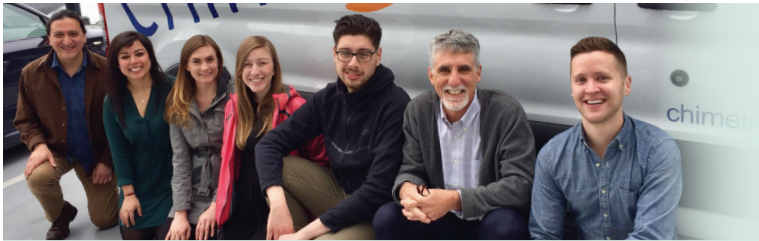


Chime In 2016

Experience with Respondent-Driven Sampling
and Low Socioeconomic Status Heterosexuals



What is Chime In?

Chime In is the name of the Portland/Vancouver Metropolitan Statistical Area (MSA) instance of the National HIV Behavioral Surveillance (NHBS) system.¹ The funding for Chime In comes from the Centers for Disease Control and Prevention. Twenty-two US cities participate in NHBS to anonymously conduct an HIV test and collect data on demographics, sexual behavior and drug use. Populations of interest rotate annually on a three-year cycle and include:

1. Low socioeconomic (SES) heterosexuals.
2. Men who have sex with men (MSM).
3. People who inject drugs.

In 2016, low SES heterosexuals made up the population of interest. All participating cities used respondent-driven sampling (RDS) to identify participants. During the June through December sampling period, Chime In staff interviewed 507 people who met the following requirements:

- Residence within the MSA;²
- Age 18–60 years;
- Vaginal or anal sex with an opposite-gender partner during previous 12 months;
- Self-identified as male or female (not transgender);
- No injection drug use within the past 12 months; and
- Income at or below the federal poverty line **or** no more than a high school education.

Chime In sample

Table 1 includes information about the age, race, ethnicity, employment and housing status of the 507 eligible Chime In participants. Almost 61% of participants were younger than 40 years. Fifty-three percent were women. Fifty-two percent were Black/African-American. Only 15% reported full-time employment. Twenty percent were currently homeless. Another 19% had been homeless within the past year.

What is respondent-driven sampling?

Respondent-driven sampling (RDS) is a sampling method that takes advantage of social networks. It starts out with a small number of people who meet all of the criteria for participation, and live in a low-income census tract. These people, known as seeds, are recruited, interviewed, and given cash compensation for participation. Chime In staff asks each seed to recruit 3–5 others from their social network. If the seeds successfully recruit others, they receive additional cash compensation. Chime In compensated eligible recruits up to \$50 for participation, in addition to \$10 compensation for each person they successfully recruited from their own social networks. Recruiting proceeded in this manner, with each new participant compensated for their interview and anyone they successfully recruited, creating recruitment chains. Figure 1 shows the recruitment chains for Chime In participants. RDS analysis methods account for participants' network sizes, as well as homophily. Homophily, roughly translated, is the likelihood that a person will recruit another person of similar race, age, gender, etc. RDS advocates argue that, if done correctly, these adjustments allow investigators to use RDS data to make valid inferences about the whole population of participants, even though selection is not random.

¹ <https://www.cdc.gov/hiv/statistics/systems/nhbs/>

² Includes Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon, and Clark and Skamania counties in Washington

