

Heavy Metals Surveillance in Michigan: Twelfth Report (January 2019 – December 2020)



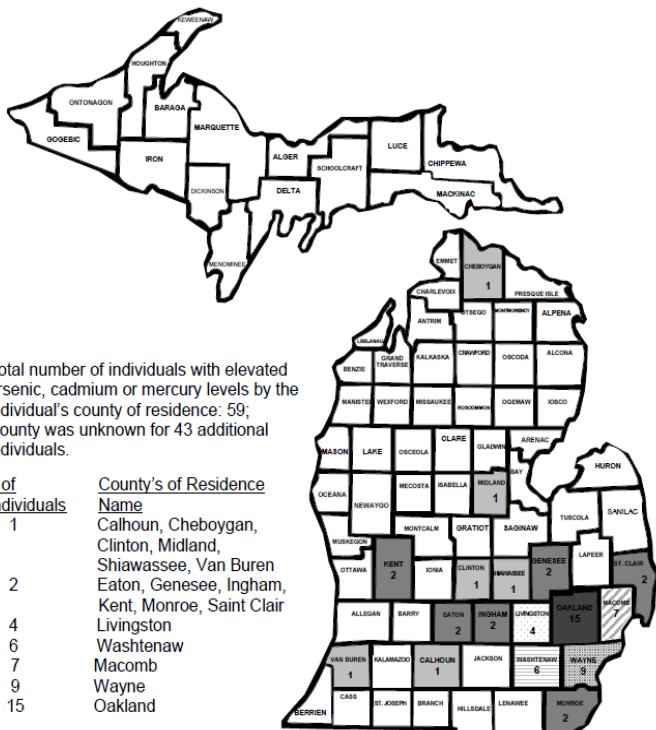
Additional Information Available at: www.oem.msu.edu

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.

2019 and 2020 Results: Laboratory reporting of clinical tests for elevated arsenic, cadmium and mercury

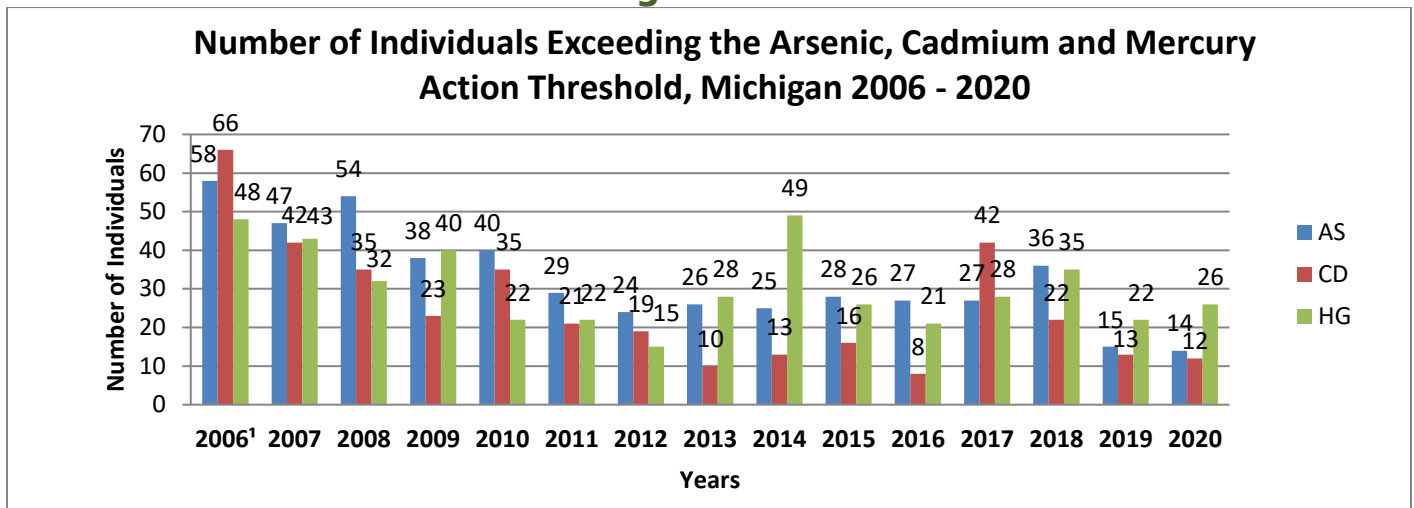
- 56 reports in 2019 and 60 reports in 2020, with levels above the action threshold, were received from seven laboratories.
- 50 individuals in 2019 and 52 individuals in 2020 had a result that exceeded one of the action thresholds. Twelve individuals had two elevated levels of the same metal in one calendar year and one individual had three elevated levels of the same metal in one calendar year, thus there were 102 different individuals in both years combined.
- In 2019, 70% and in 2020 63.5% were men. There were no children <16 with a result above the action threshold.



Number of Individuals with Elevated Arsenic, Cadmium or Mercury Levels by Gender and Age Group, Michigan 2019 - 2020

Age Group	Gender	
	Male	Female
16 - 34	9	1
35 - 65	43	15
≥ 65	16	18
Total	68	34

2006-2020: Individuals exceeding action thresholds



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

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

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

HG – Mercury Blood Action Threshold Level in Adults is >15 µg/L and in Children >10 µg/L. Urine Action 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 59.1% of individuals, and work exposure was the source of elevated cadmium or mercury in 31.8% of individuals.

Heavy Metals Poisoning Narratives

Examples of Occupational Exposures 2007-2020:

- 2007 - Five individuals employed by an electrical switch and relay manufacturer had elevated blood mercury.
- 2008 - Six individuals working in a cadmium plating department had elevated urine cadmium urine.
- 2009 - One individual working for a recyclable material wholesaler had an elevated blood mercury.
- 2013 - One individual working in a college's lab unintentionally ingested mercury and had an elevated blood mercury.
- 2015 - One individual working for a recyclable material wholesaler had an elevated urine mercury.
- 2017 - One individual working at a nonferrous foundry had an elevated urine cadmium urine.

Examples of Environmental Exposures 2007-2020:

- 2007 - A fifty-three-year old Chinese immigrant had an elevated blood and urine mercury from using a Chinese face cream with a very high mercury content.
- 2008 - A three-year-old child mistakenly ingested a mercury-containing "pill" that had been brought from India in some lentils to keep bugs away and had an elevated blood mercury.
- 2011 - A fifty-one-year old male who ate tuna five days a week had an elevated blood mercury.
- 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.
- 2014 - A sixty-five-year old male who ate salmon and trout four times a week from Lake Michigan had an elevated blood mercury.
- 2016 - A six-year-old and a ten-year-old, who lived in eastern Michigan and drank water from their home well had elevated urine arsenic.
- 2018 - A sixty-three-year old male who ate salmon, swordfish and tuna a few times a week had an elevated blood mercury.
- 2019 - A forty-eight-year old male who ate yellowtail, salmon, canned albacore tuna and sushi a few times a week had an elevated blood mercury.
- 2020 - A sixty-one-year old male who ate tuna and swordfish a few times a week had an elevated blood mercury.