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# Canadian results from the European Men-who-have-sex-with-men Internet survey (EMIS-2017)

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## Abstract

**Background:** In 2017, the international European Men-who-have-sex-with-men Internet Survey (EMIS-2017) collected data from 50 countries, including Canada for the first time.

**Objective:** To provide an overview of the Canadian EMIS-2017 data to describe the sexually transmitted and other bloodborne infection (STBBI) related needs of gay, bisexual and other men who have sex with men (gbMSM).

**Methods:** The EMIS-2017 questionnaire was an updated version of EMIS-2010. It included self-reported sociodemographic data, experience of discrimination, mental health and substance use, knowledge of preexposure prophylaxis (PrEP) for HIV, sexual practices and history of STBBI testing and diagnosis. Analysis was largely descriptive.

**Results:** Of the 6,059 respondents from Canada, 5,165 participants met the inclusion criteria for this analysis. The majority of participants were born in Canada (79.3%); and over half of the respondents (56.7%) were under the age of 39. In terms of discrimination related to their attraction to other men, participants reported high levels of intimidation (31.9%), verbal abuse (22.1%) and physical violence (1.5%) in the previous year. Regarding mental health, 23.9% had a moderate to severe depression/anxiety score. Almost two-thirds (64.1%) indicated substance use and one-fifth (21.5%) reported chemsex (or the use of stimulant drugs to make sex more intense or last longer). Only 8.4% of participants reported use of PrEP for HIV; however, 51.7% reported being likely to use PrEP if it was available and affordable. Sexual practices, such as condom use, varied by PrEP use with 91.3% of men using PrEP reporting condomless anal intercourse (CAI) compared with 71.5% of men not on PrEP. In terms of STBBI testing, 1.5% reported being diagnosed with hepatitis C and 9.0% reported an HIV diagnosis. Of those with an HIV diagnosis, most were on treatment (99.1%) and had an undetectable viral load (96.7%).

**Conclusion:** gbMSM in Canada experienced stigma, discrimination and mental health problems; substance use was high as were high-risk sexual practices, such as CAI, among some groups of men. There was a gap between the proportion of men who were interested in PrEP and those who actually used it; and comprehensive STBBI testing was low.

These findings can inform public health action and provide a baseline to examine the impact of current and new interventions.

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**Keywords:** HIV, sexually transmitted infections, sexual risk practices, gay bisexual and other men who have sex with men, gbMSM, preexposure prophylaxis, postexposure prophylaxis

## Introduction

In 2017, the second iteration of the European Men-who-have-sex-with-men Internet Survey (EMIS-2017) was launched (1). This survey collected data from gay, bisexual and other men who have

sex with men (gbMSM) living in 50 countries, with the aim of generating data useful for planning HIV and sexually transmitted infection (STI) prevention and care programs, and monitoring of

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progress in these areas (1). Canada participated in this survey for the first time.

In Canada, gbMSM continue to be particularly affected by sexually transmitted and bloodborne infections (STBBIs). In 2016, it was estimated that gbMSM make up more than half (52.5%) of the population living with HIV infection in Canada (2). Rates of syphilis and gonorrhoea have increased over the past several years, with the increase among men largely in the gbMSM population in Canada (3–5) and internationally (6,7). Hepatitis C is also on the rise among gbMSM who are HIV-positive (8).

The reasons for this are multifactorial. Among HIV-negative men, new preventive interventions like preexposure prophylaxis (PrEP) in combination with reduced use of condoms may, in part, contribute to the rise in STIs other than HIV (3,4). Among HIV-positive men, serosorting and knowledge of an undetectable viral load may lead to minimizing the risk of HIV transmission, which can lead to a concurrent decreased use of condoms, thus increasing the risk of other STBBIs (3,4). Other factors that could be influencing rates of STBBIs include changing community norms and the use of illicit drugs to enhance sexual experiences (i.e. party and play/chemsex) (9). Structural factors, such as stigma related to sexual orientation and to HIV infection, a lack of provider knowledge and training in gbMSM sexual health risks and needs, and issues related to cost and access to PrEP and HIV treatment may also be contributing to the STBI burden among gbMSM (10).

Gathering national-level information on risk and prevention behaviours, health service needs and health outcomes is crucial for understanding the current trends and for guiding the planning and evaluation of public health interventions to prevent STBBIs among gbMSM. The objective of this report is to provide an overview of the EMIS-2017 data from Canada.

## Methods

EMIS-2017 was undertaken by Sigma Research at the London School of Hygiene and Tropical Medicine in association with the Robert Koch Institute in Berlin. The survey was funded by the European Union Health Programme 2014–2020 for Europe. The survey ran from October 2017 to January 2018, inclusively, across 50 countries. In Canada, the Public Health Agency of Canada (PHAC) funded the promotion of the survey to Canadian gbMSM. Community-involved researchers (NJL, MB, DJB, TAH and BA), along with two PHAC representatives, provided feedback on the questionnaire and recruitment methods and a review and interpretation of the results.

While EMIS uses the term “men who have sex with men (MSM)”, the authors use the term “gbMSM” to describe the same population as the latter is commonly used in Canada. A more detailed description of the methods can be found elsewhere (11).

## Questionnaire

The EMIS-2017 survey was based on the questionnaire successfully used in EMIS-2010. Updates were based on a review of evidence of the epidemiology of HIV infection and STIs; the STBI-related risk and precautionary behaviours of gbMSM; a policy and practice mapping exercise; a scoping exercise of available gbMSM questionnaires published since EMIS-2010; and three rounds of consultations with partner countries, including Canada.

