

# Canadian Health Measures Survey (CHMS)

Content summary for cycles 1 to 8

May 2015





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## How to use this document

A blank shaded cell in the table indicates that the questionnaire topic, measure or lab test listed under the subject column is not included in the corresponding collection cycle. For tables 1 through 4, the cell indicates the age ranges for which the questionnaire topic, measure or lab test is applicable. For tables 5 and 6, a check mark indicates that the particular analyte was tested for in the air or water samples obtained from the respondent households.

When combining or comparing data between cycles, see the most recent instruction document for combining CHMS data, as well as the Data Dictionary and User Guide for information and relevant procedures.

**Table 1: Household Questionnaire and Specimen collection**

Theme	Subject	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
		2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
		Age (years)							
<b>Alcohol</b>	Alcohol use	12-79	12-79	12-79	12-79	12-79	12-79	12-79	12-79
<b>Anthropometry</b>	Height and weight	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Weight change	18-79	18-79						
<b>Chronic conditions</b>	Chronic conditions	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Phlegm	6-79	3-79	3-79	3-79			3-79	3-79
<b>Drug / Medication use</b>	Illicit drug use	14-79	14-79	14-79	14-79	14-79	14-79	14-79	14-79
	Medication use <sup>1</sup>	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Environmental exposure</b>	Grooming product use <sup>2</sup>	6-79							
	Hobbies	6-79	3-79	3-79	3-79				
	Housing characteristics <sup>3</sup>	6-79	3-79						
<b>Family medical history</b>	Family medical history	6-79	3-79	3-79	3-79			3-79	3-79
<b>General health</b>	General health	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Health utility index	6-79	6-79			6-79	6-79		
	Strengths and difficulties <sup>4</sup>	6-17	6-17	4-17	4-17			4-17	4-17
<b>Infection markers</b>	Hepatitis	6-79	3-79	3-79	3-79			3-79	3-79
	Human papillomavirus vaccine		9-39 F	9-59 F					
	Toxoplasmosis					3-79	3-79		
<b>Musculoskeletal health</b>	Bone health- Medication					3-79	3-79		
	Bone health- Menopause					40-65 F	40-65 F		
	Fracture history					3-79	3-79		
<b>Nutrition</b>	Dietary fat consumption	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Grains, fruits and vegetables consumption	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Meat and fish consumption <sup>5</sup>	6-79							
	Meat consumption <sup>5</sup>		3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Milk and dairy product consumption	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Salt consumption	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Water and soft drink consumption	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Oral health</b>	Oral health	6-79						3-79	
<b>Physical activity</b>	Children's physical activity	6-11	3-11	3-11	3-11	3-11	3-11	3-11	3-11
	International physical activity <sup>6</sup>			12-79					
	Physical activities <sup>7</sup>	12-79	12-79		12-79	12-79	12-79	12-79	12-79

**Table 1: Household Questionnaire and Specimen collection (continued)**

Theme	Subject	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
		2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
		<b>Age (years)</b>							
<b>Physical activity (cont'd)</b>	Sedentary activities	12-79	12-79	12-79	12-79	12-79	12-79	12-79	12-79
	Time spent outdoors			3-14	3-14	3-17	3-17		
	Neighbourhood environment					3-79	3-79		
<b>Pregnancy / Birth</b>	Birth information	6-11	3-11	3-11	3-11	3-11	3-11	3-11	3-11
	Breastfeeding	14-79 F	14-79 F			14-79 F	14-79 F		
	Breastfeeding information	6-11	3-11	3-11	3-11	3-11	3-11	3-11	3-11
	Maternal breastfeeding	14-79 F	14-79 F			14-79 F	14-79 F	14-79 F	14-79 F
	Pregnancy	14-59 F	14-59 F	14-59 F	14-59 F	14-59 F	14-59 F	14-59 F	14-59 F
	Pregnancy information	6-11	3-11	3-11	3-11	3-11	3-11	3-11	3-11
<b>Sexual health</b>	Pap smear test		14-79 F	14-79 F					
	Sexual behaviour	14-79	14-79	14-79	14-79	14-79	14-79	14-79	14-79
<b>Sleep</b>	Sleep apnea					18-79	18-79		
	Sleep	6-79	3-79	3-79	3-79			3-79	3-79
<b>Smoking</b>	Electronic cigarettes					12-79	12-79	12-79	12-79
	Exposure to second-hand smoke	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Exposure to second-hand vapor					3-79	3-79	3-79	3-79
	Smoking	12-79	12-79	12-79	12-79	12-79	12-79	12-79	12-79
<b>Socio-demographic characteristics</b>	Education	12-79	15-79	15-79	15-79	3-79	3-79	3-79	3-79
	Income	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Labour force activity	15-75	15-75	15-75	15-75	15-75	15-75	15-75	15-75
	Socio-demographic characteristics	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Specimen collection</b> <sup>8</sup>	Indoor air		Data at household level					Data at household level	
	Tap water			Data at household level				Data at household level	
<b>Vision</b>	Vision					3-79	3-79		

F=Females

<sup>1</sup> Data from the Medication use questionnaire administered during the household visit is combined with data from the Medication use questionnaire administered during the mobile examination centre (MEC) visit to form a medications data file.

<sup>2</sup> Questionnaire administered during the mobile examination centre visit for cycle 2

<sup>3</sup> Portions of the questionnaire administered during the mobile examination centre visit in cycle 3 and 4

<sup>4</sup> Strengths and Difficulties Questionnaire© Robert Goodman

<sup>5</sup> Fish portion of Meat and fish consumption questionnaire modified and administered during the mobile examination centre visit in cycles 2, 3 and 4

<sup>6</sup> International Physical Activity Questionnaire (IPAQ)

<sup>7</sup> As of Cycle 4, physical activity is divided into two blocks: one for youth (12 to 17); and one for adults (18 to 79).

