



# **Research on assessment of mercury impact on population health in Bornuur and Jargalant soums of Tuv aimag (2008-2012)**

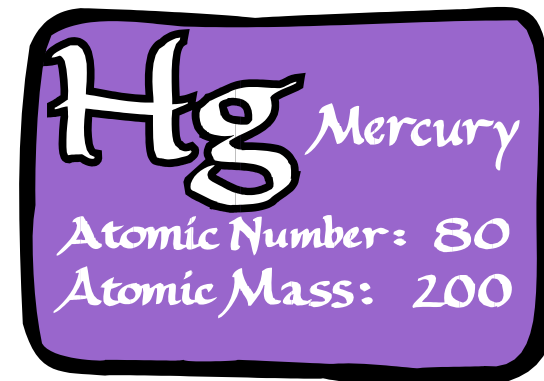
National Public Health Center  
Toxicology sector

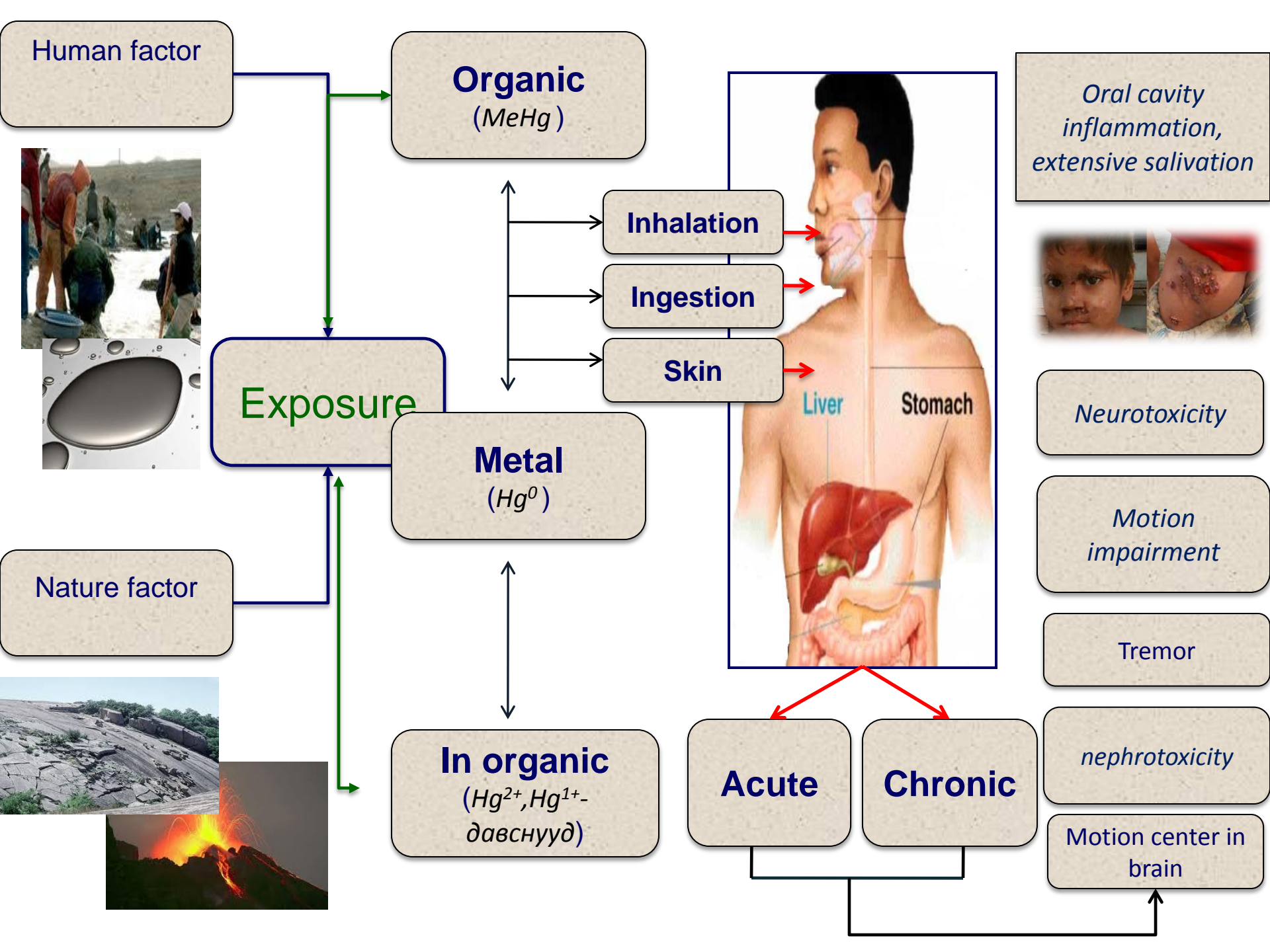
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# TYPES OF MERCURY



