HEALTH EFFECTS MONITORING PROGRAM

Funding for this study is provided by INAC.

What is the Health Effects Monitoring Program?

A long-term program to monitor the levels of Arsenic and other contaminants in the body of residents of Yellowknife, Ndilo and Dettah.

Data collection will begin in 2017.

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Why a Health Effects Monitoring Program?

Program under the **Giant Mine Remediation Project**

- Giant Mine is:
  - Located within Yellowknife boundary
  - No longer in operation since 2004
  - Highly contaminated with Arsenic Trioxide
- Site currently under care and maintenance with full remediation expected to start in 2021

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The **Giant Mine Remediation Project** was approved by the Mackenzie Valley Environmental Impact Review Board under several conditions.

One of the conditions stated:

"The Developer will work with other federal and territorial departments as necessary ***to design and implement a broad health effects monitoring program in Ndilo, Dettah and Yellowknife focusing on arsenic and any other contaminants in people which might result from this Project.*** *This will include studies of baseline health effects of these contaminants and ongoing periodic monitoring. This will be designed with input from: Health Canada, GNWT Health and Social Services and the Yellowknife medical community, and the Yellowknives Dene and other potentially affected communities."*

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Objectives

Establish | baseline levels of arsenic exposure in body

Monitor | levels of contaminants in the body over time

Ensure | that remediation efforts do not negatively impact people's health

Address | public concerns through clear and transparent communication

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Who are we?

Principal Investigator: Dr. Laurie Chan

- Full-time Professor at the University of Ottawa
- Canada Research Chair in Toxicology and Environmental Health
- Experience in traditional food safety research in this region
- Leading Nationwide First Nations Food, Nutrition and Environment Study (FNFNES)
- Member of the Independent Peer Review Panel for INAC since 2002

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Partnerships

- University of Ottawa
- Indigenous and Northern Affairs Canada
- GNWT-Environment and Natural Resources
- GNWT-Health and Social Services
- Giant Mine Oversight Board
- Yellowknives Dene First Nations
- North Slave Métis Alliance
- City of Yellowknife
- Health Canada

With additional support from:

Institute for Circumpolar Health Research

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What is Arsenic?

- Naturally occurring element
  - Soils, rock, groundwater
- Released in industrial activities like mining
- Different forms
  - Some toxic, some not
- Variety of health impacts

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How can I be exposed to Arsenic?

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Yellowknife Studies

- 1951: Survey of 230 schoolchildren
  - medical exam, urine, hair
  - small amounts of Arsenic found

- 1965: Medical study by de Villers and Baker
  - medical exam, urine, hair
  - normal levels of Arsenic found
  - mill workers found with lesions and respiratory illnesses

Yellowknife Studies

- 1975: Survey of Arsenic levels
  - Yellowknife participants
  - elevated levels of Arsenic found in hair

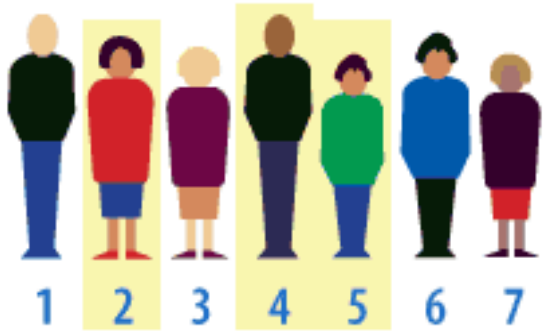
- 1976: Independent study by United Steelworkers of America & Indian Brotherhood
  - mill workers, First Nations children were tested
  - elevated levels of Arsenic found in hair

Results of Past Studies: Urine

Study	Year	Participants	# of Participants	Min	Max	Median/Mean
Medical survey in association with environmental survey	1951	Schoolchildren	230	Not reported	Not reported	Small amounts of Arsenic
Investigation of the Health Status of Inhabitants of Yellowknife, NWT	1965	Male residents of Yellowknife	361 308 Non-Mill Workers 53 Mill Workers	3 µg/L	>150 µg/L	Total Mean: 12.37 µg/L Non-Mill Workers: 11 µg/L Mill Workers: 20.3 µg/L
Con Mine Survey conducted by Cominco	1972	Con Mine employees	41 Employees 7 Mill Workers 4 Shift Bosses 7 Mechanical and Trade Personnel 13 Staff	Not reported	300 µg/L	Total mean: 64.73 µg/L Mill Workers: 186 µg/L Shift Bosses: 88 µg/L Mechanical and Trade: 50 µg/L Staff: 50 µg/L
Con Mine Survey conducted by Cominco	1975	Con Mine employees	55 employees	Not reported	>100 µg/L	Not reported
March-April 1976 Giant Mine Survey	1976	Giant Mine employees	16 employees	Not reported	>100 µg/L	Not reported
October-November 1976 Giant Mine Survey	1976	Giant Mine employees	24 employees	Not reported	75 µg/L	Not reported
1977 Giant Mine Survey	1977	Giant Mine employees	38 employees	Not reported	51 µg/L	Not reported
Con Mine Survey conducted by Cominco	1977	Con Mine employees	213 employees	Not reported	235 µg/L	Not reported

How will the program be carried out?