Figure 1: Recruitment chain for Chime In, 2016

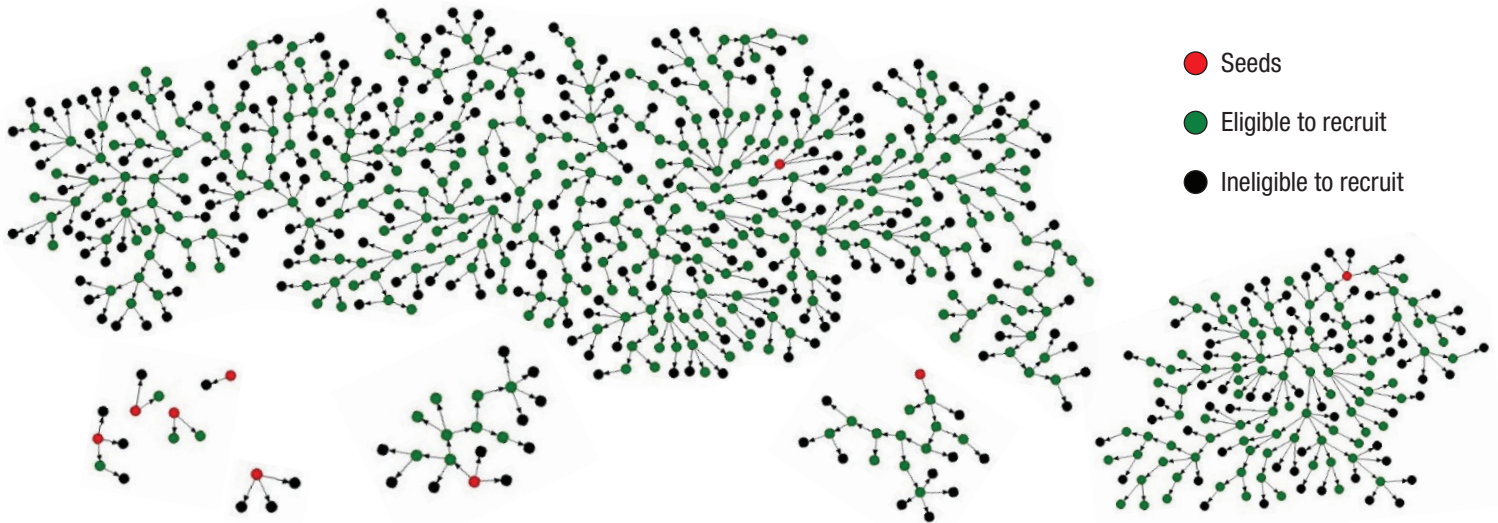


Table 1: Chime In demographics unadjusted numbers: high-risk heterosexuals, 2016

Characteristic	N (%)
Age (mean)	35.74
18–29	204 (40.24)
30–39	105 (20.71)
40–49	97 (19.13)
50–59	101 (19.92)
Sex	
Male	237 (46.75)
Female	270 (53.25)
Race/ethnicity	
NH White	113 (22.29)
NH Black	265 (52.27)
Hispanic, any race	50 (9.86)
NH Mixed	65 (12.82)
NH Other	14 (02.76)

Characteristic	N (%)
Employment	
Employed full-time	79 (15.58)
Employed part-time	106 (20.91)
Unemployed	151 (29.78)
Unable to work for health reasons	89 (17.55)
Other	82 (16.17)
Homelessness	
Not homeless*	313 (61.86)
Not currently homeless**	94 (18.58)
Currently homeless	99 (19.57)

NH=Not Hispanic

* Did not report being homeless in the last 12 months

**Reported being homeless in the last 12 months but not homeless at the time of the interview

Did respondent-driven sampling work for Chime In?

The demographic constitution of the Chime In sample was unexpected based on existing data about Portland residents of low SES. This includes data from the United States Census Bureau and from the Oregon Behavioral Risk Factor Surveillance Survey (BRFSS). Specifically, the 2016 Chime In sample included substantially more Black/ African-American participants and fewer White participants than expected. Table 2 shows how the Chime In sample differed from other estimates of racial and ethnic population sizes for the Portland area.

Table 2: Race and ethnicity of low SES Portland metro: A comparison of findings

	United States Census Bureau 2015*	Behavioral Risk Factor Surveillance Survey 2015**	Chime In 2016***
Race	%	%	% (95% confidence interval)
White	77.2	80.1	28.6 (21.1, 36.2)
Black	6.2	3.3	53.0 (45.2, 61.3)
American Indian/Alaskan Native	1.4	2.7	3.8 (0.7, 8.6)
Asian	5.5	4.9	0.5 (0.0, 1.3)
Other race	4.3	4.7	3.2 (1.5, 5.7)
Multiple	5.3	4.3	10.9 (7.1, 14.6)
Ethnicity	%	%	% (95% confidence interval)
Hispanic/Latino	18.9	23.4	10.2 (6.5, 14.6)

* Total population includes residents of the seven counties who are between 18-59 and live at or below the poverty level

** Total population includes residents of five out of the seven counties (those in Oregon) between 18 and 59 and no more education than a high school diploma/GED

*** Chime In prevalence estimates obtained by applying the respondent-driven sampling analysis tool on qualifying observations

Why is the racial and ethnic constitution of the Chime In sample so different than predicted by United States Census Bureau and Behavioral Risk Factor Surveillance Survey?

We don't fully understand why Chime In recruited more Black/African-American people than expected. Several factors likely contributed:

Field site location: Chime In located its interview site in an office complex in an area of East Portland. This area is one that United States Census Bureau tells us has higher percentages of Black/African-American residents than the average Portland/Vancouver MSA (Figure 2 and 3). Thus, likely making the site somewhat more accessible and convenient to Black/African-Americans than for White Portland residents. Furthermore, census data, being several years old, might not accurately reflect the demographics of East Portland. During the 2016 formative phase of Chime In, prior to fielding the survey, several key informants told us of displacement of Black/African-Americans from Northeast Portland to East Portland. The informants attributed this migration to rapid gentrification and rising housing costs in Northeast Portland. This suggests that census data might not be keeping pace with the rate of population redistribution by race in the Portland/Vancouver MSA.

Differential recruitment success: Careful analysis of recruitment chains indicate that Black/African-American participants recruited more quickly and more successfully than White participants did. We do not know why.

