

Canadian Health Measures Survey: Environmental laboratory data, 2014 and 2015

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Blood concentrations of lead, mercury and cadmium in the Canadian population

Chronic exposure to heavy metals such as lead, mercury and cadmium has been linked to health issues including neurological problems or kidney effects.

According to results from the latest cycle of the Canadian Health Measures Survey (CHMS), average lead and mercury levels measured in Canadians throughout 2014 and 2015 were well below Canadian guidance values for the general population above which follow-up action is recommended (10 µg/dL for lead and 20 µg/L for mercury in adults). There is currently no guidance value set out by Health Canada for cadmium in blood.

Although blood lead concentrations in Canadians were well below Health Canada's guidance value, the concentration among Canadian males was significantly higher than the levels measured in females. Results show that the average concentration of lead in blood was 0.95 microgram per decilitre (µg/dL). Blood lead levels were significantly higher in males (1.0 µg/dL) compared with females (0.87 µg/dL), and in adults aged 20 to 79 (1.1 µg/dL) compared with children and youth aged 3 to 19 (0.57 µg/dL).

The average blood cadmium concentration was 0.31 µg/L. Blood cadmium levels were significantly higher in females (0.33 µg/L) compared with males (0.28 µg/L), and in adults (0.38 µg/L) compared with children and youth (0.11 µg/L).

The average blood mercury concentration among adults aged 20 to 79 was 0.70 µg/L, which was also well below Health Canada's guidance value of 20 µg/L. Results for blood mercury were not different between males and females.

A decade of human biomonitoring with the Canadian Health Measures Survey

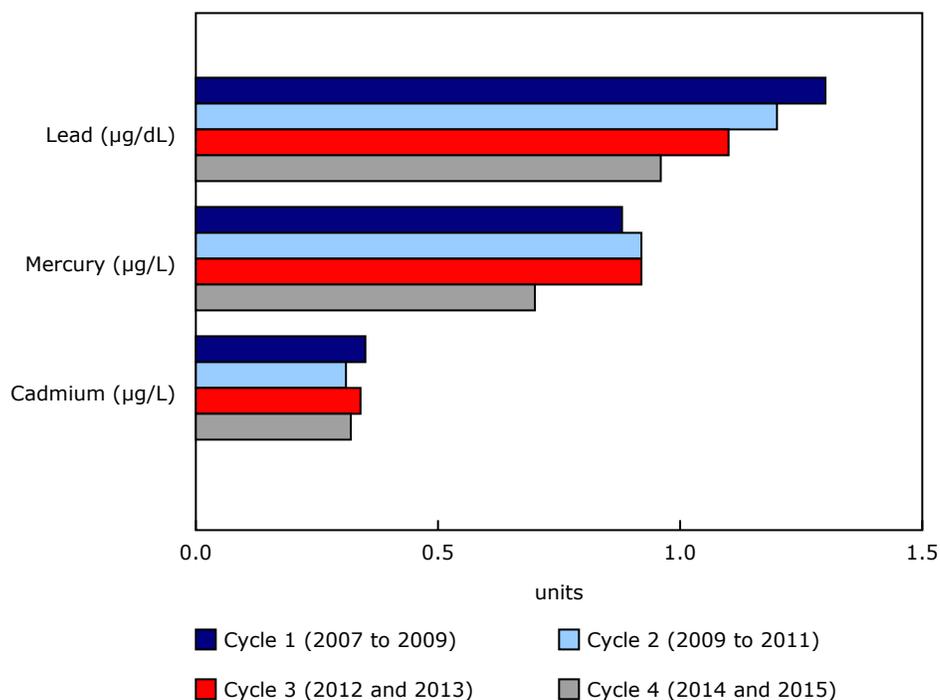
This release marks the 10-year anniversary of human biomonitoring in Canada with the CHMS, which began collection in 2007. The data can be used for a variety of purposes including assessing whether Canadians' exposure levels to chemicals are harmful to their health. As a result, the biomonitoring component of the CHMS plays a critical role in providing reliable information that governments and all Canadians can use to take action to protect their health. It is also used to measure the effectiveness of the Government of Canada's existing risk management actions, such as the [Chemicals Management Plan](#), a component of the [Vision for a Healthy Canada](#), which focuses on healthy eating, healthy living and a healthy mind.

Over this decade of biomonitoring, the average blood lead concentration among Canadians aged 6 to 79 years has declined from 1.3 µg/dL in Cycle 1 of CHMS (2007 to 2009) to 0.96 µg/dL in Cycle 4 (2014 and 2015). Average cadmium levels have also declined from 0.35 µg/L to 0.32 µg/L over the same time period. However, there has been no significant change in blood mercury levels for Canadians over this period.



Chart 1

Average concentrations of selected environmental chemicals in the Canadian population aged 6 to 79 years, Canadian Health Measures Survey, Cycle 1 (2007 to 2009) to Cycle 4 (2014 and 2015)



1. Concentrations are presented as a geometric mean.
 2. Lead, mercury and cadmium were measured in blood.
 3. For the purpose of total population comparisons, only values from participants aged 6 to 79 years were included, as participants under the age of 6 years were not included in cycle 1 (2007 to 2009).
 4. The average blood mercury concentration is for the 20 to 79 age group only. The concentration for the 3 to 19 age group was too often below detectable limits to be included in the calculation.
Source(s): Statistics Canada, Canadian Health Measures Survey.

Note to readers

The CHMS measured lead, total mercury, and cadmium in the blood of a representative sample of Canadians aged 3 to 79.

Concentrations are presented as a geometric mean, which is a type of average that is less influenced by extreme values than the traditional arithmetic mean. The geometric mean provides a better estimate of central tendency for highly skewed data. This type of data is common in the measurement of environmental chemicals in blood and urine.

It is important to note that the presence of a chemical in a person's body does not necessarily mean that it will affect their health. Factors such as the amount to which a person is exposed, the duration and timing of exposure, and the toxicity of the chemical are important to consider when determining whether adverse health effects may occur.

The average blood mercury concentration in children and youth could not be calculated as a significant proportion of them had blood levels of total mercury that were below detectable limits.

The Canadian Health Measures Survey Cycle 4 was conducted from January 2014 to December 2015.

This release consists of the Environmental Laboratory Data file, 2014 to 2015.

Definitions, data sources and methods: survey number [5071](#).

Results for lead, mercury, cadmium and other selected environmental chemicals measured in the Canadian Health Measures Survey are available in the new publication [82-627-X](#).

Additional information on these and many other environmental chemicals is presented in the Health Canada document [Fourth Report on Human Biomonitoring of Environmental Chemicals in Canada](#).

Weight files and instructions are available for combining cycle 4 Canadian Health Measures Survey data (where possible) with equivalent data from cycles 1 to 3.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).