The final version of the questionnaire included questions on:

- Sociodemographic characteristics of EMIS participants
- Experiences of discrimination, mental health and substance use
- Knowledge and use of postexposure prophylaxis (PEP) and PrEP
- Sexual practices – information on chemsex was captured by asking about the use of stimulant drugs (including ecstasy/MDMA, cocaine, amphetamine, crystal methamphetamine, mephedrone and ketamine to make sex feel more intense or last longer)
- STBI testing and diagnosis

The survey was available in 33 languages simultaneously, including 22 of the 23 official languages of the European Union; Canadian researchers provided edits to both the French and English version and the questionnaire was piloted among a small group of Canadian gbMSM. The EMIS-2017 questionnaire can be found online (12).

## Recruitment

Sigma staff commissioned advertising from 10 multi-country “dating” platforms including PlanetRomeo, Grindr, Hornet, Cruiser, RECON, Scruff, Gaydar, Manhunt/Jack’d, GROWLr and Bluesystem. Within Canada, advertisements and banners on social media, gay news websites and sexual networking apps were posted. Electronic and offline promotional materials were provided to community-based organizations across Canada, such as the Health Initiative for Men, for distribution to their networks.

All online promotions of EMIS, paid or unpaid, were allocated a specific URL to direct potential participants to the EMIS landing page. Here they could make their language selection and proceed to the survey; this page also captured data on the recruitment source. Unfortunately, the Grindr Source codes were erroneously labelled in Canada; during data cleaning, these were rectified as much as possible using the timeline for participation invitations sent out by Grindr.

## Consent and inclusion criteria

Before proceeding to the survey, participants in Canada had to confirm that they had read and understood the nature and purpose of the study, wanted to participate and were aged 16 years or older. Inclusion criteria included:



- Living in one of 50 countries participating in the study
- Identifying as a man, including cisgender men (i.e. individuals assigned male at birth who identify as men) and transgender men (i.e. individuals assigned female at birth who identify as men)
- Being sexually attracted to men and/or ever having had sex with men

For the purposes of this analysis, participants needed to provide the first part of their postal code so they could be assigned to a province or territory. Three discrepancy flags were created with regard to age, steady male partners and non-steady partners. Participants with inconsistent data were excluded from this analysis.

## Analysis

Descriptive analyses (frequencies and proportions) were conducted. Participants' characteristics were described by province and territory. Due to sample sizes less than 10, men who resided in Yukon were combined with those living in British Columbia, those from Northwest Territories with Alberta and those from Nunavut with Ontario. Similarly, participants from Manitoba and Saskatchewan were combined as were those from the four Atlantic Provinces.

A combined measure of anxiety and depression was calculated using a validated brief screening scale for anxiety and depression, the Patient Health Questionnaire-4 (13). The CAGE 4-item questionnaire was used as an indicator of alcohol dependency (14).

To monitor the uptake and effect of new HIV prevention strategies, the following indicators were derived:

- Anal intercourse with casual partners
- Condom use with casual partners
- Any condomless anal intercourse (CAI) with casual partners in the last 12 months by HIV-positive men on HIV treatment and with an undetectable viral load
- Any CAI with casual partners in the last 12 months by HIV-negative men on PrEP
- Any CAI with casual partners in the last 12 months by HIV-positive men not on HIV treatment or with a detectable viral load
- Any CAI with casual partners in the last 12 months by HIV-negative or untested men not on PrEP (15). Casual partners were defined in the questionnaire as non-steady partners: "men you have had sex with once only, and men you have sex with more than once but who you don't think of as a steady partner"

"Full STI screening" was a composite variable indicating testing for HIV infection, a blood test, an anal swab and a urethral swab (or a vaginal swab or a urine test) in non-HIV-diagnosed respondents in the previous 12 months. Only non-HIV-diagnosed

respondents were included in this indicator to ensure that it was not influenced by counts from HIV-diagnosed men who typically have regular routine STI checks as part of their clinical follow-up. This variable was developed for cross-country comparison of STI testing and treatment services coverage in the Dublin Declaration Monitoring (16). Although pharyngeal swabs are recommended in Canada (17), EMIS-2017 did not collect this information.

Numbers and proportions were suppressed when the numerator was less than five and the denominator was less than 100.

## Results

A total of 6,059 Canadian gbMSM participated in EMIS-2017. Of these, 894 (14.8%) were removed because they had discrepant data or did not provide a forward sortation area (i.e. first three characters of their postal code) and so could not be categorized by province/territory. The remaining 5,165 participants from Canada were included in this analysis.

### Characteristics of EMIS participants

All provinces and territories were represented, with 23.1% from British Columbia and Yukon, 13.7% from Alberta and the Northwest Territories, 6.6% from Saskatchewan and Manitoba, 33.0% from Ontario and Nunavut, 15.3% from Quebec and 8.3% from the Atlantic Provinces. Nationally, the majority of participants completed the survey in English (91.0%), with 7.4% completing it in French and the 1.6% completing it in one of 19 other languages.

Over 50% of participants were under the age of 39 (56.7%) (**Table 1**). The median age of the population was 36 years of age. The majority of the participants identified as gay (76.0%), and the remaining participants identified as bisexual (17.5%), straight (0.9%) or with another term or no term (5.7%). Of the participants, 2.4% identified as transgender men. In terms of ethnicity, 3.8% identified as Indigenous, 3.8% as Latin American, 3.1% identified as Asian, 2.8% as East or Southeast Asian, 1.9% as South Asian, 1.7% as Black and 1.4% as Arab/West Asian. One-fifth (20.7%) of the participants were born outside of Canada.

Over three-quarters (78.5%) of the participants reported having four or more years of education past the age of 16. Almost three-quarters (71.0%) reported that they were employed (including full-time, part-time and self-employed) whereas 13.2% identified as students, and the remaining 15.8% reported being unemployed, retired (including medically), on long-term sick leave or other. Almost half (47.9%) of the participants reported being comfortable in their financial situation, 31.9% reported being neither comfortable nor struggling, and one-fifth (20.2%) reported being uncomfortable.