Dead end recruitment chains: White participants were more likely than Black/African-American participants to report being homeless. Fifty dollars cash compensation is probably more likely to motivate homeless people than people with stable housing. Therefore, Chime In

staff became concerned about recruiting too many homeless participants and in consultation with CDC, changed the participation criteria to permit homeless people to participate, but not to recruit others. This led to premature ends of recruitment chains. In addition, White participants were more likely to recruit people who had recently used injection drugs. Injection drug users were not eligible to recruit others. For both of these reasons, recruitment chains were more likely to sustain themselves with Black/African-American participants.

What does this mean for interpreting the Chime In sample?

The race and ethnicity of the Chime In sample for 2016 likely includes proportionally more Blacks/African-Americans participants than would be expected among all low socioeconomic status people in the Portland/Vancouver MSA. The Chime In sample might also differ from the target population in other important ways not as easily recognized as race. We will continue to investigate representation biases in our data that may affect validity of other population inferences. Chime In staff and users of the Chime In data will need to be cautious about making inferences for all low SES heterosexuals in the Portland/Vancouver MSA. Chime In staff will take care to adjust forthcoming analyses for race and ethnicity or to stratify by race and ethnicity. We recommend that other users be mindful of this issue.

More information

During our interviews, many more topics were covered. Please go to <https://www.cdc.gov/hiv/pdf/statistics/systems/nhbs/cdc-nhbs-crq-idu4-deployed.pdf> for a complete list of questions. If you are interested in learning more about Chime In data, please contact Breanna McArdle, data manager for Chime In, at breanna.mcardle@state.or.us.

Figure 2: Black/African-American populations by census tract, Portland MSA

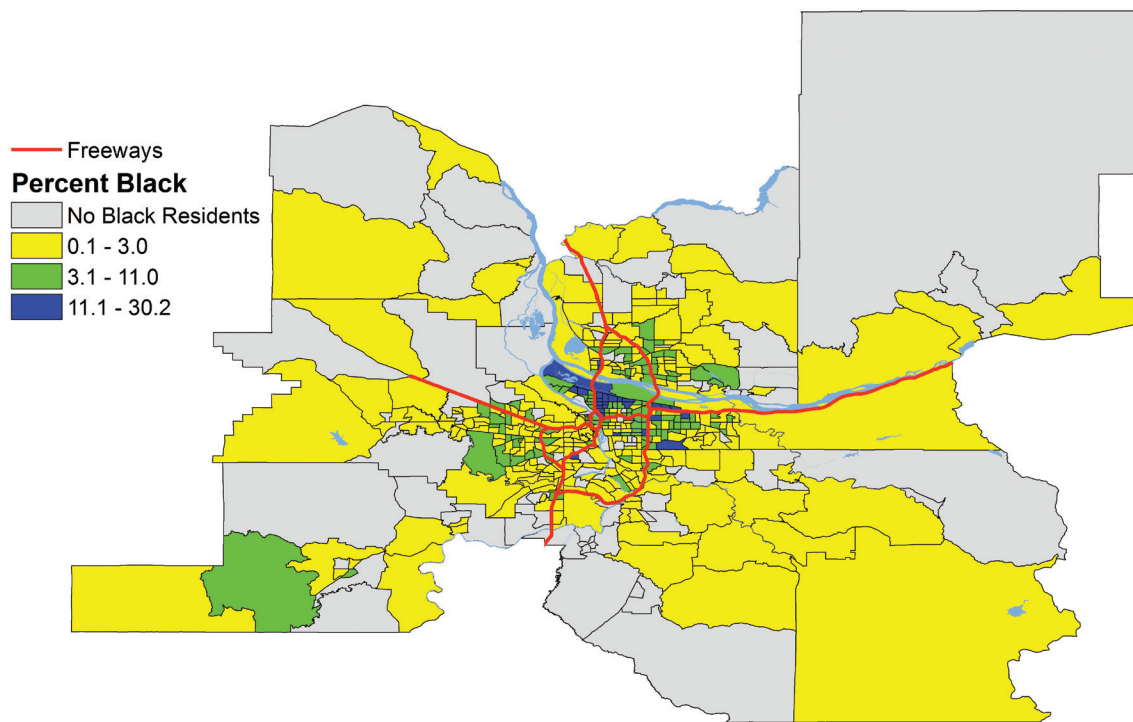
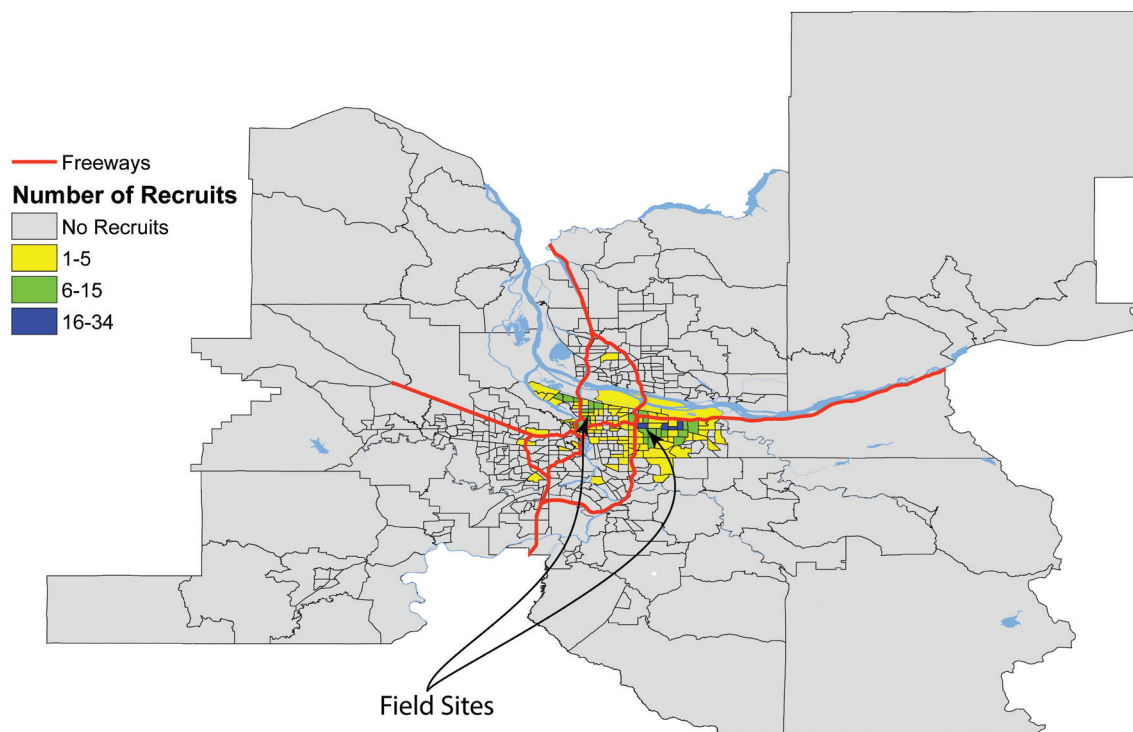


