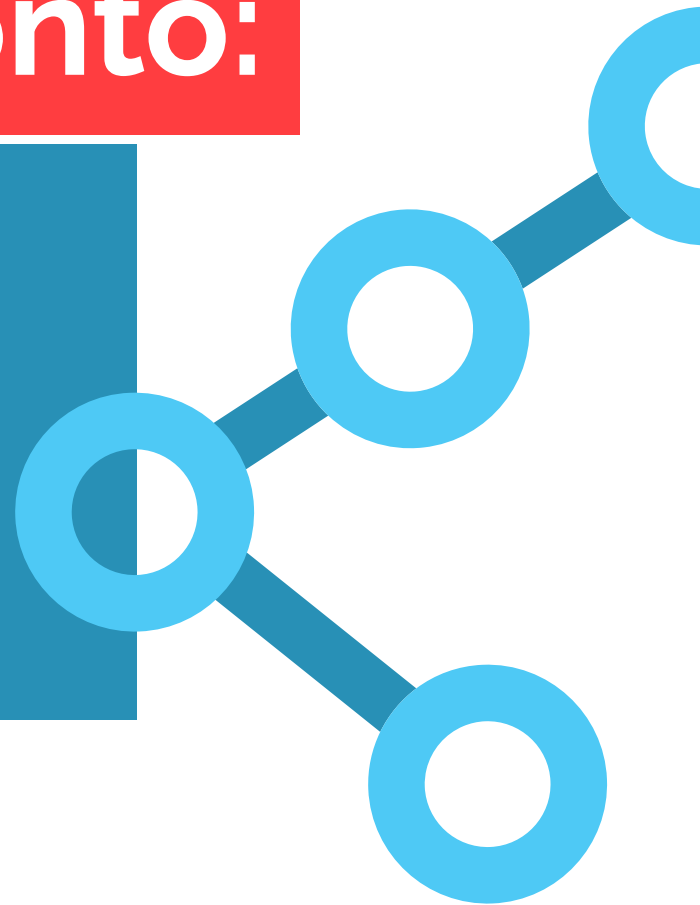


# Engage Toronto:

Portrait of the health & wellbeing of gay, bisexual & other men who have sex with men in the Greater Toronto Area.



**Baseline Sample  
(2017-2019)  
Highlights**

# Acknowledgments

Engage/Momentum II is funded by the Canadian Institutes for Health Research (CIHR, #TE2-138299; #FDN-143342; #PJT-153139), the Canadian Association for HIV/AIDS Research (CANFAR, #Engage), the Ontario HIV Treatment Network (OHTN, #1051), the Public Health Agency of Canada (#4500345082), and Ryerson University. As well, SSS is supported by postdoctoral fellowships from CIHR and CTN; DMM and NJL are supported by Scholar Awards from the Michael Smith Foundation for Health Research (#5209, #16863); TAH is supported by a Chair in Gay and Bisexual Men's Health from the OHTN; DG is supported by a Canada Research Chair in Sexual and Gender Minority Health. We would also like to thank the Engage/Momentum II study participants, office staff, and community engagement committee members, as well as our community and public health partners.

**The Engage Toronto Team:** Members of the cycle 2017-2019: S. Skakoon-Sparling (postdoctoral fellow), R. Rodrigues and L. Tooley (research coordinators), A. Parlette, V. Castillejos, and J. Burley (research associates), J. Reinhart, M. Ricci, C. Draenos, E. Campbell, and K. Hart (study nurses), S. Noor (data manager).

**The principal investigators of the Engage study are:** T. A. Hart and D. Grace (Toronto), J. Cox and G. Lambert (Montréal), as well as N. J. Lachowsky, J. Jollimore and D. M. Moore (Vancouver).

**The Community-Engagement Committee:** A. Busch, A. Ablona, D. Griffiths, A. Oliva, A. Lin, R. Sharvendiran, C. Barr, C. Idibouo, C. Cabarios, D. Lewis-Peart, J. Chander, K. MacKinnon, M. Seguin, M. Pilling, M. Fanous, P. Anand, R. Tran, R. Ahmed, T. Morden, W. Greene, G. Durrant.

**To cite this document:** Hart, T. A., Skakoon-Sparling, S., Barath, J., Sang, J., Apelian, H., Noor, S., Sinno, J., Grace, D. Engage Toronto: Portrait of the health and wellbeing of gay, bisexual and other men who have sex with men in the Greater Toronto Area. Ryerson University and the University of Toronto. March 2021.

**For more information:** [www.engage-men.ca](http://www.engage-men.ca)

# Executive Summary

**Objectives:** Despite important advances in antiretroviral therapy (ART) resulting in the reduction of morbidity and mortality rates for people living with HIV, gay, bisexual and other men who have sex with men (GBM) remain disproportionately affected by HIV in Canada (1). Similarly, the rates of bacterial sexually transmitted infections (STIs) are disproportionately high in this population, with these pathogens also playing a role as co-factors in HIV transmission (2). The objective of the Engage Study is to provide an up-to-date portrait of various aspects related to the sexual and mental health of GBM.

**Methods:** Engage is a community-based longitudinal cohort study of GBM that collects detailed sociodemographic, behavioural, attitudinal, and biological information related to sexual health, HIV, Hepatitis C, and other STIs, substance use, and psychosocial health. We used respondent driven sampling (RDS) to recruit participants into our study. RDS is a modified form of chain-referral sampling designed to approximate probabilistic samples by adjusting for selection bias (4). Engage is a three-site collaboration in Vancouver, Toronto, and Montreal.

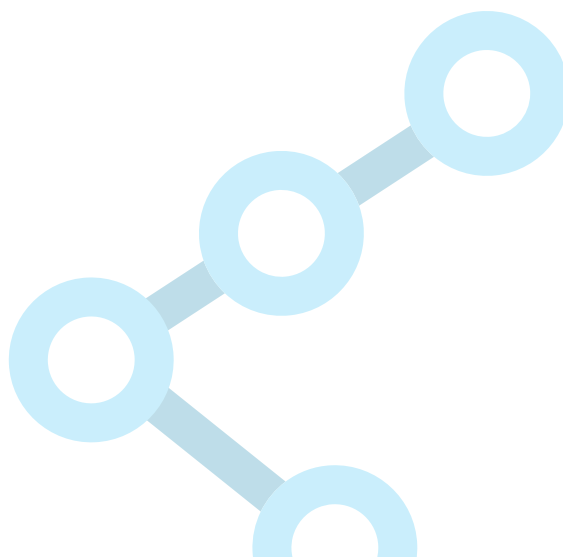
This report describes the Toronto sample at the baseline time point of the Engage Study. Recruitment for Engage in Toronto started in May 2017 and ended in August 2019. To increase the representativeness of our estimates using Engage Study data, we applied RDS weighting adjustment methods during data analysis. This method allows us to account for the fact that individuals with larger social networks are more likely to be recruited into the sample.

**Results:** The final sample of 517 men (cisgender and transgender) in Toronto was recruited in about 27 months (May 2017 – August 2019). Our sample was comprised of 81.6% HIV-negative GBM and 18.4% GBM living with HIV. About half (50.7%) were 30 years old or younger. Almost half (42.6%) were born outside of Canada, and almost half (43.3%) identified as members of a racialized group. Most (80.4%) reported having at least a high school education. Regarding sexual orientation, most (72.4%) identified as gay, and most participants reported experiencing some form of past homophobic discrimination. For example, 74.9% reported that in the past year, they had heard anti-gay/bisexual remarks from family members.

Regarding sexual activities in the past 6 months, 88.2% reported having anal sex with a male partner, and 54.6% reported anal sex without a condom. Regarding substance use in the past 6 months, the most commonly used substance was alcohol, with the vast majority (94%) having reported using alcohol in the past 6 months. However, relatively few participants (8.5%) reported problematic levels of alcohol use (e.g., substance abuse). A minority of GBM (7.1%) reported crystal methamphetamine use or used a non-medicinal drug by injection (3.6%) in the past 6 months.

Regarding healthcare access and use, HIV-negative GBM were less likely to report having a primary care provider (68.2%) than men living with HIV (99.3%). Among HIV-negative GBM, 72.9% reported having been tested for HIV in the past 12 months. Relatively fewer men reported having been tested for a sexually transmitted infection other than HIV (63.7% of HIV-negative GBM and 37.2% of GBM living with HIV). A minority (10.6%) of HIV-negative GBM reported having taken Pre-Exposure Prophylaxis (PrEP) in the past 6 months. Regarding health status for GBM living with HIV, 96.8% were aware they were living with HIV. Of those living with HIV, 85.4% were on antiretroviral treatment, and among those on treatment, 97.3% reported an undetectable viral load. Regarding mental health across all participants, regardless of HIV status, 31.9% reported moderate or severe anxiety and 9.3% reported moderate or severe depression.

