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Evaluation of Self-Directed Specimen Collection for Chlamydia and Gonorrhea Testing among People Who Use Drugs

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Abstract

Background: People who use drugs (PWUD) often have elevated sexually transmitted infection (STI) risk and unmet healthcare needs. Self-directed STI specimen collection (i.e., individuals collect the specimen and mail to the laboratory) may be valuable in addressing STI testing barriers among PWUD.

Methods: Within a cohort study among PWUD in New York City, we conducted a cross-sectional substudy from November 2021-August 2022 assessing sexual health with a one-time online survey (n=120); participants could opt-in to receive a self-collection kit. Participants who opted-in were mailed a kit containing collection materials (males: urine cup, females: vaginal swab), pre-paid return label, instructions, and educational information. Specimens were sent to the laboratory and tested for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (GC). We measured the number of kits requested, delivered, mailed to the lab, and CT/GC positive; and examined differences in requesting a kit by sociodemographic and behavioral characteristics.

Results: Sixty-three total kits were requested by 44 unique participants. Of the 63 requested, 41 were delivered; one kit was undeliverable at the provided address and the rest were not sent due to no address provided or being duplicate requests. Of the 41 kits delivered, 3 participants returned the kit to the lab; of those, one was positive for CT and GC. The greatest differences in those who did and did not request a kit were observed by age, sexual orientation, past-year sex trade and casual partnerships, and experiences of relationship violence.

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DECLARATIONS OF CONFLICTING INTERESTS
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Conclusions: Self-directed specimen collection may be desirable for PWUD, but research is needed to understand barriers to this testing approach for this population.

INTRODUCTION

Sexually transmitted infections (STIs) are caused by pathogens such as bacteria, parasites, and viruses, and can cause substantial morbidity and mortality. People who use drugs, including illicit opioids (e.g., heroin, prescription misuse), have higher STI risk and related adverse health outcomes (1–4). Rates of drug use reported among people diagnosed with STIs are rising, especially among women (5). Drug use is associated with sexual risk behaviors and people who use drugs often have unmet healthcare needs including STI screening (3, 4, 6). However, research on STIs among people who use drugs has focused on HIV and HCV, given these are also transmissible via injection drug use, or has been limited to specific groups (e.g., people who inject and/or are pregnant). There is a need to understand non-viral STI (henceforth “STI”) prevention to improve sexual and reproductive health in the broader population of people who use drugs.

STI testing and screening is a key component of preventing further complications (7). One promising approach to increase STI screening is use of self-collected specimens, in which an individual obtains the specimen themselves. Specimen collection may be clinic-based, in which one collects the specimen in a clinic/research setting then gives it to staff for testing, or may be self-directed, in which one collects the specimen at an out-of-clinic setting then sends it to the laboratory directly (8). Self-collected STI specimens are generally as sensitive as those collected by clinicians (9), and this method increases STI screening (10).

Self-collected STI specimens are recommended to expand population-level screening (11, 12), including among groups at high risk. Considering elevated rates of STIs and potential barriers to accessing healthcare, people who use drugs need innovative approaches for accessible STI testing. The scant extant evidence on self-collected STI specimens among people who use drugs shows that clinic-based self-collection is feasible, more acceptable than clinician collection, and increases uptake (13, 14). However, no known studies have assessed self-directed STI specimen collection among people who use drugs, although it may be especially valuable given limited access to necessary healthcare (15, 16).

In this preliminary and exploratory analysis, we sought to begin to fill the current gap in the literature on use of self-directed STI specimen collection among people who use drugs by describing STI risk and testing behaviors, uptake of opt-in self-directed specimen collection for Chlamydia and Gonorrhea testing, and potential differences in characteristics of participants who did and did not request a kit among a sample of people who use illicit opioids.

METHODS

Study Design and Sample.

We conducted a cross-sectional study on sexual and reproductive health needs and service utilization as a substudy within a parent longitudinal cohort study among people who use

illicit opioids in New York City (NYC). The parent study has been described in detail elsewhere (17). Briefly, from April 2019-March 2020, respondent-driven sampling was used to enroll 575 adults who used illicit opioids. At baseline, participants were administered a survey and trained in overdose prevention and naloxone administration. Participants received \$60 for the baseline assessment and \$20 for referral of up to three eligible participants. Participants were then followed for 24 months and completed monthly surveys measuring overdose risk.