**Table 1: Sociodemographic characteristics of Canadian participants in the EMIS-2017 (N=5,165)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429) <sup>a</sup>		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Age category</b>														
16–24	160	13.4	148	20.8	63	18.6	281	16.5	165	20.9	89	20.7	906	17.5
25–39	492	41.3	295	41.5	137	40.4	607	35.6	334	42.3	161	37.5	2,026	39.2
40–54	326	27.4	166	23.4	83	24.5	526	30.8	179	22.7	96	22.4	1,376	26.6
55–69	193	16.2	90	12.7	53	15.6	250	14.6	102	12.9	77	17.9	765	14.8
70+	20	1.7	11	1.5	3	0.88	43	2.5	9	1.1	6	1.4	92	1.8
<b>Sexual identity</b>														
Gay or homosexual	975	82.0	503	70.8	223	65.8	1,294	75.8	627	79.5	302	70.4	3,924	76.0
Bisexual	138	11.6	156	22.0	98	28.9	297	17.4	116	14.7	96	22.4	901	17.5
Straight or heterosexual	4	0.3	12	1.7	6	1.8	17	1.0	4	0.5	2	0.5	45	0.9
Other	72	6.1	39	5.5	12	3.5	99	5.8	42	5.3	29	6.8	293	5.7
<b>Gender identity</b>														
Cisgender man	1,158	97.2	690	97.2	331	97.6	1,675	98.1	772	97.8	413	96.3	5,039	97.6
Transgender man	33	2.8	20	2.8	8	2.4	32	1.9	17	2.2	16	3.7	126	2.4
<b>Proportion of friends, family who know about attraction to men</b>														
All, almost all	652	55.1	291	41.7	139	41.5	819	48.6	432	55.0	203	47.4	2,536	49.6
More than half	227	19.2	125	17.9	52	15.5	318	18.9	124	15.8	60	14.0	906	17.7
Less than half	136	11.5	80	11.5	44	13.1	182	10.8	74	9.4	54	12.6	570	11.1
Few	131	11.1	135	19.3	71	21.2	255	15.1	100	12.7	79	18.5	771	15.1
None	38	3.2	67	9.6	29	8.7	110	6.5	55	7.0	32	7.5	331	6.5
<b>Born in Canada</b>														
No	307	25.8	99	14.0	38	11.2	396	23.2	190	24.1	40	9.3	1,070	20.7
Yes	881	74.2	610	86.0	301	88.8	1,309	76.8	598	75.9	388	90.7	4,087	79.3
<b>Ethnicity</b>														
White	795	74.2	507	80.9	237	78.0	1,151	76.5	524	78.9	306	87.7	3,520	77.9
Indigenous	46	4.3	34	5.4	24	7.9	35	2.3	20	3.0	11	3.2	170	3.8
Latin American	39	3.6	16	2.6	10	3.3	53	3.5	41	6.2	1	0.3	160	3.5
Asian	47	4.4	17	2.7	8	2.6	53	3.5	12	1.8	3	0.9	140	3.1
East/Southeast Asian	57	5.3	16	2.6	5	1.6	36	2.4	8	1.2	4	1.1	126	2.8
South Asian	22	2.1	10	1.6	4	1.3	45	3.0	5	0.8	2	0.6	88	1.9
Black <sup>b</sup>	10	0.9	6	1.0	5	1.6	43	2.9	7	1.1	6	1.7	77	1.7
Arab/West Asian	13	1.2	5	0.8	2	0.7	22	1.5	19	2.9	4	1.1	65	1.4
Other	42	3.9	16	2.6	9	3.0	67	4.5	28	4.2	12	3.4	174	3.8
<b>Years of education past 16 years of age</b>														
None	113	9.5	70	9.9	37	10.9	174	10.2	50	6.3	39	9.1	483	9.4
1–3	156	13.1	124	17.5	49	14.5	168	9.8	66	8.4	65	15.2	628	12.2
4–6	322	27.0	210	29.6	116	34.2	479	28.1	193	24.5	136	31.7	1,456	28.2
7+	600	50.4	306	43.1	137	40.4	886	51.9	480	60.8	189	44.1	2,598	50.3
<b>Occupation</b>														
Employed full-time	664	55.8	394	55.5	206	60.8	944	55.5	422	53.6	228	53.1	2,858	55.4
Employed part-time	80	6.7	59	8.3	17	5.0	109	6.4	58	7.4	41	9.6	364	7.1
Self-employed	110	9.3	53	7.5	26	7.7	154	9.0	66	8.4	29	6.8	438	8.5
Unemployed	70	5.9	45	6.3	22	6.5	101	5.9	31	3.9	21	4.9	290	5.6
Student	125	10.5	88	12.4	40	11.8	214	12.6	155	19.7	60	14.0	682	13.2
Retired	84	7.1	41	5.8	18	5.3	105	6.2	41	5.2	34	7.9	323	6.3
Other	56	4.7	30	4.2	10	2.9	75	4.4	14	1.8	16	3.7	201	3.9
<b>Comfort level with current income</b>														
Living really comfortably	190	16.0	108	15.2	50	14.7	250	14.7	144	18.3	64	14.9	806	15.6
Living comfortably	374	31.4	207	29.2	116	34.2	572	33.6	281	35.7	118	27.5	1,668	32.3
Neither comfortable nor struggling	387	32.5	244	34.4	106	31.3	530	31.1	234	29.7	145	33.8	1,646	31.9
Struggling	170	14.3	102	14.4	42	12.4	235	13.8	105	13.3	76	17.7	730	14.2
Really struggling	69	5.8	49	6.9	25	7.4	115	6.8	23	2.9	26	6.1	307	6.0

<sup>a</sup> The total counts for each characteristic do not always add up to the provincial totals because only participants with non-missing values were included. Missing values make up less than 3% of the totals

<sup>b</sup> Black includes people with African and Caribbean ethnicities



## Experiences of discrimination, mental health and substance use

In the year previous to the survey, 31.9% of participants reported experiencing intimidation, 22.1% reported experiencing verbal abuse and 1.5% reported experiencing physical violence related to knowledge or presumption of attraction to men (Table 2).