**Conclusions:** The Engage Toronto site recruited a diverse sample of 517 sexually active GBM from the Greater Toronto Area. This report suggests the ongoing need for sexual health and HIV prevention services for Toronto GBM, including increasing access and use of PrEP among HIV-negative GBM and further increasing access and use of antiretroviral treatment for GBM living with HIV. There is also a need to increase access and use of a primary care provider among HIV-negative GBM living in Toronto. Although most GBM reported no problems with mental health or substance use, there are many GBM who would benefit from mental health promotion and treatment services and harm reduction services for men using crystal methamphetamines or non-medicinal injection drug use.



# Introduction

The objective of the Engage Study is to provide an up-to-date portrait of various aspects related to the sexual and mental health of gay, bisexual and other men who have sex with men (GBM). This information aims to support health interventions serving this population.

Despite important advances in antiretroviral therapy (ART) resulting in the reduction of morbidity and mortality rates for people living with HIV, GBM remain disproportionately affected by HIV in Canada. GBM account for more than half of all Canadians living with HIV (51.9%), despite only representing 2 to 3% of the general population (1). These trends are also consistent in Ontario, where GBM account for 52% of new HIV diagnoses and the estimated prevalence of HIV among GBM in Toronto is 23% (1). Similarly, the rates of bacterial sexually transmitted infections (STIs) are disproportionately high in this population, with these pathogens also playing a role as co-factors in HIV transmission (2). The epidemiology of HIV and STIs in Canada makes GBM a high priority population for HIV/STI prevention, care and related research. Further considerations to different socio-behavioural factors such as access to preventative health services, sexual behaviours, mental health and substance use are warranted. Recognizing that there is a significant lack of understanding of the diversity and needs of GBM across Canada, and that GBM continue to be affected and infected by HIV and STIs at alarming rates, the Engage Study was designed to address critical knowledge gaps in HIV and STI prevention.

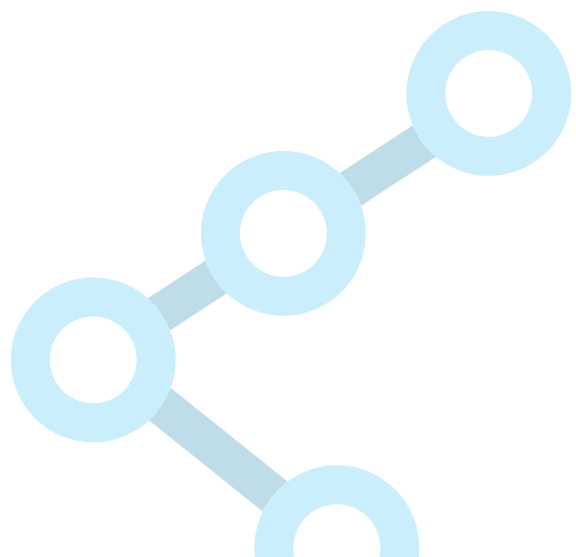
The Engage Study is a community-based longitudinal cohort of GBM that collects detailed sociodemographic, behavioural, attitudinal, and biological information related to sexual health, HIV, hepatitis C, and other STIs, substance use, and psychosocial health. The Engage Study was designed based on the success of the Momentum I Health Study, which was originally conducted in Vancouver from 2012-2019 (3). Building and expanding off of Momentum I, this current study includes the three largest cities in Canada: Vancouver, Toronto and Montréal and represents a national partnership of researchers, public health leaders, and community leaders whose shared goal is to conduct, support, and facilitate high-quality and policy-relevant HIV research on GBM. The Engage Study has six main objectives:

1. To measure self-reported HIV risk behaviour and determinants of risk behaviours among GBM. We defined risk behavior as at least one episode of condomless anal sex (CAS) with a known serodiscordant or unknown serostatus partner in the previous six months.
2. To measure the prevalence and determinants of recent HIV infection among GBM.
3. To measure the proportion and determinants of community viral load (i.e., a measured viral load  $\geq 200$  copies/ mL) among HIV positive GBM.
4. To measure the prevalence of recent and asymptomatic STIs other than HIV (HBV, HCV, gonorrhea, chlamydia, and syphilis) and related determinants among GBM.
5. To document the exposure and uptake of socio-behavioural and biomedical HIV and STI prevention programs among GBM.
6. To examine associations between specific prevention initiatives with the occurrence of recent HIV, STI, and CAS.

The current document provides an overview of selected indicators from the study data collected between May 2017 and August 2019 from 517 cisgender and transgender men aged 16 to 76 years who took part in the Toronto branch of the Engage Study. The indicators value is situated within the reported margins with a level of confidence of 95%.

The objectives for this report are to provide detailed health information about GBM in Toronto for clinical and public health audiences. These findings can be used to further develop research analyses, support existing and future research, develop HIV and STI prevention and care interventions and support further grant-funded applications. A separate community-facing report will be designed to address the interests and concerns of the GBM community in the Greater Toronto Area.

More information regarding the study and related publications are available at the national Engage website (<https://www.engage-men.ca/>).



# Methods And Analysis

To be eligible for the study, participants needed to 1) be 16 years of age or older, 2) self-identify as a man (cisgender or transgender), 3) be able to read English, 4) live in the Greater Toronto Area, 5) be willing to provide biological samples for HIV and STI testing, and 6) have engaged in sexual activity with another man in the six months prior to their study visit.

We used respondent driven sampling (RDS) to recruit participants in the Engage Study. RDS is a modified form of chain-referral sampling designed to approximate probabilistic samples by adjusting for selection bias (4). Recruitment for the Engage Study in Toronto started in May 2017 and ended in August 2019. The Toronto site initially started with 30 “seed” participants, who were chosen based upon feedback from our Community Engagement Committee of community members and service providers for Toronto gay, bisexual, and queer men’s communities. Seed participants were recruited from diverse racial and ethnic backgrounds, ages, gender identities, HIV statuses, as well as risk factors for HIV and other sexually transmitted and blood-borne infections (STBBIs). Recruitment was monitored to add more seed participants in order to retain steady recruitment and to improve our ability to achieve our targeted sample size. We also used advertisements on social networking applications, such as Grindr, Growlr, and Squirt, as well as posts on Facebook and Craigslist to raise awareness of the study and to recruit potential seed participants.

Participants were encouraged to maintain the chain of recruitment and were compensated \$15 for each person they successfully recruited into the study (to a maximum of 6 people). Potential participants received “coupons” inviting them to participate in the Engage study. Each study participant received \$50 for completing a study visit, which included a self-administered quantitative questionnaire and provision of biological samples for HIV and other STBBIs. Individuals could only participate in the baseline study once, and we collected written informed consent prior to data collection.

## Statistical Adjustment

To increase the representativeness of estimates using Engage Study data, we applied RDS weighting adjustment methods during data analysis. We adjusted all data using RDS-II weights, which is a widely used method that relies on social network size of participants (5). With this weighting method, data are adjusted according to the size of each participant's social network (weight decreases as the size of social network increases) to account for the fact that individuals with larger social networks are more likely to be recruited into the sample. A participant's social network size was based on their answer to the following question: "How many men who have sex with men aged 16 years or older, including trans men, do you know who live or work in the greater Toronto area (whether they identify as gay or otherwise) *This includes gay/bi guys you see or speak to regularly; e.g., close friends, boyfriends, spouses, regular sex partners, roommates, relatives, people you regularly hang out with, etc.?*" For the lower limit, we set the minimum value to 1 as, to be eligible for the study, all participants had to be sexually active with another man within the past six months. To manage unrealistic maximum values, we set an upper limit of 150, following standards on the maximum number of currently maintained relationships, based on Dunbar's number (6).





