

Heavy Metals Surveillance in Michigan: Seventh Annual Report (January 2012 – December 2013)

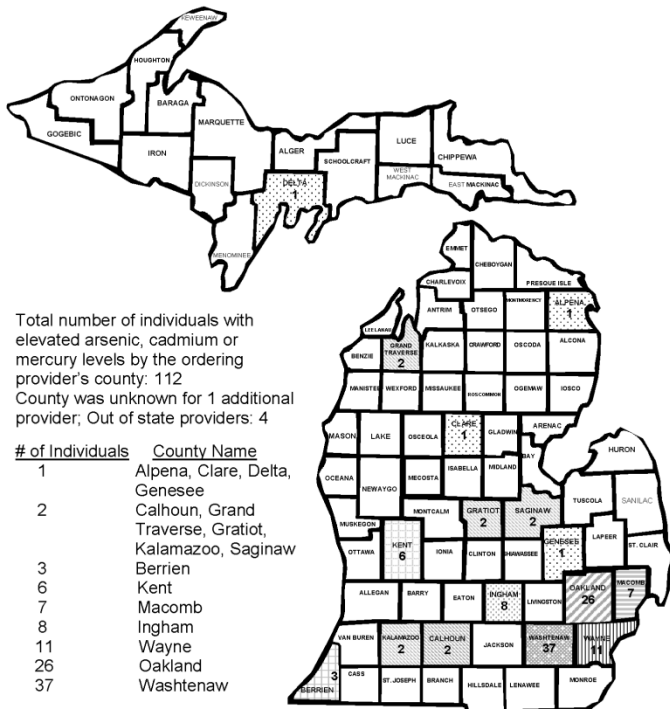
Additional Information Available at: www.michigan.gov/mdch-toxics and www.oem.msu.edu

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. Since 2012 statistics have been compiled on only reports with test values that are at or above the action threshold.

2012 and 2013 Results: Laboratory reporting of clinical tests for elevated arsenic, cadmium and mercury

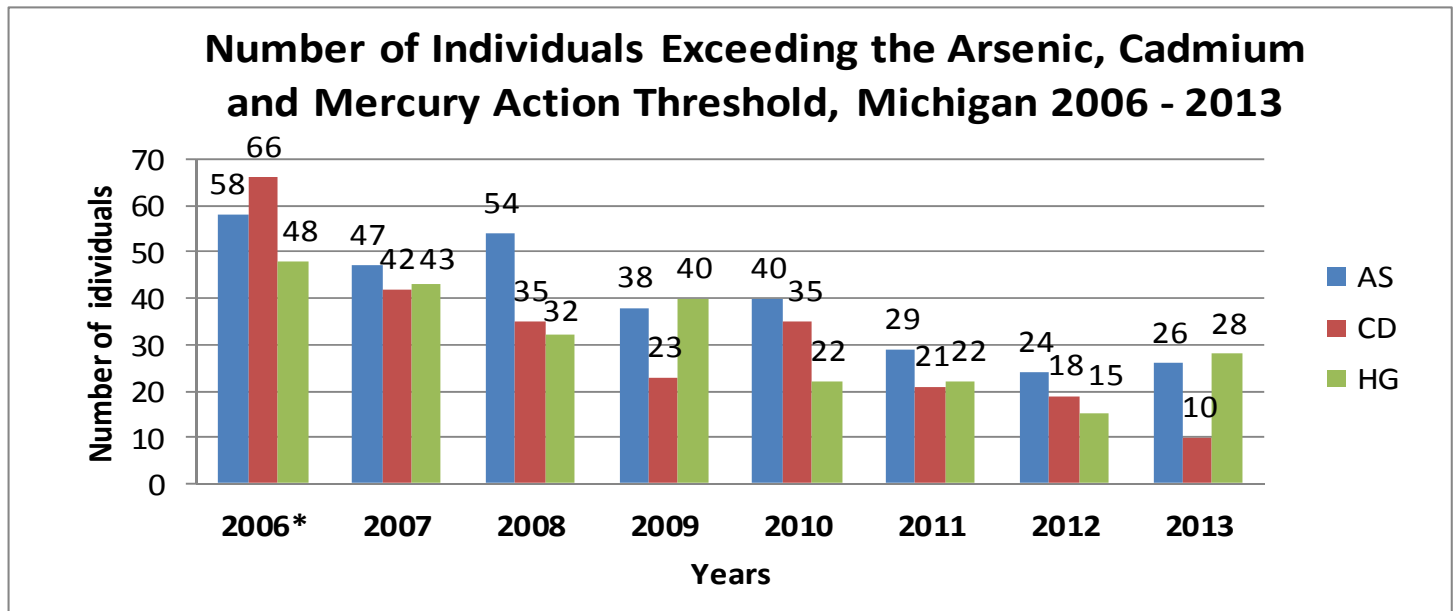
- 79 reports in 2012 and 81 in 2013 with levels above the action threshold were received from seven laboratories.
- 57 individuals in 2012 and 64 in 2013, including 3 children under the age of 16, had a result that exceeded one of the established action thresholds. Four individuals had elevated levels in both years, thus there were 117 different individuals when both years are combined.
- In 2012, 72% of these individuals were male, and in 2013, 63% were male.



Number of Individuals with Elevated Arsenic, Cadmium or Mercury Levels by Gender and Age Group, Michigan 2012-2013

Age Group	Gender	
	Male	Female
< 16	3	0
16 - 65	61	31
65 +	14	8
Total	78	39

2006-2013: Individuals exceeding action thresholds



*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 446 individuals. Fish consumption was the likely cause of elevated arsenic or mercury in 81.6%, and work exposure was the source of elevated arsenic, cadmium or mercury in 9.2%.

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 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.