

# CANADIAN HEALTH MEASURES SURVEY



Information and  
Consent Booklet

Cycle 7



Statistics  
Canada

Statistique  
Canada

Canada

## For more information about the Canadian Health Measures Survey (CHMS)



**Toll-free number:** 1-888-253-1087



**Email address:** [chms-ecms@statcan.gc.ca](mailto:chms-ecms@statcan.gc.ca)



**Telecommunication device for people who are deaf:** 1-866-753-7083






**Web page:** [www.statcan.gc.ca/chms](http://www.statcan.gc.ca/chms)

**Biobank web page:** [www.statcan.gc.ca/biobank](http://www.statcan.gc.ca/biobank)

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# AT A GLANCE

## At a glance

One or two members of your household are invited to take part in a major health initiative led by Statistics Canada called the Canadian Health Measures Survey (CHMS).

By participating in this survey, you will receive valuable information about your health and help to improve the delivery of health services in Canada.

The CHMS is a voluntary survey. Before you decide to participate, it is important to understand why we are conducting this survey and what your participation involves.

We invite you to read this booklet. Additional information, including videos, is available at [www.statcan.gc.ca/chms](http://www.statcan.gc.ca/chms).

### What is the Canadian Health Measures Survey (CHMS)?

The CHMS is a collaborative project between Statistics Canada, Health Canada and the Public Health Agency of Canada. It is a national survey that collects health information from Canadians.

This survey is unique at Statistics Canada, since it combines an interview with a physical examination.

### What is the purpose of the Canadian Health Measures Survey (CHMS)?

The CHMS aims to help us better understand how the health of Canadians aged 1 to 79 is affected by their lifestyle and environment. Questionnaire answers, physical measurements and biological samples from participants provide data that support ongoing research and contribute to exploring emerging public health issues. The main purpose of this survey is to help improve the prevention, diagnosis and treatment of illnesses and to promote health and wellness across Canada.

### Who uses the information collected?

Objective statistical information is vital to researchers, analysts and decision makers across Canada. CHMS results could be used by

- Parliament and other policy makers to track major initiatives, set priorities for prevention and research programs, and evaluate policy and program outcomes
- epidemiologists and biomedical and health service researchers to understand trends in diseases and the relationship between observed risk factors and diseases

- individual physicians to evaluate the health and risk factors of their patients (for example, by using the reference standards for height, weight and blood pressure that will be developed)
- public health professionals to track preventable illnesses and evaluate the impact of prevention and intervention programs
- advocacy groups to raise awareness and help them monitor health problems such as heart disease, cancer, diabetes, child nutrition, obesity and health disparities.

### **How did I get selected to participate in this survey?**

Your household was randomly selected. Participants are then chosen based on a selection formula that takes into account the number of people living in the household and the age of each person. The goal is to ensure that the sample represents the Canadian population. By participating, you will be representing up to 6,000 other Canadians.

### **Why should I participate in this survey?**

By participating in this survey, you will provide valuable information that will help us better understand the health factors affecting Canadians. Your information will improve health services in Canada, and this will benefit all Canadians.

You will also receive a free comprehensive health report. This report includes many physical and laboratory test results that you would not typically receive during a regular visit to a medical doctor or other health professional. You may learn something new about your physical health!



## What does participating in the Canadian Health Measures Survey (CHMS) involve?

### The CHMS is a two-step survey:

#### First step: An in-home interview

The questions cover topics that include

- Nutrition
- Tobacco use
- Drug and alcohol use
- Medical history
- Current health condition
- Lifestyle
- Physical activity
- Environment (including a tap water sample)
- Demographic, social and economic data.

#### Second step: A visit to the mobile examination centre (MEC)

The mobile examination centre (MEC) is made up of three semi-trailers temporarily set up in or near your community. The MEC was designed to ensure your comfort, safety and privacy.

Trained and certified health specialists will

- measure your height and weight
- measure your blood pressure and heart rate at rest
- measure your bone density and body composition
- assess your oral health
- collect blood\*, urine and saliva samples.

\*For more information on how much blood is collected, see the “Blood sample” section.

#### Do I need to agree to everything?

If you feel uncomfortable answering certain questions, you do not need to answer. Also, if you have concerns about certain measurements, the biological samples (such as blood, urine or saliva) or the survey, please speak to a staff member.

## Are there any risks in participating in the Canadian Health Measures Survey (CHMS)?

Participation in the CHMS should not cause you any harm. As with any health examination, some procedures may cause slight discomfort (for example, the sting of a needle during the blood sample). Rest assured that we have chosen these measures and tests **because they are safe**. We will not ask you to take part in a procedure or test that is not appropriate for your current health status.

Statistics Canada takes all the necessary precautions to ensure that the health information and biological samples are collected in a way that is safe for participants. Qualified and accredited specialists take all the measurements, and they follow strict standard clinical procedures when administering tests.

## How will my information be kept private and confidential?

Statistics Canada goes to extraordinary lengths to protect you. Your information is collected under the authority of the *Statistics Act*, which ensures that it will be kept strictly confidential.





The CHMS also uses the following safeguards:

- No unauthorized people outside Statistics Canada will ever be allowed to see your individual responses.
- All Statistics Canada employees are under oath. This means they are subject to severe penalties, including prosecution, if they do not safeguard the confidentiality of your information.
- Statistics Canada never releases personal information collected in surveys, such as your name, address and phone number. All publications and other releases are carefully reviewed to ensure that no individual or identifiable data are ever published.
- For the CHMS, we consulted with Health Canada's Research Ethics Board and the Office of the Privacy Commissioner of Canada to ensure that we have every safeguard in place to store your samples securely and to protect your privacy and the confidentiality of your data.