# Results

## RDS Recruitment

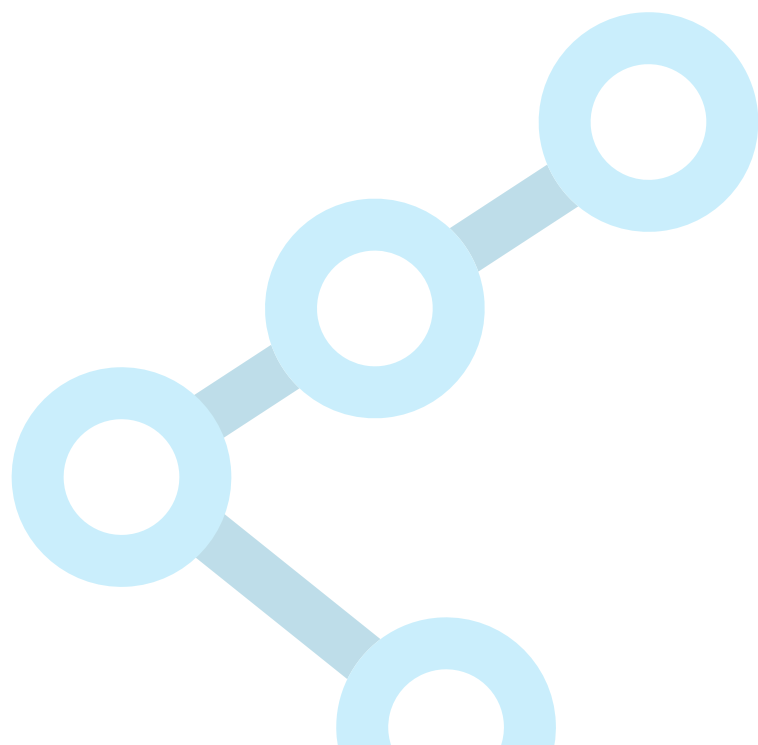
In total, there were 96 “seeds” in Toronto and 53 of these participants (61%) recruited at least one other eligible individual who completed the study protocol. Eligible recruits who finished the study protocol were also given a set number of coupons to recruit their peers. The recruited peers of seeds who enrolled in the survey became wave one respondents, and the recruits of wave one respondents became wave two respondents. This process of recruitment continued through successive waves until our final sample size was reached. In the end, the waves produced by effective seeds made up recruitment chains of varying lengths. The goal was to acquire long recruitment chains made up of multiple waves. The final sample of 517 participants in Toronto was recruited in approximately 27 months (May 2017 – August 2019). The total number of coupons distributed to potential participants was 3078 in Toronto, and the mean number of recruitment waves was 2.67 (95% CI, 2.45, 2.89). The mean length of RDS chains was 5.47 people (95% CI, 5.14, 5.81) and the mean network size (total number of eligible participants the participant knows who live or work in this city) was 56.78 people (95% CI, 52.44, 61.13). When asked about the nature of the relationship with the person from whom participants received an invitation coupon, 99% of participants described their referrer as a friend or current/past sexual partner.

## Specific Challenges

- *Selection bias that could result from the benefits of participating in the study.* Financial compensation is common in epidemiological studies. A generous compensation is likely to attract some people more than others. The ethics review boards that evaluated the study did not determine the amount provided as excessive, especially given travel to the study site and the duration of the study visit (approximately 2 1/2 hours, including time for sample collection). When asked about the main reasons for participating, most respondents reported being interested in issues related to GBM and sexual health, while only 9% reported being mostly interested in financial compensation.

The possibility of free access (regardless of having healthcare coverage in Toronto) to STBBI testing, including the rapid HIV test, may have been more appealing to some GBM than others. However, during the study recruitment period, similar screening services were offered at Hassle Free Clinic, which is not far from the Engage site in downtown Toronto.

- ***Degree of similarity between participants and their recruits (homophily).*** A high level of homophily suggests that a large proportion of participants with a certain characteristic (e.g., regular substance use) recruited only or mostly people with that same characteristic. Homophily may result in an over-representation of that characteristic. Scores range between -1 (completely recruiting outside one's group) and +1 (completely recruiting within one's group), and a score of 0.3 (or, -0.3) would indicate as "substantial" in-group (or out-group) recruitment (4). An investigation of the Engage Toronto data showed a moderate degree of homophily for age, ethno-cultural background, sexual identity, marital status, and HIV status, which was expected. For example, for age group homophily scores ranged between 0.40 to 0.53, indicating that the GBM in Toronto tended to show an in-group pattern for each age group. We also found that, regarding HIV serostatus (0.54 for HIV- and 0.41 for PLWH), in Toronto GBM tended to others with the same HIV status as their own (an in-group recruitment pattern), which is in keeping with an RDS recruitment strategy.
- ***Equilibrium reached.*** As waves of recruitment progress and recruitment chains grow, indicators (e.g., average annual income or age) are expected to stabilize, such that the addition of new participants introduces little change in the indicator (in other words, new participants are representative of the population). The investigation of data on selected sociodemographic, psychosocial and behavioural indicators and health outcomes showed that indeed equilibrium was reached for the Toronto sample before data collection ended.



## Table 1: Sociodemographic Characteristics of GBM Living in Toronto

The Engage study reached many GBM under 30 years of age and the majority were born in Canada. We were able to recruit men of different ethnic backgrounds and the majority of men had a greater than high school education.

Characteristics	Overall (N=517)					
	Total N	N	(%)	(RDS) %	95% CI	
<b>Self-reported HIV status</b>	<b>517</b>					
HIV negative/unknown		420	81.2	<b>81.6</b>	72.9	90.2
HIV positive		97	18.8	<b>18.4</b>	9.8	27.1
<b>Age</b>	<b>517</b>					
Less than 30		222	42.9	<b>50.7</b>	41.3	60.0
30 to 44		221	42.7	<b>28.3</b>	20.8	35.9
45 or more		74	14.3	<b>21.0</b>	11.3	30.6
<b>Born in Canada</b>	<b>517</b>					
No		204	39.5	<b>42.6</b>	33.7	51.6
Yes		313	60.5	<b>57.4</b>	48.4	66.3
<b>Ethnicity</b>	<b>517</b>					
White		314	60.7	<b>56.7</b>	53.7	59.7
Black		27	5.2	<b>6.7</b>	2.3	11.1
Latin American		41	7.9	<b>8.4</b>	4.0	12.8
East/South-East Asian		43	8.3	<b>10.4</b>	6.1	14.7
Aboriginal/Indigenous		3	0.6	<b>2.2</b>	-2.3	6.8
South Asian		21	4.1	<b>3.7</b>	-0.8	8.2
West Asian/North African		16	3.1	<b>3.5</b>	-1.0	8.0
Unidentified/Others		31	6.0	<b>4.4</b>	-0.1	8.9
Mixed Race/Ethnicity		21	4.1	<b>4.1</b>	-0.4	8.6
<b>Highest level of education</b>	<b>517</b>					
High school or less		55	10.6	<b>19.6</b>	10.7	28.4
Greater than high school		462	89.4	<b>80.4</b>	71.6	89.3
<b>Annual income</b>	<b>517</b>					
Less than 30000		247	47.8	<b>57.4</b>	48.0	66.7
30000 to 59999		160	30.9	<b>32.0</b>	22.4	41.5
60000 or higher		110	21.3	<b>10.6</b>	7.0	14.3

## Table 2: Gender, Sexual Orientation, Relationships, and Homophobic Discrimination

Engage participants had diverse identities but the majority (77.8%) identified as gay and did not identify as transgender (96.9%). More than half (54.0%) were not in a relationship, and across a variety of questions about past discrimination, most reported some homophobic discriminatory experiences.

Characteristics	Overall (N=517)					
	Total N	N	(%)	(RDS) %	95% CI	
Sexual orientation	517					
Gay		402	77.8	<b>72.4</b>	63.8	81.0
Bisexual		23	4.4	<b>13.6</b>	5.7	21.4
Straight						
Queer		75	14.5	<b>9.3</b>	6.0	12.5
Questioning						
Asexual						
Pansexual		13	2.5	<b>2.9</b>	0.0	6.0
Two Spirit		3	0.6	<b>1.9</b>	0.0	4.9
Other		1	0.2	<b>0.0</b>	0.0	0.1
Transgender participant	517					
No		501	96.9	<b>95.7</b>	92.2	99.3
Yes		16	3.1	<b>4.3</b>	0.7	7.8
Current relationship with a main partner	517					
No		279	54.0	<b>47.5</b>	38.2	56.7
Yes		238	46.0	<b>52.5</b>	43.3	61.8
Social time spent with gay/bi guys who you know quite well	512					
50% or less of my social time		230	44.9	<b>59.6</b>	50.8	68.3
50% or more of social time		282	55.1	<b>40.4</b>	31.7	49.2
P1Y Have been called a name like homo/fag/ other names in a derogatory manner	511					
Never		108	21.1	<b>30.2</b>	20.3	40.0
At least once		403	78.9	<b>69.8</b>	60.0	79.7
P1Y Have heard anti-gay/bisexual remarks from family members	511					
Never		143	28.0	<b>25.1</b>	17.3	33.0
At least once		368	72.0	<b>74.9</b>	67.0	82.7
P1Y Have been treated unfairly by strangers because you are a gay/bisexual man	509					
Never		98	19.3	<b>23.0</b>	14.8	31.3
At least once		411	80.7	<b>77.0</b>	68.7	85.2
P1Y Have been verbally insulted because you are a gay/bisexual man	509					
Never		165	32.4	<b>43.3</b>	33.6	52.9
At least once		344	67.6	<b>56.7</b>	47.1	66.4
P1Y Have been treated unfairly by your family because you are a gay/bisexual man	506					
Never		193	38.1	<b>39.6</b>	30.3	48.9
At least once		313	61.9	<b>60.4</b>	51.1	69.7

### Table 3a: Sexual Activities (in the past 6 months)

Most of Engage GBM (88.2%) had anal sex with a male (man) partner and more than half of them (54.2%) had anal sex without a condom with at least one guy in the past six months. Only 11.2% had sex with a female partner.

