



Overview of the Canadian Health Measures Survey

Policy makers, provincial health departments, researchers and health professionals from many fields have expressed a need for a national, comprehensive source of accurate health measures to assist them in addressing the health needs of all Canadians.

In 2003, Health Canada and the Public Health Agency of Canada supported Statistics Canada in obtaining funding for a 'direct measures' health survey to address longstanding limitations within Canada's health information system. This support was announced in the 2003 federal budget as part of an extension of the Health Information Roadmap Initiative.

The Canadian Health Measures Survey (CHMS), launched in 2007, is collecting key information relevant to the health of Canadians by means of direct physical measurements such as blood pressure, height, weight and physical fitness. As part of the CHMS, a clinical oral health examination helps to evaluate the association of oral health with major health concerns such as diabetes and respiratory and cardiovascular diseases. In addition, the survey is collecting blood and urine samples to test for chronic and infectious diseases, nutrition and environment markers.

Through household interviews, the CHMS is gathering information related to nutrition, smoking habits, alcohol use, medical history, current health status, sexual behaviour, lifestyle and physical activity, the environment and housing characteristics, as well as demographic and socioeconomic variables.

All of this valuable information will create national baseline data on the extent of such major health concerns as obesity, hypertension, cardiovascular disease, exposure to infectious diseases, and exposure to environmental contaminants. In addition, the survey will provide clues about illness and the extent to which many diseases may be undiagnosed among Canadians. The CHMS will enable us to determine relationships between disease risk factors and health status, and to explore emerging public health issues.

In the last 35 years, some Canadian surveys have collected direct physical measures:

- Nutrition Canada Survey (1970-72)
- Canada Health Survey (1978)
- Canadian Heart Health Surveys (1988-92)
- Canadian Study of Health and Aging (1992)
- Canadian Community Health Survey, Cycle 2.2 (2004)

Many countries have a long history of surveys including direct physical measures that have led to important findings. In the United States, for example, the National Health and Nutrition Examination Survey (NHANES) has helped develop the standard growth charts for children, thereby allowing doctors and parents to better understand the developmental health and well-being of children.

The American survey's biggest impact was probably its findings about the link between high cholesterol and heart disease in the 1960s. The same survey also gave the first evidence that Americans had too much lead in their blood, lead contamination being related to learning disabilities and other health problems. This pushed the government to phase out the use of lead as an additive in gasoline.

In Australia, a similar survey conducted from 1999 to 2001 found that, for every known case of diabetes, there was one undiagnosed case. Furthermore, nearly 1 million Australians over the age of 25 have diabetes. These data are important for Australia's national and regional public health education, health promotion programs and health care planning.

In New Zealand, the 1996-97 health and nutrition surveys have shown three key nutrition problems in population: obesity, food security and calcium inadequacy. These are all now priorities within New Zealand's Ministry of Health for policy work to develop prevention programs.



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All of these improvements would not have been made possible without the information gathered through measurements of physical characteristics. Many health professionals and organizations in Canada recognize the need for a physical measures survey and, accordingly, key organizations have provided their endorsement and support. The CHMS has received the endorsement of

- the Canadian Medical Association
- the Canadian Dental Association
- the Heart and Stroke Foundation of Canada
- The Canadian Lung Association
- the Canadian Red Cross
- Dietitians of Canada
- the Canadian Hypertension Society

and the support of

- the College of Family Physicians of Canada
- the Canadian Public Health Association.

Survey content

Canada is currently relying on self-reported information, isolated clinical studies and U.S. data to make estimates on the health status of Canadians. The Canadian Health Measures Survey (CHMS) is collecting health information about Canadians that cannot be otherwise captured or that may be inaccurately reported through self-report questionnaires or health care records. Hospital and medical records do provide data, but only on those who have received or are undergoing treatment, or on those who seek medical advice regularly.

The CHMS is overcoming these data gaps by collecting physical measures from a random sample of the Canadian population, thereby including individuals at varying levels of health who may or may not seek medical treatment. By examining such a cross-section of the population, the CHMS will strive to provide an estimate of the number of Canadians who show signs of a previously-undetected illness, or who may be unaware that they have a condition.

Several consultations took place with various stakeholders to determine a list of high priority variables that are being measured in the CHMS and to finalize the exact survey content.

The following are some of the measures that the CHMS includes:

Physical measures

- Anthropometry (standing height, sitting height, weight, waist circumference, hip circumference, skinfolds)
- Cardiovascular fitness (blood pressure, modified Canadian Aerobic Fitness Test)
- Musculoskeletal fitness (hand grip strength, sit and reach test, partial curl-ups)
- Physical activity (accelerometry)
- Lung function (spirometry)
- Oral health (clinical oral examination)

Blood measures

- Nutritional status (e.g., folate, calcium)
- Metabolic syndrome (e.g., indicators of pre-diabetes)
- Cardiovascular disease (e.g., lipid profile)
- Environmental exposure (e.g., lead, mercury)
- Infectious disease markers (e.g., hepatitis)

Urine measures

- Indicators of kidney disease (e.g., microalbumin, creatinine)
- Environmental exposure (e.g., cotinine, pesticides)
- Nutritional markers (e.g., iodine)

The CHMS stores biological samples for further analyses of measures at a later date. The CHMS team works closely with the Health Canada Research Ethics Board and the Office of the Privacy Commissioner of Canada in order to address privacy issues and to implement proper laboratory procedures.

