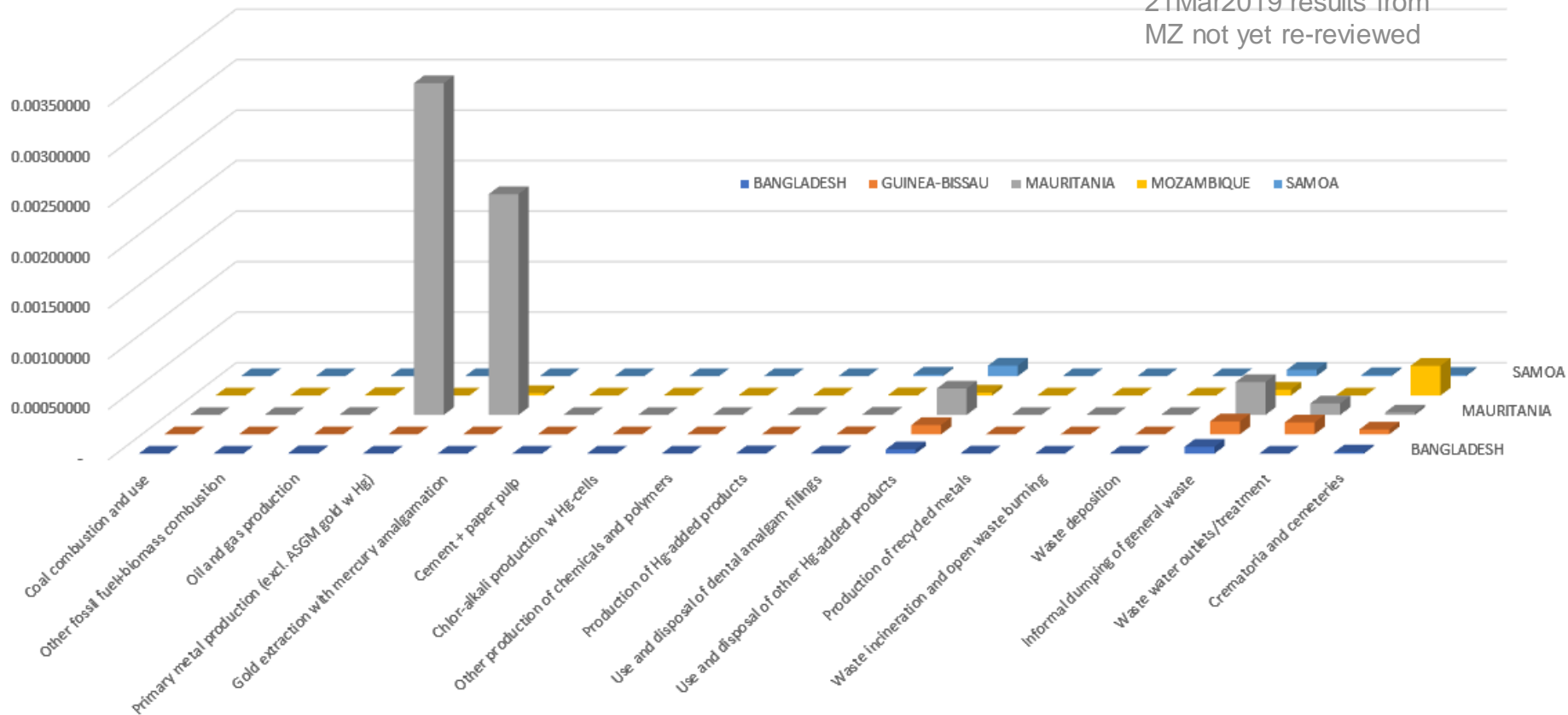21Mar2019 results from MZ not yet re-reviewed