Characteristics	Overall (N=517)				
	Total N	N	(%)	(RDS) %	95% CI
P6M Has had sex with a female partner	517				
No		485	93.8	<b>88.8</b>	81.8 95.8
Yes		32	6.2	<b>11.2</b>	4.2 18.2
P6M Has had sex with 6 or more male partners	517				
No		203	39.3	<b>65.7</b>	58.4 73.1
Yes		314	60.7	<b>34.3</b>	26.9 41.6
P6M Has had anal sex with a male partner	517				
No		45	8.7	<b>11.8</b>	4.8 18.9
Yes		472	91.3	<b>88.2</b>	81.1 95.2
P6M Has had anal sex with 6 or more male partners	517				
No		294	56.9	<b>76.1</b>	70.0 82.1
Yes		223	43.1	<b>23.9</b>	17.9 30.0
P6M Has had anal sex without a condom with at least one guy	517				
No		142	27.5	<b>45.8</b>	36.2 55.4
Yes		375	72.5	<b>54.2</b>	44.6 63.8
P6M High risk sex	508				
Never had anal sex/no anal sex		44	8.7	<b>12.1</b>	4.9 19.3
No Condomless sex P6M		98	19.3	<b>34.8</b>	24.8 44.7
Condomless sex with the same status partner		139	27.4	<b>23.8</b>	17.3 30.4
Condomless sex with an opposite or unknown status partner		227	44.7	<b>29.3</b>	21.5 37.2

### Table 3b: Contexts for Sex in the Past 6 Months

Overall, 24.1% of Engage participants had group sex and 40.8% participated in bathhouse or sex club in the past six months.

Characteristics	Overall (N=517)				
	Total N	N	(%)	(RDS) %	95% CI
P6M Group sex event	508				
No		316	62.2	<b>75.9</b>	69.6 82.2
Yes		192	37.8	<b>24.1</b>	17.8 30.4
P6M Bathhouse or sex club	510				
No		237	46.5	<b>59.2</b>	50.5 67.9
Yes		273	53.5	<b>40.8</b>	32.1 49.5
P6M GIVEN money in exchange for sex	508				
No		494	97.2	<b>98.3</b>	97.0 99.6
Yes		14	2.8	<b>1.7</b>	0.4 3.0
P6M RECEIVED money in exchange for sex	507				
No		467	92.1	<b>95.7</b>	93.6 97.8
Yes		40	7.9	<b>4.3</b>	2.2 6.4

**Table 4: Tobacco, Alcohol, and Other Substance use  
(in the past 6 months)**

Overall, in the past six months 13.8% and 10.7% of GBM participants used daily or almost daily tobacco and cannabis respectively. The most prevalent frequency of drinking alcohol was 2 to 4 times a month (38.6%) and the most prevalent substance used was Cocaine Powder (12.9%).

Characteristics	Overall (N=517)					
	Response	N	(%)	RDS %	95% CI	
P6M Use of tobacco (Total N = 517)	Never	332	64.2	<b>72.5</b>	65.5	79.5
	Once or twice	42	8.1	<b>7.9</b>	3.2	12.6
	Monthly	33	6.4	<b>3.7</b>	1.7	5.7
	Weekly	21	4.1	<b>2.0</b>	0.8	3.2
	Daily or almost daily	89	17.2	<b>13.8</b>	9.1	18.5
P6M Use of cannabis (Total N = 517)	Never	167	32.3	<b>43.4</b>	33.9	52.9
	Once or twice	116	22.4	<b>23.5</b>	15.7	31.4
	Monthly	74	14.3	<b>9.8</b>	6.3	13.3
	Weekly	74	14.3	<b>12.5</b>	5.7	19.4
	Daily or almost daily	86	16.6	<b>10.7</b>	6.9	14.5
How often do you have a drink containing alcohol (Total N = 513)	Never	44	8.6	<b>6.0</b>	3.4	8.7
	Monthly or less	104	20.3	<b>29.3</b>	20.6	37.9
	2 to 4 times a month	173	33.7	<b>38.6</b>	29.2	48.0
	2 to 3 times a week	116	22.6	<b>17.0</b>	11.5	22.5
	4 or more times a week	76	14.8	<b>9.1</b>	4.9	13.2
Use of alcohol: 6 drinks or more and 4 times a week or more (Total N = 510)	No	438	85.9	<b>91.5</b>	87.3	95.6
	Yes	72	14.1	<b>8.5</b>	4.4	12.7
Use of (NON-MEDICAL USE ONLY) Cocaine Powder (Total N = 512)	No	405	79.1	<b>87.1</b>	83.0	91.2
	Yes	107	20.9	<b>12.9</b>	8.8	17.0
Use of (NON-MEDICAL USE ONLY) Crack Cocaine (Total N = 507)	No	492	97.0	<b>98.1</b>	96.5	99.7
	Yes	15	3.0	<b>1.9</b>	0.3	3.5
P6M Frequency of cocaine use (Total N = 516)	Less than once a week	508	98.4	<b>99.6</b>	99.3	100.0
	Once a week or more	8	1.6	<b>0.4</b>	0.0	0.7
Use of (NON-MEDICAL USE ONLY) Ketamine (Total N = 511)	Never	374	73.2	<b>86.9</b>	83.2	90.7
	Used in the past 6 months	43	8.4	<b>3.0</b>	1.8	4.2
	Used greater than 6 months ago	94	18.4	<b>10.1</b>	6.7	13.4
Use of (NON-MEDICAL USE ONLY) Crystal Methamphetamine (Total N = 509)	Never	391	76.8	<b>87.6</b>	83.2	92.0
	Used in the past 6 months	59	11.6	<b>7.1</b>	3.3	10.9
	Used greater than 6 months ago	59	11.6	<b>5.4</b>	3.3	7.4
P6M Frequency of amphetamines use (Total N = 517)	Less than once a week	493	95.4	<b>97.1</b>	95.2	99.0
	Once a week or more	24	4.6	<b>2.9</b>	1.0	4.8
Used either Crystal or GHB with at least one reported partner (EL) (Total N = 504)	No	435	86.3	<b>91.4</b>	87.4	95.4
	Yes	69	13.7	<b>8.6</b>	4.6	12.6
Use of (NON-MEDICAL USE ONLY) Steroids (NOT on prescription) (Total N = 511)	Never	483	94.5	<b>98.6</b>	97.9	99.3
	Used in the past 6 months	10	2.0	<b>0.3</b>	0.1	0.6
	Used greater than 6 months ago	18	3.5	<b>1.0</b>	0.4	1.7
Use of any drug by injection (NON-MEDICAL USE ONLY) (Total N = 516)	Never	462	89.5	<b>87.3</b>	78.6	96.0
	Used in the p6m	29	5.6	<b>3.6</b>	0.4	6.7
	Used more than 6 months ago	25	4.8	<b>9.1</b>	0.7	17.6
If used any drug by injection in the past 6 months, used a syringe ALREADY USED by someone else to inject drugs (Total N = 29)	No	20	69.0	<b>40.1</b>	0.4	79.8
	Yes	9	31.0	<b>59.9</b>	20.2	99.6