- Begins September 2017
- Random sample of ~1500 residents
  - Ages 6 to 79
  - Representative of Yellowknife population
- One adult and one child in each selected household will be invited to participate
- Voluntary participation is welcome



☐ YES

☐ NO

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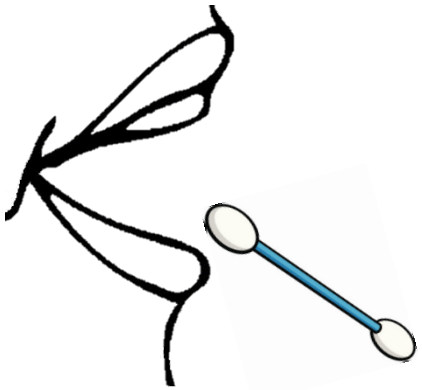
What will be done?

- Lifestyle questionnaire
- Food frequency questionnaire
- Confidential review of medical records
- Collection of biological samples:
  - Urine
  - Toenail
  - Saliva



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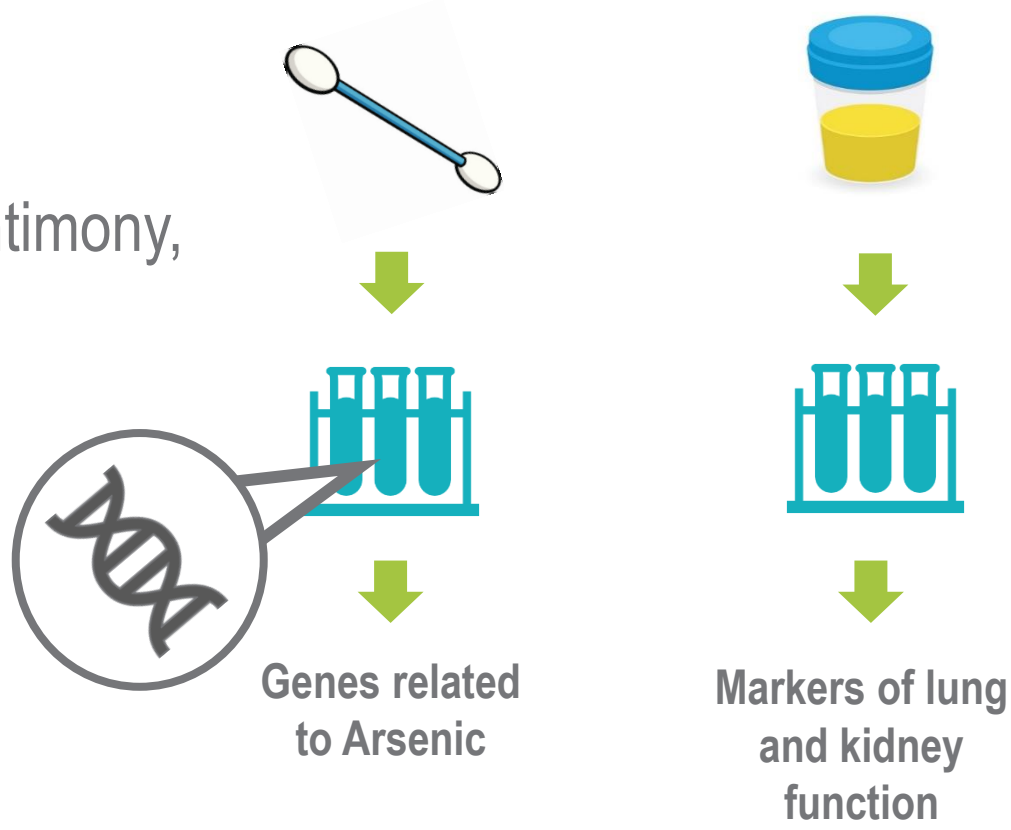
What will be measured?

- Recent exposure levels of arsenic
  - In urine and toenail
- Recent exposure levels of Cadmium, Lead, Antimony, Manganese and Vanadium
  - In urine
- Indicator of kidney function (children only)
  - In urine
- Indicator of lung function (children only)
  - In urine
- Genetic differences
  - In saliva



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What happens after sample collection?

- All samples and questionnaires identified by a code number & kept confidential throughout study
- Population level results compared with rest of Canada
- Individual results will be mailed to participants with clear explanation
- Medical counselling will be provided if needed
- Samples will be archived for future re-testing

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Why participate?

Opportunity | to find out your own levels of exposure

Help | to ensure remediation efforts do not negatively impact people's health

Contribute | to a better understanding of local contaminant exposure in and around Yellowknife, Ndilo and Dettah

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Project Timeline

Short-term:

Summer 2017
Recruitment

→

Fall 2017/2018
Sample Collection

→

Spring 2018 & Spring 2019
Communication of Results

Long-term:

- In 5 years: children 6-18 years
- In 10 years: all participants ages 6 to 79

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Resources and Communications

Web sites *(Health Effects Monitoring Program; Giant Mine Remediation Project)*

Posters, Brochure

Radio, Newspaper

To be developed in coming months:

Facebook

Fact sheets

Newsletters

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Contact Information

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Thank you!

We welcome questions and comments.