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2

SECOND REPORT
ON **HUMAN
BIOMONITORING
OF ENVIRONMENTAL
CHEMICALS
IN CANADA**

Results of the Canadian
Health Measures
Survey Cycle 2 (2009–2011)

November 2016

ERRATUM

Canada 

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Statistics Canada. (2013). *Canadian Health Measures Survey (CHMS) data user guide: Cycle 2*. Ottawa, ON. Available upon request (infostats@statcan.gc.ca).

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5.1.2.2 Fluoride

Fluoride in urine samples were analyzed using Orion pH meter with fluoride ion selective electrode (Orion Research Inc.) (INSPQ, 2009¹).

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Table 8.4.1

Cesium — Geometric means and selected percentiles of urine concentrations (µg/L) for the Canadian population aged 3–79 years by age group, Canadian Health Measures Survey cycle 2 (2009–2011).

Group (years)	Cycle	n	%<LOD ^a	GM (95%CI)	10 th (95%CI)	50 th (95%CI)	75 th (95%CI)	95 th (95%CI)
Total, 3–79	2	6311	0.02	4.6 (4.3 - 4.9)	1.7 (1.6 - 1.9)	4.9 (4.6 - 5.3)	7.3 (6.7 - 7.9)	12 (11 - 14)

a If >40% of samples were below the LOD, the percentile distribution is reported but means were not calculated.

Table 8.4.1

Cesium — Geometric means and selected percentiles of urine concentrations ($\mu\text{g/L}$) for the Canadian population aged 3–79 years by age group, Canadian Health Measures Survey cycle 2 (2009–2011).

Group (years)	Cycle	n	%<LOD ^a	GM (95%CI)	10 th (95%CI)	50 th (95%CI)	75 th (95%CI)	95 th (95%CI)
3–5	2	573	0	5.3 (4.8 - 5.8)	2.6 (2.0 - 3.2)	5.5 (4.9 - 6.1)	7.6 (6.6 - 8.6)	11 (10 - 12)
6–11	2	1062	0	4.9 (4.6 - 5.3)	2.4 (2.0 - 2.7)	5.2 (4.7 - 5.7)	7.0 (6.5 - 7.6)	11 (10 - 12)
12–19	2	1041	0.1	4.6 (4.2 - 5.1)	1.7 (1.4 - 2.1)	5.0 (4.4 - 5.5)	7.3 (6.5 - 8.0)	11 (9.6 - 12)
20–39	2	1321	0	4.4 (4.1 - 4.8)	1.7 (1.3 - 2.0)	4.8 (4.3 - 5.2)	7.2 (6.4 - 8.0)	11 (9.3 - 14)
40–59	2	1228	0	4.8 (4.3 - 5.5)	1.7 (1.5 - 1.9)	5.2 (4.5 - 5.8)	7.9 (6.8 - 8.9)	14 (11 - 17)
60–79	2	1086	0	4.2 (3.9 - 4.5)	1.7 (1.6 - 1.9)	4.3 (3.8 - 4.8)	6.7 (6.1 - 7.3)	12 (10 - 13)

a If >40% of samples were below the LOD, the percentile distribution is reported but means were not calculated.

Table 8.4.2

Cesium — Geometric means and selected percentiles of urine concentrations ($\mu\text{g/L}$) for the Canadian population aged 3–79 years by sex and age group^a, Canadian Health Measures Survey cycle 2 (2009–2011).