Almost one-quarter (23.9%) of participants were classified as moderate to severe on a combined measure of anxiety and depression, and 26.1% of participants reported some suicidal ideation ranging from on occasion to nearly every day in the previous two weeks.

With regard to substance use, 64.1% indicated ever using any illicit substance. The most frequently reported drugs used included cannabis (46.6%), which was not yet legal at the

**Table 2: Experiences of discrimination related to knowledge or presumption of attraction to men, mental health and substance use of Canadian participants in the EMIS-2017 (N=5,165)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429)		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Homophobic intimidation and assault started at or intimidated<sup>b</sup></b>														
Within last six months	172	14.5	94	13.3	43	12.7	233	13.7	67	8.5	38	8.9	647	12.6
Six months to a year ago	249	20.9	145	20.5	69	20.4	306	18.0	135	17.2	89	20.7	993	19.3
1-5 years ago	190	16.0	96	13.5	36	10.6	240	14.1	115	14.6	60	14.0	737	14.3
5+ years ago	257	21.6	104	14.7	49	14.5	351	20.6	184	23.4	80	18.6	1,025	19.9
Never	321	27.0	270	38.1	142	41.9	570	33.5	286	36.3	162	37.8	1,751	34.0
<b>Verbal insults<sup>b</sup></b>														
Within last six months	77	6.5	57	8.1	19	5.6	98	5.8	35	4.5	18	4.2	304	5.9
Six months to a year ago	223	18.8	113	16.0	62	18.3	289	17.0	83	10.6	64	15.0	834	16.2
1-5 years ago	265	22.3	117	16.5	60	17.7	332	19.5	149	19.0	73	17.1	996	19.4
5+ years ago	323	27.2	137	19.4	70	20.6	460	27.1	219	27.9	122	28.5	1,331	25.9
Never	301	25.3	283	40.0	128	37.8	520	30.6	299	38.1	151	35.3	1,682	32.7
<b>Punched, hit, kicked or beaten<sup>b</sup></b>														
Within last six months	4	0.3	8	1.1	1	0.3	4	0.2	1	0.1	4	0.9	22	0.4
Six months to a year ago	17	1.4	10	1.4	5	1.5	11	0.6	7	0.9	6	1.4	56	1.1
1-5 years ago	40	3.4	40	5.6	13	3.8	50	2.9	23	2.9	13	3.0	179	3.5
5+ years ago	216	18.2	83	11.7	34	10.0	292	17.2	125	15.9	71	16.6	821	15.9
Never	913	76.7	568	80.1	286	84.4	1,342	79.0	630	80.2	334	78.0	4,073	79.1
<b>Anxiety and Depression Scale<sup>c</sup></b>														
Normal	472	40.0	276	39.1	137	40.7	731	43.4	321	41.3	188	44.7	2,125	41.6
Mild	393	33.3	249	35.3	116	34.4	546	32.4	308	39.6	149	35.4	1,761	34.5
Moderate	176	14.9	92	13.0	41	12.2	245	14.5	87	11.2	44	10.5	685	13.4
Severe	139	11.8	88	12.5	43	12.8	164	9.7	61	7.9	40	9.5	535	10.5
<b>Suicidal ideation in previous two weeks</b>														
Not at all	885	74.4	510	71.8	237	70.1	1,268	74.7	592	75.2	311	72.5	3,803	73.8
Some days	200	16.8	129	18.2	70	20.7	305	18.0	148	18.8	87	20.3	939	18.2
More than half the days	51	4.3	33	4.6	10	3.0	63	3.7	20	2.5	16	3.7	193	3.7
Nearly every day	54	4.5	38	5.4	21	6.2	62	3.7	27	3.4	15	3.5	217	4.2
<b>Alcohol dependency<sup>d</sup></b>														
Not alcohol dependent	936	79.1	553	78.4	262	77.7	1,345	79.7	629	80.5	363	85.6	4,088	79.9
Alcohol dependent	248	20.9	152	21.6	75	22.3	343	20.3	152	19.5	61	14.4	1,031	20.1
<b>Ever taken recreational or illicit drugs</b>														
No	367	31.1	254	35.9	151	44.7	597	35.3	294	37.4	176	41.6	1,839	35.9
Yes	812	68.9	454	64.1	187	55.3	1,092	64.7	492	62.6	247	58.4	3,284	64.1
<b>Illicit drugs used in previous year<sup>e</sup></b>														
Cannabis	609	51.7	326	46.0	131	38.8	797	47.2	333	42.5	192	45.4	2,388	46.6
Cocaine	192	16.3	98	13.9	39	11.5	222	13.2	123	15.6	40	9.5	714	14
Ecstasy pills	152	12.9	53	7.5	15	4.4	147	8.7	77	9.5	16	3.8	458	8.9
Ecstasy in the form of a crystal or powder	146	12.4	65	9.2	19	5.6	132	7.8	59	7.5	23	5.5	444	8.7
GHB or GBL	136	11.5	46	6.5	9	2.7	119	7.1	58	7.4	8	1.9	373	7.3
Crystal methamphetamine	80	6.8	43	6.1	16	4.7	129	7.6	29	3.7	13	3.1	310	6.1
<b>Ever injected any drugs<sup>f</sup></b>														
No, never	1,139	96.0	679	95.8	328	96.8	1,640	96.6	770	98.1	413	96.3	4,969	96.5
Yes	48	4.0	30	4.2	11	3.2	58	3.4	15	1.9	16	3.7	178	3.5

