Heavy Metals Surveillance in Michigan: Thirteenth Report (January 2021 – December 2022)

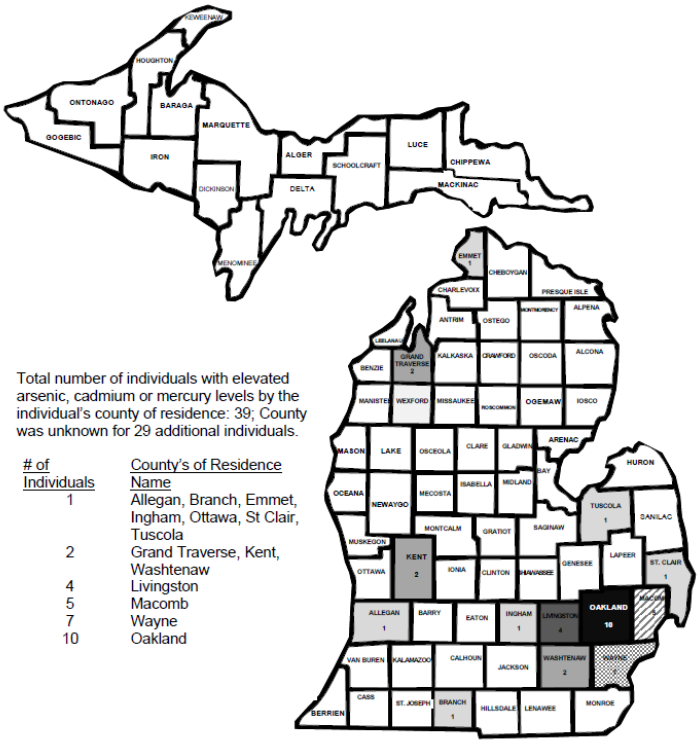
Additional Information Available at: www.oem.msu.edu

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.

2021 and 2022 Results: Laboratory reporting of clinical tests for elevated arsenic, cadmium, and mercury

- 41 reports in 2021 and 33 reports in 2022, with levels above the action threshold, were received from nine laboratories.
- 37 individuals in 2021 and 33 individuals in 2022 had a result that exceeded one of the action thresholds. Four individuals had two elevated levels of the same metal in one calendar year and one individual had two elevated levels of the same metal in 2021 and 2022, thus there were 69 different individuals in both years combined.
- In 2021, 62.2% and in 2022 57.6% were men. There were no children <16 with a result above the action threshold.



Total number of individuals with elevated arsenic, cadmium or mercury levels by the individual's county of residence: 39; County was unknown for 29 additional individuals.

# of Individuals	County's of Residence Name
1	Allegan, Branch, Emmet, Ingham, Ottawa, St Clair, Tuscola
2	Grand Traverse, Kent, Washtenaw
4	Livingston
5	Macomb
7	Wayne
10	Oakland

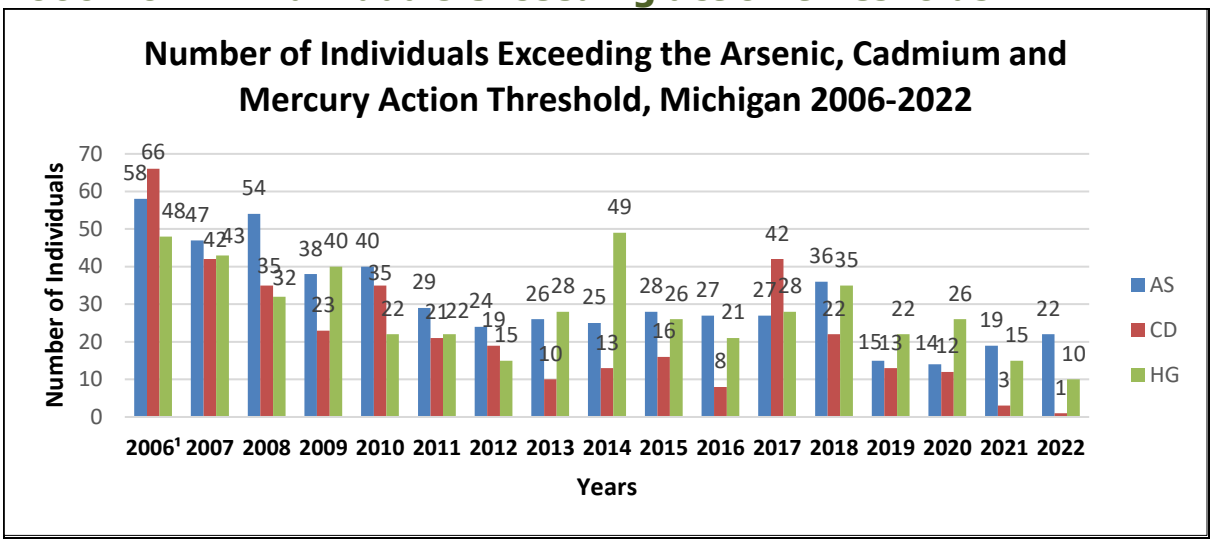
Number of Individuals with Elevated Arsenic, Cadmium or Mercury Levels by Gender and Age Group, Michigan 2021 - 2022

Age Group	Gender	
	Male	Female
16 - 34	9	1
35 - 65	20	16
≥ 65	11	11
Total	40[a]	28

a One male's age was unknown

March 16, 2023

2006-2022: 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 probable cause of elevated mercury in 40.0% of individuals. In 2021 and 2022, work exposure was the source of exposure for one elevated cadmium and one elevated mercury.

Heavy Metals Poisoning Narratives

Examples of Occupational Exposures 2012-2022:

- 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.
- 2021 – One individual working mixing silver amalgams had an elevated blood mercury.
- 2022 – One individual working at a battery recycling facility had an elevated urine cadmium.

Examples of Environmental Exposures 2012-2022:

- 2012 - A man in his 20's who ate tuna up to ten times per day as a part of his body building diet had an elevated blood mercury.
- 2014 - A man in his 60's who ate salmon and trout four times a week from Lake Michigan had an elevated blood mercury.
- 2016 -Two children, who lived in eastern Michigan and drank water from their home well had elevated urine arsenic.
- 2018 - A man in his 60's who ate salmon, swordfish, and tuna a few times a week had an elevated blood mercury.
- 2019 - A man in his 40's who ate yellowtail, salmon, canned albacore tuna and sushi a few times a week had an elevated blood mercury.
- 2020 - A man in his 60's who ate tuna and swordfish a few times a week had an elevated blood mercury.
- 2021 – A man in his 60's who ate tuna a few times a week had an elevated blood mercury.
- 2022 – A women in her 50's who ate salmon and whitefish daily and used a facial cream from a middle eastern store had an elevated blood mercury.