### **How do I withdraw my consent after participating in the Canadian Health Measures Survey (CHMS)?**

You can withdraw your consent at any time. You can request to have any part of the survey removed, including the stored blood, urine or saliva samples. We will contact participants who reach the age of 15 to reconfirm their consent to continue storing their biological sample. To withdraw your consent, visit our web page ([www.statcan.gc.ca/chms](http://www.statcan.gc.ca/chms)) or see the last page of this booklet for contact information.

### **Will my travel expenses be reimbursed?**

Yes. Every person who takes part in testing at the MEC and completes the survey will receive \$150. This amount is to reimburse you for transportation, child care services and parking expenses related to your appointment at the MEC. If two people are selected from the same household and they both complete the survey, each one will receive \$150.

### **Can I receive a volunteering letter?**

Yes. If you need one, we can provide you with an official volunteering letter, upon request, to recognize the time spent participating in the survey.





# HOUSEHOLD INTERVIEW

## What happens during the household interview?

A Statistics Canada interviewer will visit you at your home and give you information about the survey. With your consent, the interviewer will ask you a series of questions. Once the questionnaire has been completed, we will schedule an appointment for you to visit the CHMS mobile examination centre at a time that suits you.

With your consent, the interviewer will return to your home to collect a tap water sample after your MEC appointment. Only participants who take part in the MEC part of the survey will receive their tap water analysis results. It will be tested for fluoride and certain heavy metals to determine how common exposure to these substances is in Canada.

If children (aged 1 to 11) or youth (aged 12 to 17) are selected to participate, the interviewer will ask them questions similar to those asked of the adults. Parents or guardians of children will answer questions on their behalf. However, if the child is present, they may participate. Youth participants will be able to answer most questions themselves, but their parent or guardian can help if needed.

### Why do I need to provide my consent?

The interviewer will ask all participants for their verbal consent at the start of the household questionnaire (for the parent or guardian of participants aged 1 to 14 and for respondents aged 15 to 79).

The interviewer will also require verbal assent from 12- to 14-year-olds, since they will be asked to answer the household questions. The interviewer will not ask for assent from respondents younger than 12, since they do not have to be present for the household interview.

### HOUSEHOLD STEPS

1. Respondent receives intro letter by mail
2. Interviewer schedules an in-home interview with an adult member of the household
3. Interviewer visits selected household on scheduled date
4. Application randomly selects 1-2 respondents
5. A video is shown to respondents.
6. Consent
7. Interviewer administers the survey questions
8. Interviewer assists in scheduling the MEC appointment



# MOBILE EXAMINATION CENTRE

## What happens at the mobile examination centre (MEC)?

At the end of your in-home interview, the interviewer will provide the pre-testing instructions (e.g., clothing to wear, medications to bring, fasting requirements, etc.). For more information, please see Appendix B. The purpose of the pre-testing instructions is to make sure you are comfortable and safe and to control some factors that could affect certain test results.

### Do I have to participate in the Canadian Health Measures Survey (CHMS)?

Participation in this survey is voluntary. In other words, you decide whether or not you want to contribute to this health initiative. If you decide to participate, we will ask you to sign a consent form at the beginning of your visit to the MEC.



### Why do I need to provide my consent?

By signing the consent form, you are confirming your willingness to take part in the survey. In particular, you confirm that

- you have been informed of the purpose of the survey, of how the information collected will be used and of who will use it
- you have had the opportunity to review the information about the survey and ask questions
- you understand what is involved in taking part in the survey
- you have been informed that you can withdraw from the survey at any time or can decline to participate in any test or measurement.

## What is the consent process at the mobile examination centre (MEC)?

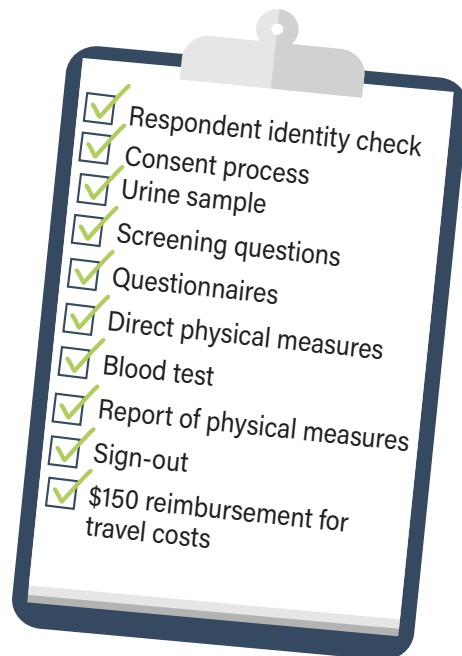
If you are 15 years or older, we will ask you at the beginning of your appointment to provide written consent to

- participate in the physical measurement tests
- have X-rays taken
- receive reports of your test results
- allow Statistics Canada to test your blood and urine for diseases and contaminants that may require mandatory reporting in your province of residence and to contact you, as well as the appropriate provincial authorities, if the results are outside the established reference range
- allow your blood, urine and saliva to be stored for use in future health studies.

