Global monitoring of human exposure to mercury and its compounds: are we ready?

Irina Zastenskaya, Carolyn Vickers, Dorota Jarosinska
WHO European Centre for Environment and Health
WHO Headquarters
Mercury HBM at global level

- **WHO:** HBM is a reliable method
  - to assess exposure,
  - to identify populations at risk
  - to plan targeted risk reduction measures
  - to evaluate effectiveness
  - to assess spatial and temporal trend

- **Minamata Convention:**
  (art 19)
  b) Modelling and geographically representative monitoring of levels of mercury and mercury compounds in vulnerable populations
  d) Harmonized methodologies for the activities undertaken under subparagraphs (a), (b) and (c)
  (art 22)
  2. … trends in levels of mercury and mercury compounds observed in biotic media and vulnerable populations
Harmonized approach

Benefits

• Comparable and reliable data
• Knowledge about population at risk at global and national level
• Effective use of human, technical and financial recourses
• Evaluation of risk reduction measures geographically and temporally

Challenges

• Cultural difference
• Ethical considerations
• Readiness (laboratory capacity and competence)
• Possibility to incorporate in existing national programmes
Development of harmonized approach
The pilot surveys

Training and document adaptation

Recruitment and field work, Q survey

Transportation and analysis

Database and statistics

Protocol

250 women
Last trimester of pregnancy

At global and national level,
Comparative study

Two week before delivery
Sampling (hair, cord blood, urine

In national and reference laboratory
Mirror analysis

World Health Organization
Organisation mondiale de la Santé
Weltgesundheitsorganisation

250 women
Last trimester of pregnancy

At global and national level,
Comparative study

Two week before delivery
Sampling (hair, cord blood, urine

In national and reference laboratory
Mirror analysis

World Health Organization
Organisation mondiale de la Santé
Weltgesundheitsorganisation
Feasibility of the methodology implementation

<table>
<thead>
<tr>
<th>Country</th>
<th>Hair</th>
<th>Cord blood</th>
<th>Urine</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Ghana</td>
<td>240</td>
<td>59</td>
<td>215</td>
</tr>
<tr>
<td>India</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>107</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>Mongolia</td>
<td>265</td>
<td>265</td>
<td>265</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>252</td>
<td>252</td>
<td>252</td>
</tr>
</tbody>
</table>

Surveys were implemented in 6 from 7 pilot countries.
Global monitoring of human exposure to mercury and its compounds: are we ready?

At global level

YES

It is feasible to conduct mercury monitoring globally

In each region and country

- Capacity building is needed: epidemiologists and laboratories
HBM: filling data gaps, matrices

- Existing inter/national, longitudinal studies continue to be used
- Fill critical data gaps in SIDS, Africa, Asia with targeted studies
- Focus on most vulnerable population – foetal exposure to MeHg
- WHO protocol for maternal hair and as an alternative cord blood
- Most efficient way to fill gaps, method has been demonstrated in developing countries