

# Heavy Metals Surveillance in Michigan: Ninth Annual Report (January 2015 – December 2016)

Additional Information Available at: [www.michigan.gov/mdch-toxics](http://www.michigan.gov/mdch-toxics) and [www.oem.msu.edu](http://www.oem.msu.edu)

## Background

In September 2005, The Michigan Department of Health and Human Services (MDHHS) 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.

## 2015 and 2016 Results: Laboratory reporting of clinical tests for elevated arsenic, cadmium and mercury

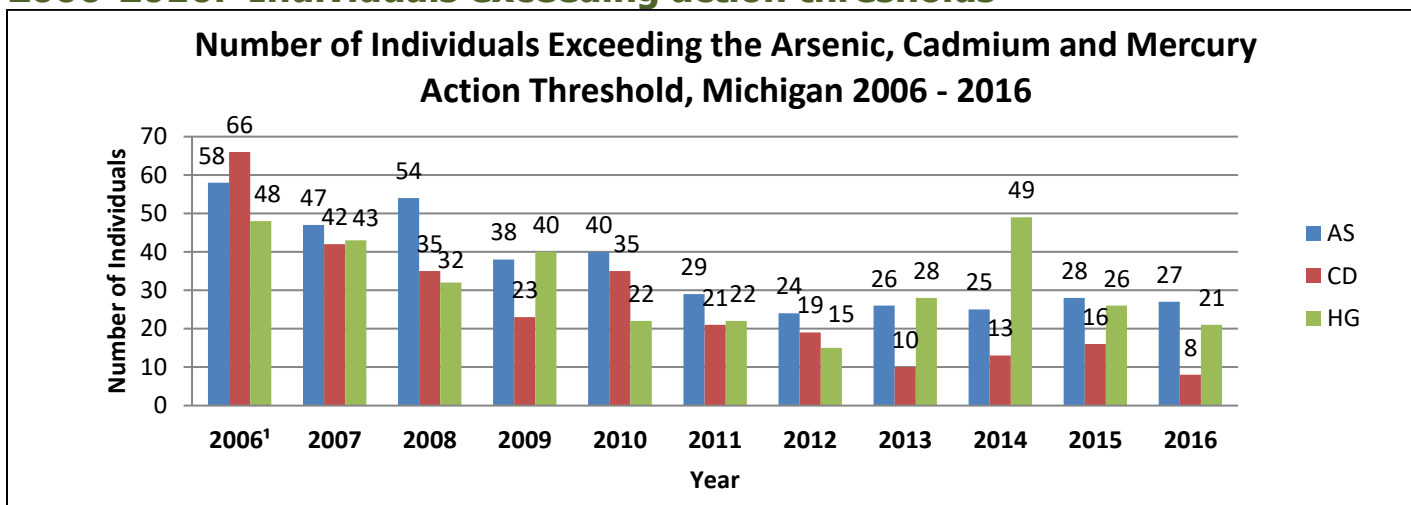
- 91 reports in 2015 and 69 reports in 2016, with levels above the action threshold, were received from seven laboratories.
- 70 individuals in 2015 and 56 individuals in 2016, including three children under the age of 16, had a result that exceeded one of the established action thresholds. Five individuals had elevated levels in both years and one individual had elevated levels of two different types of metals in one calendar year, thus there were 120 different individuals when both years combined. Three children had elevated urine arsenic level.
- In 2015, 75.7% and in 2016 42.9% were men.



Number of Individuals with Elevated Arsenic, Cadmium or Mercury Levels by Gender and Age Group, Michigan 2015 -2016

Age Group	Gender	
	Male	Female
< 16	3	0
16 - 65	47	37
> 65	24	9
Total	74	46

## 2006-2016: Individuals exceeding action thresholds



<sup>1</sup>The reporting period for the year 2006 spans 10/25/2005 through 12/31/2006.

AS – Arsenic Blood Threshold Level is >70 µg/L. Arsenic Urine Threshold Level in Adults is ≥100 µg/L and in Children ≥50 µg/L.

CD – Cadmium Blood Threshold Level is >5 µg/L, and Cadmium Urine Threshold Level is >2 µg/L or >3 µg/g creatinine.

HG – Mercury Blood Threshold Level in Adults is >15 µg/L and in Children >10 µg/L. Mercury Urine Threshold Level in Adults is >20 µg/L or >35 µg/g creatinine and in Children >10 µg/L.

When the source of exposure was determined, fish consumption was the likely cause of elevated arsenic or mercury in 76.3% individuals, and work exposure was the source of elevated arsenic or mercury in 6.8% individuals.

## Heavy Metals Poisoning Narratives

### Examples of Occupational Exposures 2007-2015:

- 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.
- 2015 - One individual working for a recyclable material merchant wholesaler had an elevated urine mercury level.

### Examples of Environmental Exposures 2007-2016:

- 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.
- 2016 - A six-year-old and a ten-year-old, who used house well water had elevated arsenic urine levels.