Figure 3: Total recruits by census tract, NHBS 2016





PUBLIC HEALTH DIVISION
HIV/STD/TB
971-673-0326

You can get this document in other languages, large print, braille or a format you prefer. Contact HIV/STD/TB at 971-673-0326 or email breanna.mcardle@state.or.us. We accept all relay calls or you can dial 711.

HIV Testing Among Low Socioeconomic Status Heterosexuals in the Portland Metropolitan Area

Results from Chime In (National HIV Behavioral Surveillance) 2016



Chime In

In 2016, the Portland metropolitan area participated in its first year of National HIV Behavioral Surveillance (NHBS). This system is locally known as Chime In. We surveyed and offered HIV tests to Portland metropolitan area residents using respondent-driven sampling (RDS). We described our experience using RDS elsewhere (www.chimeinsurvey.org).

How did we obtain these estimates?

To adjust for RDS biases, we created Poisson models with robust standard variances using generalized estimating equations (GEE) by clustering on recruiter and adjusting for network size in the model.

Who participated in 2016?

Our sample consisted of low socioeconomic status (SES) heterosexuals defined by the following:

- Residence within the Portland metropolitan area*
- Age 18 to 60 years
- Vaginal or anal sex with an opposite gender partner during previous 12 months
- Self-identified as male or female (not transgender)
- No injection drug use within the past 12 months
- Income at or below the federal poverty line or no more than a high school education

Why do we care about HIV testing?

- Increased HIV testing is one of the three primary goals for Oregon's End HIV* initiative
- U.S. Preventive Services Task Force (USPSTF) recommends that all adults aged 15–65 get screened at least once.

*<https://www.endhivoregon.org/>

Figure 1. Percentage ever tested for HIV by age, gender—low SES heterosexuals, Portland metropolitan area, 2016