If a child aged 1 to 14 is selected to participate in the survey, we will ask their parent or guardian to accompany them to the MEC and to sign the consent form. For children 1 to 2 years, an adult must accompany them at all times during the appointment.

Children aged 6 to 14 will be asked to provide their assent to participate. The form describes some of the tests we will administer and informs the child that

- we would like them to take part in some tests for the CHMS
- we will collect a small amount of their blood and urine
- they do not have to participate in any part of the survey they do not wish to.





## Which physical measurements will be taken at the mobile examination centre (MEC)?

The measurements are based on age group. Most of the measurements are not taken during a regular visit to the doctor. Therefore, this is an opportunity for you to get extra information about your health. We will not do any tests or take any measurements **without your consent**, and the data we collect will remain confidential. **One of our health specialists will monitor you throughout the process, and if for any reason, you cannot continue, we will stop the test.** You will receive the results for many of these tests on the day of your appointment.

Physical measures	Age group (years)			
	1	2	3 to 5	6 to 79
<b>Test results available at the mobile examination centre</b>				
Body composition: Recumbent height (height while lying down)	●			
Body composition: Standing height		●	●	●
Body composition: Sitting height			●	●
Body composition: Weight	●	●	●	●
Body composition: Waist circumference			●	●
Resting blood pressure and heart rate				●
Oral health	●	●	●	●
<b>Test results available after six to seven months</b>				
Blood sample	●	●	●	●
Urine sample			●	●
Saliva sample	●	●	●	●
Bone and muscle health	●	●	●	●
Activity monitor (at home)			●	●

### **Body composition (1 to 79 years)**

A health specialist will measure your height, weight and waist circumference. For participants 19 years and older, we will use your height and weight measurements to calculate your body mass index (BMI). The results will provide accurate data on how common obesity is in Canada.

### **Resting blood pressure and heart rate (6 to 79 years)**

A health specialist will measure your resting blood pressure and heart rate using an automated device. The device measures the pressure that the blood exerts on the walls of your blood vessels. The results will provide information on the health of your heart and blood vessels. They will also provide a clear picture of how common hypertension, or high blood pressure, is in Canada. These results are key in diagnosing hypertension and other heart conditions.

### **Densitometry (1 to 79 years)**

A DXA scanner is a medical device that emits very low levels of X-ray radiation to measure bone density and body composition (amount of muscle and fat). The procedure will be performed on a

DXA system under the supervision of a certified medical radiation technologist. You will be asked to wear appropriate clothing (see the pre-testing instructions in Appendix B for more information). If needed, clothing without metal parts will be provided by Statistics Canada. The technologist will ask you to lay flat on the table of the DXA scanner for two or three scans (total body, hip and lower back). You must stay still for up to 7-8 minutes. The mobile arm of the DXA scanner will move over you to create the image and will not touch you. No discomfort will be experienced during the scan. The technologist may reposition you if needed.

Although the exposure to radiation is extremely low — approximately equivalent to a typical dental x-ray for one scan and a flight from Ottawa to Vancouver for the complete exam — extra precautions will be taken to avoid radiation exposure to a fetus. All female participants 7 to 59 years will be asked the pregnancy screening questions designed to exclude anyone who is pregnant or at risk of pregnancy.

The parts of your body to be scanned will vary depending on your age.



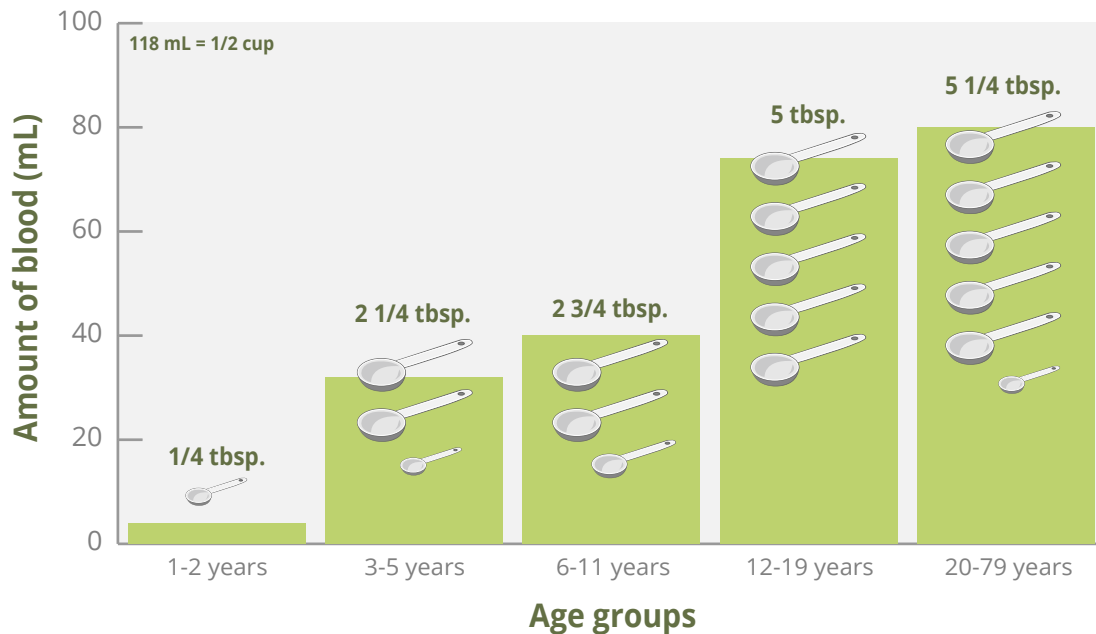
Age group (years)	Total body	Left hip	Lumbar spine (lower back)
1 to 5	●		●
6 to 79	●	●	●

### Blood sample (1 to 79 years)

Certified medical laboratory professionals will collect blood samples from participants. These professionals have received extra training on blood collection techniques specifically for 1- to 2-year-old children. Numbing cream patches (EMLA) will be available to reduce the discomfort caused by the prick of the needle. Before taking the blood sample, we will ask whether your child is allergic to these patches.