<sup>8</sup> A wide variety of lab tests are done on the specimens (see Tables 4 to 6)

<b>Table 2: Mobile Examination Centre (MEC) Physical Measures and Specimen collection</b>									
Theme	Subject	Cycle 1 2007-2009	Cycle 2 2009-2011	Cycle 3 2012-2013	Cycle 4 2014-2015	Cycle 5 2016-2017	Cycle 6 2018-2019	Cycle 7 2020-2021	Cycle 8 2022-2023
		Age (years)							
<b>Anthropometry</b>	Standing height	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Sitting height	6-79	3-79	3-79	3-79			3-79	3-79
	Weight	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Skinfolds	6-79	3-79						
	Waist circumference	6-79	3-79 <sup>1</sup>	3-79	3-79	3-79	3-79	3-79	3-79
	Hip circumference	6-79	3-79	3-79	3-79			3-79	3-79
	Neck circumference		3-19			3-79	3-79		
<b>Cardiovascular health and fitness</b>	Blood pressure (resting)	6-79	6-79	6-79	6-79	6-79	6-79	6-79	6-79
	Heart rate (resting)	6-79	6-79	6-79	6-79	6-79	6-79	6-79	6-79
	Modified Canadian Aerobic Fitness Test (mCAFT step test)	6-69	8-69			8-69	8-69		
<b>Hearing</b>	Audiometry			6-79	6-79				
	Otoacoustic Emissions			3-79	3-79				
	Otoscopy			3-79	3-79				
	Tympanometry			3-79	3-79				
<b>Lung health</b>	Fractional Exhaled Nitric Oxide (FE <sub>NO</sub> )			6-79					
	Spirometry	6-79	6-79	6-79	6-79			6-79	6-79
<b>Musculoskeletal fitness</b>	Hand grip strength	6-79	6-79	6-79	6-79	6-79	6-79	6-79	6-79
	Partial curl-ups	6-69	8-69						
	Sit and reach	6-69	6-69			6-69	6-69		
<b>Oral health</b>	Oral health examination	6-79						3-79	
<b>Physical activity</b>	Accelerometry (activity monitor) <sup>2</sup>	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Specimen collection</b> <sup>3,4</sup>	Blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Urine	6-79	3-79	3-79	3-79	3-79 <sup>6</sup> , 3-39 <sup>7</sup>	3-79 <sup>6</sup> , 3-39 <sup>7</sup>	3-79	3-79
	Hair					20-59	20-59		
	Saliva					3-79	3-79	3-79	3-79
<b>Vitamin D</b>	Skin pigmentation			3-79	3-79			3-79	3-79
<b>Vision</b>	Visual acuity					6-19, 20-39 <sup>5</sup> , 40-79	6-19, 20-39 <sup>5</sup> , 40-79		
	Visual field					20-39 <sup>5</sup> , 40-79	20-39 <sup>5</sup> , 40-79		
	Retinal photography					20-39 <sup>5</sup> , 40-79	20-39 <sup>5</sup> , 40-79		

<b>Table 2: Mobile Examination Centre (MEC) Physical Measures and Specimen collection (continued)</b>									
Theme	Subject	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
		2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
Age (years)									
<b>Vision (cont'd)</b>	Intraocular pressure					20-39 <sup>5</sup> , 40-79	20-39 <sup>5</sup> , 40-79		
<b>Musculoskeletal health</b>	Peripheral quantitative computed tomography (pQCT)					6-79	6-79		
	Mechanography (multiple 2 legged hopping)					6-79	6-79		
	Mechanography (single 2 legged jump)					6-79	6-79		
	Dual-energy x-ray absorptiometry (DXA)							6-79	6-79

<sup>1</sup> Used World Health Organization (WHO) and National Institute of Health (NIH) measurement protocols

<sup>2</sup> Respondents wear an activity monitor for seven days directly following their visit to the mobile examination centre

<sup>3</sup> A wide variety of lab tests are done on blood and urine (see Table 4: Laboratory Biospecimen Tests)

<sup>4</sup> A limited volume of blood and urine is stored for future health research

<sup>5</sup> Vision test done on sample of respondents who self-reported being diagnosed with diabetes (type 1 and type 2)

<sup>6</sup> A urine sample will also be collected at the household

<sup>7</sup> For both household and clinic urine samples, specific demographic groups will be measured for iodine

<b>Table 3: Mobile Examination Centre (MEC) Questionnaire</b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		<b>Age (years)</b>							
<b>Nutrition</b>	Fish and shellfish consumption		3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Environmental exposure</b>	Grooming product use <sup>1</sup>		3-79						
	Indoor air		3-79	3-79	3-79 S			3-79 S	3-79 S
	Tap water (water analysis questions)			3-79 S	3-79 S			3-79 S	3-79 S
<b>Hearing</b>	Hearing ability			3-79	3-79				
	Noise exposure			3-79	3-79				
<b>Medication use</b>	Medication use <sup>2</sup>	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Oral health</b>	Oral health	6-79						3-79	
<b>Screening</b>	Screening questions for physical measures	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Sun exposure</b>	Sun exposure			3-79	3-79			3-79	3-79
<b>Vision</b>	Vision					3-79	3-79		

S=Subsample

<sup>1</sup> Questions administered during the household questionnaire in cycle 1

<sup>2</sup> Data from the Medication use questionnaire administered during the household visit is combined with data from the Medication use questionnaire administered during the mobile examination centre (MEC) visit to form a medications data file.



