



HEALTH EFFECTS MONITORING PROGRAM

2023 Preliminary Results Child & Youth 5YR Follow-Up

Yellowknife, November 13, 2024
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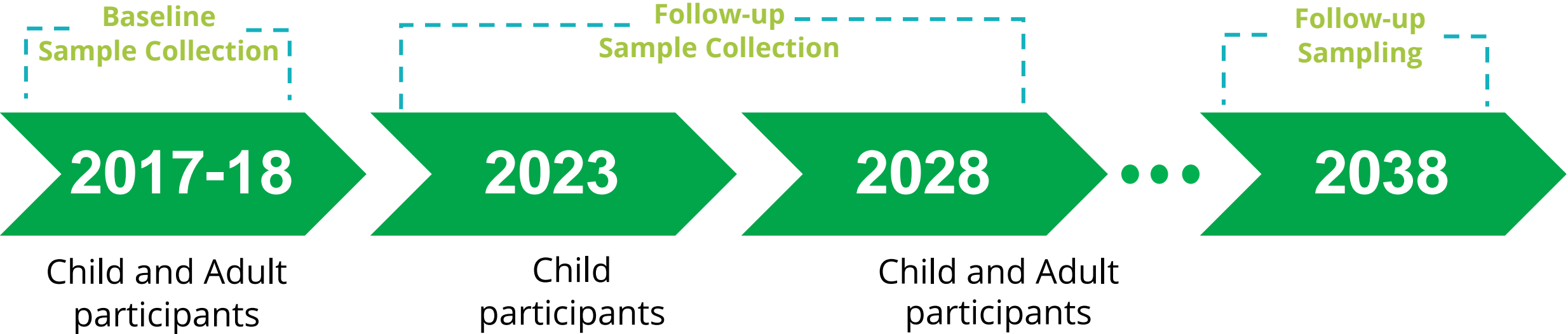
Background Information



What is the Health Effects Monitoring Program?

- A prospective cohort study
- We follow the same people over years
- We observe their level of metals over time
- We observe changes and whether those changes are related to any health outcomes

Longitudinal study



Advisory Committee (HEMPAC)



CITY OF YELLOWKNIFE



Government of Northwest Territories
Environment and Climate Change



Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada



Health Canada
Santé Canada



Government of Northwest Territories
Health and Social Services

Why a monitoring program?

- Address Measure 9 of the 2013 Mackenzie Valley Review Board Report of Environmental Assessment.
- Giant Mine Remediation Project (GMRP) required to implement a health monitoring program to address public concern.
- Find out if residents of the Yellowknife area are currently exposed to higher levels of arsenic compared to other Canadians.

Objectives

Establish baseline levels of arsenic & other metals in body.

Monitor levels of metals in the body over time.

Ensure remediation efforts do not negatively impact people's health.

Address public concerns through clear and transparent communication.

Main research questions

- 1) Do the participants from 2017/18 show the same metal levels in 2023?
- 2) Do new randomly selected sample of children and youth tested in 2023 show the same metal levels to those found in 2017/18?
- 3) How do the 2023 results compare to the Canadian general population?

2023 Child and Youth 5yr Follow-Up



Who participated?

A total of **369** children and youth:

- Repeat participants: **142**
- Random selection 2023: **122**
- Volunteers: **99**
- North Slave Métis Alliance members: **6**



Female	Male	Gender diverse
192	173	4

What was collected?



Urine



Toenails



Saliva

New participants
only



Questionnaire

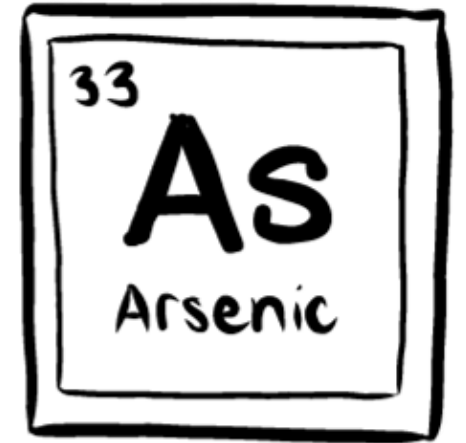


Medical Files

Results Coming in 2025

Arsenic exposure

- **Urine** shows arsenic exposure for past **3-5 days**
- **Toenails** show arsenic exposure from **2-12 months**
- Arsenic does not accumulate in the body



No current technology to test historical arsenic exposure beyond one year.

