

Heavy Metals Surveillance in Michigan: Eighth Annual Report (January – December 2014)

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

Background

In September 2005, The Michigan Department of Health and Human Services 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 MDHHS 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. MDHHS and Michigan State University partner to collect, analyze, and respond to reports from the laboratories. Since 2012 statistics have been compiled only on reports with test values that are at or above the action threshold.

2014 Results: Laboratory reporting of clinical tests for elevated arsenic, cadmium and mercury

- 126 reports with levels above the action threshold were received from five laboratories.
- 84 individuals, including 10 children under the age of 16, had a result that exceeded one of the established action thresholds. One individual had elevated levels of two different types of metals. Eight children had elevated blood or urine mercury levels, and two children had elevated blood or urine cadmium levels.
- Sixty-four percent of these individuals were males.

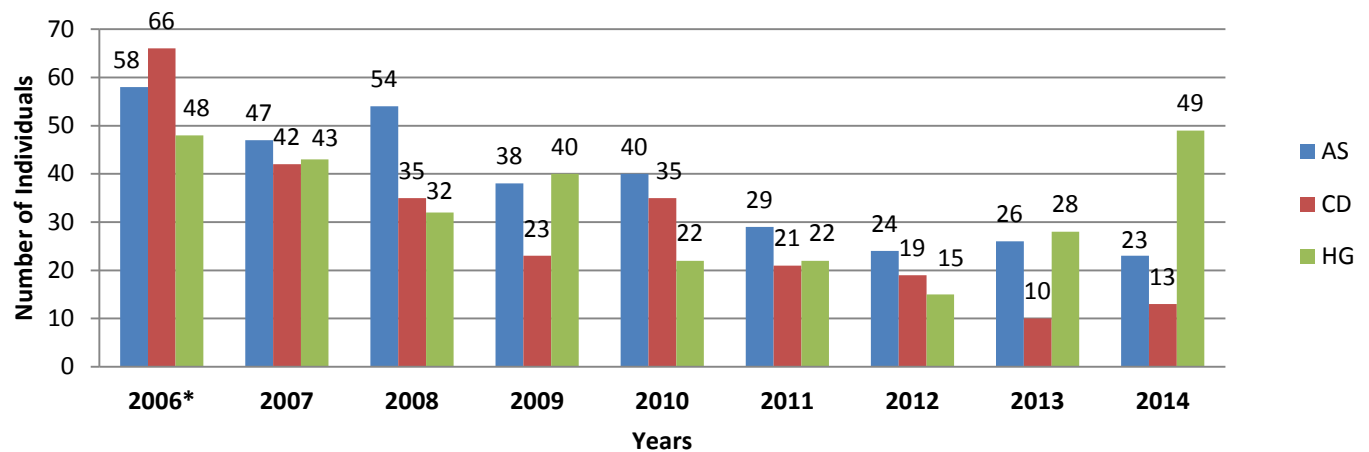


Number of Individuals with Elevated Arsenic, Cadmium or Mercury Levels by Gender and Age Group, Michigan 2014

| Age Group | Gender | |
|--------------|-----------|-----------|
| | Male | Female |
| < 16 | 8 | 2 |
| 16 - 65 | 38 | 24 |
| 65 + | 8 | 4 |
| Total | 54 | 30 |

2006-2014: Individuals exceeding action thresholds

Number of Individuals Exceeding the Arsenic, Cadmium and Mercury Action Threshold, Michigan 2006 - 2014



*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 $>10 \mu\text{g/L}$.

When the source of exposure was determined, fish consumption was the likely cause of elevated arsenic or mercury in 76.4% individuals, and work exposure was the source of elevated arsenic, cadmium or mercury in 8.7% individuals.

Heavy Metals Poisoning Narratives

Examples of Occupational Exposures:

- 2007 - Ten individuals working at a facility that performed cadmium plating were exposed to elevated cadmium air levels.
- 2007 - Five individuals employed by an electrical switch and relay manufacturer had elevated mercury blood levels.
- 2008 - Six individuals working in a different cadmium plating department than the one identified in 2007 had elevated cadmium urine levels.
- 2009 - One individual working for a recyclable material wholesaler had an elevated blood mercury level.
- 2013 - One individual working in a college's lab unintentionally ingested mercury and had an elevated blood mercury level.

Examples of Environmental Exposures:

- 2007 - 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.
- 2008 - 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.
- 2011 - A fifty-one-year old male who ate tuna for lunch five days a week had an elevated blood mercury level.
- 2012 - A twenty-year old male who ate tuna up to ten times per day as a part of his body building diet had an elevated blood mercury level.
- 2014 - A sixty-five-year old male who ate salmon and trout four times a week from Lake Michigan had an elevated blood mercury level.