**Table 4: Laboratory Biospecimen Tests**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
<b>Allergies</b>	Total immunoglobulin E	blood			6-79	6-79				
<b>Bone Health</b>	Procollagen type I N-terminal propeptide	blood					6-79	6-79		
	C-telopeptide of collagen type I	blood					6-79 S	6-79 S		
<b>Cardiovascular health</b>	Apolipoprotein A1	blood	6-79 S		20-79 S	20-79 S	20-79 S	20-79 S	20-79 S	20-79 S
	Apolipoprotein B	blood	6-79 S		20-79 S	20-79 S	20-79 S	20-79 S	20-79 S	20-79 S
	Fibrinogen	blood	12-79	12-79						
	High density lipoprotein cholesterol (HDL-C)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	High sensitivity C-reactive protein (HsCRP)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Homocysteine	blood	6-79				3-79	3-79		
	Low density lipoproteins (LDL-C)									
	Derived variable	blood		6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S
	Direct measure	blood	6-79 S							
	Total cholesterol	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Triglycerides	blood	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S
	Red blood cell fatty acids									
	cis-Monosaturated fatty acids									
	cis-Vaccenic acid	blood			20-79 S	20-79 S				
	Oleic acid	blood			20-79 S	20-79 S				
	Palmitoleic acid	blood			20-79 S	20-79 S				
	Omega-3 fatty acids									
	alpha-Linolenic acid	blood			20-79 S	20-79 S				
	Docosahexaenoic acid	blood			20-79 S	20-79 S				
	omega-3-Docosapentaenoic acid	blood			20-79 S	20-79 S				
	Eicosapentaenoic acid	blood			20-79 S	20-79 S				
	Eicosatetraenoic acid	blood			20-79 S	20-79 S				
	Omega-6 fatty acids									
	Adrenic acid	blood			20-79 S	20-79 S				
	Arachidonic acid	blood			20-79 S	20-79 S				
	Dihomo-gamma-linolenic acid	blood			20-79 S	20-79 S				
omega-6-Docosapentaenoic acid	blood			20-79 S	20-79 S					
Gamma-linolenic acid	blood			20-79 S	20-79 S					

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
Cardiovascular health (Cont'd)	Linoleic acid	blood			20-79 S	20-79 S				
	Saturated fatty acids									
	Lauric acid	blood			20-79 S	20-79 S				
	Myristic acid	blood			20-79 S	20-79 S				
	Palmitic acid	blood			20-79 S	20-79 S				
	Stearic acid	blood			20-79 S	20-79 S				
	Trans fatty acids									
	RBC Fatty acid derived variables									
	Elaidic acid	blood			20-79 S	20-79 S				
	Palmitelaidic acid	blood			20-79 S	20-79 S				
	trans-10-Octadecenoic acid	blood			20-79 S	20-79 S				
	trans-Vaccenic acid	blood			20-79 S	20-79 S				
	alpha-Linolenic acid/Eicosapentaenoic acid	blood			20-79 S	20-79 S				
	Arachidonic acid/Eicosapentaenoic acid	blood			20-79 S	20-79 S				
	Omega-3 index	blood			20-79 S	20-79 S				
	Total cis-18:1 fatty acids	blood			20-79 S	20-79 S				
	Total cis-monounsaturated fatty acids	blood			20-79 S	20-79 S				
	Total n-3 PUFA	blood			20-79 S	20-79 S				
	Total n-3 (18:4; 20:4; 20:5; 22:5; 22:6)	blood			20-79 S	20-79 S				
	Total n-6 PUFA	blood			20-79 S	20-79 S				
	Total n-6 (18:3; 20:3; 20:4; 22:4; 22:5)	blood			20-79 S	20-79 S				
	Total n-6 PUFA/total n-3 PUFA	blood			20-79 S	20-79 S				
	Total n-6 LC-PUFA/total n-3 LC-PUFA	blood			20-79 S	20-79 S				
	Total polyunsaturated fatty acids	blood			20-79 S	20-79 S				
	Total saturated fatty acids	blood			20-79 S	20-79 S				
	Total trans-18:1 fatty acids	blood			20-79 S	20-79 S				
Total trans-18:2 fatty acids	blood			20-79 S	20-79 S					
Total trans-18:3 fatty acids	blood			20-79 S	20-79 S					
Total trans fatty acids	blood			20-79 S	20-79 S					
Chemistry Panel	Alanine aminotransferase (ALT)	blood	6-79	3-79		3-79	3-79	3-79	3-79	3-79
	Albumin	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
<b>Chemistry Panel (Cont'd)</b>	Alkaline phosphatase (ALKP)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Aspartate aminotransferase (AST)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Bicarbonate (CO2)	blood	6-79							
	Chloride	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Creatinine	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Gamma-glutamyl transferase (GGT)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Lactate dehydrogenase (LD)	blood	6-79							
	Magnesium	blood			3-79	3-79	3-79	3-79	3-79	3-79
	Phosphorus	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Potassium	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Sodium	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Total bilirubin (TBIL)	blood	6-79	3-79						
	Calcium	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Total protein (TP)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Urea	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
Uric acid	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79	
<b>Complete blood count</b>	Hemoglobin									
	Hemoglobin	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Mean corpuscular hemoglobin	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Mean corpuscular hemoglobin concentration	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Platelets									
	Mean platelet volume	blood	6-79	3-79						
	Platelet count	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Red blood cell									
	Hematocrit	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Mean corpuscular volume	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Red cell distribution width	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
Red blood cell count (RBC)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79	

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
Complete blood count (Cont'd)	White blood cell									
	Basophils	blood	6-79	3-79						
	Eosinophils	blood	6-79	3-79						
	Lymphocytes	blood	6-79	3-79						
	Neutrophils	blood	6-79	3-79						
	Monocytes	blood	6-79	3-79						
	White blood cell count (WBC)	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
Diabetes	Glucose - plasma	blood	6-79							
	Glucose - serum	blood		3-79	6-79 S	6-79 S	3-79	3-79	3-79	3-79
	Glycated hemoglobin A1c (HbA1c)	blood	6-79	6-79	6-79	6-79	6-79	6-79	6-79	6-79
	Insulin	blood	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S	6-79 S
Environmental exposure (EE) - Acrylamide	Acrylamide hemoglobin adduct	blood			3-79 S	3-79 S	3-79 S	3-79 S		
	Glycidamide hemoglobin adduct	blood			3-79 S	3-79 S	3-79 S	3-79 S		
EE - Benzene metabolites	tt-Muconic acid	urine		3-79 S	3-79 S	3-79 S				
	Phenol	urine		3-79 S						
	s-Phenylmercapturic acid	urine		3-79 S	3-79 S	3-79 S				
EE - Carbamate insecticides	Carbofuranphenol	urine		3-79 S						
	2-Isopropoxyphenol	urine		3-79 S						
EE - Chlorophenols	2,4-Dichlorophenol	urine	6-79	3-79 S						
	2,5-Dichlorophenol	urine		3-79 S						
	Pentachlorophenol	urine		3-79 S						
	2,4,5-Trichlorophenol	urine		3-79 S						
	2,4,6-Trichlorophenol	urine		3-79 S						
EE - Metals and trace elements	Aluminum	hair					20-59	20-59		
	Antimony	hair					20-59	20-59		
	Antimony	urine	6-79	3-79						
	Arsenic (speciated)									
	Arsenobetaine/arsenocholine	urine		3-79 S	3-79 S	3-79 S	3-79 S	3-79 S		
	Arsenocholine	urine			3-79 S	3-79 S				

