

Hg Inventory of releases – views from an environmental health perspective

**Comments on perceived current limitations and
opportunities in relation to health of humans and biota**

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How current NARAP actions assist Health Canada/agencies

- Improved release information –
 - Help focus attention on continued sources e.g., human exposure via **dental amalgam** route
 - Allow better focus on product-related exposure, e.g. **thermometer breakages** and indoor air Hg levels, Hg use in **jewelry** items and ‘**alternative health-products**’
 - identify areas/**communities** with potential elevated environmental Hg exposure (**Zacatecas** initiative)
 - **RESULTS: Communication of advice about risks, monitoring or surveillance of exposure**

Where opportunities exist for identifying links to Hg health risks

- Awareness of **magnitude of diffuse sources** (back-yard burning, land disposal of wastes) and the impact on atmospheric burdens & long-range transport
- **Time-trends in Hg** concentrations in soils/ sediments/ biota, and impact on marine and fresh-water food chains leading to humans
- **Land use changes** (de-forestation, dams, climate change effects) – especially ecosystem impacts on Hg in watersheds

Reasons to also focus on ‘big-picture’ issues - ecosystem changes and understanding of scientific mechanisms

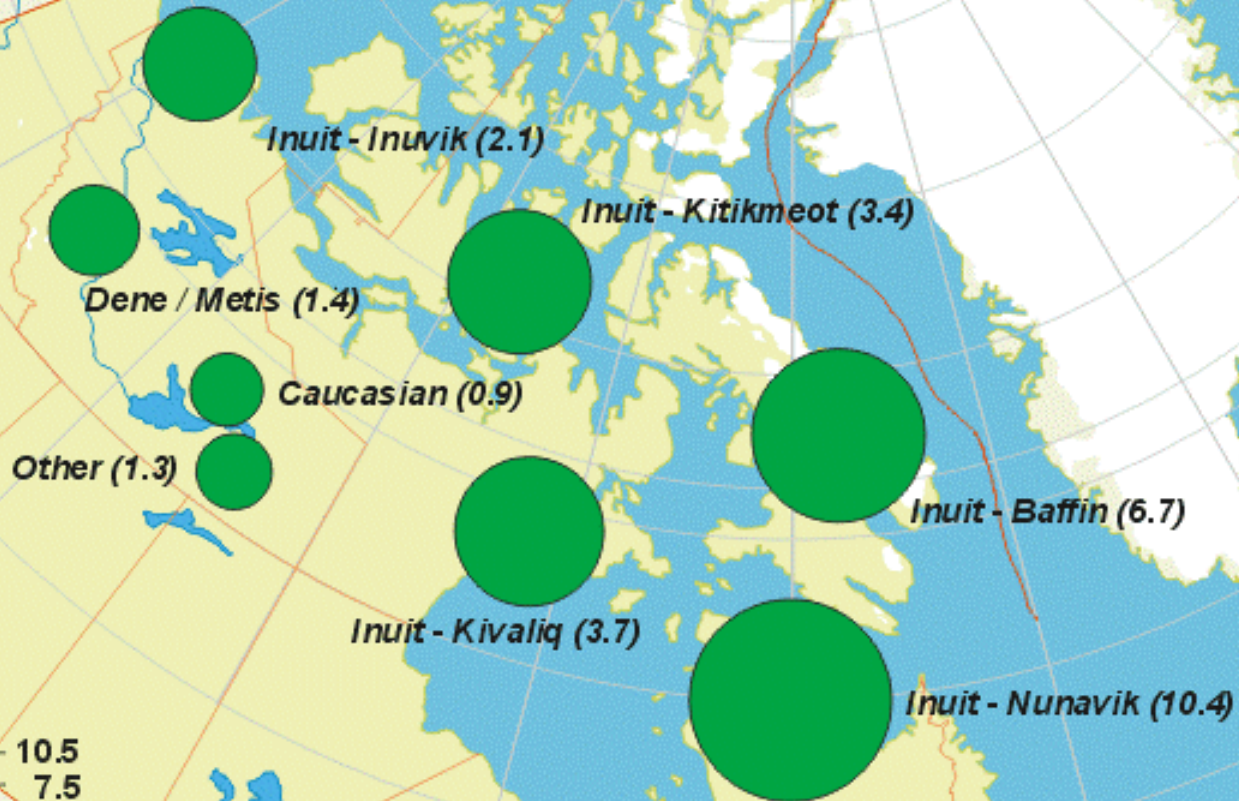
- Evidence from **Arctic and northern regions** -new AMAP Report on Arctic Pollution (2002) from 8 circum-polar nations + Canadian Arctic Contaminants Assessment Report, (in press)
- Evidence from research on **weather patterns and hemispheric Hg** transportation
- Evidence on **disruption to watersheds** and impact on Hg in biota/humans (Amazon and Quebec)