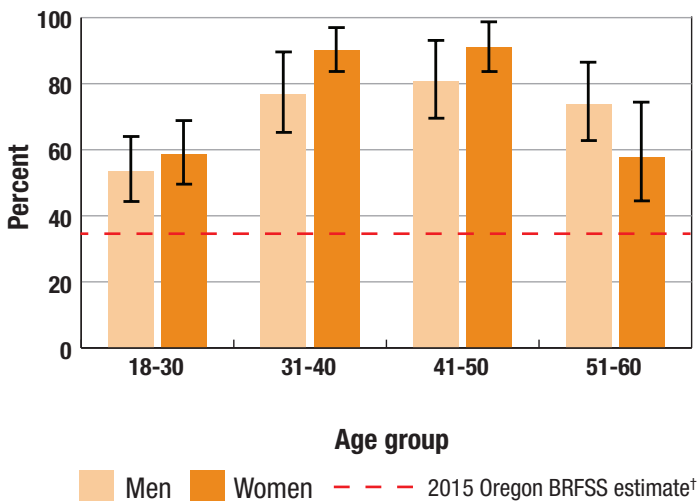
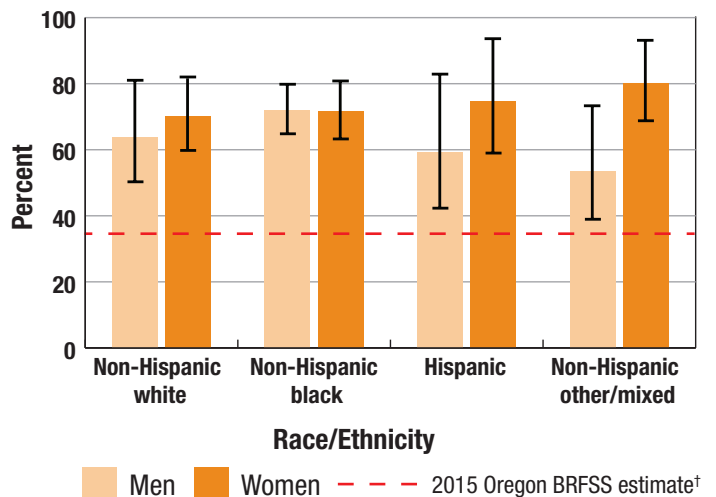


Figure 2. Percentage ever tested for HIV by race/ethnicity, gender—low SES heterosexuals, Portland metropolitan area, 2016



*For this project, the Portland metropolitan area includes Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon and Clark and Skamania counties in Washington

[†]Behavioral Risk Factor Surveillance System (BRFSS). Estimate applies to ages 18 years and older.

Table 1. Testing among low socioeconomic status heterosexuals within the previous 12 months

	Men* % (95% CI)	Women* % (95% CI)
Overall*	26.3 (21.2, 32.6)	27.2 (22.3, 33.2)
Race*		
Non-Hispanic white	25.8 (15.5, 43.1)	23.4 (15.6, 34.9)
Non-Hispanic black	31.4 (24.5, 40.2)	28.5 (21.3, 38.1)
Hispanic	19.7 (9.1, 42.4)	28.8 (15.7, 52.9)
Non-Hispanic other	10.1 (3.6, 28.3)	27.7 (17.7, 43.1)
Casual sex†		
No	22.9 (14.5, 36.4)	23.8 (16.5, 34.2)
Yes	18.2 (12.7, 25.9)	29.4 (22.7, 38.1)
Multiple sex partners†		
No	22.9 (13.5, 38.8)	23.0 (15.9, 33.2)
Yes	18.8 (13.5, 26.3)	29.9 (23.2, 38.6)
Unprotected anal sex†		
No	20.0 (13.7, 29.0)	27.2 (17.5, 42.2)
Yes	20.3 (11.5, 35.8)	26.9 (21.1, 34.5)
Unprotected vaginal sex†		
No	14.1 (8.0, 25.0)	25.20 (15.0, 39.7)
Yes	22.3 (15.4, 32.4)	27.5 (21.2, 35.7)
STD test (not including HIV)†		
No	16.2 (11.4, 23.2)	11.5 (6.9, 19.1)
Yes	48.5 (38.1, 61.6)	43.0 (34.8, 53.0)
Provider offered HIV Test†‡		
No	9.8 (5.9, 16.4)	7.1 (4.1, 12.3)
Yes	60.5 (44.2, 82.8)	75.4 (63.1, 90.0)

*Model adjusted for age

†Reported in the last 12 months; model adjusted for age and race/ethnicity

‡ asked only to those who had seen a healthcare provider within the last 12 months

What did we find?

- Women aged 31–50 years are most likely to have had an HIV test at least once in their life.
- Rates for lifetime HIV testing do not meaningfully differ among races/ethnicities.
- Reporting risky sexual behavior within the last 12 months is not associated with increased likelihood of HIV testing.
- Women and men are both more likely to have had an HIV test within the last 12 months if they also had an STD test within the last 12 months.
- People who are offered an HIV test by their provider are significantly more likely to have an HIV test within the last 12 months.

What does this mean?

Universal HIV testing is one of three principal goals of Oregon’s End HIV initiative. Before Chime In, data from the Behavioral Risk Factor Surveillance System (BRFSS) provided the only available source that we are aware of for HIV testing rates in Oregon. Statewide, BRFSS responses suggest that <40% of Oregon adults have ever been tested for HIV. Chime In provides an opportunity to assess HIV testing rates in the Portland metropolitan area, specifically among low SES heterosexuals.

Overall, low SES heterosexuals in the Portland metropolitan area are more likely to have had an HIV test than BRFSS estimates suggest. However, there is an opportunity to increase testing rates among men and women under 30 and over 50 years old. Additionally, people with multiple sex partners, especially those who engage in condomless vaginal or anal intercourse, should be tested regularly for HIV and other sexually transmitted infections (STI), not just once. However, in this population, these behaviors were not associated with increased likelihood of past-year testing. This suggests a need for health care providers to more thoroughly collect this information and increase frequency of HIV and STI testing.