As part of this survey, we will collect a small amount of blood from you or your child.

### Amount of blood collected, by age group



### **Restrictions on sampling for participants 1 to 19 years old**

If you or your child aged 1 to 19 have had blood tests in the past 8 weeks or are scheduled to have a blood test within 8 weeks of your visit to the MEC, we will not collect any blood samples during your visit.

If, within eight weeks of your visit to the MEC, you or your child require a blood test, we recommend that you inform your doctor or other health care professional of the blood sample taken at the MEC.

The blood test results will give information about how common certain diseases are and the risk factors. They will also give baseline information on the health and nutritional status of the population and environmental contaminants.

### **Urine sample (3 to 79 years)**

We will ask you to provide two urine samples. The first will be collected at the MEC. We will use the results of that sample to produce national information on the general health and lifestyle of Canadians for a variety of characteristics.

We will also give you instructions on how to collect a second urine sample at home. This second sample will help us better assess your nutritional intake. We will provide prepaid packaging to return the sample.

### **Oral health (1 to 79 years)**

A dentist will check your teeth, gums and tongue to determine the general health of your mouth. We will also collect a sample of your saliva for future health studies.

Poor oral health can cause tooth decay, gum and bone (periodontal) disease and infections, as well as pain, tooth loss and bad breath. Periodontal disease has also been linked to a higher risk of general health problems, such as heart disease and diabetes.

The results will allow us to assess the oral health of Canadians and will contribute to developing policies for oral care services.



### **Activity monitor (3 to 79 years)**

We will ask you to wear an activity monitor for seven days following your MEC visit. This small, portable monitor, called ActiGraph, tracks your physical activity and sleep. It is waterproof and must be worn on your right hip. The device will record data on your physical activity patterns and body movements. For more information on the device and how you should wear it, visit our website, ([www.statcan.gc.ca/chms](http://www.statcan.gc.ca/chms)). We will provide prepaid packaging to return the device.

The results will allow us to learn more about the physical activity levels of Canadians and better understand the links between physical activity, sleep quality and overall health status.





# LABORATORY TESTS

## Which blood and urine tests are conducted at the mobile examination centre (MEC)?

Appendix A lists all the blood and urine tests conducted for the CHMS. The results you will receive in your report will depend on your age, sex, fasting status, and whether the test is conducted on a smaller group of survey participants. Your participation in a smaller group is selected at random. The different types of blood and urine tests are described below.

### Blood tests

#### **Chemistry panel (3 to 79 years)**

We will analyze a variety of elements in your blood to assess the functioning of different organs, such as the kidneys and liver. Examples of what we measure in the chemistry panel include calcium, potassium and magnesium.

#### **Cardiovascular health (various age groups)**

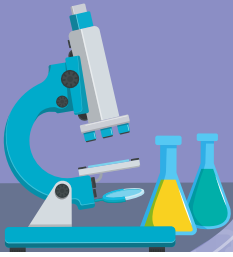
We will test your blood for levels of high-density lipoprotein, known as “good cholesterol” (helps remove cholesterol from the blood), and low-density lipoprotein, known as “bad cholesterol” (can cause cholesterol build-up in the blood vessels). We will also test for total cholesterol, triglycerides (a type of fat that the body uses to produce energy) and many fatty acids.

#### **Complete blood count (1 to 79 years)**

We will evaluate many components in your blood, including white blood cells, red blood cells, hemoglobin and platelets.

#### **Diabetes (various age groups)**

Diabetes is a chronic disease that stems from the body's inability to use and store glucose, a type of sugar that provides energy to cells. We will analyze your glucose levels and glycated hemoglobin (A1C). This gives an indication of your average blood sugar levels over the last two to three months.



### **Environmental exposure (various age groups)**

We will analyze your blood sample to determine your exposure to substances found in the environment. These substances include cadmium, total arsenic, total mercury, nicotine, flame retardants and polycyclic musks.

### **Nutritional status (various age groups)**

We will analyze your blood sample to evaluate your nutritional status. For example, we will measure vitamin and mineral levels, including folate, vitamin B12, vitamin D and iron.

### **Thyroid status (3 to 79 years)**

The thyroid is a gland that helps regulate body temperature and the metabolism of proteins, fats and sugars. A thyroid disorder can lead to many chronic diseases, such as heart disease and diabetes.



## Urine tests

### Environmental exposure (various age groups)

We will analyze your urine samples to determine your exposure to substances found in the environment. These substances include flame retardants, parabens, pesticides (DEET) and herbicides (glyphosate).

### Nutritional status (various age groups)

We will analyze your urine samples for indicators of your nutritional status, including iodine, which is essential for the thyroid gland to function properly.