Results: Urine and Toenail Samples



Results: Urine samples

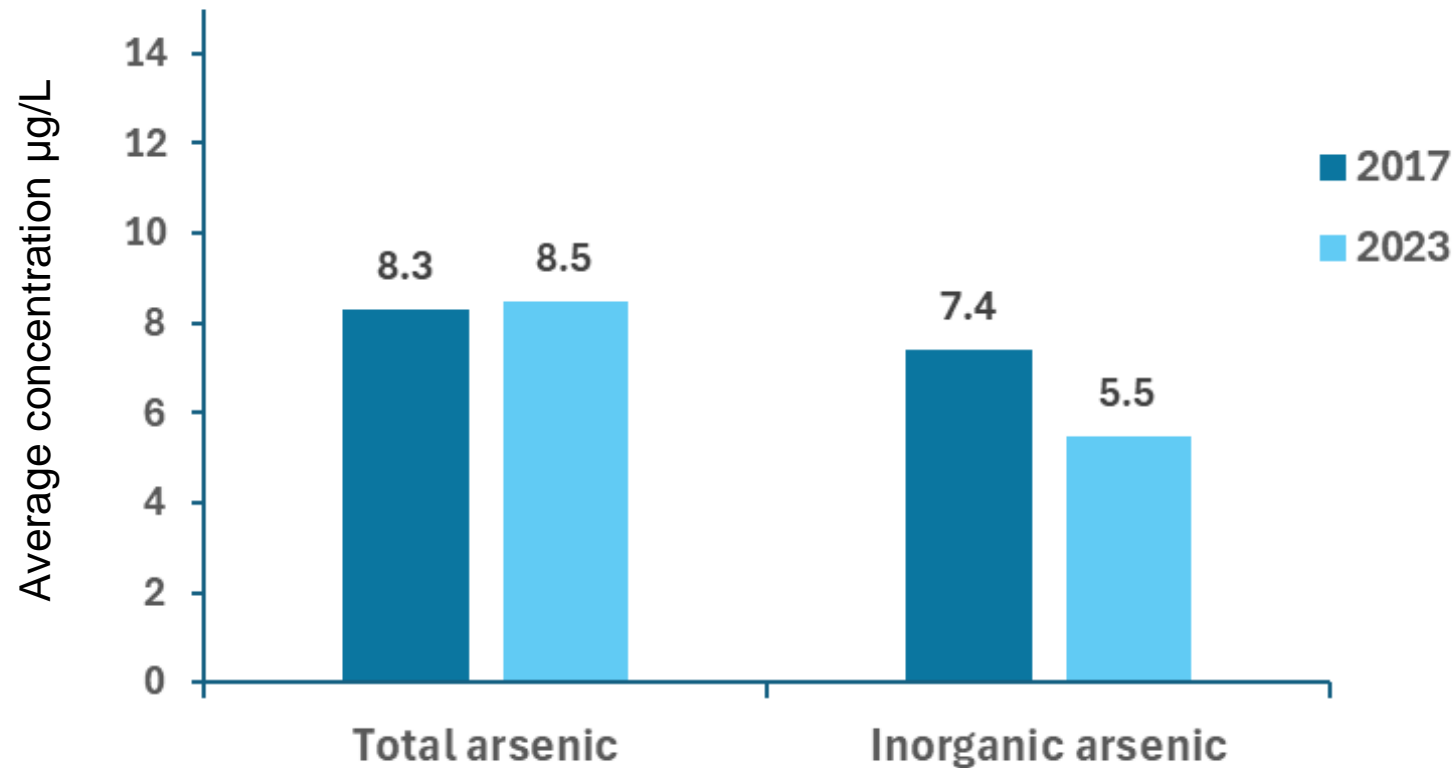


Urine samples: Introduction



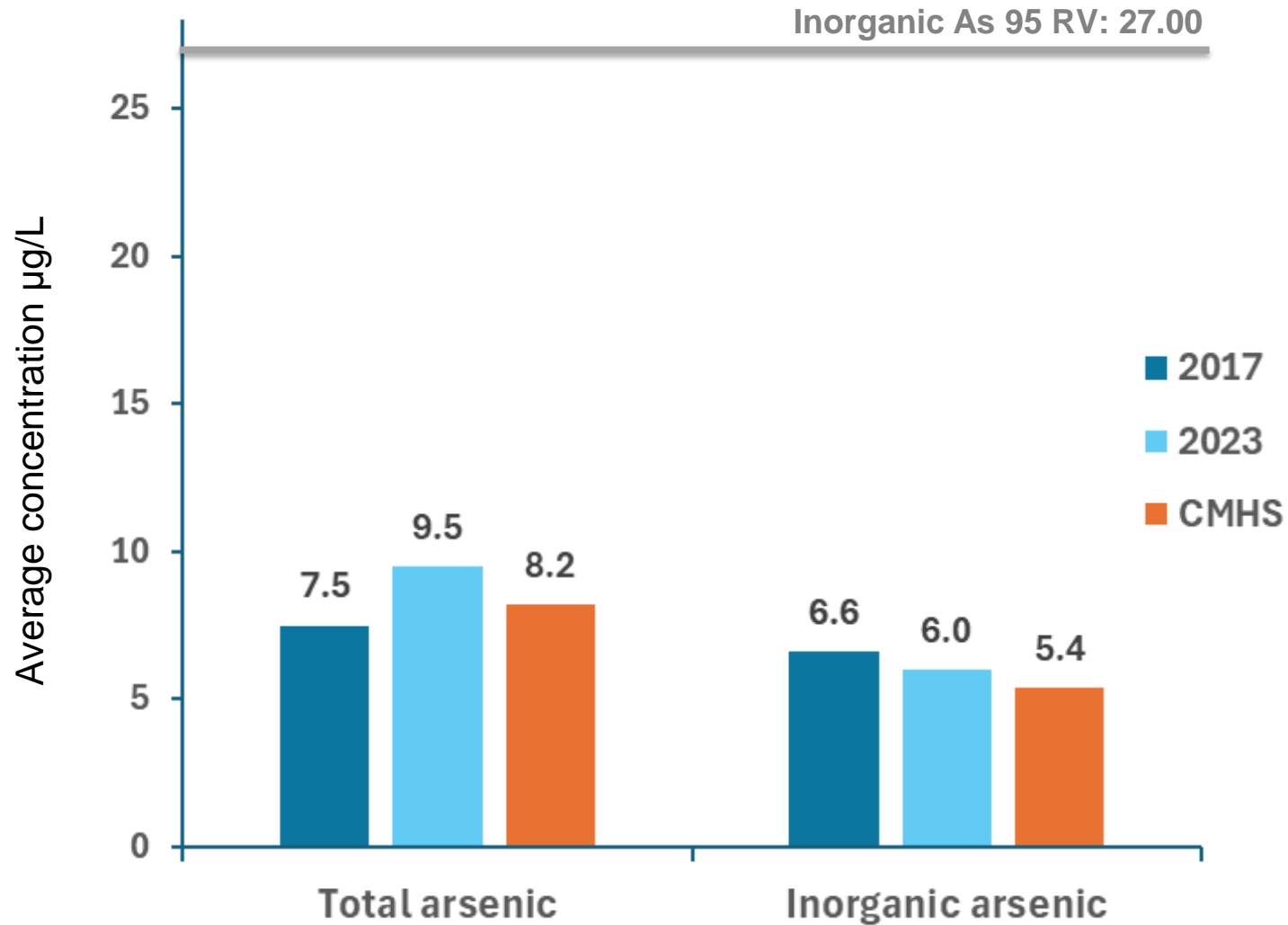
- Urine samples were tested for levels of **arsenic**, **cadmium**, and **lead**.
- **Total arsenic**: all arsenic species detected in a sample.
- **Inorganic arsenic**: toxic forms of arsenic.

Average arsenic concentration in urine (repeat participants)



- Arsenic levels were similar in 2017/18 and 2023, with year-to-year variation.
- Concentrations did not differ based on age or sex.

