MCPA

Environmental estimates (circa 2011): Supplemental data

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1. Data for lifetime excess cancer risk estimates

Overview

Calculating lifetime excess cancer risk requires an estimate of intake and a cancer potency factor. No published cancer potency factors for inhalation or ingestion of MCPA are available from Health Canada, the California Office of Environmental Health Hazard Assessment (OEHHA), or the US Environmental Protection Agency (US EPA).

Concentrations of MCPA have been measured in Canadian outdoor air and drinking water in a limited number of studies – see below.

Data by exposure pathway

i. Outdoor air

Outdoor air concentrations are based on data published in peer-reviewed literature since 2000. A ranking system was used to select data most representative of Canadian conditions circa 2011:

1. Canadian data collected in 2000 or more recently, sample duration of 24 hours or longer;
2. US studies of similar currency and sample duration;
3. Studies from northern European countries of similar currency and sample duration;
4. Canadian, US or European studies with data collected prior to 2000 and similar sample duration; and
5. Studies with sample duration of less than 24 hours regardless of country or collection date, or studies from countries not comparable to Canada.

Rank: 1 Author: Aulagnier (2008) Location: Canada, Québec

Samples (n)	DF*	DL**	Sample Date	Units	Sample Duration	Min	Max	Mean (AM)	Med	Geomean (GM)	Percentile
1	.5	1.0×10^{-6}	2004	µg/m³	May – June	b.d.l.	0.000053	0.000024			
1	0				July – Sept	b.d.l	b.d.l.	b.d.l.			

*DF = Detection frequency
**DL = Detection limit
b.d.l. = below detection limit

Rank: 1 Author: Yao (2006) Location: Canada, Saskatchewan

Samples (n)	DF*	DL**	Sample Date	Units	Sample Duration	Min	Max	Mean (AM)	Med	Geomean (GM)	Percentile
1			2003	µg/m³	Jul22-Aug19	0.00001	0.00496	0.000513			
1					May12-Aug13	0.0000154	0.000342	0.000082			
1					May12-Aug13	n.d.	0.000160	0.0000328			

Note: Values listed in the following order: Bratt's Lake, Hafford, and Waskesiu, SK
*DF = Detection frequency
**DL = Detection limit
n.d. = non-detect

Rank: 1	Author: Yao (2008)				Location: Canada: BC, SK, ON, QC, PEI					
Samples (n)	DF *	DL**	Sample Date	Units	Sample Duration	Min	Max	Mean (AM)	Med	Geomean (GM)	Percentile
1		$1.0x10^{-6}$	2004	µg/m³	Apr28 – Jun1	0.000005	0.0000502	0.00002			
1					May19 – Aug4	0.000015	0.00583	0.000916			
1					May18 – Jul13	n.d.	0.0000304	0.000006			
1					May21 – Jul23	n.d.	n.d.	n.d.			
1					May4 – Jun29	n.d.	0.0000602	0.000012			
1					May4 – Jun29	n.d.	0.0000940	0.000021			
1					Jun24 – Sep28	n.d.	0.000980	0.000122			
1			2005		May4 – May30	n.d.	n.d.	n.d.			
1					May19 – Jul7	n.d.	0.000834	0.000137			
1					Jun2 – Aug5	n.d.	n.d.	n.d.			
1					Jun16 – Aug11	n.d.	0.000408	0.000059			
1					Jun1 – Jun29	n.d.	0.000323	0.000112			
1					Jun1 – Jun29	n.d.	n.d.	n.d.			
1					Aug8 – Sep5	n.d.	n.d.	n.d.			