## Reportable environmental contaminants

We will test your samples for environmental contaminants only if you consent to

- have these tests performed
- allow the CHMS medical advisor to contact you if your results are outside the normal healthy range
- allow Statistics Canada to contact you if your results are outside the established reference range and require a follow-up
- allow Statistics Canada to contact the appropriate provincial authorities if your results require mandatory reporting (such as for cadmium, lead, mercury and arsenic in Quebec).

If you do not want your information to be shared with local public health authorities, we will not test your blood.

For a full list of the environmental contaminants tested, please see Appendix A.



# RESULTS

## What happens once I complete the survey?

At the end of your MEC appointment, you will receive a report of the results of your **physical measures that are available.**

**With your consent, six to seven months** after your appointment, we will send you a **final report** of your results for some of the tests that were administered. The final report will include

- laboratory analysis results of your blood samples
- laboratory analysis results of your urine samples
- information on your level of physical activity
- your bone density and body composition results
- laboratory analysis results of your tap water samples.

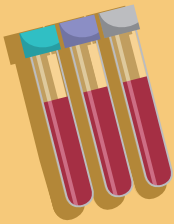
Tests conducted as part of the CHMS do not replace regular health care and are not intended to be diagnoses. However, if a test result is outside a normal range and you provided consent to receive test results, you will receive an **early report** before the **final report**. Our medical advisor will contact you if your test results require immediate attention. We will also provide a letter to give to your doctor or other health care professional in case you need a follow-up or if you want further explanation of the results.

Youth aged 15 to 17 who consent to participate in the survey and receive their results will receive them by mail. The results for participants younger than 15 will be sent to their parent or guardian.



## Note

Many of the substances we analyze in blood and urine have never been measured at a national level. One of the objectives of the CHMS is to establish national levels for these substances in order to support future health research. Your final report may not contain all the results for these substances, as the healthy ranges are still unknown. If you wish to receive results that are not in your final report, please contact us.



# BIOBANK

## Why will my blood, urine and saliva samples be stored?

With your consent, some of the blood, urine and saliva samples are stored in freezers in a secure location for use in future health studies.

The main purpose of the Statistics Canada biobank program is to support health research that will benefit all Canadians. For more information on the biobank, please visit [www.statcan.gc.ca/biobank](http://www.statcan.gc.ca/biobank).

In addition, storing your biological samples

- reduces the need for researchers to collect new samples from participants for each research project
- gives researchers quicker and easier access to samples for their research needs
- helps Canadians benefit from advances in science and medicine.

Before samples can be used, research projects undergo a thorough scientific, ethical and security review process.



### **How are my samples stored?**

Each biological sample tube is labelled with a barcode. No other personal information is associated with your samples.

Only authorized Statistics Canada employees can access this information on a need-to-know basis. A limited number of employees can associate the barcodes with other information you have provided. Your name and address are kept in a separate file at our head office. **No one outside Statistics Canada will have access to your personal information.**

### **Where will my samples be stored?**

The blood, urine and saliva samples are frozen and stored at the Public Health Agency of Canada's National Microbiology Laboratory. This is a high-security facility that meets international security standards for laboratories. Samples are stored in accordance with Statistics Canada's strict confidentiality requirements.

### **How will researchers access my data and biological samples?**

Researchers can access data and biological samples for their study by following strict security guidelines. To gain access to the samples, they must

- submit a research project that receives support through an established scientific review process and from Statistics Canada
- obtain approval for the project by a research ethics board
- take an oath to protect data confidentiality.



# CANADIAN HEALTH MEASURES SURVEY PUBLICATIONS AND DATA SHARING

## How are the survey results made available?

To ensure anonymity, results are published at a high level. This means that any information you provide will be combined with the information of other participants and published as averages, totals or proportions. We do not release any information that could identify you or any member of your household.

### Where can I find published survey results?

The results of previous cycles of the CHMS have been published in a variety of scientific and medical publications and on Statistics Canada's website. Links to Statistics Canada publications and external publications that have used CHMS data can be found on the CHMS web page.


### What is data linkage and could my data be used?

During the survey, we will tell you about the possibility of linking the information you provide to the CHMS with information from other surveys or administrative data sources.

Data linkage combines information on survey participants from at least two different sources. This is done only for statistical and research purposes. Linking data helps governments monitor, evaluate and modify health policies. If you agree to data linkage, we will

- ask you for your health card number to help with the linkage process
- combine the information we collect in this survey with some of your information that your provincial health ministry, health registries or other recognized health organizations already have on file
- remove personal identifiers such as your name, address and health card number from the linked file as soon as the linkage is complete
- destroy all linkage files at the end of the project.





Only Statistics Canada employees will link the data. All linked data will remain confidential in accordance with the *Statistics Act*. We will not provide any information about you to your provincial health ministry or any other organization.

For more information on data linkage, visit <https://www.statcan.gc.ca/eng/record/gen>.

### **How could my data be shared?**

We will ask you whether you consent to the information you provide through the CHMS being shared with Health Canada and the Public Health Agency of Canada. Sharing data allows researchers to fully use the information collected in order to improve health policies and, in turn, the health of Canadians. Data sharing also enables us to reduce the number of times we have to survey Canadians.

If you consent, we will share your data under the following conditions:

- We will remove your name, address (except postal code), date of birth and health card number from all files before sharing them.
- We will not share any information from your provincial health ministry or your health records.
- We will not share your information with any other party without your consent.
- Health Canada and the Public Health Agency of Canada will use this information only for statistical and research purposes, and they must ensure its confidentiality.

