Additional files

Additional file 3 – Human biomonitoring concentrations and categorization into exposure limit values

Human biomonitoring	Subgroups	
	Controls	**Occupationally exposed**
Hg in urine*	n=91	n=181
Mean (µg/l)	0.3	91.3
Median (µg/l)	<LOD	26.1
Range (min.-max.) (µg/l)	<LOD - 8.8	<LOD - 1,530.3
95thpercentile (µg/l)	1.3	376.9
Hg in urine, exposure limit values (p<0.001)		
Below HBM I	90 (99%)	38 (21%)
Between HBM I and HBM II	1 (1%)	49 (27%)
Between HBM II and BAT	0 (0%)	7 (4%)
Above BAT	0 (0%)	87 (48%)
Hg in urine corrected for creatinine (crea.)*	n=80	n=181
Mean (µg/g crea.)	0.2	58.3
Median (µg/g crea.)	<LOD	25.8
Range (min.-max.) (µg/g crea.)	<LOD - 3.6	<LOD - 666.9
95th percentile (µg/g crea.)	1.1	214.5
Hg in urine (crea.), exposure limit values (p<0.001)		
Below HBM I	80 (100%)	32 (18%)
Between HBM I and HBM II	0 (0%)	47 (26%)
Between HBM II and BAT	0 (0%)	9 (5%)
Above BAT	0 (0%)	93 (51%)
Hg in blood*	n=48	n=152
Mean (µg/l)	0.5	18.5
Median (µg/l)	0.4	11.4
Range (min.-max.) (µg/l)	<LOD - 1.9	<LOD - 100.8
95thpercentile (µg/l)	1.7	58.0
Hg in blood, exposure limit values (p<0.001)		
Below HBM I	48 (100%)	34 (22%)
Between HBM I and HBM II	0 (0%)	56 (37%)
Between HBM II and BAT	0 (0%)	52 (34%)
Above BAT	0 (0%)	10 (7%)
Hg in hair*	n=79	n=158
Mean (µg/l)	0.2	8.9
Median (µg/l)	0.1	3.3
Range (min.-max.) (µg/l)	0.1 - 3.3	0.3 - 112.2
95thpercentile (µg/l)	0.3	34.0
Hg in hair, exposure limit values (p<0.001)		
Below HBM I	77 (97%)	18 (11%)
Between HBM I and HBM II	2 (3%)	84 (53%)
Between HBM II and BAT	0 (0%)	56 (35%)

Data sources: The data were taken from the Global Mercury Project (GMP) conducted by UNIDO in Zimbabwe in 2004 [1, 2], and from a health and biomonitoring project focusing on women of child-bearing age and their infants conducted by the University of Munich (LMU; Germany) in Zimbabwe in 2006 [3]. HBM I and II for blood and urine were taken from the Commission for Human Biomonitoring of the German Federal Environment Agency [4-6]; BAT for blood and urine were taken from the German Research Foundation [7]. HBM I for hair was derived by Drasch et al. [8] from the U.S. EPA benchmark limit [9]. HBM II for hair was derived by Drasch et al. [8] from the HBM II value for blood [4-6] together with results from the Seychelles study [10].

*LOD: The limit for determining total mercury in urine and blood was 0.20 µg/l, and 0.02 µg/g in hair related to a 100 mg hair sample. Values below the detection threshold were included in the statistical analyses with one-half the detection threshold.

** A sum of less than 100% is due to rounding.

References

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