Purpose and goal of the First Nations Biomonitoring Initiative

The First Nations Biomonitoring Initiative seeks to assess the health of First Nations communities throughout Canada, by identifying chemicals that are polluting community members, and determining the concentration of these chemical loads. Community testing will take place over a two year period, starting in 2010. The goal of the initiative is to create baseline data for contaminants in First Nations communities.

Benefits of the initiative

This study will help First Nations communities gain a better understanding of their exposures to a range of substances, determine whether a person or a group has an unusually high level of a contaminant in their body, identify potentially vulnerable groups that may experience higher levels of exposure, and track, over time, trends in levels of exposure in First Nations populations.

TABLE OF CONTENTS

Purpose and goal of the First Nations Biomonitoring Initiative................................................................. 1
Benefits of the initiative............................................................... 1
How study results will be used.................................................... 2
General FAQs........................................................................... 2-4
How to Get Involved.................................................................. 4
The results of this biomonitoring assessment will allow future research efforts to focus on the link between exposure and health, and provide information to guide action by individuals, communities and government(s).

**How study results will be used**

The study will not only help create baseline data on toxic exposure in First Nations communities across Canada, but will also determine what chemicals are contaminating community members. Through this important study, information will be collected which will be used to influence the development of future policies.

---

**GENERAL FAQS**

**What is biomonitoring?**

Biomonitoring is a scientific technique for measuring the presence of chemicals in a person, by sampling and analyzing their tissues and fluids. Biomonitoring techniques are used to assess a person’s body burden, which is the amount of toxic chemicals stored in the body at a given time.

**Why is biomonitoring important?**

Biomonitoring is a powerful tool for protecting communities from the potential negative health impacts of chemicals. It provides strong evidence that people can be polluted with toxic chemicals no matter where they live, work or play. Both adults and children tested using biomonitoring techniques have been found to have a long list of chemicals in their body.

Many of the chemicals detected in biomonitoring are associated with adverse health effects which have become more prevalent in recent years, such as carcinogens, hormone disruptors, respiratory toxins, neurotoxins and reproductive/developmental toxins.

**What does biomonitoring entail?**

Before any involvement in biomonitoring, potential volunteers are provided with a detailed information package and are required to sign consent forms to confirm their free and informed participation.

Once participants have been selected for the study, they must answer a brief lifestyle questionnaire, and are set up for an appointment at a local laboratory or clinic for testing. The participants provide samples which are sent from the laboratory where they are collected to independent Canadian laboratories that conduct the toxicological analysis.

The results of the tests are available approximately six to eight weeks after the samples are taken and indicate: the chemical concentrations detected in blood and urine specimens, comparisons between individual test results and those of others who have been tested; and, other supplemental information to help participants and the larger community understand their results.

**What is chemical exposure?**

We come into contact with chemicals in almost every aspect of our lives, and low levels of many toxic chemicals are detectable in individuals no matter what their age. Most of us are unaware that we are surrounded by harmful chemicals everyday and that we carry the legacy of long-term chemical exposure in our bodies.

In the last 50 years, the global production and use of chemicals has escalated; more than 80,000 new chemicals have been created worldwide. In Canada, over 23,000 chemicals are registered for use in the market, many of which are particularly harmful to children's health, and each year approximately 300 new substances are added to this list.
What are sources of exposure?

The contamination of Canadians is the result of industrial, commercial and individual pollution of our air, land and water with vast quantities of toxic chemicals, as well as the failure for these sectors and government to address the release of toxic chemicals during the use or disposal of a consumer product.

Toxic chemicals are found at low levels in a number of applications, in everything from personal care products, and cooking pots and pans, to electronics, furniture, clothing, food wrap and building materials.

What are routes of exposure?

Toxic chemicals make their way into our bodies through our food, air, water, soil and dust. Chemicals are transferred to, or absorbed by, your body through your lungs, digestive system, and skin. Chemical uptake occurs through inhalation, ingestion and dermal (skin) contact. For instance, the main route of exposure for chemicals carried in food is your stomach, where chemicals are absorbed through digestion. Chemicals carried in air can enter your body through inhalation and skin contact. Contaminants in water and soil are absorbed through all three main routes of exposure.

What are the health implications?

A large body of scientific research links exposure to toxic chemicals to many ailments that plague Canadians, including several forms of cancer, reproductive problems and birth defects, respiratory illnesses such as asthma, and neurodevelopmental disorders such as Attention Deficit Hyperactivity Disorder (ADHD). Chemicals can also be toxic to the immune system, the kidneys, the gastrointestinal system and liver, skin and sense organs, the musculoskeletal system, and the cardiovascular system.

Who is most vulnerable?

Risks to First Nations communities
First Nations communities are especially vulnerable to chemical exposure for a number of reasons. Cultural influence on diet can lead to an increase in exposure to harmful pollutants. For example, the consumption of fish, marine mammals and wild game has cultural, spiritual and nutritional significance, but these food sources also tend to have much higher concentrations of mercury and other persistent organic pollutants, such as PCBs, pesticides and PBDEs. Toxins build up in the fatty tissues of fish, marine mammals and other food sources through the process of bioaccumulation. Elders can sometimes be the most contaminated in a community, having depended on a traditional diet for a longer period of time.

In addition, many transboundary pollutants accumulate in Northern communities due to air and water currents and climate conditions.

Communities are often situated close to industry and other sources of pollution. Due to their proximity, many community members work in these industrial settings, increasing their level of exposure to toxic chemicals.

Risks to the fetus, infants and children
Children are more vulnerable than adults to negative health effects from environmental exposures due to their physiology and behaviour. Because children’s bodies and physiological systems undergo substantial growth and development from conception through adolescence, they are particularly sensitive to chemical interference. Depending on age, the barriers that keep chemicals from entering the body, and the physiological mechanisms that usually protect the body from chemicals that do invade, may be undeveloped. Children’s exposure and vulnerability to harmful chemicals are affected by additional factors, including genetic susceptibility, socioeconomic, nutritional and cultural factors.

By far the most vulnerable time in a child's development
is the first nine months from conception to birth, during which time environmental exposures may lead to anatomical abnormalities and physiological defects. In utero, during both the embryonic and fetal stages, major organs, body structures and the nervous and reproductive systems are formed.

The value of community-wide participation

While it is useful to see the chemical body burden of one individual, it is even more telling when testing is conducted community-wide. Researchers can find trends in group data analysis which can help them decipher (1) the source(s) of contamination in the region, (2) how communities may have been exposed to specific chemicals, and (3) which groups are most vulnerable/have the largest chemical load in the community.

**HOW TO GET INVOLVED**

To find out more, visit the website

To learn more about the AFN biomonitoring study or how to get involved, visit [http://www.afn.ca/](http://www.afn.ca/)