Questions?

Contact Chime In’s Data Manager at breanna.mcardle@state.or.us

STDs and Low Socioeconomic Status Heterosexuals in the Portland Metropolitan Area

Results from Chime In (National HIV Behavioral Surveillance) 2016



Chime In

In 2016, the Portland metropolitan area participated in its first year of National HIV Behavioral Surveillance (NHBS). This system is locally known as Chime In. We surveyed and offered HIV tests to Portland metropolitan area residents using respondent-driven sampling (RDS). We described our experience using RDS elsewhere (www.chimeinsurvey.org).

How did we obtain these estimates?

To adjust for RDS biases, we created Poisson models with robust standard variances using generalized estimating equations (GEE) by clustering on recruiter and adjusting for network size in the model.

Who participated in 2016?

Our sample consisted of low socioeconomic status (SES) heterosexuals defined by the following:

- Residence within the Portland metropolitan area*
- Age 18 to 60 years
- Vaginal or anal sex with an opposite gender partner during previous 12 months
- Self-identified as male or female (not transgender)
- No injection drug use within the past 12 months
- Income at or below the federal poverty line or no more than a high school education

Who should be screened for STDs?

The Centers for Disease Control and Prevention recommends chlamydia and gonorrhea screening for the following:

- Annually for any sexually active women aged ≤ 24 , regardless of risk factors
- At least annually for any sexually active women aged ≥ 25 if at increased risk, including having a new sex partner, >1 sex partner, or a sex partner with concurrent partners.
- Young men in high prevalence clinic settings specifically for chlamydia

Table 1. STD testing* during the previous 12 months by gender, low socioeconomic heterosexuals in the Portland metropolitan area, 2016

	Men % (95% CI)	Women % (95% CI)
Overall†	28.2 (22.8, 34.8)	51.2 (45.5, 57.7)
Race/Ethnicity†		
Non-Hispanic white	20.7 (11.6, 36.8)	45.0 (35.0, 57.8)
Non-Hispanic black	36.9 (29.2, 46.6)	52.2 (44.5, 61.2)
Hispanic	13.2 (4.8, 36.4)	47.4 (32.7, 68.7)
Non-Hispanic other/mixed	15.5 (7.4, 32.2)	53.5 (42.3, 67.7)
Casual sex partner‡		
No	15.3 (9.9, 23.7)	45.6 (37.3, 55.8)
Yes	22.7 (15.4, 33.5)	52.5 (44.3, 62.2)
Multiple sex partners‡		
No	14.3 (8.4, 24.5)	41.9 (33.8, 52.0)
Yes	22.0 (15.3, 31.6)	55.0 (46.6, 64.9)
Unprotected anal sex‡		
No	20.4 (14.0, 29.9)	46.6 (39.5, 54.9)
Yes	17.8 (9.3, 34.0)	60.3 (48.7, 74.8)
Unprotected vaginal sex‡		
No	17.0 (10.0, 29.1)	43.2 (31.8, 58.6)
Yes	21.0 (14.4, 30.4)	51.2 (43.7, 60.0)

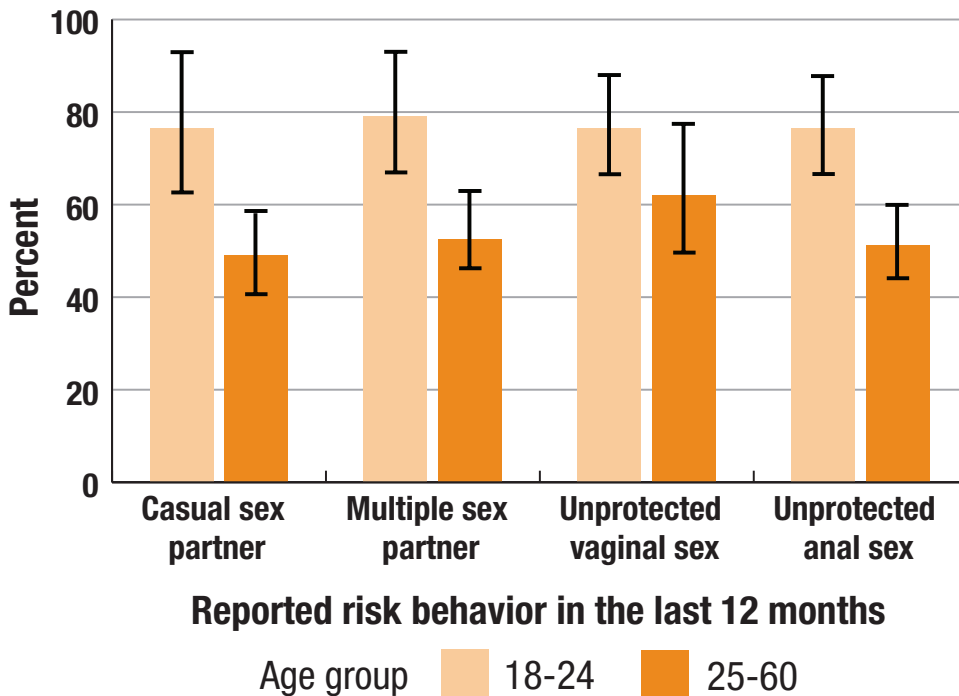
*STD test includes chlamydia, gonorrhea or syphilis, but not HIV