We recruited participants from the parent longitudinal study to participate in this cross-sectional substudy. Specifically, parent study participants were sent an email and/or text message inviting them to complete a one-time online survey on sexual and reproductive health from November 2021-August 2022; 120 participants enrolled. Participants could opt-in to receive an STI self-collection kit; if so, participants provided their name/nickname and an address at which they could receive mail. The kit contained collection materials (urine cups for males, vaginal swabs for females), pre-paid return label, instructions, and educational information on *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (GC) (18). Specimen containers were labeled with participants' study identification (ID) number, shipped to the HIV/STD Laboratory Core of the Center for AIDS research at University of North Carolina-Chapel Hill, and tested for CT and GC using nucleic acid amplification tests (Aptima Combo 2, Hologic, Inc). The written informed consent indicated participants would be notified by phone only if positive, and positive results would also be reported to the health department. Parent study baseline data were linked to data collected in the substudy via the common study ID number. All activities were approved by the Institutional Review Board at NYU Grossman School of Medicine.

Measures.

Sociodemographic characteristics were measured at parent study baseline and include self-reported gender categorized as male, female, transgender female, transgender male, or other; age; race and ethnicity (categorized as Hispanic, non-Hispanic Black, non-Hispanic White); current homelessness; employment; self-reported sexual orientation categorized as heterosexual and gay/lesbian/bisexual/other; marital status; health insurance coverage; and having seen a healthcare provider in the past 12 months.

Substance use history indicators, unless otherwise noted, were measured at parent study baseline and include average number of opioid use events in the past 30 days; past 30-day injection drug use; opioid use disorder (OUD) and alcohol use disorder (AUD) severity based on DSM-5 criteria and categorized as mild/moderate (scores <6) versus severe (scores ≥ 6) (19); and past-year syringe service program (SSP) utilization and lifetime opioid treatment program (OTP) attendance (both measured in the substudy).

Sexual and reproductive health history was measured on the substudy survey and regarded the past 12 months unless otherwise noted. Indicators include multiple (≥ 2) sex partners and new partners, and gender identity of partners (e.g., female, male, transgender female, transgender male). Participants were asked if they had a main sexual partner, and if so, whether their main partner definitely/probably had other partners, whether they used drugs within two hours and/or during sex with that partner, and whether that partner definitely/

probably had an STI. Participants reported similar information for sex trade and casual partners. Violence from a sex partner was defined as having been threatened, pushed/shoved, slapped, hit, kicked, or injured.

A question that was asked separately for males and females stated that sometimes people have problems that affect their reproductive organs and directed them to select any symptoms experienced in the past 12 months. Response options for males included abnormal discharge, genital irritation, painful urination, frequent urination, genital sores or ulcers, and genital warts; response options for females additionally included abnormal vaginal odor, pain during sex, lower abdominal pain not due to menstruation, and abnormal bleeding or spotting. We categorized potential STI symptoms as reporting 1 symptom versus none. Participants reported how much they worry about STI. From a list of pregnancy and/or STI prevention methods, participants selected all that they and/or their partners used to prevent STIs; we categorized responses as those providing no/ineffective STI prevention (i.e., nothing used, oral birth control, vasectomy, Depo-Provera/injectable contraception, Nuvaring/vaginal contraceptive ring, contraceptive patch, diaphragm, intrauterine device, pulling out) versus effective (i.e., condoms). Participants reported prior STI diagnoses; sexual and reproductive health service receipt; and whether partners' preference was a barrier to using their preferred STI prevention method. Participants reported whether they would be comfortable receiving sexual and reproductive healthcare from a SSP's mobile clinic.

STI Specimen Collection Shipping and Results.—We used FedEx tracking information for requested collection kits shipped to the participants and for those shipped to the lab.

Analyses.