Group (years)	Cycle	n	%<LOD ^b	GM (95%CI)	10 th (95%CI)	50 th (95%CI)	75 th (95%CI)	95 th (95%CI)
Males, Total 3–79	2	3036	0	4.9 (4.5 - 5.3)	1.9 (1.7 - 2.2)	5.2 (4.7 - 5.6)	7.6 (6.9 - 8.3)	13 (12 - 14)
Males, 6–11	2	532	0	5.1 (4.6 - 5.6)	2.6 (2.3 - 2.9)	5.1 (4.4 - 5.7)	6.9 (6.1 - 7.7)	11 (9.9 - 13)
Males, 12–19	2	542	0	4.9 (4.3 - 5.5)	2.1 (1.6 - 2.7)	5.2 (4.5 - 5.8)	7.3 (6.4 - 8.3)	11 (7.9 - 13)
Males, 20–39	2	551	0	4.6 (4.2 - 5.1)	1.8 (1.4 - 2.2)	5.1 (4.6 - 5.7)	7.3 (6.4 - 8.2)	12 (9.9 - 15)
Males, 40–59	2	616	0	5.2 (4.4 - 6.2)	1.9 (1.4 - 2.3)	5.5 (4.4 - 6.6)	8.4 (6.3 - 11)	14 (11 - 17)
Males, 60–79	2	505	0	4.5 (4.1 - 5.0)	1.9 (1.6 - 2.3)	4.7 (4.2 - 5.2)	7.1 (6.4 - 7.7)	12 (9.9 - 14)
Females, Total 3–79	2	3275	0.03	4.3 (4.1 - 4.6)	1.6 (1.4 - 1.7)	4.6 (4.3 - 4.9)	7.0 (6.5 - 7.5)	11 (10 - 13)
Females, 6–11	2	530	0	4.8 (4.4 - 5.2)	1.9 (1.7 - 2.2)	5.3 (4.8 - 5.7)	7.2 (6.6 - 7.9)	10 (9.2 - 12)
Females, 12–19	2	499	0.2	4.3 (3.9 - 4.8)	1.5 (1.2 - 1.8)	4.6 (4.0 - 5.3)	7.2 (6.4 - 8.0)	11 (9.6 - 12)
Females, 20–39	2	770	0	4.2 (3.7 - 4.8)	1.5 (1.0 - 2.0)	4.5 (4.0 - 5.1)	7.0 (5.9 - 8.1)	10 (8.9 - 12)
Females, 40–59	2	612	0	4.5 (4.0 - 5.0)	1.5 (1.3 - 1.8)	5.0 (4.5 - 5.4)	7.3 (6.3 - 8.2)	13 (8.8 - 16)
Females, 60–79	2	581	0	3.9 (3.6 - 4.3)	1.6 (1.3 - 1.8)	3.8 (3.2 - 4.4)	6.2 (5.5 - 7.0)	11 (9.2 - 13)

a Breakdown by sex for the 3–5 year old age group is not recommended.

b If >40% of samples were below the LOD, the percentile distribution is reported but means were not calculated.

Table 8.4.3

Cesium (creatinine adjusted) — Geometric means and selected percentiles of urine concentrations ($\mu\text{g/g}$ creatinine) for the Canadian population aged 3–79 years by age group, Canadian Health Measures Survey cycle 2 (2009–2011).

Group (years)	Cycle	n	%<LOD ^a	GM (95%CI)	10 th (95%CI)	50 th (95%CI)	75 th (95%CI)	95 th (95%CI)
Total, 3–79	2	6291	0.02	4.4 (4.2 - 4.6)	2.5 (2.4 - 2.6)	4.3 (4.1 - 4.6)	5.8 (5.5 - 6.1)	9.9 (9.0 - 11)
3–5	2	572	0	8.9 (8.3 - 9.6)	5.2 (4.5 - 5.8)	8.9 (8.3 - 9.5)	12 (11 - 13)	19 (16 - 22)
6–11	2	1058	0	5.6 (5.3 - 5.9)	3.3 (3.1 - 3.5)	5.4 (5.0 - 5.9)	7.3 (6.8 - 7.9)	11 (10 - 12)
12–19	2	1039	0.1	3.4 (3.3 - 3.5)	2.1 (2.0 - 2.2)	3.4 (3.3 - 3.6)	4.6 (4.4 - 4.8)	6.5 (5.8 - 7.2)
20–39	2	1319	0	3.6 (3.4 - 3.8)	2.3 (2.1 - 2.4)	3.5 (3.2 - 3.7)	4.8 (4.4 - 5.2)	6.7 (5.5 - 7.9)
40–59	2	1223	0	4.7 (4.3 - 5.0)	2.7 (2.5 - 2.9)	4.6 (4.2 - 5.0)	6.1 (5.6 - 6.6)	9.8 (7.7 - 12)
60–79	2	1080	0	5.0 (4.7 - 5.2)	2.8 (2.5 - 3.0)	5.0 (4.8 - 5.1)	6.5 (6.1 - 6.9)	11 (10 - 12)

a If >40% of samples were below the LOD, the percentile distribution is reported but means were not calculated.

Table 8.4.4

Cesium (creatinine adjusted) — Geometric means and selected percentiles of urine concentrations ($\mu\text{g/g}$ creatinine) for the Canadian population aged 3–79 years by sex and age group^a, Canadian Health Measures Survey cycle 2 (2009–2011).