### Table 5: Access to Health and Prevention Services

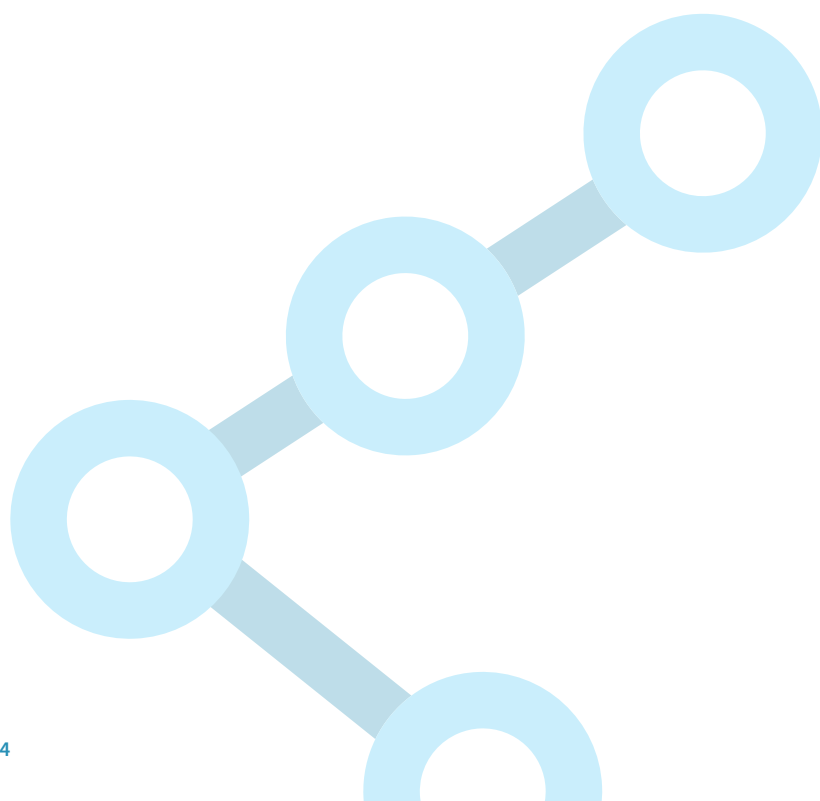
In the past year, 72.9% and 63.7% of HIV negative/unknown participants were tested for HIV and an STI respectively. Of this group, 3.7% had ever taken PEP and 10.6% had taken PrEP in the last six months.

Characteristics	Response	HIV Negative/Unknown (n=420)				Living with HIV (n=97)					
		N	(%)	(RDS) %	95% CI	N	(%)	(RDS) %	95% CI		
Currently have a regular primary health care provider (N = 517)	No	99	23.6	<b>31.8</b>	23.4	40.2	2	2.1	<b>0.7</b>	0.0	1.8
	Yes	321	76.4	<b>68.2</b>	59.8	76.6	95	97.9	<b>99.3</b>	98.2	100.0
Current regular primary health care provider know that the participant has sex with men (N = 389)	No	26	8.8	<b>16.0</b>	7.2	24.9	95	100.0	<b>100.0</b>	100.0	100.0
	Yes	268	91.2	<b>84.0</b>	75.1	92.8					
P6M Receive information about sexual health from On-line interaction with a worker or volunteer from a Community-Based Organization (N = 517)	No	398	94.8	<b>95.7</b>	92.3	99.0	86	88.7	<b>82.9</b>	65.4	100.0
	Yes	22	5.2	<b>4.3</b>	1.0	7.7	11	11.3	<b>17.1</b>	0.0	34.6
P6M Receive information about sexual health from On-going or multiple-session programs or support groups (N = 517)	No	407	96.9	<b>96.5</b>	93.6	99.5	81	83.5	<b>89.6</b>	80.7	98.6
	Yes	13	3.1	<b>3.5</b>	0.5	6.4	16	16.5	<b>10.4</b>	1.4	19.3
P6M Receive information about sexual health from One-time workshop or presentation (N = 517)	No	384	91.4	<b>94.0</b>	91.1	96.9	65	67.0	<b>45.0</b>	18.2	71.7
	Yes	36	8.6	<b>6.0</b>	3.1	8.9	32	33.0	<b>55.0</b>	28.3	81.8
P6M Receive information about sexual health from In-person interaction with a worker or volunteer from a Community-Based Organization (N = 517)	No	375	89.3	<b>93.1</b>	90.0	96.1	63	64.9	<b>53.3</b>	26.1	80.5
	Yes	45	10.7	<b>6.9</b>	3.9	10.0	34	35.1	<b>46.7</b>	19.5	73.9
P12M Tested for HIV (N = 499)	No	70	17.4	<b>27.1</b>	16.4	37.7					
	Yes	332	82.6	<b>72.9</b>	62.3	83.6					
P6M Tested for HIV (among participants had 6 or more male sex partners) (N = 312)	No	64	26.0	<b>27.5</b>	19.2	35.8					
	Yes	182	74.0	<b>72.5</b>	64.2	80.8					
P12M Tested for an STI (N = 510)	No	108	26.2	<b>36.3</b>	26.4	46.3	13	13.4	<b>62.8</b>	41.8	83.8
	Yes	305	73.8	<b>63.7</b>	53.7	73.6	84	86.6	<b>37.2</b>	16.2	58.2
P6M Tested for an STI (among participants had 6 or more male sex partners) (N = 311)	No	78	(31.8)	<b>(31.7)</b>	(23.2)	(40.1)	8	(12.1)	<b>34.1</b>	2.7	65.6
	Yes	167	(68.2)	<b>(68.3)</b>	(59.9)	(76.8)	58	(87.9)	<b>65.9</b>	34.4	97.3
Ever received one or more doses of Hepatitis B vaccine (N = 517)	No	41	9.8	<b>12.9</b>	6.8	18.9	6	6.2	<b>3.6</b>	0.0	7.8
	Yes	299	71.2	<b>65.2</b>	56.8	73.7	77	79.4	<b>88.6</b>	80.0	97.2
	Unsure	80	19.0	<b>21.9</b>	15.2	28.5	14	14.4	<b>7.8</b>	1.1	14.4
Ever received one or more doses of the HPV vaccine (N = 517)	Never received	192	45.7	<b>39.2</b>	29.6	48.9	37	38.1	<b>33.1</b>	6.5	59.8
	Yes received	130	31.0	<b>29.2</b>	20.5	37.9	35	36.1	<b>23.1</b>	8.2	38.0
	Never heard of the HPV vaccine	58	13.8	<b>19.2</b>	12.2	26.2	10	10.3	<b>23.6</b>	0.0	51.2
	Unsure if heard of the HPV vaccine	20	4.8	<b>7.1</b>	2.3	11.9	3	3.1	<b>0.3</b>	0.0	0.8
	Unsure if received the HPV vaccine	20	4.8	<b>5.3</b>	1.2	9.4	12	12.4	<b>19.8</b>	0.0	40.9
Ever received one or more doses of the HPV vaccine (among participants 26 years old or younger) (N = 123)	Never received	39	34.2	<b>31.1</b>	14.1	48.1	3	33.3	<b>43.0</b>	4.3	81.7
	Yes received	45	39.5	<b>32.0</b>	18.3	45.7	5	55.6	<b>44.8</b>	7.0	82.5
	Never heard of the HPV vaccine	14	12.3	<b>17.1</b>	5.6	28.6	1	11.1	<b>12.2</b>	0.0	35.4
	Unsure if heard of the HPV vaccine	7	6.1	<b>10.4</b>	0.0	21.2					
	Unsure if received the HPV vaccine	9	7.9	<b>9.4</b>	0.0	19.6					
Ever taken PEP (N = 510)	No	383	92.3	<b>96.3</b>	94.2	(98.5)					
	Yes	32	7.7	<b>3.7</b>	1.5	(5.8)					
P6M Taken PrEP (N = 420)	No	333	79.3	<b>89.4</b>	85.7	93.1					
	Yes	87	20.7	<b>10.6</b>	6.9	14.3					
P6M Taken PrEP (among participants who had 6 or more male sex partners) (N = 248)	No	168	67.7	<b>73.9</b>	65.9	81.8					
	Yes	80	32.3	<b>26.1</b>	18.2	34.1					
Contacted most or all of the recent sexual partners to tell them to get tested or treated (among participants who have received a diagnosis of a sexually transmitted infection (STI) P6M) (N = 81)	No	15	26.3	<b>32.5</b>	8.7	56.4	12	50.0	<b>57.2</b>	28.5	85.9
	Yes	42	73.7	<b>67.5</b>	43.6	91.3	12	50.0	<b>42.8</b>	14.1	71.5

## Table 6: Opinions About HIV Infection

Of those living with HIV, more than half (60.9%) agreed that new HIV treatments would take worry out of sex and made HIV/AIDS a less serious threat (63.6%), while 65.4% of those living with HIV disagreed with the idea that It is very hard to get HIV nowadays because most HIV-positive guys have undetectable viral loads. With having undetectable viral load among most of them. However, the majority (97.5%) perceived themselves as low risk for transmitting HIV to a sex partner.

