

Canada's Biomonitoring Program and the Use of Biomonitoring Data in Chemical Risk Assessment

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Background & Objectives

Health Canada monitors Canadians' exposure to environmental chemicals as part of the Canadian Health Measures Survey (CHMS), a national direct measures health survey led by Statistics Canada, in partnership with Health Canada and the Public Health Agency of Canada. This national biomonitoring program provides levels of a range of environmental chemicals measured in blood, urine, or hair. This nationally representative data provide a basis to compare with sub-populations and with other countries. It is also a unique database for tracking trends in environmental chemical levels over time and to explore relationships between exposure to environmental chemicals and potential health effects.

Methods & Approach

The CHMS is a cross sectional survey carried out in ongoing two-year cycles. Every cycle, blood and urine are collected from around 5,000 participants aged 3-79 years at 16 sites across the country. Along with biomonitoring data, the CHMS also collects information on the general health and lifestyles of Canadians to provide information on chronic and infectious disease, physical fitness, nutrition, and other factors that influence health.

Results & Lessons Learned

Five cycles of data collection have been completed over the past decade, measuring over 250 chemicals (metals, persistent organic pollutants, environmental phenols, acrylamide, pesticides, phthalates) in over 30,000 Canadians at 81 sites across the country. For many chemicals, this data provides the first national level baseline of exposure. For others, repeated measures can help track exposure trends over time. Tools have also been developed to interpret and communicate biomonitoring data in a risk-based context. Case studies that demonstrate how biomonitoring data for different chemicals are used in risk assessment will be presented.

Conclusions & Implications

Human biomonitoring data are being used increasingly to quantify human exposure and to provide information for setting priorities or chemical risk assessment. These data have not only provided baseline concentrations in the Canadian population but have been used to inform regulatory risk assessment and improve evidence-based decision making in public policies aiming to reduce exposure to toxic chemicals and protect the health of Canadians.