Survey operations

The first cycle of the Canadian Health Measures Survey (CHMS) will collect measures from approximately 5,000 people representing around 97% of the Canadian population aged 6 to 79. The survey collection began in early 2007 and will continue until early 2009. Initial data dissemination is planned for early 2010. In 2008, ongoing funding was officially approved for future cycles of the CHMS. The survey can now become an ongoing part of Canada's health information system. The second cycle of data collection is scheduled to begin in August 2009.

The CHMS is collecting data in 15 sites across the country. For the first cycle, the collection sites are located in five provinces: New Brunswick, Quebec, Ontario, Alberta and British Columbia. Collection includes a combination of a personal interview using a computer-assisted interviewing method and a visit to a mobile clinic specifically designed for the survey's collection of the physical measures. The CHMS mobile clinic remains in each site for six to eight weeks collecting direct measures from approximately 350 respondents per site.

First step: personal interview at the household

The first contact with respondents is a letter sent through the mail. The letter informs people living at the sampled address that an interviewer will visit their home to collect some information about the household.

When visiting the home, the interviewer randomly selects one or two respondents and conducts a health interview. The interview should take 45 to 60 minutes per respondent. The interviewer assists each respondent in setting an appointment for the physical measures to be taken by health professionals at the CHMS mobile clinic.

Second step: visit to the CHMS mobile clinic

The CHMS uses mobile clinics to conduct the clinic portion of the survey. Similar clinics have been used successfully for years by the NHANES in the United States.

The clinic consists of two trailers linked by an enclosed pedestrian walkway. One trailer serves as a reception and administration area, while the other contains clinic rooms and a laboratory.

For each respondent, the complete visit to the centre lasts about two hours. This is an approximate time, given that each respondent is assessed for the suitability of each measure and tested accordingly.

At the end of the visit to the mobile clinic, respondents are provided with a waterproof activity monitor. This small device is to be worn for a week at all times except when sleeping—even when swimming or bathing. It will record information about normal physical activity patterns without the respondents having to do anything special. When the seven-day period is over, respondents will return the monitor in a special prepaid envelope they are given for this purpose.

Test results

If respondents so desire, they will receive a preliminary report of their test results before leaving the mobile clinic. A few months after their visit, the respondents' laboratory test results will be sent to them.

Confidentiality and consent

The Canadian Health Measures Survey is conducted under the authority of the *Statistics Act*. Participation in this survey is voluntary. Respondents are asked to give their written consent for the clinic portion of the survey.

Consultations

The survey's content and methods were developed in consultation with Health Canada, the Public Health Agency of Canada and three advisory committees: the Expert Advisory Committee, the Physician Advisory Committee and the Laboratory Advisory Committee. Extensive consultations were held with experts from the NHANES in order to validate the protocols for the measures.

Throughout the process, consultations were held on a monthly basis with the Health Canada Research Ethics Board. Several meetings were also held with the Office of the Privacy Commissioner of Canada and with provincial privacy commissioners. A Privacy Impact Assessment has been presented to the Office of the Privacy Commissioner.

Pre-test of the survey

A successful test of the Canadian Health Measures Survey (CHMS) was conducted in the fall of 2004. The objectives of the pre-test—to determine logistics, cost, time required to conduct all aspects of the survey, procedures, participation rates, etc.—were met with success. A dress rehearsal was conducted in early 2007. The lessons learned from the pre-test of the survey and the dress rehearsal were applied to the actual survey.

The participation rate in the pre-test was considered satisfactory by Statistics Canada. Respondents of all ages agreed to participate in the selected direct measures (physical and biological tests), with more than 90% of those who attended the clinic agreeing both to the physical measures and to give blood and urine samples. The lessons learned in the pre-test helped us achieve an even better response to the survey when the CHMS entered the field in 2007.

The pre-test survey data could not provide any statistical inferences about the Canadian population, but the data did provide interesting information about the sample population. One such finding of the pre-test was that self-reported measures are not as accurate as direct measures. For example:

- For body mass index (BMI), 20% of respondents were misclassified: the most common reclassifications for adults were from normal to overweight, and from overweight to obese. Height was reported accurately, but weight was under-reported by all age groups.
- For hypertension, nearly one-fifth of respondents were hypertensive. Of those, less than half were actually aware that they had high blood pressure.

The overall lessons learned were that Canadians seem interested in, and supportive of, a survey of this nature, and that the CHMS will be able to yield quality data on the health status of the Canadian population. This is good news, given that the CHMS represents a wealth of new information for public health professionals and researchers.

For more information

For more information on the Canadian Health Measures Survey, please contact the Statistics Canada regional office nearest you, send an e-mail to chms-ecms@statcan.gc.ca or visit www.statcan.gc.ca/chms.

Aussi disponible en français.