Characteristics	Response	HIV Negative/Unknown (N = 420)				Living with HIV (N = 97)					
		N	(%)	(RDS) %	95% CI	N	(%)	(RDS) %	95% CI		
If a guy is using pre-exposure prophylaxis it makes using condoms during anal sex less important (Total N = 516)	Strongly disagree/Disagree	234	55.8	<b>69.0</b>	61.3	76.8	35	36.1	<b>62.4</b>	39.7	85.1
	Agree/Strongly agree	185	44.2	<b>31.0</b>	23.2	38.7	62	63.9	<b>37.6</b>	14.9	60.3
New HIV treatments will take the worry out of sex (Total N = 516)	Strongly disagree/Disagree	203	48.4	<b>57.5</b>	48.5	66.6	28	28.9	<b>39.1</b>	11.6	66.6
	Agree/Strongly agree	216	51.6	<b>42.5</b>	33.4	51.5	69	71.1	<b>60.9</b>	33.4	88.4
HIV/AIDS is a less serious threat than it used to be because of new treatments (Total N = 516)	Strongly disagree/Disagree	138	32.9	<b>42.3</b>	32.4	52.3	23	23.7	<b>36.4</b>	8.6	64.3
	Agree/Strongly agree	281	67.1	<b>57.7</b>	47.7	67.6	74	76.3	<b>63.6</b>	35.7	91.4
It is very hard to get HIV nowadays because most HIV-positive guys have undetectable viral loads (Total N = 516)	Strongly disagree/Disagree	366	87.4	<b>91.2</b>	87.4	95.0	71	73.2	<b>65.4</b>	37.5	93.3
	Agree/Strongly agree	53	12.6	<b>8.8</b>	5.0	12.6	26	26.8	<b>34.6</b>	6.7	62.5
Current risk of getting HIV (Total N = 509)	Low perceived risk (includes px whom believe they may already be HIV positive)	339	82.3	<b>81.6</b>	75.5	7.8					
	High perceived risk	73	17.7	<b>18.4</b>	12.2	24.5					
Current risk of transmitting HIV to a sex partner (Total N = 515)	HIV positive										
	Low perceived HIV transmission risk						92	96.8	<b>97.5</b>	93.9	100.0
	High perceived HIV transmission risk						3	3.2	<b>2.5</b>	0.0	6.1
	HIV negative/unknown										





### Table 7a: Health Status in HIV Negative and Positive Participants

Engage HIV negative/unknown participants, compared to those living with HIV, had higher rates of poor mental health (13.0% vs 8.6%), moderate or severe anxiety (34.1% vs 23.2%), and moderate or severe depression (10.8% vs 3.5%).

living with HIV had a higher prevalence of gonorrhea (28.8% vs 6.8%), chlamydia (10.4% vs 4.4%), and syphilis (41.2% vs 11.0%) compared to HIV negative/unknown participants.

Characteristics	Response	HIV Negative/Unknown (N = 420)					Living with HIV (N = 97)				
		N	(%)	(RDS) %	95% CI		N	(%)	(RDS) %	95% CI	
P6M Mental health in general <sup>6</sup> (Total N = 512)	Good or excellent mental health	361	86.6	<b>87.0</b>	82.0	9w	80	84.2	<b>91.4</b>	84.4	98.3
	Poor mental health	56	13.4	<b>13.0</b>	8.0	18.0	15	15.8	<b>8.6</b>	1.7	15.6
HADS anxiety score (dichotomized) <sup>7</sup> (Total N = 493)	Low anxiety scores (0 to 10)	271	67.8	<b>65.9</b>	57.1	74.8	65	69.9	<b>76.8</b>	58.0	95.6
	Moderate or severe anxiety (11 to 21)	129	32.3	<b>34.1</b>	25.2	42.9	28	30.1	<b>23.2</b>	4.4	42.0
HADS depression score (dichotomized) <sup>7</sup> (Total N = 485)	Low depression scores (0 to 10)	369	93.4	<b>89.2</b>	83.2	95.2	83	92.2	<b>96.5</b>	92.3	100.0
	Moderate or severe depression (11 to 21)	26	6.6	<b>10.8</b>	4.8	16.8	7	7.8	<b>3.5</b>	0.0	7.7
ASSIST Score (alcohol) (Total N = 504)	Low risk (ASSIST score 0 to 10)	225	54.9	<b>52.6</b>	42.7	62.5	51	54.3	<b>78.3</b>	64.5	92.2
	Moderate risk (ASSIST score 11 to 26)	114	27.8	<b>22.8</b>	15.9	29.8	19	20.2	<b>9.5</b>	1.9	17.0
	High risk (ASSIST score 27+)	23	5.6	<b>2.5</b>	1.1	4.0	8	8.5	<b>4.3</b>	0.0	8.8
	Did not use the drug in the p6m	31	7.6	<b>12.7</b>	4.4	21.0	13	13.8	<b>6.3</b>	0.7	12.0
	Did not use the drug in the p3m	5	1.2	<b>1.5</b>	0.0	4.0	2	2.1	<b>1.2</b>	0.0	3.4
	Never used drugs (lifetime)	12	2.9	<b>7.9</b>	0.0	15.7	1	1.1	<b>0.3</b>	0.0	1.1
ASSIST Score (cocaine/amphetamines/ inhalants/sedatives/ hallucinogens and opioids) (Total N = 510)	Low risk (any ASSIST Score 0 to 3)	52	12.6	<b>9.5</b>	5.8	13.3	13	13.5	<b>5.0</b>	0.7	9.3
	Moderate risk (any ASSIST score 4 to 26)	133	32.1	<b>16.7</b>	12.0	21.4	44	45.8	<b>36.8</b>	12.4	61.2
	High Risk (any ASSIST score 27+)	11	2.7	<b>1.2</b>	0.2	2.2	14	14.6	<b>8.5</b>	1.4	15.6
	Did not use the drug in the p6m/p3m	206	49.8	<b>64.6</b>	55.8	73.4	24	25.0	<b>49.3</b>	21.2	77.4
	Never used drugs (lifetime)	12	2.9	<b>7.9</b>	0.1	15.8	1	1.0	<b>0.3</b>	0.0	1.1
Ever been told by a doctor or nurse that he has Genital or Anal Warts (Total N = 509)	No	337	81.6	<b>83.8</b>	75.8	91.8	58	60.4	<b>70.3</b>	49.7	90.8
	Yes	76	18.4	<b>16.2</b>	8.2	24.2	38	39.6	<b>29.7</b>	9.2	50.3
Ever been told by a doctor or nurse that he has Herpes Simplex Virus (Total N = 506)	No	359	87.1	<b>92.1</b>	88.5	95.8	64	68.1	<b>85.2</b>	74.8	95.7
	Yes	53	12.9	<b>7.9</b>	4.2	11.5	30	31.9	<b>14.8</b>	4.3	25.2
P12M Had been told by a doctor or nurse that he has Chlamydia (Total N = 502)	Yes in P12M	62	15.2	<b>10.2</b>	5.6	14.8	22	23.2	<b>10.7</b>	2.4	19.0
	Yes but not in P12M	72	17.7	<b>11.6</b>	7.3	15.9	35	36.8	<b>22.4</b>	4.2	40.6
	Never	273	67.1	<b>78.2</b>	71.9	84.4	38	40.0	<b>66.9</b>	45.6	88.2
P12M Had been told by a doctor or nurse that he has Gonorrhea (Total N = 507)	Yes in P12M	72	17.4	<b>11.2</b>	7.0	15.5	19	20.2	<b>6.5</b>	1.1	12.0
	Yes but not in P12M	68	16.5	<b>10.4</b>	6.3	14.4	40	42.6	<b>34.9</b>	11.3	58.5
	Never	273	66.1	<b>78.4</b>	72.4	84.4	35	37.2	<b>58.6</b>	33.5	83.6
P12M Had been told by a doctor or nurse that he has Syphilis (Total N = 504)	Yes in P12M	17	4.1	<b>4.0</b>	0.8	7.2	16	17.2	<b>8.0</b>	1.4	14.6
	Yes but not in P12M	37	9.0	<b>6.0</b>	2.6	9.5	41	44.1	<b>35.5</b>	12.9	58.1
	Never	357	86.9	<b>90.0</b>	85.3	94.7	36	38.7	<b>56.5</b>	31.2	81.7
<b>Biomedical STIs - Data Collected During Nursing Visit</b>											
Prevalence of gonorrhea (pharyngeal or urinary or rectal) (Total N = 221)	Negative	174	93.5	<b>93.2</b>	88.2	98.2	27	77.1	<b>71.2</b>	40.3	100.0
	Positive	12	6.5	<b>6.8</b>	1.8	11.8	8	22.9	<b>28.8</b>	0.0	59.7
Prevalence of chlamydia (pharyngeal or urinary or rectal) (Total N = 220)	Negative	168	92.3	<b>95.6</b>	92.1	99.1	29	76.3	<b>89.6</b>	77.8	100.0
	Positive	14	7.7	<b>4.4</b>	0.9	7.9	9	23.7	<b>10.4</b>	0.0	22.2
Prevalence of syphilis (Total N = 506)	Nonreactive	365	88.6	<b>89.0</b>	81.3	96.8	43	45.7	<b>58.8</b>	34.6	83.1
	Reactive	47	11.4	<b>11.0</b>	3.2	18.7	51	54.3	<b>41.2</b>	16.9	65.4
Non-treponemal: RPR titer >= 1:8 (compatible with an active infection) (Total N = 505)	No	410	99.5	<b>99.8</b>	99.5	100.0	83	89.2	<b>93.7</b>	87.4	100.0
	Yes	2	0.5	<b>0.2</b>	0.0	0.5	10	10.8	<b>6.3</b>	0.0	12.6
<b>Characteristics</b>		<b>Median</b>	<b>(Q1-Q3)</b>	<b>Adjusted Median</b>	<b>Q1</b>	<b>Q3</b>	<b>Median</b>	<b>(Q1-Q3)</b>	<b>Adjusted Median</b>	<b>Q1</b>	<b>Q3</b>
HADS anxiety score (Continuous) (Total N = 493)		8	(5-11)	<b>9</b>	5	11	8	(5-12)	<b>9</b>	6	12
HADS depression score (Continuous) (Total N = 485)		4	(2-7)	<b>4</b>	2	7	4	(2-7)	<b>5</b>	2	8