†Model adjusted for age

‡Reported in the last 12 months; Model adjusted for age and race/ethnicity

*For this project, the Portland metropolitan area includes includes Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon and Clark and Skamania counties in Washington

Figure 1. Reported STD test previous year by sexual behavior, age group—low SES heterosexual women, Portland metropolitan area, 2016



Why are testing rates for women almost double those for men?

Women, especially those of child bearing age, are susceptible to long-term consequences of STDs such as gonorrhea and chlamydia. Undiagnosed gonorrhea or chlamydia can lead to pelvic inflammatory disease, infertility and chronic pelvic pain. Because of these serious reproductive outcomes, various guidelines recommend screening in young women and not men.

Table 2: Reported STDs by Gender—Low SES Heterosexuals and the General Population in the Portland metropolitan area 2016

	Chime In men % (95% CI)	Reported cases in men [†] %	Chime In women % (95% CI)	Reported cases in women [†] %
Chlamydia, in the last 12 months*	3.2 (1.6, 6.3)	0.40	5.0 (2.9, 8.5)	0.64
Gonorrhea, in the last 12 months*	2.9 (1.4, 6.1)	0.24	4.1 (2.3, 7.2)	0.10
Syphilis, in the last 12 months*	0.3 (0.8, 1.3)	0.01	0.3 (0.0, 3.6)	0.01
Genital herpes, ever in life*	1.1 (0.4, 3.4)	N/A	5.3 (3.1, 9.0)	N/A
Genital warts, ever in life*	2.0 (0.8, 4.8)	N/A	4.3 (2.5, 7.4)	N/A

*Model adjusted for age

†Represents proportion of women/men in the 5 Oregon counties of the Portland metropolitan between 18 and 60 years old who had a reported case of the disease

What does this mean?

Chime In data let us assess whether or not increases in risky sexual behavior correspond with increases in STD testing. Chime In data show very little significant association between risky behavior and STD testing among low SES heterosexuals in the Portland metropolitan area. Limited access to care, lack of education about STDs, or poor assessment of STD risk either by patients themselves or their providers might contribute to this.

While chlamydia, gonorrhea, and syphilis are all reportable infections, socioeconomic information is rarely collected from people with reported infections. Chime In provides a unique opportunity to assess burden of STDs on low SES heterosexuals in the Portland metropolitan area. Compared to the overall population of the metropolitan area, low SES heterosexual Chime In participants report a higher rate of STDs than the rates in the general population (Table 2). This population would benefit from increased use of evidence-based strategies to reduce disease incidence such as expedited partner therapy, increased access to frequent screening, and wider availability of free condoms.

Questions?

Contact Chime In's Data Manager at breanna.mcardle@state.or.us

Drug Use Among Low Socioeconomic Status Heterosexuals in the Portland Metropolitan Area

Results from Chime In (National HIV Behavioral Surveillance) 2016



Chime In

In 2016, the Portland metropolitan area participated in its first year of National HIV Behavioral Surveillance (NHBS). This system is locally known as Chime In. We surveyed and offered HIV tests to Portland metropolitan area residents using respondent-driven sampling (RDS). We described our experience using RDS elsewhere (www.chimeinsurvey.org).

How did we obtain these estimates?

To adjust for RDS biases, we created Poisson models with robust standard variances using generalized estimating equations (GEE) by clustering on recruiter and adjusting for network size in the model.

Who participated in 2016?

Our sample consisted of low socioeconomic status (SES) heterosexuals defined by the following:

- Residence within the Portland metropolitan area*
- Age 18 to 60 years
- Vaginal or anal sex with an opposite gender partner during previous 12 months
- Self-identified as male or female (not transgender)
- No injection drug use within the past 12 months
- Income at or below the federal poverty line or no more than a high school education

Why do we care about drug use (Figure 1)?