Group (years)	Cycle	n	%<LOD ^b	GM (95%CI)	10 th (95%CI)	50 th (95%CI)	75 th (95%CI)	95 th (95%CI)
Males, Total 3–79	2	3028	0	4.0 (3.8 - 4.2)	2.3 (2.2 - 2.4)	3.8 (3.6 - 4.1)	5.3 (5.0 - 5.6)	9.0 (7.9 - 10)
Males, 6–11	2	530	0	5.5 (5.1 - 6.0)	3.2 (2.9 - 3.5)	5.3 (4.8 - 5.9)	7.6 (7.0 - 8.2)	11 (10 - 12)
Males, 12–19	2	541	0	3.3 (3.1 - 3.5)	1.9 (1.7 - 2.1)	3.3 (3.0 - 3.5)	4.5 (4.1 - 4.8)	6.9 (5.2 - 8.6)
Males, 20–39	2	550	0	3.2 (3.0 - 3.4)	2.1 (1.7 - 2.4)	3.2 (3.0 - 3.4)	4.1 (3.8 - 4.4)	5.6 (5.3 - 5.9)
Males, 40–59	2	615	0	4.2 (3.8 - 4.6)	2.6 (2.2 - 2.9)	4.1 (3.7 - 4.6)	5.6 (5.0 - 6.1)	8.2 (6.0 - 10)
Males, 60–79	2	503	0	4.4 (4.1 - 4.7)	2.6 (2.4 - 2.8)	4.5 (4.2 - 4.7)	5.6 (5.0 - 6.2)	8.6 (7.1 - 10)
Females, Total 3–79	2	3263	0.03	4.8 (4.6 - 5.1)	2.7 (2.5 - 2.9)	4.7 (4.4 - 5.0)	6.3 (5.9 - 6.8)	11 (9.4 - 13)
Females, 6–11	2	528	0	5.6 (5.3 - 6.0)	3.6 (3.3 - 3.8)	5.5 (5.0 - 6.1)	7.0 (6.5 - 7.5)	11 (9.7 - 12)
Females, 12–19	2	498	0.2	3.6 (3.4 - 3.7)	2.2 (2.0 - 2.4)	3.5 (3.3 - 3.8)	4.7 (4.5 - 4.9)	6.3 (5.7 - 7.0)
Females, 20–39	2	769	0	4.1 (3.8 - 4.4)	2.5 (2.2 - 2.8)	4.0 (3.7 - 4.4)	5.2 (4.7 - 5.6)	8.0 (7.0 - 9.0)
Females, 40–59	2	608	0	5.2 (4.7 - 5.7)	3.0 (2.8 - 3.2)	5.0 (4.5 - 5.4)	6.7 (5.9 - 7.6)	12 (8.0 - 15)
Females, 60–79	2	577	0	5.6 (5.2 - 5.9)	3.1 (2.6 - 3.6)	5.5 (5.2 - 5.8)	7.2 (6.8 - 7.6)	12 (11 - 13)

a Breakdown by sex for the 3–5 year old age group is not recommended.

b If >40% of samples were below the LOD, the percentile distribution is reported but means were not calculated.

Table 16.1.1

Hydroxylated polyaromatic hydrocarbon (PAH) metabolites measured in the Canadian Health Measures Survey cycle 2 (2009–2011) and their parent PAH compounds.

PAH	CASRN	Hydroxylated PAH metabolites	CASRN
Fluorene	86-73-7	2-Hydroxyfluorene 3-Hydroxyfluorene 9-Hydroxyfluorene	2443-58-5 6344-67-8 1689-64-1
Fluoranthene	206-44-0	3-Hydroxyfluoranthene	17798-09-3
Phenanthrene	85-01-8	1-Hydroxyphenanthrene 2-Hydroxyphenanthrene 3-Hydroxyphenanthrene 4-Hydroxyphenanthrene 9-Hydroxyphenanthrene	2433-56-9 605-55-0 605-87-8 7651-86-7 484-17-3

Appendix B

	Cycle 1	Cycle 2
Metals and Trace Elements in Blood		
Zinc	0.0007 mg/L	0.1 mg/L

Appendix C

Benzene Metabolites		
<i>t,t'</i> -MA	142.11	0.00704

Appendix C

Adjustment Factor		
Creatinine	113.18	88.4 ^a

a Creatinine CF from mg/dL → μmol/L