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Alberta Environmental and Public Health
Information Network

Human Biomonitoring of Environmental Chemicals in Canada and the Prairies

Frequently Asked Questions (FAQs)

Who is the data owner and custodian?
Health Canada and Statistics Canada are the joint owners of the national biomonitoring dataset.

What is the Canadian Health Measures Survey?
 "The Canadian Health Measures Survey (CHMS) is a national survey that is led by Statistics Canada, in partnership with Health Canada and the Public Health Agency of Canada, which collects information from Canadians about their general health." Since 2007, the CHMS has collected biomonitoring data from six cycles of the survey. For more information: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/environmental-contaminants/human-biomonitoring-environmental-chemicals/canadian-health-measures-survey.html.

What is biomonitoring?
Biomonitoring is the measurement of how much of a chemical, or the product(s) it makes when it breaks down, is present in a person. This measurement is usually taken from blood or urine samples. More information about human biomonitoring, including its uses, limitations and an overview of Canadian biomonitoring surveys, can be found on the following Government of Canada website: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/environmental-contaminants/human-biomonitoring-environmental-chemicals.html.

What are Biomonitoring Fact Sheets and where can I find them?
Health Canada's Biomonitoring Fact Sheets provide visualizations of the latest environmental chemical exposure data in Canadians. Fact Sheets for select priority chemicals can be found here: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/environmental-contaminants/human-biomonitoring-resources.html.

What is the prairies dataset?
The prairies dataset contains the averages of results from the combined biomonitoring dataset of CHMS Cycles 1-5 for the provinces of Alberta, Saskatchewan, and Manitoba specifically (designated by Statistics Canada as the Prairies region) on selected parameters only. Alberta Health has acquired the point estimates from Statistics Canada. These point estimates are representative of the population of the three provinces.

What are the considerations for interpreting the prairies dataset?
The point estimates are a combination of five cycles (Cycle 1-5) of data for lead, mercury (total), cadmium and bisphenol A (BPA) contaminants. Combining cycles is necessary when doing regional analysis as the sample size would otherwise be insufficient to provide robust results. Individual provincial point estimates are currently not available.

The analysis for the prairie dataset followed the same procedures as is done in Health Canada's "Fifth Report on Human Biomonitoring of Environmental Chemicals in Canada" and "Sixth Report on Human Biomonitoring of Environmental Chemicals in Canada." Specifically, please see sections 6 and 7 (Statistical data analyses and Considerations for interpreting the biomonitoring data) of the sixth report (https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/environmental-contaminants/sixth-report-human-biomonitoring.html#s6) or refer to the Valcke *et al.* (2020) paper in References.

What are the limitations of the prairies dataset?

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Each cycle has different limits of detection. This is because testing methods, testing labs, or interpretation of the results by the lab may change periodically over the course of CHMS cycles. For this prairies-specific analysis, the most conservative limits of detection for the selected parameters were used for all cycles. In cycles where measured points of data were observed that were smaller than the most conservative limit of detection, these values were replaced with half of the conservative limit of detection and reconsidered as 'less than the limit of detection' for this analysis.

Since only one point estimate is provided by combining all cycles of available data, it is not possible to determine if a trend exists across time. Finally, because the point estimate combines data from an extended period of time, it may not be representative of the true value that exists in the target population today – the prairie dataset should be considered as a rough estimate for comparison only.

What are biomonitoring guidance values? How do I interpret them?
Biomonitoring guidance values are tools used in the assessment of biomonitoring data in a health-risk context. They are population-level concentrations above which potential adverse effects could occur, but the values used in the visualization are for visual comparisons only. Biomonitoring guidance values should not be used to interpret personal laboratory test results or inform clinical treatment approaches. If a physician has requisitioned blood work or urinalysis for a parameter reported on this website, please consult with that physician directly to discuss health-based implications of any findings.

For some chemicals such as lead and mercury, guidance are available based on a direct and quantitative relationship between chemical concentration in a tissue (e.g. blood) and an adverse health outcome. For other chemicals, data from toxicological studies may be used to model or derive blood or urinary chemical concentrations that are equivalent to an exposure guidance value (e.g. Tolerable Daily Intake), and the modeled tissue concentration (called a biomonitoring equivalent) may be used in the health-based interpretation of biomonitoring data. Other guidance values such as the Human Biomonitoring Values (HBM values) and Human Biomonitoring Guidance Values (HBM-GV) have also been developed for an increasing number of chemicals; however, the scope and utility vary among the different types of guidance values.

The guidance values used in this visualization, with the exception of lead, are those identified or updated by Faure et al (2020) for their interpretation of population biomonitoring data derived from the Canadian Health Measures Survey (2007-2015). Accordingly, users should refer to Faure et al (2020) and/or any chemical specific documents cited by Faure et al 2020 for additional nuances around the meaning and interpretation of specific guidance values. The user may also consult the Human Biomonitoring Health-Based Guidance Value (HB2GV) Dashboard (https://biomonitoring.shinyapps.io/guidance/) developed by International Human Biomonitoring Network's Guidance Value Working Group. The dashboard provides a searchable database of human biomonitoring guidance values and related publications.

For lead, this visualization uses the United States CDC's blood lead reference level (https://www.cdc.gov/nceh/lead/advisory/acclpp/actions-blls.htm) as a conservative guidance. However, it is important to recognize the existence of a Canadian blood lead intervention level (https://www.canada.ca/en/health-canada/services/environmental-workplace-health/environmental-contaminants/lead.html; Health Canada, 2013) and an anticipated new Canadian guidance when the draft guidance report, "Blood lead testing – indications and interpretation: a guide for health care providers" is published by the Council of Chief Medical Officers of Health (CCMOH; publication pending).

What if I need more information?
For any questions regarding the national dataset, please contact the National Biomonitoring Section at Health Canada: biomonitoring-biosurveillance@hc-sc.gc.ca. For any questions regarding the CMHS, please contact Statistics Canada infostats@statcan.gc.ca.

Please contact the AEPHIN Team (health.ephs@gov.ab.ca) if you are interested in requesting the prairie dataset or if you have any questions regarding the visualization.

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