Of the 120 substudy participants, two did not have a valid study ID number. Analyses of STI specimen collection shipping and results were conducted among the entire substudy sample (n=120), and the rest of the analyses were conducted among those linked to the parent study data (n=118 with valid study ID numbers). Participants who selected “other” (n=2) when reporting gender were further excluded from the analyses stratified among males and females; no participants reported their gender identity as transgender male or female hence all analyses stratified by gender are cisgender participants.

We described sociodemographic characteristics, substance use, and sexual and reproductive health among the sample. We calculated the number of specimen collection kits requested, delivered, returned to the lab, and positive for STI. Finally, we described potential differences in sociodemographic and behavioral characteristics among those who did and did not request a kit. Given gender-specific questionnaire items and that sexual and reproductive health risk varies among males and females who use drugs (4), we present the results among the total sample and stratified by gender.

RESULTS

Among the 118 substudy participants with valid parent study ID numbers, 61 (52%) were male, 54 were female (46%), two responded as “other” (1.7%, which was not further identified in the parent study survey), and one (0.8%) was missing. The mean age at parent study enrollment was 45.3 years, and most were Hispanic/Latinx (Table 1). Approximately one-third reported homelessness, and most were not employed. Reporting one’s sexual orientation as gay, lesbian, bisexual, or other (free-text responses for “other” included pansexual and asexual) was more prevalent among females than males, as was reporting being married/cohabiting. Most health insurance coverage was through Medicaid, with almost all reporting they had seen a healthcare provider in the past year.

Participants used opioids illicitly 86 times per month on average. About two-thirds injected drugs and most met criteria for severe OUD; approximately 12% met criteria for severe AUD. Fewer than half visited a SSP in the past 12 months and three-quarters had been to an OTP.

Approximately one-quarter of participants had multiple and/or new sexual partners in the past 12 months. Over 80% had a main sexual partner. Males reported a higher prevalence of casual sex partners. Half of the sample reported female partners in the past 12 months, which was more common among males than females, and 40% of the sample reported male partners, which was more common among females than males; reporting transgender sexual partners was rare. Almost 8% had experienced violence from a sexual partner, which was more commonly reported by females. One-third of females reported potential STI symptoms compared to 20% of males, while approximately 26% of males worried moderately/a lot about STIs compared to 14% of females. Most participants were using no/ineffective STI prevention methods. Compared to males, a higher percentage of females reported that partner’s preference was a barrier to using their choice STI prevention method and receiving a past-year STI diagnosis. Approximately 3% received STI testing from a SSP and 10% from an OTP. Approximately 12% of males reported experiencing barriers to sexual and reproductive healthcare compared to 2% of females. Over half of participants reported they would be comfortable receiving care from a SSP’s mobile clinic.

STI Self-Collection Requests, Returns, and Results.

Among 120 substudy participants, 63 specimen collection kits were requested (Figure 1) by 44 unique participants. Of the 63 requested kits, 41 kits were successfully delivered; one was undeliverable, seven were not sent because they were duplicative (i.e., same day) requests and 14 were not sent because no address was provided. Of the 41 delivered kits, three participants mailed the specimen to the laboratory; of those three specimens, one was positive for CT and GC, which was reported to the participant and health department within 48 hours.

Differences in Requesting a Self-Collection Kit by Sociodemographic and Behavioral Characteristics.

The mean age of those requesting a kit was 42.8 years compared to 47.5 years who did not (Table 2). Among males, those who reported homelessness requested a kit less frequently compared to those not reporting homelessness (13% versus 40%). Sixty percent of participants who identified as gay, lesbian, bisexual, or other requested a kit compared to 35% of those who identified as heterosexual. Requesting a kit did not appear to differ by marital status, healthcare utilization, and substance use history.

Half of participants who reported multiple partners requested a kit compared to 36% without multiple partners; among females, 64% with multiple partners requested a kit compared to 42% without multiple partners. Similarly, 58% of females with new partners requested a kit compared to 44% without new partners; among males, 22% with new partners requested a kit versus 38% without new partners.

