

## Substance Use

### Overview

A desired outcome common to many charitable programs is the prevention or reduction of use of substances, especially among younger individuals. In 2017, the overall cost of substance use in Canada was estimated at \$46 billion, based solely on tangible costs such as lost productivity, health care costs, criminal justice costs, and other direct costs<sup>1</sup>. This cost is much larger when intangible costs such as increased risk of mortality are considered. In this paper, we consider the costs of use of different substances in Canada.

### Prevalence of Substance Use

We consider first the annual prevalence of use of different types of substances in Canada, as these data will be necessary later on when we calculate per person costs of substance use. We consider eight types or categories of substances: alcohol, tobacco, cannabis, opioids (including heroin and pain relievers), other CNS (central nervous system) depressants (including sedatives, benzodiazepines, and barbiturates), cocaine, other CNS stimulants (including amphetamine and methamphetamine), and other substances (including hallucinogens and inhalants).

**Table I – Annual Prevalence of Substance Use**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	77.1%	14.2%	18.1%	12.8%	11.3%	2.1%	3.3%	2.0%
Alberta	77.2%	15.3%	19.0%	12.9%	11.3%	2.3%	3.7%	2.3%
British Columbia	77.3%	13.5%	19.1%	13.2%	11.3%	1.7%	3.2%	2.3%
Manitoba	75.4%	14.2%	17.9%	13.2%	11.3%	2.0%	3.3%	1.7%
New Brunswick	76.6%	13.8%	18.2%	13.0%	11.3%	1.9%	3.3%	2.0%
Newfoundland	77.5%	16.5%	18.2%	12.4%	11.3%	2.2%	3.3%	2.0%
Nova Scotia	76.3%	15.5%	22.2%	13.4%	11.3%	2.2%	3.3%	1.6%
Ontario	76.0%	13.4%	18.1%	13.0%	11.3%	2.2%	3.5%	1.9%
Prince Edward Island	74.8%	13.8%	17.8%	12.9%	11.3%	1.8%	3.3%	1.6%
Quebec	79.1%	14.8%	16.4%	12.1%	11.3%	2.1%	3.3%	1.9%
Saskatchewan	77.1%	15.6%	18.1%	12.7%	11.3%	2.0%	3.3%	1.8%

Prevalence data come from multiple sources<sup>2</sup>; we take the average of available data points to estimate annual prevalence of use of particular substances in Canada and each province (data for the territories are systematically unavailable). In most cases prevalence data are based on individuals of adolescent age and older

<sup>1</sup> *Costs of substance use: National Landscape*. (n.d.). Canadian Substances Use Costs and Harms. <https://csuch.ca/resources/national/>

<sup>2</sup> *Alcohol and drug use in Canada, 2019*. (2021, December 20). Statistics Canada. <https://www150.statcan.gc.ca/n1/daily-quotidien/211220/dq211220c-eng.htm>; *Canadian Alcohol and Drugs Survey (CADS): 2019 detailed tables*. (2021, December 20). Government of Canada. <https://www.canada.ca/en/health-canada/services/canadian-alcohol-drugs-survey/2019-summary/detailed-tables.html>; *Canadian substance use costs and harms 2015-2017*. (2020). Canadian Substance Use Costs and Harms; *Canadian Tobacco, Alcohol and Drugs (CTADS) Survey: 2017 detailed tables*. (2021, August 12). Government of Canada. <https://www.canada.ca/en/health-canada/services/canadian-alcohol-drugs-survey/2017-summary/2017-detailed-tables.html>; Carrière, G., Garner, R., & Sanmartin, C. (2021). *Significant factors associated with problematic use opioid pain relief medications among the household population, Canada 2018*. Statistics Canada; Rush, B. et al. (2008). Prevalence of co-occurring substance use and other mental disorders in the Canadian population. *The Canadian Journal of Psychiatry*, 53(12), 800-809; *Smokers, by age group*. (2022, August 26). Statistics Canada. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009610>

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(usually 15 plus). We present in Table I our estimates of the annual prevalence of use of different substances in Canada and the provinces.

Next, we collect using the Canadian Substance Use Costs and Harms (CSUCH) Visualization Tool data on total annual substance use-attributable costs related to health care, productivity, criminal justice, and other phenomena connected to substance use<sup>3</sup>. Costs are from 2020 and are available for Canada as a whole as well as, in most cases, for each province and territory. We collect data on all types of health care costs, which include costs related to inpatient hospitalization, day surgeries, emergency department visits, paramedic services, physician time, and prescription drugs. In the case of productivity, we focus on the costs related to long- and short-term disability. We consider criminal justice costs as a whole. Finally, of all costs in the ‘other’ category, we focus only on costs related to social assistance. All costs are adjusted for inflation.