- Mercury exists in 3 types in the nature:
- metal
- Non-organic
- Organic





# HBM = Human Bio-Monitoring threshold levels for human urea and blood

	Hg level in blood (µg/L)	Hg level in urea (µg/L)	Hg level in urea (µg/L) (creatinin)	Hg level in hair (µg/L)	
<b>Lower than HBM I-</b>	<b>0-5</b>	<b>0-7</b>	<b>0-5</b>	<b>0-1 (*)</b>	<b>Normal</b>
<b>In between HBM I- HBM II</b>	<b>5-15</b>	<b>7-25</b>	<b>5-20</b>	<b>1-5 (*, **)</b>	<b>Warning level</b>
<b>Exceeding HBM II-</b>	<b>&gt; 15</b>	<b>&gt;25</b>	<b>&gt; 20</b>	<b>&gt; 5 (**)</b>	<b>High</b>

# Researches on mercury exposure

- WHO Field Mission to Study Health Effects related to an Environmental Emergency in Khongor Soum. Mongolia **2008**
- Field Mission To Study Health Effects Related To Mercury From Small Scale Gold Mining In Bomuur And Jargalant Soum **2008-2012**
- Field Mission To Study Health Effects Related To Mercury In Bayankhongor Aimag **2008, 2013**
- Study on Health Effects Related To Mercury exposure In Umungobi Aimag, **2009**
- Re-Survey Study Report For Environmental Pollution In Khongor Soum, Darkhan-Uul Province, **2010**
- Study report on health impacts of mercury among the mothers with chronic pathological anamnesis and mothers with children aged 0-5years old in Umnugobi Aimag, **2011**
- REFERENCE VALUE OF MERCURY IN BLOOD AND URINE OF MONGOLIAN PEOPLE, **2012**

## Number of participants in %-age by HBMI & HBMI levels for urine Hg analysis, 2008 & 2012 studies

	HBMI (%)		HBMI (%)		Total participants Nr_Env	Total participants Nr_Occup	Total participants Nr
	Env	Occup	Env	Occup			
<b>2008</b>	8.7	17.5	2.2	1.6	92	63	155
<b>2012</b>	2.5	9.3	0.0	2.3	40	43	83

# Mean Hg in urine samples from residents of Bornuur, Jargalant villages

	Urine Hg mean content $\mu$ /ml			
	Mining area /Jargalant & Bornuur/			
	Occupational exposure	Environmental exposure	Control group (Khushaat)	Reference level
2008 <sup>a,b</sup>	5.70	4.78	0.15	-
2012	1.17	0.51	0.25	
Reference level Mongolian <sup>c</sup>				
HBMI (Health based) <sup>d</sup>				7
HBMII (health based) <sup>d</sup>				25

<sup>a</sup>Jennifer B. et al., Minerals 2011, 1, 122-143

<sup>b</sup>Nadine S. et al., Science of the Total Environment 409 (2011) 994–1000

<sup>c</sup>Ichinkhorloo B., et al., Study report, Toxicology center, NPHC, Ministry of Health, Mongolia, WHO 2012

<sup>d</sup>Schulz C. et al., Int. J. Hyg. Environm. Health 210 (3-4):373-382

## Mean Hg in blood samples from residents of Bornuur, Jargalant villages

	Blood Hg mean content $\mu$ /ml			
	Mining area /Jargalant & Bornuur/			
	Occupational exposure	Environmental exposure	Control group (Khushaat)	Reference level
2008 <sup>a,b</sup>	0.55	0.33	0.24	-
2012	0.34	0.38	0.7	
Reference level Mongolian <sup>c</sup>				
HBMI (Health based) <sup>d</sup>			5	
HBMI (health based) <sup>d</sup>			15	



# CONCLUSION

1. The assessments of mercury impact on population health in Bornuur and Jargalant soums of Tuv aimag, conducted 2008-2012 shows that Hg levels in human biosamples in Jargalant and Bornuur soums has tendency to decrease in coherence with government policies toward restriction licenses, environmental restoration operations and band for Hg usage.
2. Hg level in blood, which is marker for chronic exposure keeps same which is related to Hg use (legal and hidden)
3. Alternative healthy, environmentally friendly, safe and sustainable livelihood resources needed to be elaborated for ASM
4. People who had chronic exposure to Hg needed to have health service assessment.

**THANK YOU**