## Table 7b: Health Status for All Engage Participants

The majority of Engage participants were immune to HBV due to vaccination (71.1%) or due to natural infection (8.6%), leaving 15.0% susceptible to HBV.

Characteristics	Overall (N=517)				
	Total N	N	(%)	RDS %	95% CI
<b>HBV Infection</b>	<b>498</b>				
Other		8	1.6	<b>4.0</b>	0.0 10.2
Susceptible to HBV		88	17.7	<b>15.0</b>	8.1 21.9
Immune to HBV due to vaccine		372	74.7	<b>71.1</b>	61.2 81.0
Immune to HBV due to natural infection		27	5.4	<b>8.6</b>	1.5 15.7
Chronic or acute HBV		3	0.6	<b>1.3</b>	0.0 3.4
<b>HIV Infection (test result)</b>	<b>517</b>				
HIV Negative/unknown		417	80.7	<b>77.9</b>	68.2 87.6
HIV Positive		100	19.3	<b>22.1</b>	12.4 31.8
<b>Final HIV status (among participants who had ever used injection drugs)</b>	<b>52</b>				
HIV positive		33	63.5	<b>77.5</b>	51.2 100.0
HIV negative		19	36.5	<b>22.5</b>	0.0 48.8

## Table 7c: Health Status for All Engage Participants living with HIV or HCV or Co-infection of HIV and HCV

The prevalence of HIV/HCV co-infection among all Engage participants was 3.3%, compared to 19.3% for HIV-mono-infected, and 0.6% for HCV mono-infected.

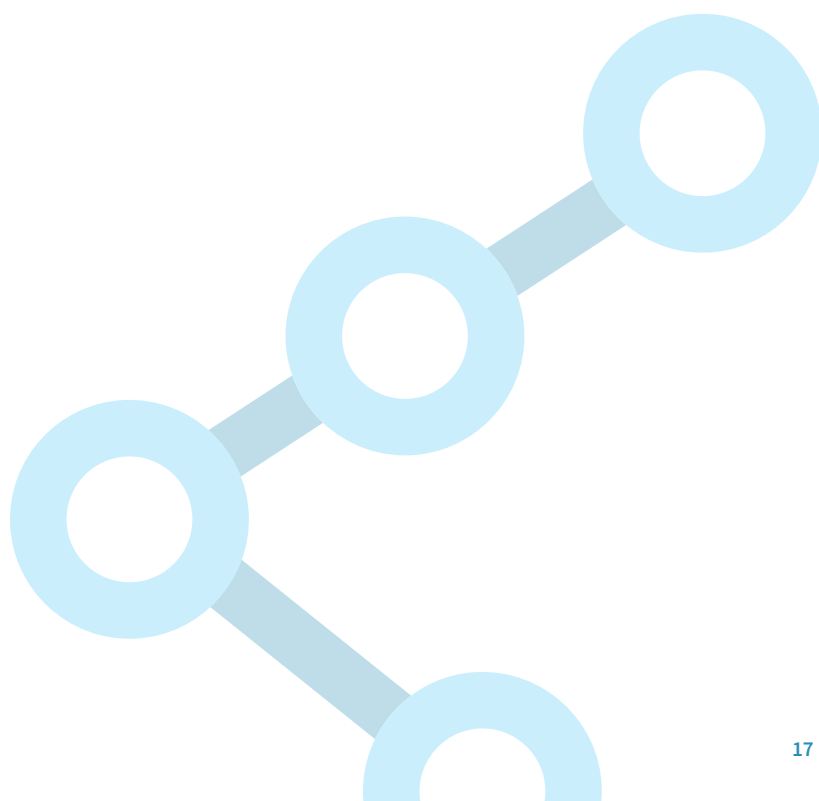
Characteristics	Overall (N=517)				
	Total N	N	(%)	RDS %	95% CI
<b>Co-infection of HIV and HCV</b>	<b>506*</b>				
HIV positive and HCV positive		6	1.2	<b>3.3</b>	0.0 9.3
HIV positive and HCV negative		92	18.2	<b>19.3</b>	10.5 28.2
HIV negative and HCV positive		3	0.6	<b>0.6</b>	0.0 1.4
HIV negative and HCV negative		405	80.0	<b>76.8</b>	67.0 86.7

\* Note: 11 participants had missing data for HCV antibody testing.

## Table 7d: Health Status for Participants Living with HIV

The majority of Engage participants (96.8%) were aware of their HIV status, and of those who were aware, 85.4% were on treatment. Of participants who were on treatment, 96.0% self-reported having an undetectable HIV viral load.

Characteristics	Overall (N=517)				
	Total N	N	(%)	RDS %	95% CI
Aware of HIV status (among HIV positive participants)	<b>100</b>				
No		2	2.0	<b>3.2</b>	0.0 9.0
Yes		98	98.0	<b>96.8</b>	91.0 100.0
Currently on treatment (among participants aware of HIV status)	<b>97</b>				
No		2	2.1	<b>14.6</b>	0.0 40.3
Yes		95	97.9	<b>85.4</b>	59.7 100.0
Tested HIV viral load (among participants aware of HIV status and currently on treatment)	<b>59</b>				
Less than 50 copies/ml		54	91.5	<b>97.3</b>	94.0 100.0
50 or higher		5	8.5	<b>2.7</b>	0.0 6.0
Tested HIV viral load (among participants aware of HIV status and currently on treatment)	<b>59</b>				
Less than 200 copies/ml		57	96.6	<b>99.0</b>	97.5 100.0
200 or higher		2	3.4	<b>1.0</b>	0.0 2.5
Self-reported HIV viral load (among participants aware of HIV status and currently on treatment)	<b>95</b>				
Detectable		4	4.2	<b>4.0</b>	0.0 9.0
Undetectable		91	95.8	<b>96.0</b>	91.0 100.0



# Notes

- 1. The Greater Toronto Area:** Includes the city of Toronto and the surrounding suburbs that form the Greater Toronto Area (GTA).
- 2. Missing data:** Depending on the variable, the proportion of missing data (“prefer not to answer” or “don’t know/don’t remember”) varied between 0.1-3.5%. However, when scores are obtained from psychosocial-behavioural scales composed of several questions, the proportion of missing data varied between 2.1-3.9%.
- 3. RDS-adjusted data:** The indicators presented and their 95% confidence intervals were adjusted based on the size of the social network reported by each participant (5).
- 4. Testing for sexually transmitted infections other than HIV:** The list of infections included chlamydia, gonorrhoea, syphilis, lymphogranuloma venereum (LGV), hepatitis A (HAV), hepatitis B (HBV), hepatitis C (HCV), anal and genital warts, shigella, giardiasis and herpes (HSV).
- 5. Discrimination scale:** The Heterosexist Harassment, Rejection and Discrimination Scale consists of 14 items. Respondents indicate the frequency at which each event occurred over the past year (“never”, “once in a while”, “sometimes”, “a lot”, “most of the time”, “all of the time”) (7).
- 6. Self-rated mental health:** Excellent, very good, good, fair= Excellent or Good mental health. Poor=Poor mental health.
- 7. Anxiety and Depression Scale:** The Hospital Anxiety and Depression Scale consists of 14 items (7 measuring anxiety and 7 measuring depression). Participants choose the answer that best corresponds to how they had felt during the past week (e.g., “I feel tense or wound up”; answer choices include: “most of the time”, “a lot of the time”, “from time to time/occasionally”, “not at all”). Scores are classified into the 4 following categories: normal, mild (low), moderate or severe (8).
- 8. Psychoactive drugs used in the context of sexual activities (chemsex):** This includes any of the following 2 substances: gamma-hydroxybutyrate (GHB) or methamphetamine (crystal meth).
- 9. ASSIST:** The types of amphetamines are grouped according to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). ASSIST was developed for the World Health Organization (WHO) by an international group of substance abuse researchers to detect the risk of developing substance use dependence and related problems. ASSIST is a 7-item questionnaire; scores are classified into 3 categories: lower risk, moderate risk or high risk (9).
- 10. Includes the following substances:** cocaine, amphetamines, inhalants, sedatives, hallucinogens, opioids.