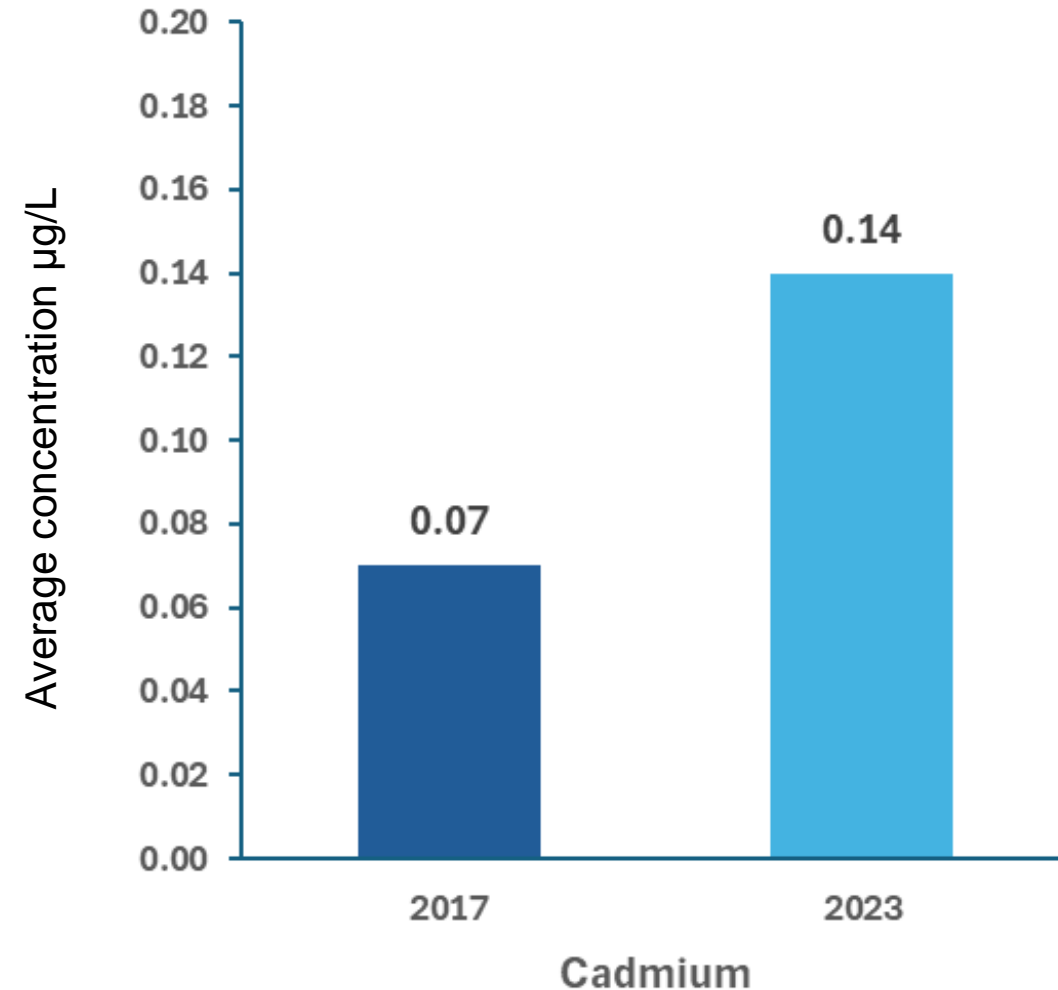
Average concentration of arsenic in urine compared with the average Canadian (CHMS) (randomly selected)



- Arsenic levels were similar in 2017/18 and 2023, with year-to-year variation.
- Compared to the Canadian average, arsenic levels were similar.