Abbreviations: GBL, gamma-Butyrolactone; GHB, Gamma-hydroxybutyrate

<sup>a</sup> The total counts for each characteristic do not always add up to the provincial totals because only participants with non-missing values were included. Missing values make up less than 3% of the totals

<sup>b</sup> Because someone knew or presumed the participant was attracted to men

<sup>c</sup> PHQ-4 measurement (13)

<sup>d</sup> CAGE 4-item Indicator (14)

<sup>e</sup> The denominators for the proportions of participants who used each substance are based on the number of participants who responded to the individual substance use questions. Total counts for each substance ranged from 5,113 to 5,121. The proportions for substances used do not add up to 100% as they were not mutually exclusive; participants could report the use of more than one substance

<sup>f</sup> Other than anabolic steroids or prescribed medicine



time of the survey, cocaine (14.0%) and ecstasy pills (8.9%) (Table 2). Substances used in the previous year by less than 5% of participants overall were as follows: amphetamine (4.4%), ketamine (4.0%), LSD (3.9%), synthetic cannabinoids (2.1%), crack cocaine (1.5%), heroin (0.9%), mephedrone (0.4%) and synthetic stimulants other than mephedrone (0.5%). Only 3.5% of participants reported ever injecting drugs.

### Knowledge and use of PEP and PrEP

Most participants had heard of PrEP (86.4%); a slightly smaller proportion had heard of PEP (74.3%), and 8.4% of all the participants, regardless of HIV status, had taken or were currently taking PrEP (Table 3). Of HIV-negative or untested men, 51.7% reported being likely to use PrEP if it was available and affordable.

**Table 3: Awareness and use of PEP and PrEP, and healthcare provider knowledge of sexual attraction to men of Canadian participants in the EMIS-2017 (N=5,165)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429) <sup>a</sup>		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Heard of PEP</b>														
No	157	13.4	175	24.8	76	22.6	265	15.7	167	21.3	117	27.8	957	18.7
Yes	958	81.5	465	65.9	222	66.1	1,323	78.6	560	71.5	268	63.7	3,796	74.3
Not sure	61	5.2	66	9.3	38	11.3	96	5.7	56	7.2	36	8.6	353	6.9
<b>Ever taken PEP<sup>b</sup></b>														
No, have not tried to get it	923	89.4	634	95.5	304	94.4	1,395	91.8	629	87.1	386	95.5	4,271	91.6
No, tried, but could not get it	20	1.9	12	1.8	8	2.5	29	1.9	14	1.9	9	2.2	92	2.0
No, had the opportunity but decided not to	14	1.4	5	0.8	4	1.2	19	1.3	13	1.8	1	0.2	56	1.2
Yes, one or more courses	76	7.4	13	2.0	6	1.9	77	5.1	66	9.1	8	2.0	246	5.3
<b>Confidence in ability to access PEP<sup>b</sup></b>														
Very confident	322	31.2	145	21.9	71	22.0	470	30.9	262	36.2	69	17.0	1,339	28.7
Quite confident	268	25.9	149	22.5	66	20.5	344	22.6	231	31.9	70	17.2	1,128	24.1
A little confident	173	16.7	126	19.0	64	19.9	287	18.8	98	13.5	93	22.9	841	18.0
Not at all confident	118	11.4	107	16.1	56	17.4	192	12.6	49	6.8	79	19.5	601	12.9
I don't know	152	14.7	136	20.5	65	20.2	230	15.1	84	11.6	95	23.4	762	16.3
<b>Heard of PrEP</b>														
No	88	7.5	96	13.7	53	15.8	146	8.7	93	11.9	79	18.8	555	10.9
Yes	1,063	90.7	576	82.1	265	79.1	1,506	89.3	669	85.7	326	77.6	4,405	86.4
Not sure	21	1.8	30	4.3	17	5.1	34	2.0	19	2.4	15	3.6	136	2.7
<b>Ever taken PrEP</b>														
No	1,099	92.4	674	95.5	325	95.9	1,532	90.3	664	84.7	415	97.6	4,701	91.6
Yes	90	7.6	32	4.6	14	4.1	165	9.7	120	15.3	10	2.4	431	8.4
<b>Likelihood of using PrEP if available and affordable<sup>c</sup></b>														
Very unlikely	117	11.3	46	6.9	30	9.3	143	9.4	88	12.2	36	8.9	460	9.9
Quite unlikely	111	10.7	50	7.6	39	12.1	134	8.8	99	13.7	32	7.9	465	10.0
Not sure	277	26.8	185	27.9	79	24.5	440	29.0	200	27.7	143	35.5	1,324	28.4
Quite likely	185	17.9	156	23.6	74	23.0	319	21.0	145	20.1	88	21.8	967	20.7
Very likely	343	33.2	225	34.0	100	31.1	483	31.8	190	26.3	104	25.8	1,445	31.0

Abbreviations: PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis

<sup>a</sup> The total counts for each characteristic do not always add up to the provincial totals because only participants with non-missing values were included. Missing values make up less than 3% of the totals

<sup>b</sup> Among all HIV-negative or untested men (N=4,665)

<sup>c</sup> Among all HIV-negative or untested men (N=4,676)



## Sexual practices

Over half of participants (62.1%) always or almost always had sober sex in the previous 12 months (Table 4). One-fifth (21.5%) of the participants reported participation in chemsex, and 5.8% participated in chemsex in the past six months.

With regard to sexual practices, 62.1% of the participants reported any anal intercourse with casual partners; of these men, 73.6% were inconsistent in their condom use in the previous year (ranging from one to multiple condomless acts).