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
EE - Metals and trace elements (Cont'd)	Arsenic (V) acid	urine		3-79 S	3-79 S	3-79 S	3-79 S	3-79 S		
	Arsenous (III) acid	urine		3-79 S	3-79 S	3-79 S	3-79 S	3-79 S		
	Dimethylarsinic acid	urine		3-79 S	3-79 S	3-79 S	3-79 S	3-79 S		
	Monomethylarsonic acid	urine		3-79 S	3-79 S	3-79 S	3-79 S	3-79 S		
	Arsenic (total)	blood	6-79							
	Arsenic	hair					20-59	20-59		
	Arsenic (total)	urine	6-79	3-79						
	Baryum	hair					20-59	20-59		
	Beryllium	hair					20-59	20-59		
	Bismuth	hair					20-59	20-59		
	Boron	urine					3-79 S	3-79 S		
	Cadmium	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Cadmium	hair					20-59	20-59		
	Cadmium	urine	6-79	3-79			3-79 S	3-79 S		
	Cesium	urine		3-79						
	Chromium	hair					20-59	20-59		
	Cobalt	blood		3-79						
	Cobalt	hair					20-59	20-59		
	Cobalt	urine		3-79						
	Copper	blood	6-79	3-79						
	Copper	hair					20-59	20-59		
	Copper	urine	6-79	3-79						
	Fluoride	urine		3-79 S	3-79 S	3-79 S				
	Lead	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Lead	hair					20-59	20-59		
	Lead	urine	6-79	3-79						
	Lithium	hair					20-59	20-59		
	Manganese	blood	6-79	3-79						
Manganese	hair					20-59	20-59			
Manganese	urine	6-79	3-79							

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
EE - Metals and trace elements (Cont'd)	Mercury									
	Inorganic	blood	6-79 S							
	Inorganic	urine	6-79		3-79	3-79				
	Methyl	blood			20-79 S	20-79 S	3-19 S	3-19 S		
	Total	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Molybdenum	blood	6-79	3-79						
	Molybdenum	hair					20-59	20-59		
	Molybdenum	urine	6-79	3-79						
	Nickel	blood	6-79	3-79						
	Nickel	hair					20-59	20-59		
	Nickel	urine	6-79	3-79						
	RBC chromium	blood					3-79 S	3-79 S		
	Selenium	blood	6-79	3-79			3-79	3-79		
	Selenium	urine	6-79	3-79						
	Selenium	hair					20-59	20-59		
	Silver	blood		3-79						
	Silver	hair					20-59	20-59		
	Silver	urine		3-79						
	Strontium	hair					20-59	20-59		
	Tellurium	hair					20-59	20-59		
	Thallium	urine		3-79						
	Thallium	hair					20-59	20-59		
	Thorium	hair					20-59	20-59		
	Tin	hair					20-59	20-59		
	Tungsten	hair					20-59	20-59		
	Tungsten	urine		3-79						
	Uranium	blood	6-79	3-79						
	Uranium	hair					20-59	20-59		
	Uranium	urine	6-79	3-79						
	Vanadium	hair					20-59	20-59		
Vanadium	urine	6-79	3-79							

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
EE - Metals and trace elements (Cont'd)	Zinc	blood	6-79	3-79						
	Zinc	hair					20-59	20-59		
	Zinc	urine	6-79	3-79						
EE - Organochlorine pesticides	Aldrin	blood	20-79 S							
	alpha-Chlordane	blood	20-79 S							
	gamma-Chlordane	blood	20-79 S							
	cis-Nonachlor	blood	20-79 S							
	trans-Nonachlor	blood	20-79 S							
	Oxychlordane	blood	20-79 S							
	beta-Hexachlorocyclohexane (β-HCH)	blood	20-79 S							
	gamma-Hexachlorocyclohexane (γ-HCH)	blood	20-79 S							
	Hexachlorobenzene (HCB)	blood	20-79 S							
	Mirex	blood	20-79 S							
	p,p'-DDE	blood	20-79 S							
	p,p'-DDT	blood	20-79 S							
	Toxaphene parlar 26	blood	20-79 S							
Toxaphene parlar 50	blood	20-79 S								
EE - Organophosphate insecticides	Acephate	urine			3-79 S					
	Diethylphosphate (DEP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Diethylthiophosphate (DETP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Diethyldithiophosphate (DEDTP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Dimethylphosphate (DMP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Dimethylthiophosphate (DMTP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Dimethyldithiophosphate (DMDTP)	urine	6-79 S	3-79 S			3-79 S	3-79 S		
	Malathion dicarboxylic acid	urine			3-79 S	3-79 S				
	Methamidophos	urine			3-79 S	3-79 S				
	3,5,6 Trichloro-2-pyridinol	urine			3-79 S	3-79 S				
EE - Parabens	Butyl paraben	urine			3-79 S	3-79 S	3-79	3-79		
	Ethyl paraben	urine			3-79 S	3-79 S	3-79	3-79		
	Methyl paraben	urine			3-79 S	3-79 S	3-79	3-79		
	Propyl paraben	urine			3-79 S	3-79 S	3-79	3-79		