Recent Hg trends in the Arctic – from *Arctic Monitoring & Assessment Program and Canadian Arctic Contaminants Assessment Report, 2003*

- Next Three slides:
 - Recent study of blood-Hg levels in Inuit communities in Arctic Canada
 - Hg - margins of safety *re* Health Canada guidelines on ‘Tolerable daily intake’ (TDI) in humans
 - Trends in hair-Hg levels

Maternal Contaminant Levels in Arctic Canada

TOTAL MERCURY



Geometric Mean
(ug / L)

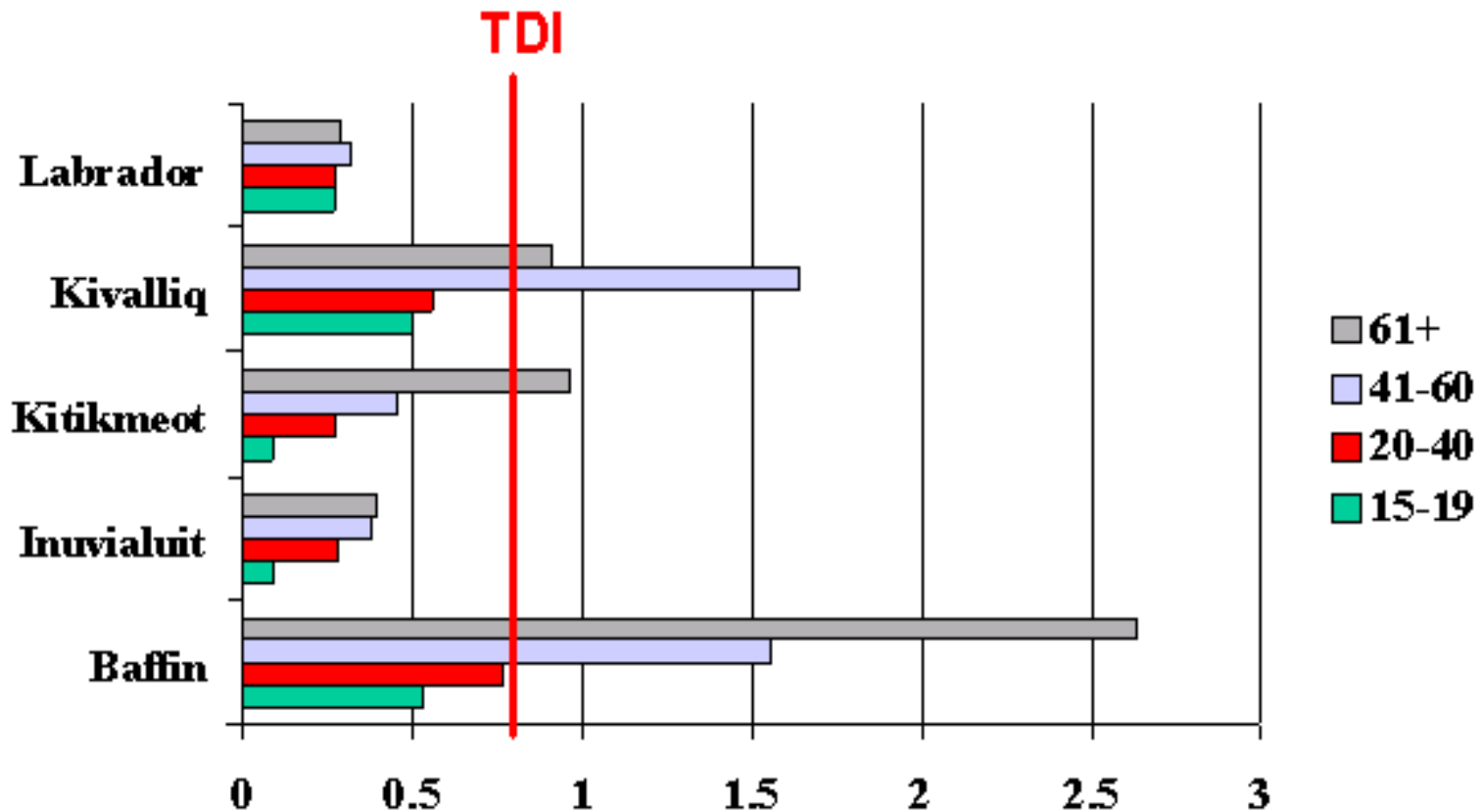
10.5
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Map Source ::
CDGI Geogratis Basemap [1:750M]