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*We will not share or link your data if you do not consent. You can always decline any linking or sharing request, in which case Statistics Canada will not link or share the collected information.*

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## Support from health organizations and associations

The CHMS has received the support of many key Canadian health organizations, including the following:

- Canadian Public Health Association
- Heart and Stroke Foundation of Canada
- Canadian Association of Optometrists
- ParticipACTION
- Hypertension Canada
- Osteoporosis Canada
- College of Family Physicians of Canada
- Glaucoma Research Society of Canada
- Best Start Resource Centre
- World Health Organization
- Canadian Society for Exercise Physiology
- Obesity Canada
- Red Cross
- Canadian Medical Association
- Canadian Dental Hygienists Association
- Canadian Dental Association

## For more information about the Canadian Health Measures Survey (CHMS)



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# APPENDIX A: LABORATORY TESTS

## WHOLE BLOOD, PLASMA, AND SERUM MEASURES

	Ages		Ages
<b>Diabetes biomarkers</b>		<b>Nutrition biomarkers</b>	
Glycated hemoglobin A1c*	6-79	Ferritin*	3-79
Insulin <sup>1</sup>		Red blood cell folate	
<b>Cardiovascular health</b>		Vitamin B12*	
<b><i>Apolipoproteins - Fasting</i></b>	20-79	<b><i>Vitamin D</i></b>	
Apolipoproteins A1		Total 25-OH Vitamin D*	
Apolipoproteins B		Vitamin D <sub>3</sub> [25(OH)]	
<b><i>Lipid profile &amp; hsCRP - Fasting</i></b>	6-79	Vitamin D <sub>3</sub> [3-epi-25(OH)]	
Total cholesterol*		Vitamin D2 [25(OH)]	
High sensitivity C-reactive protein		<b>Nicotine and its metabolites</b>	
High density lipoprotein-cholesterol		Free cotinine (non-smoking)	
Triglycerides*		Free cotinine (smoking)	
Low density lipoprotein-cholesterol, direct measure			
Total cholesterol/High density lipoprotein-cholesterol ratio		<b>Metals and trace elements</b>	
Low density lipoprotein-cholesterol		Cadmium (in blood)*	
<b><i>Lipid profile &amp; hsCRP -Non-fasting</i></b>	3-79	Lead*	
Total cholesterol*		Total mercury*	
High sensitivity C-reactive protein		Methyl mercury*	
High density lipoprotein-cholesterol		Inorganic mercury	
Total cholesterol/High density lipoprotein-cholesterol ratio		Selenium	
		Manganese	
		Total arsenic*	
<b>Homocysteine</b>	3-79		
1 Fasting			

\* Laboratory measures for which respondents will receive an early report if their results are equal to or outside the cut-off range if their test results are equal to or outside the cut-off range.

<sup>1</sup> Environmental contaminants reportable to local public health authorities in Quebec (lead, cadmium, mercury, arsenic), Alberta (lead) and British Columbia (lead, mercury).

## WHOLE BLOOD, PLASMA, AND SERUM MEASURES

	Ages		Ages
<b>Complete blood count (CBC)</b>		<b>Red blood cell fatty acid profile</b>	
White blood cell count*	1-79	Linoleic acid	20-79
Red blood cell count		Lauric acid	
Mean corpuscular volume		Myristic acid	
Mean corpuscular hemoglobin		Palmitic acid	
Mean corpuscular hemoglobin concentration		Stearic acid	
Red cell distribution width		Palmitoleic acid	
Hemoglobin*		cis-Vaccenic acid	
Hematocrit		Oleic acid	
Platelet count*		Palmitelaidic acid	
<b>Thyroid status</b>		Elaidic acid	
Free thyroxine*	3-79	Trans-10-Octadecenoic acid	
Thyroid stimulating hormone*		Trans-Vaccenic acid	
<b>Red blood cell fatty acid profile</b>		Total saturated fatty acids	
Alpha-linolenic acid	20-79	Total trans-18:1 fatty acids	
Docosahexanoic acid		Total trans-18:2 fatty acids	
Omega-3 docosapentanoic acid		Total trans fatty acids	
Eicosapentanoic acid		Total cis-18:1 fatty acids	
Adrenic acid		Total cis-monounsaturated fatty acids	
Arachidonic acid		Total omega-6 polyunsaturated fatty acids	
Dihomo-gamma-linolenic acid		Total omega-6 fatty acids (18:3; 20:3; 20:4; 22:4; 22:5)	
Omega-6 docosapentanoic acid		Total omega-3 polyunsaturated fatty acids	
Gamma-linolenic acid			