Since costs data are from 2020, we want to compare these against the number of individuals in Canada and the provinces in 2020 who we estimate used different substances. In the cases of health care and social assistance costs, we estimate the number of individuals ages 15 or older who used substances by multiplying estimates of the number of individuals in each geography ages 15 or older<sup>4</sup> by the annual prevalence of use of a given substance. In the case of productivity costs, which we believe mostly will be applicable to individuals of working age, we estimate the number of individuals ages 20 to 64 who used substances by multiplying estimates of the number of individuals in each geography ages 20 to 64 by the annual prevalence of use of a given substance. Finally, in the case of criminal justice costs, which we believe mostly will be applicable to individuals in the typical age range for criminal behaviour, we estimate the number of individuals ages 15 to 29 who used substances by multiplying estimates of the number of individuals in each geography ages 15 to 29 by the annual prevalence of use of a given substance.

We estimate costs of substance use per substance user by dividing total costs of substance use in each category (inpatient hospitalization, long-term disability, criminal justice, etc.) by the number of individuals in each geography and age group who we estimate used substances. Since there were no prevalence data for the territories, we assume for these geographies the same per person values as for Canada as a whole. We present in Tables II through XI our estimates of the annual per substance user cost of inpatient hospitalization, day surgeries, emergency department visits, paramedic services, physician time, prescription drugs, long-term disability, short-term disability, criminal justice, and social assistance.

**Table II – Annual Per User Cost of Inpatient Hospitalization (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
<b>Canada</b>	70	320	11	25	12	56	59	7
<b>Alberta</b>	124	442	23	54	21	95	134	13
<b>British Columbia</b>	95	395	14	46	15	102	140	11
<b>Manitoba</b>	104	454	15	19	16	72	110	20
<b>New Brunswick</b>	91	555	19	22	16	55	71	8
<b>Newfoundland</b>	120	603	11	21	21	75	23	7
<b>Northwest Territories</b>	70	320	11	25	12	56	59	7
<b>Nova Scotia</b>	138	577	10	19	16	93	30	7
<b>Nunavut</b>	70	320	11	25	12	56	59	7
<b>Ontario</b>	72	377	9	22	12	54	31	5
<b>Prince Edward Island</b>	109	588	14	21	14	34	40	7
<b>Quebec</b>	70	320	11	25	12	56	59	7
<b>Saskatchewan</b>	118	518	26	40	22	98	158	17
<b>Yukon</b>	70	320	11	25	12	56	59	7

<sup>3</sup> CSUCH Visualization Tool. (n.d.). Canadian Substance Use Costs and Harms. <https://csuch.ca/explore-the-data/>

<sup>4</sup> These data we get from *Population estimates on July 1st, by age and sex*. (2021, September 29). Statistics Canada. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501>

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**Table III – Annual Per User Cost of Day Surgeries (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	3	15	0	0	0	1	0	0
Alberta	4	11	0	0	0	1	1	0
British Columbia	5	41	0	0	0	2	1	0
Manitoba	5	39	0	0	0	2	1	0
New Brunswick	3	24	0	0	0	0	0	0
Newfoundland	6	43	0	0	0	1	0	0
Northwest Territories	3	15	0	0	0	1	0	0
Nova Scotia	4	9	0	0	0	1	0	0
Nunavut	3	15	0	0	0	1	0	0
Ontario	3	11	0	0	0	1	0	0
Prince Edward Island	4	19	0	0	0	0	0	0
Quebec	3	15	0	0	0	1	0	0
Saskatchewan	5	30	0	0	0	2	1	0
Yukon	3	15	0	0	0	1	0	0

**Table IV – Annual Per User Cost of Emergency Department Visits (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	10	22	3	7	3	17	19	3
Alberta	17	34	5	12	4	24	41	4
British Columbia	17	31	5	12	4	31	50	5
Manitoba	15	28	3	10	4	20	26	6
New Brunswick	19	31	3	8	4	37	13	3
Newfoundland	21	39	3	8	4	36	13	4
Northwest Territories	10	22	3	7	3	17	19	3
Nova Scotia	20	36	3	8	4	39	17	5
Nunavut	10	22	3	7	3	17	19	3
Ontario	9	23	3	7	3	15	11	2
Prince Edward Island	23	34	4	11	4	49	19	5
Quebec	10	22	3	7	3	17	19	3
Saskatchewan	17	36	4	11	4	23	26	5
Yukon	10	22	3	7	3	17	19	3