Requesting a kit appeared less frequent among those with a main partner; however, among participants with a main partner, those using drugs before/during sex and who believed that partner had an STI requested a kit more frequently than those who did not report those factors regarding their main partner. Requesting a kit was more frequent among participants with sex trade and casual partners than those without those partners. Approximately 71% of those who used drugs before/during sex with casual partners requested a kit compared to 22% who did not. A higher percentage of females who reported female sexual partners requested a kit compared to those who did not have female partners (67% versus 44%, respectively). Among males, none of those who reported having male sex partners requested a kit. Almost 80% of participants who experienced violence requested a kit compared to 36% who had not experienced violence. Worry about STI and no/ineffective STI prevention appeared similar for those who did and did not request a kit. A higher percentage of those reporting partners' preference was a barrier to using their choice STI prevention methods requested a kit compared to those who did not report partners' preference as a barrier.

CONCLUSIONS

This study describes preliminary findings suggesting that self-directed STI testing may be desirable for people who use drugs, especially those at higher risk. However, we found that there likely are barriers to this STI testing approach that must be explored further to ensure this is a feasible and acceptable method in this population.

Of the 41 requested kits able to be delivered, only three participants sent the specimen to the laboratory. Prior studies in other populations report somewhat low levels of returning requested kits (14, 20). In a study targeting recent users of emergency contraception, approximately 28% of kits were returned (20). "I Want the Kit" (IWTK), a program providing self-directed STI specimen collection throughout the US (21) has reported low but increasing kit return rates (22). We cannot determine whether participants could not collect the specimen and/or the barriers to returning it. Our shipping container was a small non-descript box, like that used for IWTK (21), and included a pre-paid return label. However, a potential barrier in NYC may have been difficulty accessing FedEx shipping

locations to return the kits. We used FedEx because logistics for shipping biospecimens were convenient for study staff, but this may not have been the case for participants if locations were unknown or far away, and because some package stores charge a fee even with pre-paid labels. Participants in prior studies of self-directed specimen collection report the entire process is “very easy” (23), but importantly, those studies were not among people who use drugs, who may have unique barriers. Research is needed to understand the feasibility of this STI testing method for people who use drugs in diverse locations.

Research on self-directed STI specimen collection has focused on higher risk groups (14, 20), and IWTK’s website includes a screener to assess one’s risk before requesting a kit (21). In our sample, there were differences in those who did and did not request a kit by age, sexual orientation, sex trade and casual partnerships, drug use before/during sex, and experiencing violence from partners, and that appeared to also vary by gender. Our findings may support that self-directed STI screening is best targeted towards those who self-identify as high risk, which may vary by gender. For example, there is a robust relationship among relationship violence and STI risk, particularly among females (24), in which sexual risk behavior, partner non-monogamy, and lacking control over one’s sexual health may be mediating pathways (25). Hence, self-directed specimen collection may offer the opportunity to mitigate STI risk for those experiencing relationship violence and related risk factors.

An important consideration is where and how to reach people who use drugs for STI screening. Currently, focus is on integrating sexual and reproductive health services within SSPs or OTPs, which appears feasible and acceptable (26, 27). In our sample, fewer than half visited a SSP in the past year, about half were in OUD treatment, and a small proportion received STI testing in those settings. We do not know if STI services were not available or not accessed; although HIV/HCV testing is frequently offered in SSPs and OTPs, on-site testing for other STIs is relatively rare (28, 29). In addition to integrating drug and sexual health services, innovative approaches are needed to reach the broader population of people who use drugs. The Covid-19 pandemic demonstrated successful expansion of self-directed STI specimen collection in the general population (16) as well as feasibility of provision of telehealth services to people who use drugs (15). Applying lessons learned to extend the reach of existing online STI testing programs while also addressing specific barriers experienced by people who use drugs (e.g., literacy, internet access, housing instability, stigma) could increase STI testing within this population (11, 16).

We were surprised by the low rate of return for requested kits, which motivated this exploratory analysis. However, this was not the primary aim of our substudy and we did not collect data that could have illuminated important issues and barriers. While none of the participants in the substudy reported identifying as transgender and we based the method of specimen collection (i.e., urine cup or vaginal swab) on their response to whether they should be asked questions specific to men or women, it is possible that participants may have received a kit that did not align with their anatomy. Still, our findings may provide some initial insight regarding barriers to self-directed STI testing among people who use drugs. For example, those experiencing homelessness, particularly males, requested a kit less frequently, which may be due to not having an address at which they could receive mail.