Design ::
ground.level.geographics

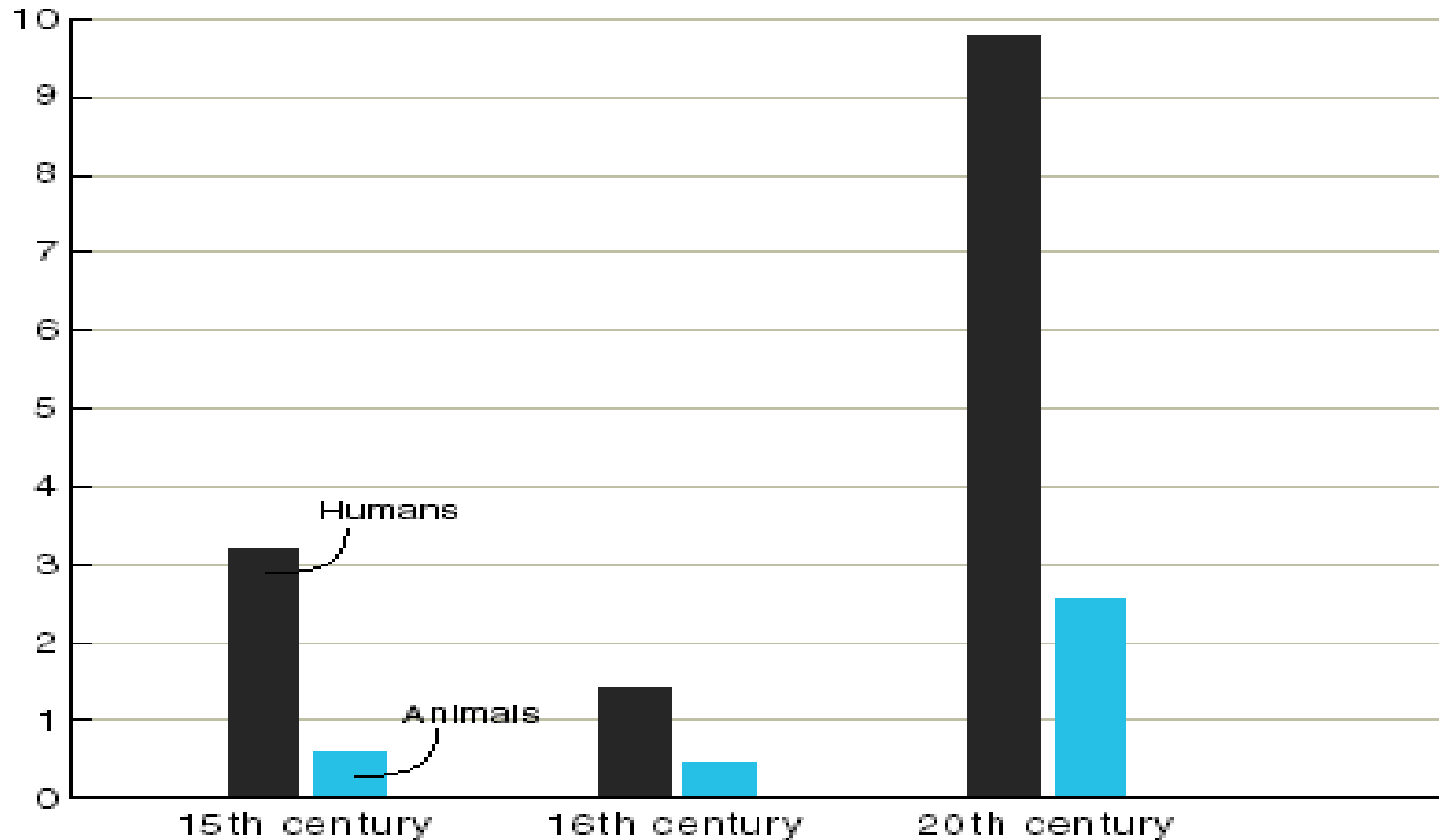
From Van Oostdam et al., Canadian Arctic Contaminants Assessment Report, (2003 in press)