**Table V – Annual Per User Cost of Paramedic Services (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	6	12	1	4	2	9	10	2
Alberta	11	19	3	8	3	14	23	3
British Columbia	10	19	2	8	3	18	28	3
Manitoba	16	32	3	11	5	22	28	6
New Brunswick	15	36	3	8	4	31	14	4
Newfoundland	6	13	1	2	1	10	4	2
Northwest Territories	6	12	1	4	2	9	10	2
Nova Scotia	18	37	3	8	5	34	15	6
Nunavut	6	12	1	4	2	9	10	2
Ontario	3	8	1	3	1	5	3	1
Prince Edward Island	14	28	3	7	3	29	12	4
Quebec	6	12	1	4	2	9	10	2
Saskatchewan	7	14	1	5	2	8	11	2
Yukon	6	12	1	4	2	9	10	2

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**Table VI – Annual Per User Cost of Physician Time (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	83	461	23	46	261	92	114	14
Alberta	116	428	41	66	36	132	263	22
British Columbia	88	399	24	67	25	151	283	18
Manitoba	84	425	23	26	23	100	178	26
New Brunswick	65	497	31	26	21	91	118	12
Newfoundland	77	486	11	21	28	93	21	8
Northwest Territories	83	461	23	46	261	92	114	14
Nova Scotia	94	480	13	20	17	114	32	9
Nunavut	83	461	23	46	261	92	114	14
Ontario	79	506	19	41	27	72	44	10
Prince Edward Island	66	465	16	20	13	34	43	6
Quebec	70	443	18	39	23	69	40	9
Saskatchewan	87	398	31	44	21	103	212	19
Yukon	83	461	23	46	261	92	114	14

**Table VII – Annual Per User Cost of Prescription Drugs (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	78	440	23	41	26	81	99	13
Alberta	95	376	36	59	31	91	192	17
British Columbia	76	332	19	54	21	109	227	16
Manitoba	68	330	20	225	19	75	163	20
New Brunswick	74	594	35	26	28	85	127	13
Newfoundland	98	570	18	27	34	110	32	8
Northwest Territories	78	440	23	41	26	81	99	13
Nova Scotia	105	570	18	18	22	176	47	10
Nunavut	78	440	23	41	26	81	99	13
Ontario	72	472	20	36	25	65	42	11
Prince Edward Island	84	516	27	24	17	43	58	11
Quebec	77	471	24	42	28	77	49	12
Saskatchewan	81	363	32	46	25	89	223	18
Yukon	78	440	23	41	26	81	99	13

**Table VIII – Annual Per User Cost of Long-Term Disability (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	89	340	23	57	28	119	148	15
Alberta	103	270	29	66	29	99	182	16
British Columbia	116	344	28	102	34	219	409	24
Manitoba	79	263	17	27	21	89	164	23
New Brunswick	113	678	49	46	39	184	244	14
Newfoundland	186	749	25	59	67	247	50	12
Northwest Territories	89	340	23	57	28	119	148	15
Nova Scotia	205	791	28	37	47	396	84	19
Nunavut	89	340	23	57	28	119	148	15
Ontario	87	395	18	50	29	91	44	12
Prince Edward Island	176	720	55	60	37	126	119	13
Quebec	49	212	20	42	18	95	149	11
Saskatchewan	77	236	21	47	20	82	184	14
Yukon	89	340	23	57	28	119	148	15

**Table IX – Annual Per User Cost of Short-Term Disability (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	104	516	41	81	44	167	210	25
Alberta	139	410	70	112	49	1,865	418	33
British Columbia	119	436	43	128	47	264	547	38
Manitoba	95	403	36	41	31	154	312	39
New Brunswick	86	666	86	53	64	206	322	26
Newfoundland	131	773	37	57	78	216	59	16
Northwest Territories	104	516	41	81	44	167	210	25
Nova Scotia	117	591	31	29	40	378	90	19
Nunavut	104	516	41	81	44	167	210	25
Ontario	66	389	23	49	31	96	55	14
Prince Edward Island	105	588	60	46	43	84	112	21
Quebec	136	808	49	105	62	200	108	27
Saskatchewan	142	520	70	114	54	226	547	42
Yukon	104	516	41	81	44	167	210	25