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
EE - Perfluoroalkyl substances	Perfluorobutane sulfonate (PFBS)	blood		12-79 S				3-79 S	3-79 S	
	Perfluorodecanoic acid (PFDA)	blood		12-79 S				3-79 S	3-79 S	
	Perfluorohexane sulfonate (PFHxS)	blood	20-79	12-79 S				3-79 S	3-79 S	
	Perfluorohexanoic acid (PFHxA)	blood		12-79 S				3-79 S	3-79 S	
	Perfluoro-n-butyric acid (PFBA)	blood		12-79 S				3-79 S	3-79 S	
	Perfluorononanoic acid (PFNA)	blood		12-79 S				3-79 S	3-79 S	
	Perfluorooctane sulfonate (PFOS)	blood	20-79	12-79 S				3-79 S	3-79 S	
	Perfluorooctanoic acid (PFOA)	blood	20-79	12-79 S				3-79 S	3-79 S	
	Perfluoroundecanoic acid (PFUDA)	blood		12-79 S				3-79 S	3-79 S	
EE - Phenoxy Herbicide	2,4-Dichlorophenoxyacetic acid (2,4-D)	urine	6-79	3-79 S						
EE - Phthalate metabolites	Mono benzyl phthalate (MBzP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-3-carboxypropyl phthalate (MCPP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-3-hydroxy-n-butyl phthalate (3OH-MBP)	urine						3-79 S	3-79 S	
	Mono cyclohexyl phthalate (MCHP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-2-ethylhexyl phthalate (MEHP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono ethyl phthalate (MEP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-iso-butyl phthalate (MiBP)	urine		3-79 S				3-79 S	3-79 S	
	Mono-isononyl phthalate (MNP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-n-butyl phthalate (MBP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-n-octyl phthalate (MOP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-methyl phthalate (MMP)	urine	6-49	3-79 S				3-79 S	3-79 S	
	Mono-carboxy-n-heptyl phthalate (MCHpP)	urine						3-79 S	3-79 S	
	Mono(2-ethyl-5-carboxypentyl) phthalate (MECPP)	urine						3-79 S	3-79 S	
Mono(2-carboxymethylhexyl) phthalate (MCMHP)	urine						3-79 S	3-79 S		



**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
<b>EE - Phthalate metabolites (Cont'd)</b>	Mono(carboxyisooctyl) phthalate (MCIOP)	urine						3-79 S	3-79 S	
	Mono(oxoisobonyl) phthalate (MOINP)	urine						3-79 S	3-79 S	
	Mono(hydroxyisobonyl) phthalate (MHINP)	urine						3-79 S	3-79 S	
	Monocarboxyisobonyl phthalate (MCiNP)	urine						3-79 S	3-79 S	
	Monoisodecyl phthalate (MIDP)	urine						3-79 S	3-79 S	
	Monooxoisodecyl phthalate (MOiDP)	urine						3-79 S	3-79 S	
	Monohydroxyisodecyl phthalate (MHiDP)	urine						3-79 S	3-79 S	
<b>EE - Alternate plasticizers</b>	Mono-isobonyl-cyclohexane-1,2-dicarboxylate (MINCH)	urine						3-79 S	3-79 S	
	Cyclohexane-1,2-dicarboxylic acid (CHDA)	urine						3-79 S	3-79 S	
	Cyclohexane-1,2-dicarboxylic mono hydroxyisobonyl ester (OH-MINCH)	urine						3-79 S	3-79 S	
	cyclohexane-1,2-dicarboxylic mono oxoisobonyl ester (oxo-MINCH)	urine						3-79 S	3-79 S	
	Cyclohexane-1,2-diarboxylic mono carboxyisobonyl ester(cx-MINCH)	urine						3-79 S	3-79 S	
	2,2,4 trimethyl-1,3, pentanediol diisobutyrate (TXIB)	urine						3-79 S	3-79 S	
	2,2,4-trimethyl-1,2-pentanediol (TMPD)	urine						3-79 S	3-79 S	
	2,2,4-trimethyl-3-hydroxy valeric acid (HTMV)	urine						3-79 S	3-79 S	
	1-mono(2-ethylhexyl)trimellitate (1-MEHTM)	urine						3-79 S	3-79 S	
	2-mono(2-ethylhexyl)trimellitate (2-MEHTM)	urine						3-79 S	3-79 S	
	4-mono(2-ethylhexyl)trimellitate (4-MEHTM)	urine						3-79 S	3-79 S	
	1,2-di(2-ethylhexyl)trimellitate (1,2-DEHTM)	urine						3-79 S	3-79 S	
	2,4-di(2-ethylhexyl)trimellitate (2,4-DEHTM)	urine						3-79 S	3-79 S	
1,4-di(2-ethylhexyl)trimellitate (1,4-DEHTM)	urine						3-79 S	3-79 S		
<b>EE - Polyaromatic hydrocarbons</b>	Chrysenes									
	2-Hydroxychrysene	urine		3-79 S	3-79 S	3-79 S				
	3-Hydroxychrysene	urine		3-79 S	3-79 S	3-79 S				
	4-Hydroxychrysene	urine		3-79 S	3-79 S	3-79 S				
	6-Hydroxychrysene	urine		3-79 S	3-79 S	3-79 S				
	Fluoranthene									