Our participants are not a representative sample of people who use drugs, and we cannot generalize these findings. Specifically, our sample's mean age is mid-40s, the majority had received healthcare in the past year, and approximately three-quarters did not report multiple and/or new sexual partners. Therefore, the STI risk and behaviors among our sample may be different from people who use drugs in other locations and/or younger people, which in turn may influence perceptions of need and interest in STI testing. We could not describe differences in sociodemographic and behavioral characteristics for those who did and did not return requested kits and/or tested positive, although prior studies have not found substantial differences in those factors between those who do and do not return requested kits (20). Other limitations include the small sample size and self-reported data on sensitive topics.

In conclusion, we found that self-directed STI specimen collection may be desirable for people who use drugs, especially those at high risk, but barriers may limit its use in this population. Further research is needed to inform approaches for implementing, expanding, and tailoring this STI testing method among people who use drugs.

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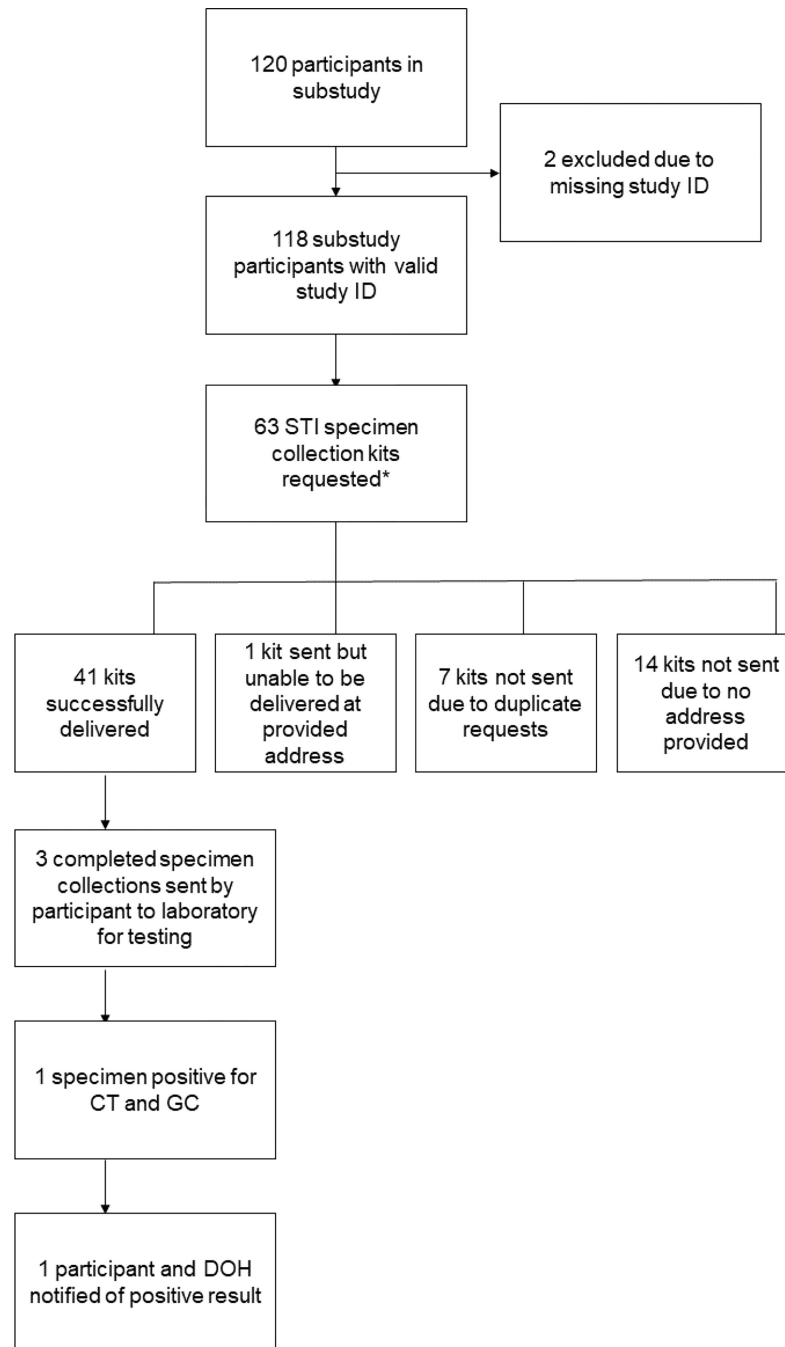


Figure 1. Flow Diagram of STI Self-Collection Specimen Kit Requests, Delivery, and Testing among People who Use Illicit Opioids in New York City (n=120)

Table 1.