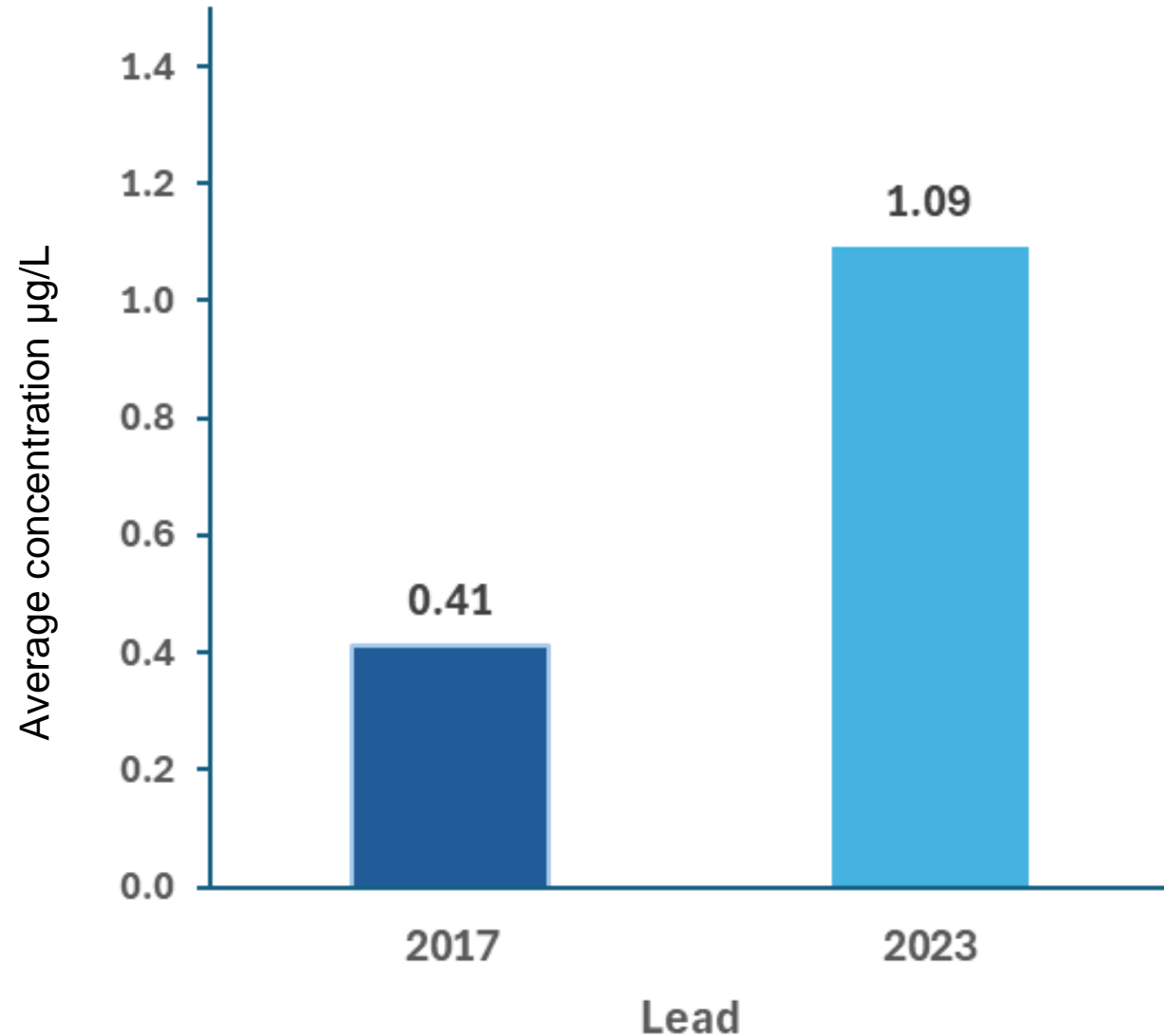
Average concentration of cadmium in urine (repeat participants)

- Cadmium levels were higher in 2023 than in 2017/18
- Possible reasons: increase in age or smoking



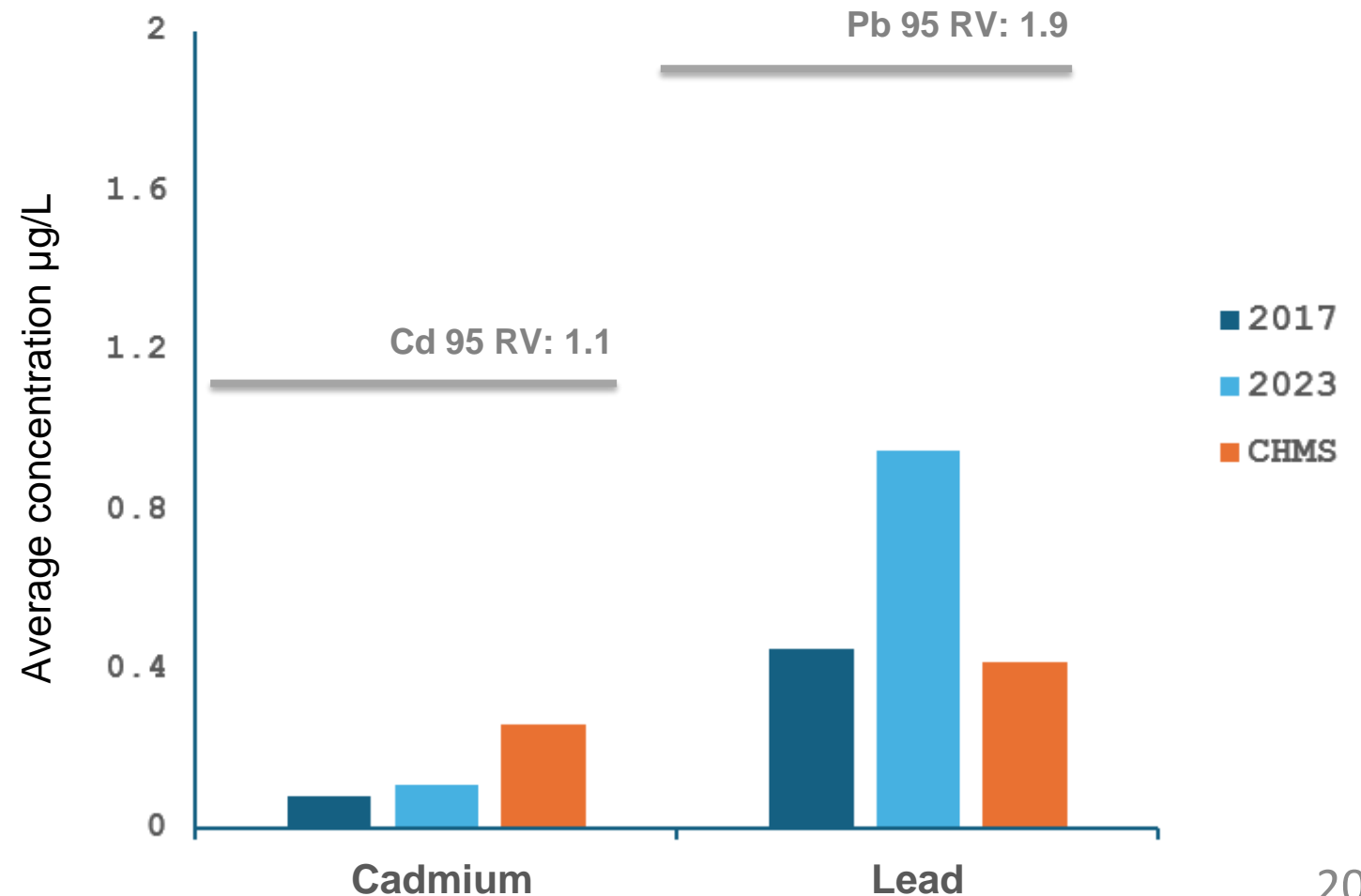
Average concentration of lead in urine (repeat participants)