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
<b>EE - Polyaromatic hydrocarbons (Cont'd)</b>	3-Hydroxyfluoranthene	urine		3-79 S	3-79 S	3-79 S				
	Fluorenes									
	2-Hydroxyfluorene	urine		3-79 S	3-79 S	3-79 S				
	3-Hydroxyfluorene	urine		3-79 S	3-79 S	3-79 S				
	9-Hydroxyfluorene	urine		3-79 S	3-79 S	3-79 S				
	Napthalenes									
	1-Hydroxynaphthalene	urine		3-79 S	3-79 S	3-79 S				
	2-Hydroxynaphthalene	urine		3-79 S	3-79 S	3-79 S				
	Phenanthrenes									
	1-Hydroxyphenanthrene	urine		3-79 S	3-79 S	3-79 S				
	2-Hydroxyphenanthrene	urine		3-79 S	3-79 S	3-79 S				
	3-Hydroxyphenanthrene	urine		3-79 S	3-79 S	3-79 S				
	4-Hydroxyphenanthrene	urine		3-79 S	3-79 S	3-79 S				
	9-Hydroxyphenanthrene	urine		3-79 S	3-79 S	3-79 S				
	Pyrene									
	3-Hydroxybenzo(a)pyrene	urine		3-79 S	3-79 S	3-79 S				
1-Hydroxypyrene	urine		3-79 S	3-79 S	3-79 S					
<b>EE - Polybrominated flame retardents</b>	Polybrominated biphenyls 153 (PBB 153)	blood	20-79 SP							
	Polybrominated diphenyl ether (PBDE) 15, 17	blood	20-79 SP							
	PBDE 25, 28, 33, 47, 99, 100, 153	blood	20-79 SP							
<b>EE - Polychlorinated biphenyls (PCBs)</b>	Aroclor 1260	blood	20-79 S							
	PCB 28, 52, 66, 74, 99, 101, 105, 118,	blood	20-79 S							
	PCB 128, 138, 146, 153, 156, 163, 167, 170	blood	20-79 S							
	PCB 178, 180, 183, 187, 194, 201, 203, 206	blood	20-79 S							
<b>EE - Pyrethroids (metabolites)</b>	Cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DBCA)	urine	6-79	3-79 S			3-79 S	3-79 S		
	Cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DCCA)	urine	6-79	3-79 S			3-79 S	3-79 S		
	4-fluoro-3-phenoxybenzoic acid (4-F-3-PBA)	urine	6-79	3-79 S			3-79 S	3-79 S		

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8	
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023	
			Age (years)								
EE - Pyrethroids (metabolites) (Cont'd)	3-phenoxybenzoic acid (3-PBA)	urine	6-79	3-79 S				3-79 S	3-79 S		
	trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA)	urine	6-79	3-79 S				3-79 S	3-79 S		
EE - Tobacco	Nicotine and metabolites										
	Anabasine	urine	12-79 S		12-79			12-79	12-79		
	Free cotinine	urine	6-79	3-79	3-79	3-79		3-79	3-79		
	Cotinine-n-glucuronide	urine	12-79 S		12-79			12-79	12-79		
	Total cotinine	urine	12-79 S								
	Nicotine (total)	urine	12-79 S		12-79			12-79	12-79		
	Nicotine-n-glucuronide	urine	12-79 S		12-79			12-79	12-79		
	Trans-3-Hydroxycotinine (total)	urine	12-79 S		12-79			12-79	12-79		
	Trans-3-Hydroxycotinine-glucuronide	urine	12-79 S		12-79			12-79	12-79		
	NNK metabolites (4-(methyl-nitrosamino)-1-butanone)										
	Free NNAL	urine	12-79 S		12-79 S			12-79 S	12-79 S		
	Total NNAL	urine	12-79 S		12-79 S			12-79 S	12-79 S		
EE - Triazine herbicides	Atrazine mercapturate	urine		3-79 S							
	Desethylatrazine	urine		3-79 S							
	Diaminochlorotriazine	urine		3-79 S							
EE - Volatile organic compounds	Common fuel pollutants (BTEX)										
	Benzene	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Ethylbenzene	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	m- & p-Xylenes	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	o-Xylene	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Toluene	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Trihalomethanes										
	Bromodichloromethane	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Dibromochloromethane	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Tribromomethane	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Trichloromethane	blood			12-79 S	12-79 S	12-79 S	12-79 S			
	Other										

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
			Age (years)							
<b>EE - Volatile organic compounds (Cont'd)</b>	Styrene	blood			12-79 S	12-79 S	12-79 S	12-79 S		
	Alkanes									
	Hexane	blood					12-79	12-79		
	Heptane	blood					12-79	12-79		
	Furans and dioxins									
	Tetrahydrofuran	blood					12-79	12-79		
	2,5-dimethylfuran	blood					12-79	12-79		
	1,4-dioxane	blood					12-79	12-79		
	Chlorinated hydrocarbons									
	1,1,1,2-tetrachloroethylene	blood			12-79 S	12-79 S	12-79 S	12-79 S		
	1,1,2-trichloroethylene	blood			12-79 S	12-79 S	12-79 S	12-79 S		
	1,2-dichloroethane	blood					12-79	12-79		
	Hexachloroethane	blood					12-79	12-79		
	Chlorobenzene	blood					12-79	12-79		
	1,2-dichlorobenzene	blood					12-79	12-79		
	1,4-dichlorobenzene	blood					12-79	12-79		
	1,2,3-trichloropropane	blood					12-79	12-79		
	Chloromethylbenzene	blood					12-79	12-79		
<b>EE - Other</b>	Bisphenol A (BPA)	urine	6-79	3-79 S	3-79	3-79 S	3-79 S	3-79 S	3-79 S	3-79 S
	Ethylene thiourea (ETU)	urine					3-79 S	3-79 S		
	ortho-phenylphenol (OPP)	urine					3-79 S	3-79 S		
	Pooled serum organohalogens	blood			3-79 P	3-79 P	3-79 P	3-79 P		
	Triclocarban	urine		3-79 S						
	Triclosan	urine		3-79 S	3-79 S	3-79 S				
<b>General characterization</b>	Creatinine	urine	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Specific gravity	urine		3-79	3-79	3-79	3-79	3-79	3-79	3-79
<b>Infection markers</b>	Hepatitis A, B and C profile									
	Hepatitis A virus antibody	blood	14-79							
	Hepatitis B virus core antibody	blood	14-79	14-79	14-79	14-79			14-79	14-79
	Hepatitis B virus surface antibody	blood	14-79	14-79	14-79				14-79	14-79
	Hepatitis B virus surface antigen	blood	14-79 <sup>1</sup>	14-79 <sup>1</sup>	14-79 <sup>1</sup>	14-79 <sup>1</sup>			14-79 <sup>1</sup>	14-79 <sup>1</sup>