**Table 4: Sexual practices of Canadian participants in the EMIS-2017 (N=5,165)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429)		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Nonsober sex (last 12 months)<sup>b</sup></b>														
None of it	362	33.1	252	41.0	125	41.7	533	35.0	253	35.8	160	44.3	1,685	36.6
Almost none of it	278	25.4	174	28.3	81	27.0	380	25.0	171	24.2	87	24.1	1,171	25.5
Less than half	141	12.9	71	11.6	26	8.7	209	13.7	92	13.0	42	11.6	581	12.6
About half	115	10.5	42	6.8	21	7.0	122	8.0	67	9.5	24	6.6	391	8.5
More than half	74	6.8	27	4.4	9	3.0	111	7.3	49	6.9	16	4.4	286	6.2
Almost all of it	97	8.9	31	5.0	31	10.3	121	8.0	58	8.2	23	6.4	361	7.8
All of it	28	2.6	17	2.8	7	2.3	46	3.0	17	2.4	9	2.5	124	2.7
<b>Recency of chemsex<sup>c</sup></b>														
Within six months	95	8.1	26	3.7	11	3.3	105	6.2	47	6.0	14	3.3	298	5.8
Six months to a year	76	6.5	56	7.9	14	4.1	127	7.5	50	6.4	20	4.7	343	6.7
1–5 years ago	50	4.2	37	5.2	10	3.0	62	3.7	31	3.9	12	2.8	202	3.9
5+ years ago	77	6.5	31	4.4	8	2.4	84	5.0	40	5.1	20	4.7	260	5.1
Never	879	74.7	558	78.8	295	87.3	1,311	77.6	617	78.6	357	84.4	4,017	78.5
<b>Anal intercourse with casual partners (participants of any HIV status)<sup>d</sup></b>														
No anal intercourse	420	36	258	36.7	125	37.3	632	37.8	308	39.6	181	42.9	1,924	37.9
Any anal intercourse	748	64	444	63.3	210	62.7	1,038	62.2	470	60.4	241	57.1	3,151	62.1
<b>Consistent condom use with casual partners (participants of any HIV status)<sup>e</sup></b>														
Non-consistent condom use	561	75.0	327	73.6	160	76.2	765	73.8	320	68.2	185	76.8	2,318	73.6
Consistent condom use	187	25.0	117	26.4	50	23.8	272	26.2	149	31.8	56	23.2	831	26.4
<b>Any CAI by HIV-negative men, on PrEP<sup>f</sup></b>														
No CAI	–	–	–	–	–	–	–	–	–	–	–	–	30	8.7
Any CAI	–	–	–	–	–	–	–	–	–	–	–	–	314	91.3
<b>Any CAI among HIV-negative or HIV-unknown men not on PrEP<sup>g</sup></b>														
No CAI	180	26.5	114	27.4	50	25.1	265	29.5	134	36.1	54	23.4	797	28.5
Any CAI	498	73.5	302	72.6	149	74.9	632	70.5	237	63.9	177	76.6	1,995	71.5
<b>Any CAI by HIV-positive men, on treatment, undetectable viral load<sup>h</sup></b>														
No CAI	–	–	–	–	–	–	–	–	–	–	–	–	22	7.3
Any CAI	–	–	–	–	–	–	–	–	–	–	–	–	278	92.7
<b>Any CAI among HIV-positive men not on treatment and detectable viral load<sup>i</sup></b>														
No CAI	–	–	–	–	–	–	–	–	–	–	–	–	12	85.7
Any CAI	–	–	–	–	–	–	–	–	–	–	–	–	2	14.3
<b>Paid a man to have sex</b>														
Within 12 months	57	4.9	33	4.8	24	7.4	108	6.6	51	6.8	14	3.5	287	5.8
1–5 years	61	5.3	27	4.0	15	4.6	89	5.4	34	4.5	16	4.0	242	4.9
5+ years	78	6.7	31	4.6	19	5.9	113	6.9	38	5.1	18	4.4	297	6.0
Never	961	83.1	590	86.6	266	82.1	1,333	81.1	626	83.6	357	88.1	4,133	83.3
<b>Paid by a man to have sex</b>														
Within 12 months	40	3.5	30	4.4	7	2.2	67	4.1	36	4.8	20	4.9	200	4.0
1–5 years ago	44	3.8	22	3.2	12	3.7	72	4.4	44	5.9	17	4.2	211	4.3
5+ years ago	114	9.9	43	6.3	24	7.4	153	9.3	33	4.4	25	6.2	392	7.9
Never	959	82.9	586	86.0	281	86.7	1,353	82.2	637	84.9	344	84.7	4,160	83.8

Abbreviations: CAI, condomless anal intercourse; PrEP, preexposure prophylaxis; –, numbers were suppressed due to small cell sizes

<sup>a</sup> The total counts for each characteristic do not always add up to the provincial totals because only participants with non-missing values were included. Missing values make up less than 5% of the totals

<sup>b</sup> Among men who have had sex with a man in last 12 months (N=4,599)

<sup>c</sup> Used stimulant drugs to make sex more intense or last longer. Note: The stimulant drugs include ecstasy/MDMA, cocaine, amphetamine (speed), crystal methamphetamine (Tina, Pervitin), mephedrone and ketamine

<sup>d</sup> Among men of any HIV status who had one or more casual partners in the last 12 months (N=5,075)

<sup>e</sup> Among men of any HIV status who had anal intercourse with one or more casual partners in the last 12 months (N=3,149)

<sup>f</sup> Among HIV-negative men on PrEP who had anal intercourse with one or more casual partners in last 12 months (N=344)

<sup>g</sup> Among HIV-negative or untested men not on PrEP who had anal intercourse with one or more casual partners in last 12 months (N=2,792)

<sup>h</sup> Among HIV-positive men on treatment and undetectable viral load who had anal intercourse with one or more casual partners in last 12 months (N=300)

<sup>i</sup> Among HIV-positive men not on treatment and with a detectable viral load who had anal intercourse with one or more casual partners in last 12 months (N=21)



Of the HIV-negative men using PrEP who had anal intercourse with one or more casual partners in the past year (n=344), 91.3% participated in any CAI with casual partners in the past year. Of those who were HIV-negative or did not know their status, who had anal intercourse with one or more casual partners in the past year and were currently not using PrEP (n=2,792), 71.5% participated in any CAI with casual partners in the past year. Of the HIV-positive participants who had anal intercourse with one or more casual partners in the past year and who had an undetectable viral load (n=300), 92.7% participated in any CAI with casual partners in the past year. Of the men who were HIV-positive who had anal intercourse with one or more casual partners in the past year, were not taking antiretroviral therapy and had a detectable viral load (n=14), 14.3% had engaged in CAI with casual partners in the past year.

