Chemical Exposure

Biomonitoring is increasingly being used as an effective method of measuring and monitoring the level of contaminants in human populations. The Assembly of First Nations (AFN) is presently assessing the interest of First Nations in participating in a national First Nations’ specific biomonitoring study. A First Nations’ specific biomonitoring project on a national level would give First Nations communities the opportunity to focus on specific environmental health related issues and provide baseline data for future biomonitoring work or research on the health impact of chemicals in the environment.

Our chemical world

We come into contact with chemicals through almost every aspect of our lives. Most of us don’t know realize that we are in fact surrounded by harmful chemicals and that we carry the evidence of these chemical exposures in our bodies.

In the last 50 years, the global production and use of chemicals has increased with more than 80,000 new chemicals being created. There are over 23,000 chemicals registered for use in Canada and about 300 new chemicals are added to this list each year.

Human exposure to chemicals

Sources of exposure

The contamination of Canadians by toxic chemicals is the result of industrial, commercial, and household pollution of our air, land, food, and water. Industries and governments often fail to address the release of toxic chemicals during the making, use, or disposal of a consumer product. However, people also have individual choice as consumers of these products. Many toxic chemicals are found at low levels in a number of commercial products (e.g., personal care products (e.g., shampoo), non stick cooking pots and pans, electronics, fire retardant furniture and rugs, clothing, food wrap, and building materials).

Routes of exposure

Toxic chemicals are found in food, air, water, soil and dust and can find their way into our bodies via the air we breathe, food we eat, water we drink and skin contact with objects. Chemicals are transferred to, or absorbed by, your body through your lungs, digestive system, and skin. Chemicals carried in or on food can be absorbed through your stomach and chemicals carried in air can enter your body through breathing and skin. Contaminants in water and soil are absorbed through all three main routes of exposure.
**Risk assessment and total load**

The presence of chemicals everywhere means that people are exposed to multiple chemicals everyday of their life. Some are so hazardous that they can have effects at very low doses. However, governments often determine if such a chemical is “safe” on the basis of how much is in our environment. Whether or not a chemical is “safe” is usually partly based on computer-modeled data and not entirely based on real-world data. Also, very few studies or government risk assessments examine the health effects of our exposure to low levels of lots of different toxic chemicals at the same time, which is the way we often encounter them in every day life.

**Who is most vulnerable?**

**Risks to First Nations communities**

First Nations communities are especially vulnerable to chemical exposures for a number of reasons. For example, eating fish, marine animals and wild game has cultural, spiritual, and nutritional significance, but these food sources also tend to have much higher concentrations of mercury and other POPs (e.g., PCBs, pesticides and PBDEs). Toxins build up in the fatty tissues of fish, marine mammals and other food sources through the process of bioaccumulation. In First Nation communities higher risk groups for contamination are: infants, pregnant and breastfeeding women, and Elders.

In addition, many pollutants can travel long distances and accumulate in Northern communities due to air, water currents, and climate. Other communities are often situated close to industry and other sources of pollution. Due to proximity to these industrial areas 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 to negative health effects from environmental exposures than adults. They are particularly sensitive to chemical interference because their bodies rapidly grow and change from before birth through adolescence. By far the most vulnerable time in a child's development is while in the womb and during childhood. During this time, major organs, body structures, and the nervous and reproductive systems are formed and environmental exposures may lead to anatomical abnormalities and physiological defects. Children’s exposure and vulnerability to harmful chemicals are also affected by other genetic, social, economic, nutritional, and cultural factors.

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