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023
Age (years)										
<b>Infection markers (Cont'd)</b>	Hepatitis C virus antibody	blood	14-79	14-79	14-79	14-79			14-79	14-79
	Hepatitis C RNA	blood			14-79 S	14-79 S			14-79	14-79
	Chlamydia trachomatis	urine		14-59			14-59	14-59		
	Herpes simplex-2	blood		14-59						
	Human Papillomavirus (HPV 6, 11, 13, 16, 18, 26, 30-35, 39, 40, 42-45, 51-54, 56-59, 61, 62, 66-74, 81-87, 89-91, 97)	urine		14-59 F						
	Toxoplasmosis	blood					3-79			
<b>Kidney health</b>	Microalbumin	urine	6-79	3-79						
<b>Nutritional status</b>	Ferritin	blood		3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Iodine (clinic)	urine	6-79	3-79	3-79	3-79	3-39 <sup>2</sup>	3-39 <sup>2</sup>	3-79	3-79
	Iodine (household)	urine					3-39 <sup>2</sup>	3-39 <sup>2</sup>		
	Sodium (hhld & clinic)	urine					3-79	3-79		
	Potassium (hhld & clinic)	urine					3-79	3-79		
	Parathyroid hormone	blood		3-79			6-79 S	6-79 S		
	Red blood cell folate	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Vitamin B12	blood	6-79	3-79	3-79	3-79	3-79	3-79	3-79	3-79
	Vitamin C (L-ascorbic acid)	blood			6-79 S					
	Vitamin D3 [(25-OH)] - plasma	blood	6-79	3-79						
	Vitamin D3 [(25-OH)] - serum	blood			3-79	3-79	3-79	3-79	3-79	3-79
	Vitamin D3 [3-epi-25-OH]	blood					3-79	3-79	3-79	3-79
Vitamin D2 [25-OH]	blood					3-79	3-79	3-79	3-79	
<b>Reproductive hormones</b>	Estradiol (E2)	blood			6-79	6-79				
	Follicle-stimulating hormone (FSH)	blood			6-79 F	6-79 F				
	Luteinizing hormone (LH)	blood			6-79 F	6-79 F				
	Progesterone (P4)	blood			6-79 F	6-79 F				
	Testosterone	blood			6-79 M	6-79 M				
<b>Thyroid Status</b>	Anti-thyroglobulin	blood			3-79	3-79				
	Anti-thyroid peroxidase	blood			3-79	3-79				
	Free thyroxine	blood			3-79	3-79	3-79	3-79		
	Thyroid stimulating hormone	blood			3-79	3-79	3-79	3-79		

**Table 4: Laboratory Biospecimen Tests (continued)**

Theme	Subject	Biospecimen	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8
			2007-2009	2009-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023

Age (years)

M=Males; F=Females; S=Subsample; P=Pooled Serum; EE=Environmental exposure

<sup>1</sup> Lab test done on sample of respondents who tested positive for hepatitis B core antibody

<sup>2</sup> For both household and clinic urine samples, specific demographic groups will be measured for iodine

<b>Table 5: Laboratory Indoor Air Sample Tests<sup>1</sup></b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		Tested at the household level							
<b>Environmental exposure</b>	Acetone		✓	✓	✓			✓	✓
	a-Pinene		✓	✓	✓			✓	✓
	Benzaldehyde		✓	✓	✓			✓	✓
	Benzene		✓	✓	✓			✓	✓
	Benzenepropanol		✓						
	Benzofuran			✓	✓			✓	✓
	Biphenyl		✓						
	1-Bromodecane			✓				✓	✓
	Bromodichloromethane		✓	✓	✓			✓	✓
	Tribromomethane		✓	✓	✓			✓	✓
	1-Bromooctane			✓				✓	✓
	1-Bromopropane			✓				✓	✓
	1-Butanol		✓	✓	✓			✓	✓
	2-Butanone		✓	✓	✓			✓	✓
	2-Butoxyethanol		✓	✓	✓			✓	✓
	Butyl ester benzoic acid		✓						
	Camphene		✓	✓	✓			✓	✓
	Carbon tetrachloride		✓						
	Chlorobenzene			✓	✓			✓	✓
	1-Chlorododecane			✓				✓	✓
	Trichloromethane		✓	✓	✓			✓	✓
	Chloromethylbenzene		✓	✓	✓			✓	✓
	4-Chloro,3-methylphenol		✓						
	3-Chloropropene		✓						
	Cyclohexane		✓	✓	✓			✓	✓
	Cyclohexanol		✓	✓	✓			✓	✓
	Cyclohexanone		✓	✓	✓			✓	✓
	Decamethylcyclopentasiloxane		✓	✓	✓			✓	✓
Decamethyltetrasiloxane			✓	✓	✓		✓	✓	
Decanal		✓	✓	✓	✓		✓	✓	

<b>Table 5: Laboratory Indoor Air Sample Tests<sup>1</sup> (continued)</b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		Tested at the household level							
<b>Environmental exposure (cont'd)</b>	Decane		✓	✓	✓			✓	✓
	Dibromochloromethane		✓	✓	✓			✓	✓
	1,2-Dibromoethane		✓	✓				✓	✓
	1,2-Dichlorobenzene		✓	✓	✓			✓	✓
	1,4-Dichlorobenzene		✓	✓	✓			✓	✓
	1,1-Dichloroethane			✓	✓			✓	✓
	1,2-Dichloroethane			✓				✓	✓
	2,4-/2,5-dichlorotoluene		✓					✓	✓
	1,3-Dichloro-2-propanol			✓				✓	✓
	1,2-dichloropropane		✓						
	2,3-dichloropropene		✓						
	1,2-Dimethoxyethane			✓	✓			✓	✓
	Dimethoxymethane		✓						
	1,2-Dimethoxy-4-(2-propenyl)benzene		✓						
	Dimethyl ester pentanedioic acid			✓	✓			✓	✓
	2,5-Dimethylfuran			✓	✓			✓	✓
	1,4-Dioxane		✓	✓	✓			✓	✓
	Dodecamethylcyclohexasiloxane		✓						
	Dodecamethylpentasiloxane			✓	✓			✓	✓
	Dodecane		✓	✓	✓			✓	✓
	Ethanediol diacetate		✓						
	1-Ethenylpyrrolidinone		✓						
	2-(2-Ethoxyethoxy)ethanol		✓						
	2-Ethoxyethyl acetate		✓						
	Ethylbenzene		✓	✓	✓			✓	✓
	Ethyl ester benzoic acid		✓						
	2-Ethyl-1-hexanol		✓	✓	✓			✓	✓
	2-Furancarboxaldehyde		✓	✓	✓			✓	✓
Heptanal			✓	✓	✓		✓	✓	
Heptane		✓	✓	✓	✓		✓	✓	