In the past year, 5.8% of participants bought sex and 4.0% sold sex with male partners.

### STBBI testing and diagnosis

Although almost two-thirds of participants (62.5%) had tested for HIV in the previous year, only one-quarter (24.9%) reported full STI screening in the last 12 months (Table 5). This proportion was higher (37.7%) among participants who engaged in any CAI in the previous year.

Most of the participants (90%) who had been tested for STIs other than HIV infection in the previous year stated that their healthcare provider knew they had sex with other men.

With regard to bloodborne infections, 1.5% of participants were ever diagnosed with hepatitis C and 9% reporting being diagnosed with HIV infection. Of those with an HIV diagnosis, 99.1% of the HIV-positive participants reported current use of antiretroviral therapies; of those, 96.7% reported an undetectable viral load. For other STBBIs, 3.2% of the participants had received a syphilis diagnosis within the previous year. The proportions of participants diagnosed in the previous year with gonorrhoea and chlamydia (including lymphogranuloma venereum) were 7.1% and 6.5%, respectively.

**Table 5: Sexually transmitted and bloodborne infection testing and diagnoses of Canadian participants in the EMIS-2017 (N=5,165)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429) <sup>a</sup>		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Received full STI screen in last 12 months<sup>b</sup></b>														
No	698	66.7	480	71.6	246	76.4	1,270	82.5	473	64.9	377	92.0	3,544	75.1
Yes	348	33.3	190	28.4	76	23.6	269	17.5	256	35.1	33	8.0	1,172	24.9
<b>Healthcare provider's knowledge of sex with men<sup>c</sup></b>														
Definitely/Probably knew	718	91.8	358	86.1	153	86.4	883	91.3	451	93.8	155	78.7	2,718	90.0
Did not know or Don't know if they knew	64	8.2	58	13.9	24	13.6	84	8.7	30	6.2	42	21.3	302	10.0
<b>HIV testing history<sup>d</sup></b>														
Within six months	213	20.6	94	14.2	39	12.1	224	14.7	131	18.1	26	6.4	727	15.5
Six months to a year	507	49.0	311	46.8	150	46.6	731	47.9	327	45.2	173	42.6	2,199	47.0
1-5 years	151	14.6	91	13.7	36	11.2	219	14.4	103	14.2	67	16.5	667	14.3
5+ years	45	4.4	26	3.9	22	6.8	83	5.4	28	3.9	25	6.2	229	4.9
Never	118	11.4	142	21.4	75	23.3	269	17.6	135	18.6	115	28.3	854	18.3
<b>Last syphilis diagnosis</b>														
Within 12 months	50	4.2	21	3.0	8	2.4	53	3.2	25	3.2	5	1.2	162	3.2
1-5 years ago	71	6.0	24	3.4	16	4.8	93	5.5	47	6.1	20	4.7	271	5.3
5+ years	44	3.7	22	3.1	9	2.7	84	5.0	19	2.5	14	3.3	192	3.8
Never	1,015	86.0	635	90.5	301	90.1	1,447	86.3	684	88.3	387	90.8	4,469	87.7
<b>Last gonorrhoea diagnosis</b>														
Within 12 months	110	9.3	43	6.1	19	5.7	99	5.9	77	10.0	11	2.6	359	7.1
1-5 years ago	147	12.5	60	8.5	22	6.6	135	8.0	72	9.3	17	4.0	453	8.9
5+ years ago	131	11.1	60	8.5	22	6.6	180	10.7	65	8.4	32	7.5	490	9.6
Never	790	67.1	540	76.8	268	81.0	1,268	75.4	559	72.3	365	85.9	3,790	74.4
<b>Last chlamydia or LGV diagnosis</b>														
Within 12 months	105	9.0	35	5.1	14	4.3	106	6.4	60	7.8	7	1.7	327	6.5
1-5 years ago	109	9.3	57	8.2	26	7.9	140	8.4	67	8.7	18	4.3	417	8.2
5+ years ago	94	8.0	43	6.2	24	7.3	127	7.6	42	5.4	21	5.0	351	6.9
Never	865	73.7	558	80.5	265	80.5	1,293	77.6	604	78.1	375	89.1	3,960	78.3

**Table 5: Sexually transmitted and bloodborne infection testing and diagnoses of Canadian participants in the EMIS-2017 (N=5,165) (continued)**