Illicit drug use and drug use outside of a prescription is associated with:

- Spread of infectious disease
- Homelessness
- Addiction
- Overdose

Figure 1. Non-injection non-marijuana drug use population estimates for low SES heterosexuals in the Portland metropolitan area, 2016

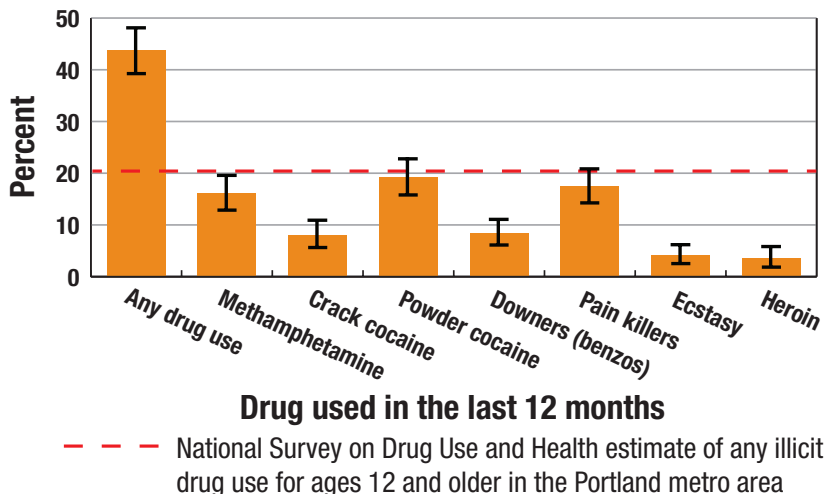


Table 1: Alcohol use in the previous 30 days, low socioeconomic heterosexuals in Portland metropolitan area, 2016

	Men* % (95% CI)	Women* % (95% CI)
Any alcohol drinks	74.4 (68.5, 80.8)	74.0 (68.9, 79.5)
Binge drinking ≥ 1 time	34.2 (28.6, 40.8)	28.9 (23.7, 35.1)
Binge drinking ≥ 1 times	14.0 (10.0, 19.5)	8.4 (5.6, 12.7)

*Model adjusted for age; We classify binge drinking as 4 drinks within 2 hours for women and 5 drinks within 2 hours for males.

Why do we care about binge drinking (Table 1)?

Binge drinking is associated with:

- Unintentional injuries
- Violence
- Alcohol dependence

*For this project, the Portland metropolitan area includes Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon and Clark and Skamania counties in Washington

Highlights on marijuana use

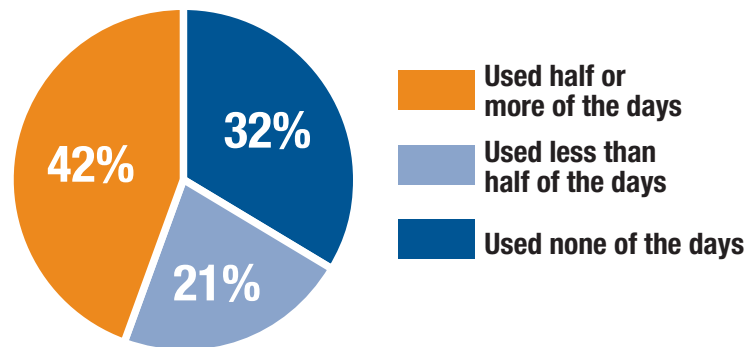
Marijuana is the most commonly reported drug used among low SES heterosexuals in the Portland metropolitan area. Approximately two-thirds of the population reported using marijuana in the last 30 days; 96% (95% CI: 95%-98%) of the population have tried marijuana at least once, with the average age at first use being 14 years. In 2015 Oregon voters legalized Marijuana for recreational use. Since marijuana was legalized, 12% (95% CI: 9%, 15%) of low SES heterosexuals in the Portland metropolitan area use, or intend to use marijuana more. It is common to use marijuana with another substance. For example, over a third of low SES heterosexuals in Portland metropolitan area used marijuana and alcohol at the same time in the last 30 days.

Why do we care about marijuana use (Figure 2)?

Marijuana use is associated with:

- Impaired brain development in teenagers
- Mental health issues, including anxiety and depression
- Lung issues when smoked

Figure 2. Marijuana usage over the previous 30 days among low SES heterosexuals in the Portland metropolitan area, 2016



*Does not add up to 100% due to model calculations

What does this mean?

Public health professionals have limited access to data on substance use in the Portland metropolitan area, with National Survey on Drug Use and Health (NSDUH) being the major source of information on this topic. Chime In provides local public health professionals with a new source of information about substance use habits among low SES heterosexuals. From these data, we learned this population has high frequency of illicit and outside of prescription drug use, binge drinking, and marijuana use.

Chime In results suggest that low SES heterosexuals may benefit from targeted efforts to reduce binge drinking, marijuana use, and illicit or outside-of-prescription drug use. Increasing access and decreasing cost of drug and alcohol treatment programs for this population could have a substantial impact. We found that one out of sixteen low SES heterosexuals in the Portland metropolitan area reported trying to get into a program to treat drug use in the last 12 months but were unable to. There should be a specific focus on people 26–35 years because they are significantly more likely to have used drugs in the last 12 months compared to those age 18–25 and 36–60 years old (data not shown). Marijuana use before the age of 18 years was common in this population. Schools should consider implementing evidence-based programs to address marijuana use.

Questions?

Contact Chime In's Data Manager at breanna.mcardle@state.or.us