Figure 5.1.5 Mean intake of Hg in different regions ($\mu\text{g}/\text{kg}/\text{d}$)



Trends for Hg in the North – how have things changed over centuries? (From: Arctic Pollution 2002, Arctic Monitoring and Assessment Program, Oslo, Norway)

Mercury concentration in hair, $\mu\text{g/g}$



Action on Hg

International

- Global report on Hg for Governing Council by UN Environment Programme (UNEP)

Regional

- UN ECE (Economic Commission for Europe) Protocol on long-range transport of metals - to be ratified. : USA and Canada + European nations
- NAAEC NARAP Phase II : Mexico USA, Canada
- AMAP – Arctic circumpolar nations

National & Local

- e.g. Canada has “Canada-wide Standards” action

Link to new NARAP Activities

- North American Regional Action Plan on Environmental Monitoring and Assessment
 - approved June 2002 – **implementation Task Force** members being assembled [governments / academia / NGO / aboriginal members]
 - To **include Hg** as well as other substances
 - To **include biota and human health** components
 - **Leveraging of funds** is a critical part – reliant on ‘buy-in’ from governments/other funding agencies

Issues with impacts on human and biota exposure to Hg [Ecosystem health perspectives]

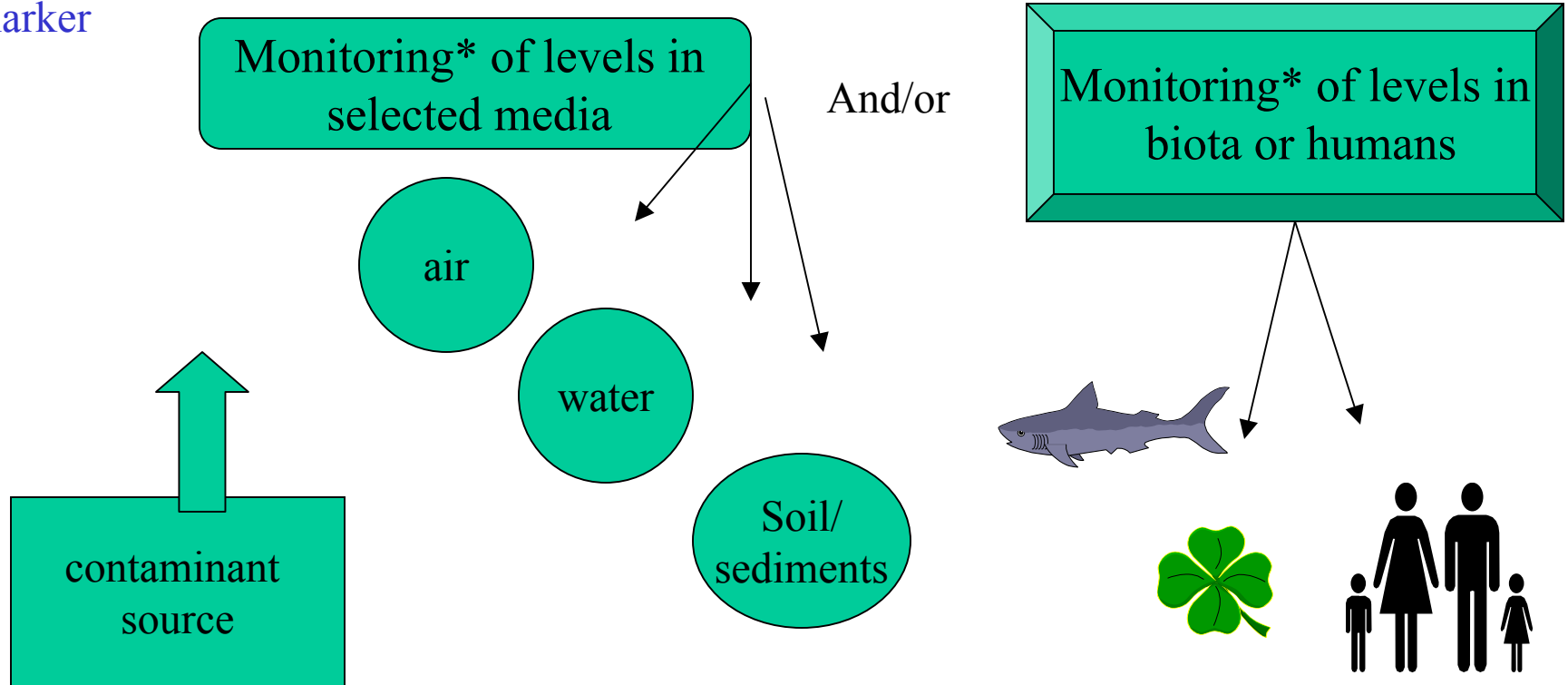
- **Fluxes to aquatic ecosystems**
 - De-forestation or land-use changes in watersheds (dams etc.)
 - Increased Hg run-off from soils to water (& Hg release to atmosphere)
- **Fluxes between aquatic food-chains and biota / humans**
 - Increased methylation of Hg = rise in Hg levels in fish (food-chain or gill-transfer)

Schematic of a possible regional monitoring process for PBTs

Choose appropriate medium or species or bio-marker

Environmental monitoring aims

Aims related to health status/trends in ecosystems, biota or humans



*Harmonization / tie-in with existing national programs where possible

Need for more science/research?

- **Yes, because (I):**
 - Ensure we are maximizing efforts to reduce exposure to humans and to susceptible biota (if incremental decreases in atmospheric releases not so important vs. other fluxes)
 - Lessons learned in N. American region can be passed to other global regions where institutional / financial capacity for such research is less feasible.

Need for more science/research?

- Yes, because (II):
 - Analytical methods for measuring complex species present in different media (air, water, soil, biota) are improving / becoming possible.
 - Current knowledge suggests need for great care in interpretation of older literature – given new findings and understanding about chemical species of mercury [big impact on modelling].

Need for more science/research?

- Yes because (III):
 - North America includes northern/arctic region where Hg accumulation in environment, biota and humans continues to cause concern
 - Magnitude of non-point sources (combustion) may be important for Hg releases, but are difficult to quantify