Note: Values listed in the following order for 2004: Abbotsford, BC; Bratt's Lake, SK; Egbert, ON; Vineland, ON; St. Anicet, QC; Baie St. Francois, QC; Kensington, PEI. Values listed in the following order for 2005: Abbotsford, BC; Egbert, ON; Vineland, ON; Downsview, ON; St. Anicet, QC; Baie St. Francois, QC; Kensington, PEI

*DF = Detection frequency

**DL = Detection limit

n.d. = non-detect

Sources for outdoor air data:

- Aulagnier F, Poissant L, Brunet D, Beauvais C, Pilote M, Deblois C, Dassylva N. 2008. Pesticides measured in air and precipitation in the Yamaska Basin (Québec) : occurrence and concentrations in 2004. Sci Total Environ 294(2-3): 338-348.
- Yao Y, Tuduri L, Harner T, Blanchard P, Waite D, Poissant L, Murphy C, Belzer W, Aulagnier F, Li Y, Sverko E. 2006. Spatial and temporal distribution of pesticide air concentrations in Canadian agricultural regions. Atmospheric Environment 40: 4339-4351.
- Yao Y, Harner T, Blanchard P, Tuduri L, Waite D, Poissant L, Murphy C, Belzer W, Aulagnier F, Sverko E. 2008. Pesticides in the atmosphere across Canadian agricultural regions. Environ. Sci. Technol. 42 : 5931-5937.

ii. Drinking water

Drinking water data are from the Ontario Drinking Water Surveillance Program (DWSP) for 2006. A review of published reports was also conducted in order to compare how well the Ontario data represented other regions in Canada.

Source	Units	DL
Ontario DWSP 2006	(µg/L)	0.02

Sample Type	Parameter	Mean	SD	Min	25th	50th	75th	Max	N
Treated Water		0.02	0.0	0.02	0.02	0.02	0.02	0.02	54

DL = Detection limit
SD = Standard Deviation

Rank: 1 Author: Byrtus (2004) Location: Canada, Alberta

Samples (n)	DF*	DL**	Sample Date	Units	Sample Duration	Min	Max	Mean (AM)	Med	Geomean (GM)	Percentile
238	14.3		2000	µg/L			0.045				
196	15.8		2001				0.18				
212	4.7		2002				0.024				
111	5.4		2003				0.079				

*DF = Detection frequency
**DL = Detection limit

Rank: 1 Author: Donald (2007) Location: Canada: Alberta, Saskatchewan, Manitoba

Samples (n)	DF*	DL**	Sample Date	Units	Sample Duration	Min	Max	Mean (AM)	Med	Geomean (GM)	Percentile
28		0.0005	2004-2005	µg/L		0.00058	0.865	0.0965			

*DF = Detection frequency
**DL = Detection limit

Sources for drinking water data:

- Byrtus G, Pongar K, Browning C, Burland R, McGuinness E, Humphries D. 2004. A summary of pesticide residue data from the Alberta Treated Water Survey, 1995-2003. Alberta Environment, Environmental Assurance Service. Edmonton. 57 pp.
- Donald DB, Cessna AJ, Sverko E, Glozier N. 2007. Pesticides in surface drinking-water supplies of the Northern Great Plains. Environmental Health Perspectives 115(8): 1183-1191.

2. Data quality for lifetime excess cancer risk estimates

We searched for only publicly available data of measurements of MCPA in the Canadian environment. No systematic method for measuring data quality was possible, so we provide the following assessments of how well the data used may represent the actual Canadian average levels. Quality is rated higher when there are data from a number of Canadian monitors, or from Canadian studies that show results similar to other comparable studies. Quality is rated lower when data from few monitors or studies were available, and lowest when estimates are based on non-Canadian data. Others may rate data quality differently.

Exposure Pathway	Data Quality	Notes
Outdoor air	Very Low	• Three recent Canadian studies were identified, which measured MCPA in outdoor air in various provinces of Canada.
Indoor air	Gap	• No recent data or studies identified using appropriately accurate analytical methods.
Indoor dust	Gap	• No recent data or studies identified using appropriately accurate analytical methods.
Drinking water	Very Low	• MCPA was not measured in the Ontario Drinking Water Surveillance Program in 2011. It was not detected in any samples of treated drinking water (n=54) based on data from the Ontario Drinking Water Surveillance Program in 2006. The detection limit was 0.02 µg/L. • Two recent studies in the Canadian prairies were identified that measured MCPA in drinking water.
Food and beverages	Gap	• No Canadian or US data on concentrations of MCPA in foods and beverages were identified.