## WHOLE BLOOD, PLASMA, AND SERUM MEASURES

	Ages		Ages	
<b>Red blood cell fatty acid profile</b>		<b>Flame retardants: PBDE</b>		
Total omega-3 fatty acids (18:4; 20:4; 20:5; 22:5; 22:6)	20-79	5-hydroxy-2,2',4,4'-tetrabromodiphenyl ether (5-OHB-DE-47)	3-79	
Total polyunsaturated fatty acids		6-hydroxy-2,2',4,4'-tetrabromodiphenyl ether (6-OH-BDE-47)		
Omega-3 index		6-methoxy-2,2',4,4'-tetrabromodiphenyl ether (6-MeO-BDE-47)		
Total omega-6 polyunsaturated fatty acids / Total omega-3 polyunsaturated fatty acids ratio		4'-hydroxy-2,2',4,5'-tetrabromodiphenyl ether (4'-OH-BDE-49)		
Total long-chain omega-6 polyunsaturated fatty acids / Total long-chain omega-3 polyunsaturated fatty acids ratio		<b>Parents</b>		
Alpha-linolenic acid / Eicosapentanoic acid ratio		2,2',4,4'-Tetrabromodiphenyl ether (PBDE 47)	3-79	
Arachidonic acid / Eicosapentanoic acid ratio		2,2',4,4',5-Pentabromodiphenyl ether (PBDE 99)		
Eicosapentanoic acid / Arachidonic acid ratio		2,2',4,4',6-Pentabromodiphenyl ether (PBDE 100)		
<b>Flame retardants: Polybrominated diphenyl ethers (PBDE)</b>			2,2',4,4',5,5'-Hexabromodiphenyl ether (PBDE 153)	
<b>Metabolites</b>			<b>Chemistry panel</b>	
Pentabromoethylbenzene (PBEB)	3-79	Albumin*	3-79	
2-ethyl-1-hexyl 2,3,4,5-tetrabromobenzoate (EHTBB) or (TBB)		Alanine aminotransferase*		
Bis(2-ethylhexyl)-tetrabromophthalate (TBPH)		Alkaline phosphatas		

## WHOLE BLOOD, PLASMA, AND SERUM MEASURES

	Ages		Ages		
<b>Chemistry panel</b>		<b>Flame retardants: SCCPs</b>			
Aspartate aminotransferase*	3-79	Congener C11H19Cl5			
Calcium*		Congener C11H18Cl6			
Chloride*		Congener C11H17Cl7			
Creatinine*		Congener C11H16Cl8			
Gamma-glutamyl transferase		Congener C11H15Cl9			
Glucose*		Congener C11H14Cl10			
Magnesium*		Congener C12H21Cl5			
Phosphorus*		Congener C12H20Cl6			
Potassium*		Congener C12H19Cl7			
Total protein		Congener C12H18Cl8			
Sodium*		Congener C12H17Cl9			
Urea*		Congener C12H16Cl10			
Uric acid*		Congener C13H23Cl5			
<b>Flame retardants: SCCPs</b>	20-79	Congener C13H22Cl6			
<i>Short-chain chlorinated paraffins (SCCPs) (C10-C13)</i>		Congener C13H21Cl7			
Congener C10H17Cl5		Congener C13H20Cl8			
Congener C10H16Cl6		Congener C13H19Cl9			
Congener C10H15Cl7		Congener C13H18Cl10			
Congener C10H14Cl8		<b>Polycyclic musks</b>			
Congener C10H13Cl9		Tonalide		3-79	
Congener C10H12Cl10		Galaxolide			
* Laboratory measures for which respondents will receive an early report if their results are equal to or outside the cut-off range					



## URINE MEASURES

	Ages		Ages
<b>Nutrition biomarkers</b>		<b>Food additives/Antioxidants<sup>2</sup></b>	
Iodine	3-19 (M)	3,5-di-tert-butyl-4-hydroxybenzoic acid (BHT-acid)	3-79
Iodine-creatinine ratio	3-39 (F)		
<b>General characterization</b>		<b>Electrolytes</b>	
Creatinine		Sodium	3-79
Specific gravity	3-79	Potassium	
<b>Environmental phenols</b>		<b>Pesticides</b>	
Bisphenol 4-4' (BP44)		<b>Pesticides 1<sup>2</sup></b>	
Bisphenol A (BPA)		N,N-Diethyl-m-toluamide (DEET)	
Bisphenol B (BPB)		m-[(N,N-diethylamino)carbonyl] benzoic acid (DCBA)	3-79
Bisphenol E (BPE)		N,N-Diethyl-m-hydroxymethylbenzamide (DHMB)	
Bisphenol F (BPF)	3-79	2-isopropyl-4-methyl-6-hydroxypyrimidine (IMPY)	
Bisphenol S (BPS)			
Bisphenol Z (BPZ)		<b>Pesticides 2<sup>2</sup></b>	
Bisphenol AF (BPAF)		Glyphosate (GLYPH)	
Triclosan		Aminomethylphosphonic acid (AMPA)	3-79
<b>Flame retardants: OP<sup>2</sup></b>		Glufosinate (GLUF or glufosinate ammonium)	
Organiophosphates (OP)		3-Methylphosphinicopropionic acid (3-MPPA)	
Bis(2-chloropropyl) phosphate (BCIPP)			
Bis(1,3-dichloro-2-propyl) phosphate (BDCIPP)		<b>Phenoxy herbicide</b>	
Diphenyl phosphate (DPHP)	3-79	2,4-Dichlorophenoxyacetic acid (2,4-D)	3-79
Bis-2-(chloroethyl) phosphate (BCEP)			
Para-isopropylphenyl phenyl phosphate (ip-PPP)			
Dibutylphosphate (DBP)			