# Conclusions

The Engage Toronto study recruited a total of 517 cisgender and transgender men from March 2017 to August 2019. Our sample reached a diverse group of GBM from varying sociodemographic backgrounds. However, transgender participants (3.1%), Aboriginal/Indigenous participants (0.6%), African, Caribbean, or Black participants (5.2%) and South Asian participants (4.1%) were underrepresented in our data. Further research on the associations between intersecting identities and health and wellbeing for sexual and gender minorities is warranted.

In Engage Toronto we found encouraging findings on HIV care cascade outcomes. HIV prevalence was 18.4% (95% CI, 9.8, 27.1) in Engage Toronto. A total of 85.4% (95% CI, 59.7, 100) of GBM living with HIV were receiving ART and 99% had a suppressed viral load (95% CI, 97.5, 100). In our sample, 3.3% (95% CI, 0.0, 9.3) of GBM ever had an HIV and HCV co-infection. Assessing HIV attitudes towards treatment and stigma in Engage Toronto, we found similar agreement between self-reported HIV-negative/unknown and GBM living with HIV. Taken together, our findings demonstrate GBM in Toronto are actively engaged in the HIV Cascade of Care, promoting treatment as prevention in decreasing community viral load (10). Further work is needed to promote U=U among HIV-negative/unknown GBM (11).

We also looked at other STBBIs among our sample. The presence of bacterial STIs varied from 16.6% (95% CI, 9.4, 23.8) for syphilis, 5.3% (95% CI, 2.0, 8.6) for chlamydia, and 9.9% (95% CI, 4.4, 15.5) for gonorrhoea. Nine (3.9%, 95% CI, 0.0, 9.9) participants in the study had a reactive HCV antibody (Ab) result. HCV was more prevalent among GBM who had ever injected drugs and among those who also had a positive HIV test. Among GBM who both injected drugs and were living with HIV, the prevalence of HCV was 48% (95% CI, 0.0, 100.0). STBBIs continue to disproportionately affect GBM and further public health efforts are needed to prevent, test and treat infections to reduce disease burden.

Looking at access to health services, almost all GBM living with HIV had a primary care provider (99.3%, 95% CI, 98.2, 100.0) and were open about their sexual orientation with their provider (100%). These levels were lower for HIV-negative/unknown GBM. Among all HIV-negative/unknown GBM, we found 72.9% (95% CI, 62.3, 83.6) tested for HIV in the past year, while 63.7% (95% CI, 53.7, 73.6) tested for an STI. Also, HIV-negative/unknown GBM who reported six or more partners in the past six months,

reported higher rates of PrEP utilization than other GBM in the past six months. Our research demonstrates that there continues to be a gap between HIV testing and STI testing, begging the issue of comprehensive sexual health screening. Given the relative newness of PrEP across Canada, we support further qualitative and quantitative research on the effects of PrEP use and U=U on attitudes toward traditional, condom use-focused methods, and on the HIV and STI diagnoses, testing, and treatment.

Self-reported HIV risk behaviours varied by HIV status. Among HIV-negative/unknown GBM, 26.4% (95% CI, 18.1, 34.8) reported condomless anal sex with an unknown or different status partner at least once in the past six months, while prevalence was 42.3% (95% CI, 17.4, 67.2) among GBM living with HIV. Overall, less than half of GBM reported more than six sexual partners in the past six months, with about a quarter of HIV-negative/unknown GBM reporting anal sex with six or more sexual partners in the past six months. We also found GBM living with HIV attended a bathhouse or sex club and a group sex event less than HIV-negative/unknown GBM in the past six months. Further analysis is needed to examine factors associated with sexual behaviours such as PrEP use and reporting an undetectable viral load or having sexual partners who are undetectable.

We assessed various determinants of risk behaviour including mental health and substance use factors. Although a substantial minority of GBM (13.0%) reported poor or fair mental health, the majority of GBM reported low anxiety and depression scores. We also found that more than half of all GBM in the sample reported at least one form of discrimination in the past year. Substance use varied by self-reported HIV status. The most reported substances among GBM living with HIV were crystal methamphetamine use (38.5%) and daily cigarette smoking (30.6%). The most reported practice related to substance use among HIV-negative/unknown GBM was injection drug use where a syringe was already used by someone else (among injection drug users) 71.0% (95% CI, 26.0, 100.0), daily tobacco use 13.6% (95% CI, 8.3, 18.9) and daily cannabis use 10.6% (95% CI, 6.4, 14.9). Notably, about a quarter (25.3%) of GBM reported moderate risk of developing alcohol related dependency and moderate risk of developing stimulant related dependency. These findings demonstrate the importance of reaching a large minority of GBM who struggle with mental health and substance use problems.

Taken together, our findings highlight various health and wellbeing outcomes among GBM in Toronto, including psychosocial health, substance use, STI, HIV risk and HIV prevention, and community viral load. These baseline findings provide useful data specific to GBM who may often be overlooked in population health research. Future longitudinal data collection from the Engage study will allow us to explore temporal associations between various exposures and health outcomes that further explain the risks and resiliencies of GBM.

# References

1. Challacombe L. The epidemiology of HIV in gay, bisexual and other men who have sex with men CATIE2018 Available from: <https://www.catie.ca/fact-sheets/epidemiology/epidemiology-hiv-gay-men-and-other-men-who-have-sex-men>.
2. Brogan N, Paquette DM, Lachowsky NJ, Blais M, Brennan DJ, Hart TA, Adam B. Canadian results from the European Men-who-have-sex-with-men Internet survey (EMIS-2017). *Can Commun Dis Rep*. 2019 Nov 7;45(11):271-282. doi: 10.14745/ccdr.v45i11a01. PMID: 31755878; PMCID: PMC6850724.
3. Lachowsky NJ, Lal A, Forrest JI, Card KG, Cui Z, Sereda P, et al. Including Online-Recruited Seeds: A Respondent-Driven Sample of Men Who Have Sex With Men. *Journal of medical Internet research*. 2016;18(3):e51.
4. Heckathorn DD. Respondent-Driven Sampling II: Deriving Valid Population Estimates from Chain-Referral Samples of Hidden Populations. *Social problems* (Berkeley, Calif). 2002;49(1):11-34.
5. Volz E, & Heckathorn, D. D Probability based estimation theory for respondent driven sampling. *Journal of Official Statistics*. 2008;24(1):79-97.
6. Dunbar RIM. *How many friends does one person need?: Dunbar's number and other evolutionary quirks*. London; Cambridge, MA;: Harvard University Press; 2010.
7. Szymanski DM. Does Internalized Heterosexism Moderate the Link Between Heterosexist Events and Lesbians' Psychological Distress? *Sex roles*. 2006;54(3-4):227-34.
8. Snaith RP. The Hospital Anxiety And Depression Scale. *Health and Quality of Life Outcomes*. 2003;1(1):29-.
9. Humeniuk R, Ali R, Babor TF, Farrell M, Formigoni ML, Jittiwutikarn J, et al. Validation of the alcohol, smoking and substance involvement screening test (ASSIST). *Addiction* (Abingdon, England). 2008;103(6):1039-47.
10. Montaner JSG, Lima VD, Harrigan PR, Lourenço L, Yip B, Nosyk B, et al. Expansion of HAART Coverage Is Associated with Sustained Decreases in HIV/AIDS Morbidity, Mortality and HIV Transmission: The "HIV Treatment as Prevention" Experience in a Canadian Setting. *PloS one*. 2014;9(2):e87872-e.
11. Grace D, Nath R, Parry R, Connell J, Wong J, Grennan T. '... if U equals U what does the second U mean?': sexual minority men's accounts of HIV undetectability and untransmittable scepticism. *Culture, Health & Sexuality*. 2020; 17:1-7.