- Lead levels were higher in 2023 than in 2017/18.
- Unknown reason. The team is investigating.

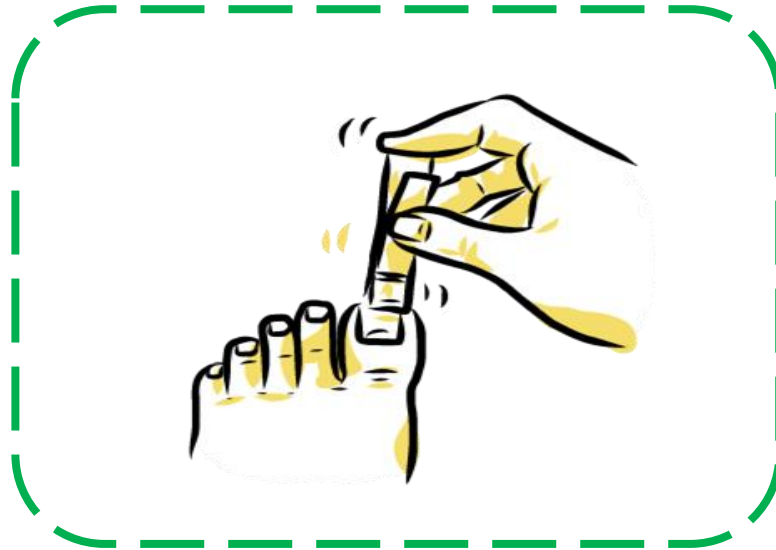


Average concentration of lead and cadmium in urine by year compared with CHMS (randomly selected)

- Lead levels in 2023 were more than double the levels in 2017-18.
- Cadmium levels in 2023 were higher than in 2017/18.
- Compared to the Canadian average:
 - Lead levels were higher in Yellowknife.
 - Cadmium levels were lower in Yellowknife.



Results: Arsenic in Toenail Samples



Toenail samples: Introduction

- Toenail samples reflect long-term exposure.
- There is no Canadian reference level for arsenic in toenail clippings.



Toenail samples: Arsenic results



Repeat participants and randomly selected participants:

- **Total arsenic:** No difference in total arsenic concentrations between 2017/18 and 2023.

What is next?

- Personal result letters – sent November 2024
- Follow-up appointments with study nurse for those with higher metal levels
- More results to come in 2025: genetics and medical files
- Re-sample children and adults in 2028 – 10 years after baseline

Questions? Contact us!

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Mahsi Cho!