Characteristics	British Columbia + Yukon (n=1,191) <sup>a</sup>		Alberta + Northwest Territories (n=710) <sup>a</sup>		Saskatchewan + Manitoba (n=339) <sup>a</sup>		Ontario + Nunavut (n=1,707) <sup>a</sup>		Quebec (n=789) <sup>a</sup>		Atlantic Provinces (n=429) <sup>a</sup>		Total (N=5,165) <sup>a</sup>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Ever diagnosed with hepatitis C</b>														
No	1,135	95.3	672	94.9	331	97.9	1,648	96.8	765	97.2	408	95.8	4,959	96.3
Yes	26	2.2	13	1.8	0	0.0	23	1.4	11	1.4	3	0.7	76	1.5
I don't know	30	2.5	23	3.2	7	2.1	31	1.8	11	1.4	15	3.5	117	2.3
<b>Ever diagnosed with HIV</b>														
No	1,034	87.4	664	94.1	322	95.0	1,526	89.8	724	92.0	406	95.5	4,676	91.0
Yes	149	12.6	42	5.9	17	5.0	174	10.2	63	8.0	19	4.5	464	9.0
<b>Currently taking ART<sup>b</sup></b>														
No	–	–	–	–	–	–	–	–	–	–	–	–	4	0.9
Yes	–	–	–	–	–	–	–	–	–	–	–	–	436	99.1
<b>Detectable at last viral load<sup>f</sup></b>														
Undetectable	–	–	–	–	–	–	–	–	–	–	–	–	440	96.7
Detectable	–	–	–	–	–	–	–	–	–	–	–	–	15	3.3

Abbreviations: ART, antiretroviral therapy; LGV, lymphogranuloma venereum; STI, sexually transmitted infection; –, numbers were suppressed due to small cell sizes

<sup>a</sup> The total counts for each characteristic do not always add up to the provincial totals because only participants with non-missing values were included. Missing values make up less than 3% of the totals

<sup>b</sup> Full STI screening in last 12 months: HIV infection, blood test, anal swab and urethral swab (or vaginal swab or urine test), excluding individuals with long-standing HIV infections of more than one year (N=4,716)

<sup>c</sup> Among men who had tested for STIs other than HIV in previous year (N=3,020)

<sup>d</sup> Among all HIV-negative or untested men (N=4,676)

<sup>e</sup> Among men who self-reported as HIV-diagnosed and responded to the question on ART (N=440)

<sup>f</sup> Among men who self-reported as HIV-diagnosed and responded to the question on viral load (N=455)

## Discussion

EMIS-2017 identified that Canadian participants experienced high levels of intimidation, as well as verbal abuse and physical violence related to their attraction to other men. Moderate to severe anxiety or depression were present in almost 25% of participants. Substance use was high and, for the first time, there are national data showing that over 20% of participants engaged in chemsex. There was a significant gap between the proportion of participants who reported using PrEP and the proportion who reported they would use PrEP if it was readily available: 8.4% versus 51.7%. Although virtually all HIV-diagnosed respondents were undergoing treatment and had undetectable viral loads, less than 25% stated that they had received full STI testing in the previous year.

## Strengths and limitations

The strength of the Canadian EMIS-2017 survey was the use of a global, validated questionnaire that will facilitate cross-country comparisons, a large sample size and participation from all regions of Canada.

A number of limitations need to be considered when interpreting the findings. Since the EMIS-2017 was based on self-reported data and included sensitive topics such as sexual practices and substance use, some degree of underreporting of higher-risk behaviours may have occurred. However, any underreporting was likely limited given the self-administered nature of the survey. EMIS-2017 made use of non-probability sampling methods,

including the use of social and sexual networking mobile applications for recruitment, and, as a result, it more likely represents sexually active nonmonogamous gbMSM. However, this is a main target population for both behavioural surveys and public health interventions.

## Implications

Many of the findings are consistent with previous studies. For example, a Canadian survey of gbMSM found a higher risk of suicidal ideation and related behaviour among gbMSM than among heterosexual men (17). A review of the international literature found a higher prevalence of substance use among gbMSM than heterosexual men (18). The reported use of chemsex (21.5%) in the Canadian portion of the EMIS-2017 was higher than found by regional Canadian studies (6% and 18%) (19,20) and may reflect regional variation. Other studies have also found that mental health challenges and substance use are associated with gbMSM engaging in higher-risk sexual practices (21–23). The tendency of these issues to coincide has been conceptualized as a syndemic, defined as co-occurring epidemics that results in a higher disease burden in marginalized populations (24). Previous studies have indicated that in some cities between 10.5% and 12.5% of gbMSM are using PrEP (25), and that 50% to 60% of gbMSM are interested and willing to use PrEP (26,27), suggesting affordability and accessibility are barriers (28,29). A low proportion of participants reporting full STI testing have been found in other surveys of gbMSM in Canada (30) and internationally (31,32). The finding that almost all participants diagnosed with HIV infection were undergoing



treatment and had undetectable viral loads is similar to recent regional surveys of gbMSM (33,34).

### Next steps

The EMIS-2017 findings point to the need for implementation research to determine best practices to address the high levels of discrimination, poor mental health and substance use harms that gbMSM experience. The EMIS-2017 study also provides useful baseline data on PrEP. In light of changes to provincial formularies and recent guidelines on PrEP prescribing, we anticipate an uptake of this effective prevention technology. Further research would be useful in determining the role of PrEP on sexual risk practices and on the subsequent rates of infection with HIV and other STBBIs. As this survey likely captured a specific and important subgroup of gbMSM regarding STBBIs, triangulating these data with information generated from future surveys using alternative sampling methods would lead to a more comprehensive understanding of this population as a whole.

### Conclusion

gbMSM in Canada experienced high levels of stigma, discrimination, mental health problems, and substance use. Furthermore, a low prevalence of condom use was found among them. The gap between the proportion of men who were interested in PrEP and those who actually used it is significant and comprehensive STBBI testing was low. These findings can inform public health action and provide a baseline to examine the impact of current and new interventions.

### Authors' statement

NB — Conceptualization, data curation, formal analysis, writing (original draft and review and editing)

DMP — Funding acquisition, project administration, conceptualization, data curation, formal analysis, writing — review and editing

NJL — Conceptualization, formal analysis, writing (review and editing)

MB — Conceptualization, formal analysis, writing (review and editing)

DJB — Conceptualization, formal analysis, writing (review and editing)

TAH — Conceptualization, formal analysis, writing (review and editing)

BA — Conceptualization, formal analysis, writing (review and editing)

### Conflict of interest

None.

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