

Heavy Metals Surveillance in Michigan: Sixth Annual Report (January – December 2011)

Additional Information Available at: www.michigan.gov/mdch-toxics and www.oem.msu.edu

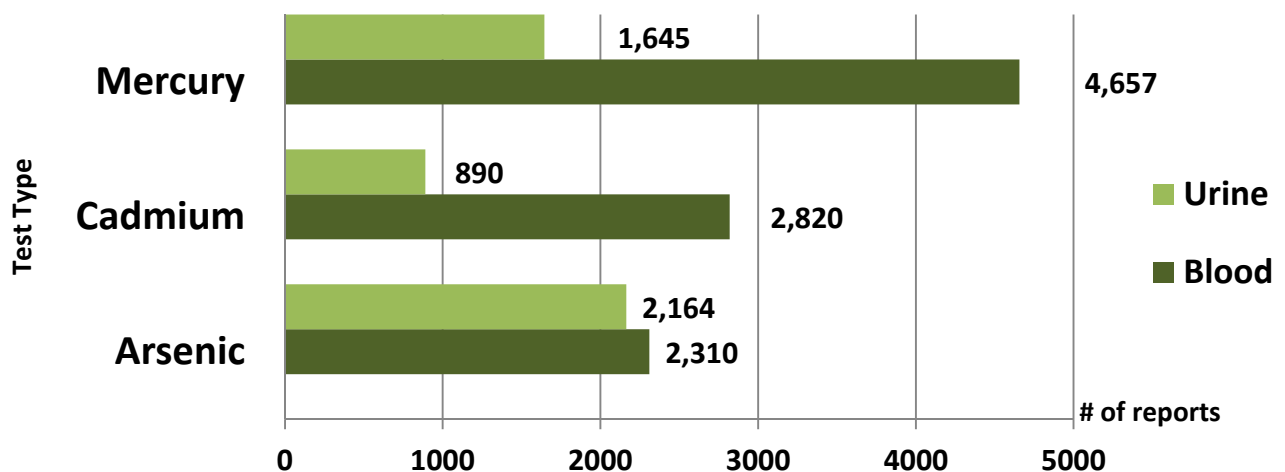
Background

In September 2005, The Michigan Department of Community Health promulgated rules requiring clinical laboratories to report all clinical test results of arsenic, cadmium, and mercury in blood and urine, under the statutory authority of the Public Health Code. The reporting requirement was established so that MDCH could improve the tracking and prevention of the impacts on human health of environmental and occupational exposures to these heavy metals. Individuals with results exceeding action thresholds are interviewed to determine the source of exposure to the metal and assess if public health interventions are warranted. MDCH and Michigan State University partner to collect, analyze, and respond to reports from the laboratories.

2011 Results: Laboratory reporting of clinical tests for arsenic, cadmium and mercury

- 14,547 reports were received on 6,734 individuals from 12 labs.
- 15.8% of the individuals had testing done for one metal only; the other 84.2% were tested for two or three of the metals at the same time.
- 72 individuals, including 1 child under the age of 16, had a result that exceeded one of the established action thresholds.
- More men (60.0%) were tested than women (40.0%).

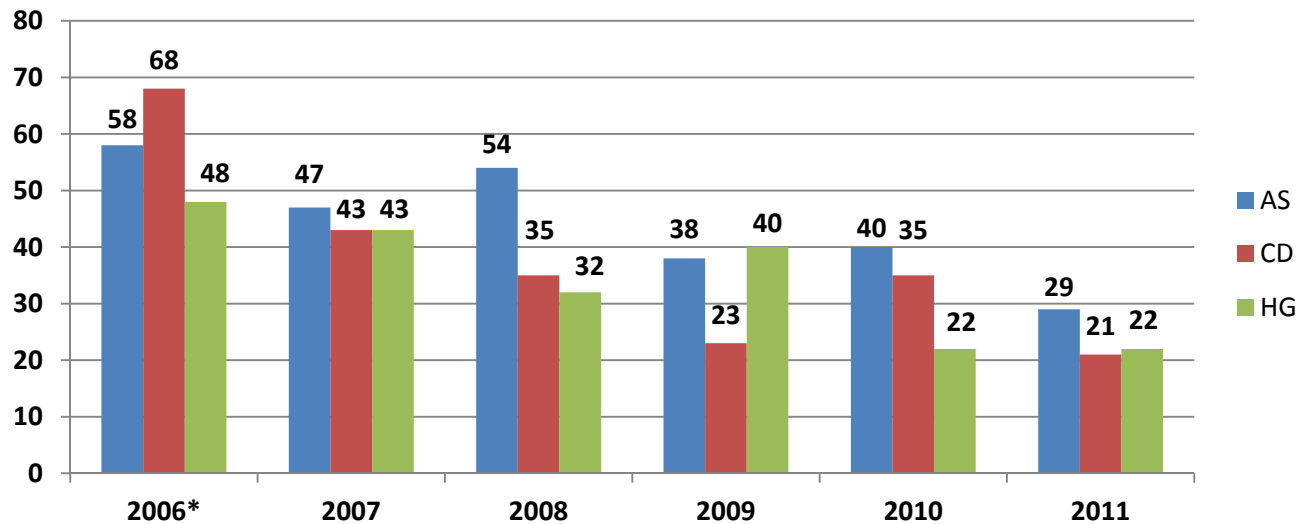
Breakdown of reports by test and specimen type, Michigan 2011*



*Test type and/or specimen type was missing for 61 (0.42%) of the total number of reports (n=14,547).

2006-2011: Individuals exceeding action thresholds

Number of individuals exceeding the Arsenic, Cadmium and Mercury Action Threshold, Michigan 2006 – 2011



*The reporting period for the year 2006 spans 10/25/2005 through 12/31/2006.

AS – Arsenic Blood Threshold Level is $>70 \mu\text{g/L}$. Arsenic Urine Threshold Level in Adults is $\geq 100 \mu\text{g/L}$ and in Children $\geq 50 \mu\text{g/L}$.

CD – Cadmium Blood Threshold Level is $>5 \mu\text{g/L}$, and Cadmium Urine Threshold Level is $>2 \mu\text{g/L}$ or $>3 \mu\text{g/g}$ creatinine.

HG – Mercury Blood Threshold Level in Adults is $>15 \mu\text{g/L}$ and in Children $>10 \mu\text{g/L}$. Mercury Urine Threshold Level in Adults is $>20 \mu\text{g/L}$ or $>35 \mu\text{g/g}$ creatinine and in Children $>10 \mu\text{g/L}$.

Exposure was identified from interviews with 392 individuals. Fish consumption was the likely cause of elevated arsenic or mercury in 80%, and work exposure was the source of elevated arsenic, cadmium or mercury in 9%.

Heavy Metals Poisoning Narratives

Examples of Occupational Exposures:

- Ten individuals working at a facility that performed cadmium plating were exposed to elevated cadmium air levels.
- Five individuals employed by an electrical switch and relay manufacturer had elevated mercury blood levels.
- Six individuals working in a different cadmium plating department than the one identified in 2007 had elevated cadmium urine levels.
- One individual working for a recyclable material wholesaler had an elevated blood mercury level.

Examples of Environmental Exposures:

- A three-year-old child accidentally ingested a mercury-containing “pill” that had been brought from India in some lentils to keep bugs away. The child’s blood mercury level was three times higher than our action threshold.
- A fifty-three-year old Chinese immigrant had an elevated blood and urine mercury level from using a Chinese face cream with very high mercury content.
- A fifty-one-year old male who ate tuna for lunch five days a week had an elevated blood mercury level.