21Mar2019 results from
MZ not yet re-reviewed


Mercury emissions to air, kg Hg/(capita*y) – MA industrial gold div. by 3
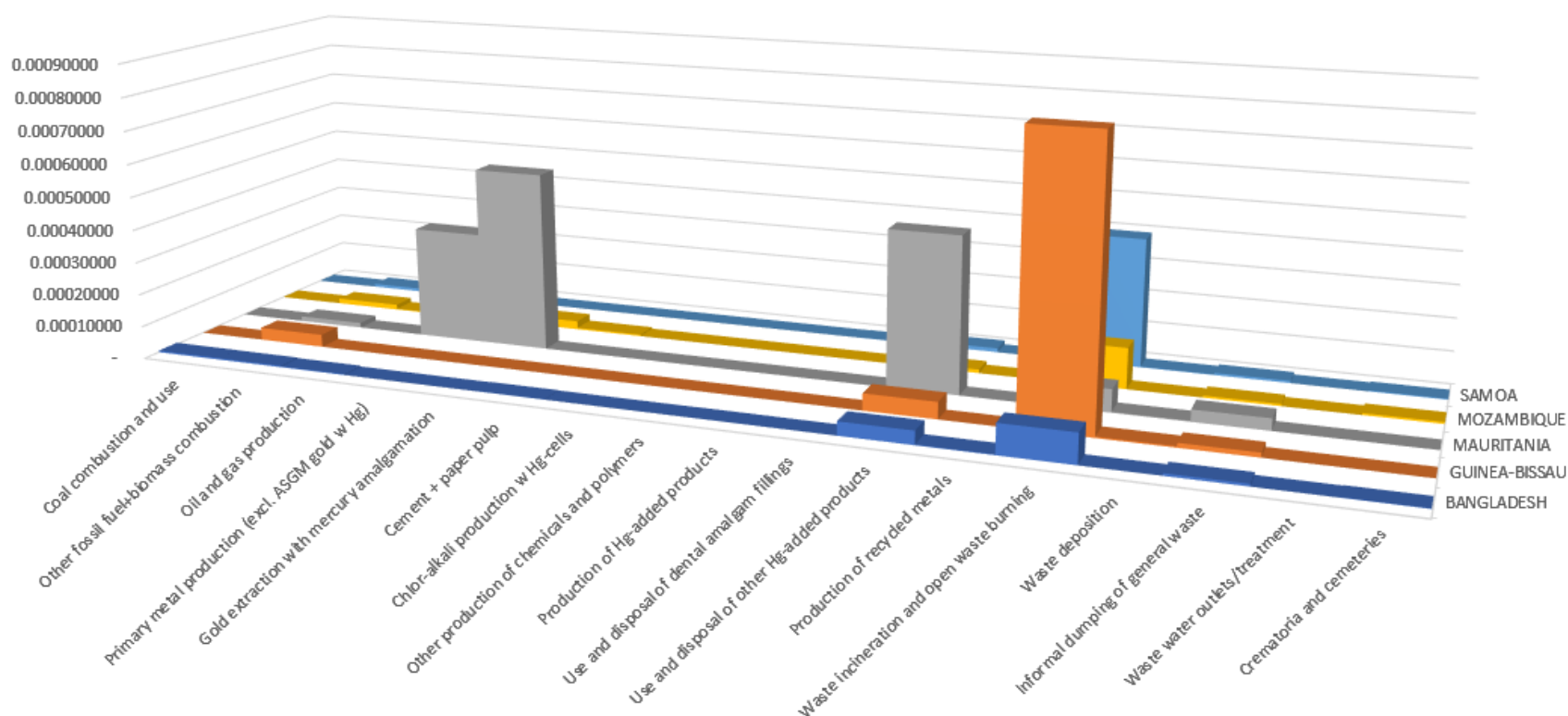
Mercury releases to water+land, kg Hg/(capita*y) – MA industrial gold div. by 3

21Mar2019 results from MZ not yet re-reviewed

Legend: BANGLADESH, GUINEA-BISSAU, MAURITANIA, MOZAMBIQUE, SAMOA

What we saw on charts:

- Industrial non-ferrous metal production and ASGM dominate, when they are present

- Other major sources are typically mercury-added products, open waste burning and informal dumping

    - Mercury-added products often underestimated due to lack of data

Mercury emissions to air, kg Hg/(capita*y) - MA industrial gold div. by 3
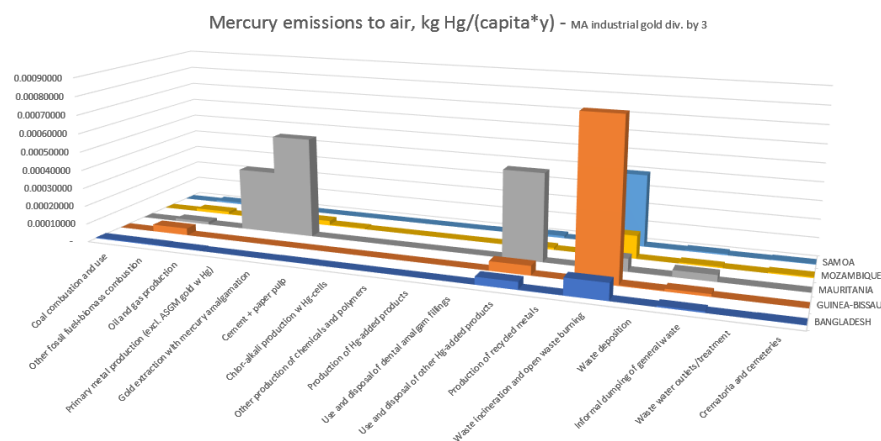
- Toolkit version differences: Waste input factors are under adjustment in the Toolkit

  - Implemented early in inventories for: SA, BD – reflected in MIA's

  - Not implemented in inventories for: MAU, G-B, MZ
    (but changed for MZ by JM 25MAR)

Lessons learned

- ## Lack of national data:
    - ### Consumption data for some products:
        - Thermometers, share of Hg-containing
        - Switches and relays
        - Polyurethane with Hg catalysts
        - Biocides/pesticides
        - Paints (preservatives)
        - Pharmaceuticals
        - Cosmetics (skin-lightening creams)
        - Blood pressure gauges + other manometers
        - Laboratory Hg uses
        - Religious uses
    - ### Resulting in <u>general underestimation of mercury inputs to society</u>

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- Lack of national data:
  - Mercury concentrations in waste + wastewater
    - Resulting in general overestimation of emissions/releases from waste treatment
  - Emission sources' filters and management solutions
  - National specific input and output factors
    - For improving accuracy
    - Only a few countries contributed with original factor data

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- Reasons for lack of national data:
    - Lack of trust from data owners
    - Data collection is time-consuming; resource-intensive
        - Face-to-face meetings, inspections, measurements
    - In-experienced data collectors
    - Not all inventory personnel received training

- ## Solutions:
  - Use international data, if available
  - Use approximations and assumptions, accept uncertainty
  - Assistance to collection of additional data in future updates/build-outs
    - Combined with additional training
  - National training sessions allow for inclusion of all key persons and stakeholders
  - Sufficient funding
  - National set-up: Include key data owners through small data search contracts

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- Incomplete products inventories

- Input factors for major emission sources, vary extensively in real world

  - For gold producing countries: Industrial gold production, Hg concentration in ores

- Input factors for waste and waste water

  - Virtually un-investigated in developing countries so far

Conclusions

✓ Basic training performed

✓ First rough baseline established

✓ Key priorities for implementation of Minamata Convention identified

✓ Key priorities for further research identified

- Improved products inventories
- Measurements of concentrations in
  - Industrial gold ores
  - Municipal solid waste
  - Other non-ferrous metal concentrates
- Measurements of mercury mass balances (fates) in same sectors/activities

THANK YOU FOR YOUR
ATTENTION

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