<b>Table 5: Laboratory Indoor Air Sample Tests<sup>1</sup> (continued)</b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		Tested at the household level							
<b>Environmental exposure (cont'd)</b>	1,1,2,3,4,4-Hexachloro-1,3-butadiene			✓	✓			✓	✓
	Hexachloroethane		✓	✓	✓			✓	✓
	Hexamethyldisiloxane			✓	✓			✓	✓
	Hexanal		✓	✓	✓			✓	✓
	Hexane		✓	✓	✓			✓	✓
	2-Hexanone			✓	✓			✓	✓
	Limonene		✓	✓	✓			✓	✓
	2-Methoxyethyl acetate		✓						
	2-(2-Methoxyethoxy)ethanol		✓						
	2-Methyl-1,3-butadiene		✓	✓	✓			✓	✓
	Methyl ester benzoic acid		✓						
	Methyl ester hexanoic acid		✓						
	1-Methylethylbenzene		✓	✓	✓			✓	✓
	5-Methyl-2-hexanone		✓	✓	✓			✓	✓
	4-Methyl-2-pentanone		✓	✓	✓			✓	✓
	4-Methylpenten-2-one		✓						
	2-Methyl-2-propanol		✓	✓	✓			✓	✓
	2-Methylpropyl ester benzoic acid		✓						
	1-Methylpyrrolidinone		✓						
	Naphthalene		✓	✓	✓			✓	✓
	Nitromethane		✓						
	1-Nitropropane		✓						
	2-Nitropropane		✓						
	2-nitrotoluene		✓						
	Nonanal		✓	✓	✓			✓	✓
	Nonane			✓	✓	✓		✓	✓
	Nonanol		✓						
	Octamethylcyclotetrasiloxane		✓	✓	✓			✓	✓
Octamethyltrisiloxane			✓	✓	✓		✓	✓	
Octanal		✓	✓	✓	✓		✓	✓	

**Table 5: Laboratory Indoor Air Sample Tests<sup>1</sup> (continued)**

Theme	Subject	Cycle 1 2007-2009	Cycle 2 2009-2011	Cycle 3 2012-2013	Cycle 4 2014-2015	Cycle 5 2016-2017	Cycle 6 2018-2019	Cycle 7 2020-2021	Cycle 8 2022-2023	
		Tested at the household level								
Environmental exposure (cont'd)	Octane			✓	✓			✓	✓	
	Octanol		✓							
	Pentachloroethane			✓	✓			✓	✓	
	Pentane		✓	✓	✓			✓	✓	
	1-Pentanol		✓	✓	✓			✓	✓	
	Pentanone		✓							
	2-Pentanone			✓	✓			✓	✓	
	Perchloroethylene		✓	✓	✓			✓	✓	
	Phenol			✓	✓			✓	✓	
	1-Propanol		✓							
	2-Propanol		✓	✓	✓			✓	✓	
	Quinoline		✓	✓	✓			✓	✓	
	Styrene		✓	✓	✓			✓	✓	
	1,1,1,2-Tetrachloroethane			✓	✓			✓	✓	
	Tetrahydrofuran		✓	✓	✓			✓	✓	
	Toluene		✓	✓	✓			✓	✓	
	1,2,3-Trichlorobenzene				✓	✓			✓	✓
	1,2,4-Trichlorobenzene				✓	✓			✓	✓
	1,3,5-Trichlorobenzene				✓	✓			✓	✓
	1,1,2-Trichloroethane				✓	✓			✓	✓
	Trichloroethylene		✓							
	1,2,3-Trichloropropane				✓	✓			✓	✓
	1,2,3-Trimethylbenzene			✓	✓	✓			✓	✓
	1,2,4-trimethylbenzene			✓	✓	✓			✓	✓
	1,3,5-Trimethylbenzene				✓	✓			✓	✓
	3,5,5-Trimethyl-2-cyclohexen-1-one			✓						
	Undecane			✓	✓	✓			✓	✓
	o-Xylene			✓	✓	✓			✓	✓
m,p-Xylene			✓	✓	✓			✓	✓	

<b>Table 5: Laboratory Indoor Air Sample Tests<sup>1</sup> (continued)</b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		<b>Tested at the household level</b>							

<sup>1</sup> As part of cycles 2, 3, 4, 7 and 8, respondents deploy an indoor air sampler (IAS) in their household. The IAS is deployed for seven days directly following their visit to the mobile examination centre. The IAS is then sent to a laboratory where the air is analysed for the volatile organic compounds indicated.

<b>Table 6: Laboratory Tap Water Sample Tests<sup>1</sup></b>									
<b>Theme</b>	<b>Subject</b>	<b>Cycle 1 2007-2009</b>	<b>Cycle 2 2009-2011</b>	<b>Cycle 3 2012-2013</b>	<b>Cycle 4 2014-2015</b>	<b>Cycle 5 2016-2017</b>	<b>Cycle 6 2018-2019</b>	<b>Cycle 7 2020-2021</b>	<b>Cycle 8 2022-2023</b>
		<b>Tested at the household-level (subsample of households)</b>							
<b>Environmental exposure</b>	Fluoride			✓	✓				
	Volatile organic compounds								
	Common fuel pollutants (BTEX)								
	Benzene			✓	✓				
	Ethylbenzene			✓	✓				
	m- & p-Xylenes			✓	✓				
	o-Xylene			✓	✓				
	Toluene			✓	✓				
	Total xylene			✓	✓				
	Trihalomethanes								
	Bromodichloromethane			✓	✓				
	Dibromochloromethane			✓	✓				
	Tribromomethane			✓	✓				
	Trichloromethane			✓	✓				

<sup>1</sup> As part of cycles 3 and 4, interviewers collect water samples from a subsample of respondent homes at the time of the household interview