2. Subsample



## URINE MEASURES

	Ages		Ages
<b>Parabens<sup>2</sup></b>		<b>Neonicotinoids<sup>2</sup></b>	
Ethylparaben		Acetamiprid (NXL)	
Methylparaben		Clothianidin	
Propylparaben	3-79	Dinotefuran (DTQ)	
Butylparaben		Imidacloprid (ICP)	
Benzyl-paraben		Nitenpyram (NTM)	
Iso-butylparaben		Thiacloprid (TAP)	3-79
<b>Metals and trace elements</b>		Thiamethoxam (THM)	
<b><i>Speciated arsenic<sup>2</sup></i></b>		Sulfoxaflor	
Arsenobetaine and arsenocholine		4-Hydroxyimidacloprid	
Arsenous acid (Arsenite)		5-Hydroxyimidacloprid	
Dimethylarsinic acid		N-Desmethylacetamiprid	
Monomethylarsenic acid		N-Desmethylclothianidin	
Arsenic acid (Arsenate)		N-Desmethylthiamethoxam	
Total inorganic arsenic <sup>*+</sup>	3-79		
<b><i>Mercury<sup>*+</sup></i></b>			
<b><i>Cadmium (in urine)<sup>+</sup></i></b>			
<b><i>Fluoride<sup>*+</sup></i></b>			
<b><i>Boron</i></b>			
<b><i>Total arsenic<sup>*</sup></i></b>			

2. Subsample

\* Laboratory measures for which respondents will receive an early report if their results are equal to or outside the cut-off range.

+ Environmental contaminants reportable to local public health authorities in Quebec (lead, cadmium, mercury, arsenic), Alberta (lead) and British Columbia (lead, mercury).

Disclaimer: The above tests are randomly selected and you may not receive all the results.



## HOUSEHOLD URINE MEASURES

## TAP WATER MEASURES

	Ages		Ages
<b>Nutrition biomarkers</b>		<b>Fluoride in tap water</b>	
Iodine (home)	3-79	Fluoride*	3-79
Iodine-creatinine ratio (home)			
<b>General characterization</b>		<b>Metals and trace elements in tap water</b>	
Creatinine (home)	3-79	Antimony (Sb)*	1-79
<b>Electrolytes</b>		Arsenic (total) (As)*	
Sodium (home)	3-79	Beryllium (Be)	
Potassium (home)		Boron (B)*	
		Cadmium (Cd)*	
		Chromium (Cr)	
		Cobalt (Co)	
		Copper (Cu)	
		Lead (Pb)*	
		Manganese (Mn)	
		Molybdenum (Mo)	
		Nickel (Ni)	
		Selenium (Se)*	
		Silver (Ag)	
		Uranium (Ur)*	
		Zinc (Zn)	

\* Laboratory measures for which respondents will receive an early report if their results are equal to or outside the cut-off range.

Disclaimer: The above tests are randomly selected and you may not receive all the results.



# **APPENDIX B: PRE-TESTING INSTRUCTIONS**



# CANADIAN HEALTH MEASURES SURVEY



## Pre-testing instructions — Fasting appointment

### MY APPOINTMENT

Date (dd/mm/yyyy): \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time: \_\_\_\_\_

**TO BOOK AN APPOINTMENT—Monday to Friday 8 a.m. to 6 p.m,  
Saturday and Sunday 8 a.m. to 4 p.m.**

- 1) Call the mobile examination centre at **1-866-498-8518** (toll-free).
- 2) Provide your **Clinic ID number**: \_ \_ \_ \_ - \_ \_ \_ \_ \_
- 3) Provide your **name** and indicate that you need a **fasting appointment**.
- 4) If you need to reschedule your appointment, please call the MEC at least 24 hours in advance.

### INSTRUCTIONS FOR YOUR APPOINTMENT

- ◇ Children **under 15 years** must be accompanied by a parent or guardian for **some** components of the appointment.
- ◇ Children **1-2 years** of age must be accompanied by a non-selected **parent or guardian** for **all** components of the appointment.
- ◇ Please arrive **15 minutes prior to your scheduled appointment**.
- ◇ **8 hours before** your appointment (*for respondents 6-79 years old*):
  - Do not eat or drink anything other than water (no food, candies, gum, cough lozenges, flavoured water, coffee, alcoholic beverages, etc.)
- ◇ **6 hours before** your appointment:
  - It is not recommended to smoke or consume cannabis.
- ◇ **2 hours before** your appointment:
  - Do not urinate as you will be asked to **provide a urine sample upon arrival** (*for respondents 3-79 years old*)
  - Do not smoke or use other tobacco and nicotine products
- ◇ **On the day** of your appointment:
  - Take your medications as usual
  - Do not exercise
  - Remove all piercings and jewellery (if possible)

### WHAT TO BRING TO YOUR APPOINTMENT

- ◇ **All medications** (prescription or over-the-counter), **natural health products**, or **supplements**.
- ◇ **Dental prosthetics** (with their case) and your **toothpaste**.
- ◇ **Appropriate clothing and footwear** (short-sleeved top, flat indoor footwear and socks, shorts or loose-fitting clothing, **avoid** clothing with metal parts, such as zippers, rivets and underwire in bras).
- ◇ **Provincial health insurance card**.
- ◇ **Information of two contact persons** (name, address and phone number).



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# CANADIAN HEALTH MEASURES SURVEY



## Pre-testing instructions — Non-fasting appointment

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**TO BOOK AN APPOINTMENT—Monday to Friday 8 a.m. to 6 p.m.,  
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- 3) Provide your **name** and indicate that you need a **non-fasting appointment**.
- 4) If you need to reschedule your appointment, please call the MEC at least 24 hours in advance.

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### WHAT TO BRING TO YOUR APPOINTMENT

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# CANADIAN HEALTH MEASURES SURVEY



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# CANADIAN HEALTH MEASURES SURVEY



## Pre-testing instructions — Non-fasting appointment

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