**Table X – Annual Per User Cost of Criminal Justice (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	756	6	867	1,290	447	16,532	4,072	881
Alberta	672	5	634	1,287	279	13,833	4,417	600
British Columbia	713	6	826	1,416	395	17,775	3,846	881
Manitoba	940	5	902	1,413	360	26,035	5,904	1,109
New Brunswick	810	7	728	1,083	432	16,941	4,852	707
Newfoundland	941	6	828	1,185	389	19,722	3,124	769
Northwest Territories	756	6	867	1,290	447	16,532	4,072	881
Nova Scotia	876	5	669	1,063	498	17,534	3,224	1,062
Nunavut	756	6	867	1,290	447	16,532	4,072	881
Ontario	722	6	858	1,296	408	15,826	3,441	860
Prince Edward Island	891	6	625	815	456	16,111	4,028	804
Quebec	715	6	1,034	1,102	672	15,287	4,151	995
Saskatchewan	1,125	5	996	1,604	383	23,229	6,665	1,077
Yukon	756	6	867	1,290	447	16,532	4,072	881

**Table XI – Annual Per User Cost of Social Assistance (\$)**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
Canada	14	52	3	9	4	18	23	2
Alberta	15	40	4	10	4	15	27	2
British Columbia	17	50	4	16	5	34	64	4
Manitoba	13	45	3	5	4	15	28	4
New Brunswick	17	109	8	7	6	29	39	2
Newfoundland	26	110	4	9	10	36	7	2
Northwest Territories	14	52	3	9	4	18	23	2
Nova Scotia	33	132	5	6	8	66	14	3
Nunavut	14	52	3	9	4	18	23	2
Ontario	12	59	3	8	4	14	7	2
Prince Edward Island	29	123	9	10	6	22	20	2
Quebec	10	34	3	7	3	15	24	2
Saskatchewan	12	37	3	7	3	13	29	2
Yukon	14	52	3	9	4	18	23	2

We collect also from the CSUCH Visualization Tool data on substance use-attributable mortality counts in 2020 by substance and geography. Based on our estimates of the number of individuals ages 15 or older who used substances in 2020, we estimate excess mortality rates among substance users by dividing mortality counts by the number of individuals in each geography who we estimate used substances. We present in Table XII our estimates of excess mortality rates among substances users, again with results for the territories mirroring the results for Canada as a whole.

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**Table XII – Annual Excess Mortality Rate, Substance Use**

	alcohol	tobacco	cannabis	opioids	other CNS depressants	cocaine	other CNS stimulants	other substances
<b>Canada</b>	0.1%	1.0%	0.0%	0.2%	0.0%	0.2%	0.1%	0.0%
<b>Alberta</b>	0.1%	0.8%	0.0%	0.2%	0.0%	0.2%	0.2%	0.0%
<b>British Columbia</b>	0.1%	1.0%	0.0%	0.3%	0.0%	0.4%	0.2%	0.0%
<b>Manitoba</b>	0.1%	1.0%	0.0%	0.1%	0.0%	0.2%	0.2%	0.0%
<b>New Brunswick</b>	0.1%	1.3%	0.0%	0.1%	0.0%	0.2%	0.1%	0.0%
<b>Newfoundland</b>	0.1%	1.3%	0.0%	0.1%	0.0%	0.3%	0.1%	0.0%
<b>Northwest Territories</b>	0.1%	1.0%	0.0%	0.2%	0.0%	0.2%	0.1%	0.0%
<b>Nova Scotia</b>	0.1%	1.4%	0.0%	0.1%	0.0%	0.2%	0.1%	0.0%
<b>Nunavut</b>	0.1%	1.0%	0.0%	0.2%	0.0%	0.2%	0.1%	0.0%
<b>Ontario</b>	0.1%	1.0%	0.0%	0.1%	0.0%	0.3%	0.1%	0.0%
<b>Prince Edward Island</b>	0.1%	1.4%	0.1%	0.1%	0.1%	0.3%	0.2%	0.2%
<b>Quebec</b>	0.1%	1.2%	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%
<b>Saskatchewan</b>	0.1%	1.0%	0.0%	0.2%	0.0%	0.3%	0.2%	0.0%
<b>Yukon</b>	0.1%	1.0%	0.0%	0.2%	0.0%	0.2%	0.1%	0.0%