Characteristics among People who Use Illicit Opioids in New York City in the Total Sample (n=118) and among Females (n=54) and Males (n=61)**

Characteristics	N (%) Total Sample	N (%) Among Females	N (%) Among Males
Sociodemographic Characteristics			
Age, mean (SD) *	45.3 (11.8)	44.4 (11.9)	46.7 (11.3)
Race/ethnicity *			
Non-Hispanic White	33 (29.0)	16 (29.6)	17 (28.3)
Non-Hispanic Black	30 (26.3)	16 (29.6)	14 (23.3)
Hispanic	50 (43.9)	22 (40.7)	28 (46.7)
Other	1 (0.9)	0 (0.0)	1 (1.7)
Currently Homeless *			
No	81 (70.4)	37 (68.5)	44 (72.1)
Yes	34 (29.6)	17 (31.5)	17 (27.9)
Employment Status *			
Not Employed	90 (79.0)	44 (81.5)	46 (76.7)
Employed	24 (21.0)	10 (18.5)	14 (23.3)
Sexual Orientation *			
Heterosexual	100 (87.7)	42 (77.8)	58 (96.7)
Gay/Lesbian/Bisexual/Other	14 (12.3)	12 (22.2)	2 (3.3)
Marital Status *			
Not Married	80 (69.6)	34 (63.0)	46 (75.4)
Married/Cohabiting as Married	35 (30.4)	20 (37.0)	15 (24.6)
Health Insurance Coverage *			
None	3 (2.6)	1 (1.8)	2 (3.3)
Private Insurance	3 (2.6)	2 (3.7)	1 (1.7)
Medicaid	97 (85.1)	46 (85.2)	51 (85.0)
Medicare	11 (9.6)	5 (9.3)	6 (10.0)
Saw a Healthcare Provider in Past 12 Months *			
No	8 (7.0)	3 (5.6)	5 (8.2)
Yes	106 (92.2)	51 (94.4)	55 (90.2)
Substance Use History			
Average number of opioid use events per day in past 30 days, mean (SD) *	86.0 (69.7)	83.5 (80.0)	89.4 (60.4)
Injected drugs in past 30 days *			
No	37 (32.2)	16 (29.6)	21 (34.4)
Yes	78 (67.8)	38 (70.4)	40 (65.6)
Opioid Use Disorder *			
Mild/Moderate	13 (12.9)	9 (18.8)	4 (7.6)
Severe	88 (87.1)	39 (81.2)	49 (92.4)
Alcohol Use Disorder *			
Mild/Moderate	99 (88.4)	47 (90.4)	52 (86.7)
Severe	13 (11.6)	5 (9.6)	8 (13.3)
Visited a Syringe Service Program in Past 12 Months			
No	65 (59.1)	30 (57.7)	35 (60.3)
Yes	45 (40.9)	22 (42.3)	23 (39.7)
Ever been to an Opioid Treatment Program			
No	27 (24.8)	12 (23.5)	15 (25.9)
Yes	82 (75.2)	39 (76.5)	43 (74.1)
Sexual and Reproductive Health History			

Characteristics	N (%) Total Sample	N (%) Among Females	N (%) Among Males
2 Sexual Partners in Past 12 Months			
No	84 (73.7)	40 (75.5)	44 (72.1)
Yes	30 (26.3)	13 (24.5)	17 (27.9)
New Sexual Partner(s) in Past 12 Months			
No	81 (71.7)	40 (75.5)	41 (68.3)
Yes	32 (28.3)	13 (24.5)	19 (31.7)
Had a Main Sexual Partner in Past 12 Months			
No	19 (16.7)	6 (11.1)	13 (21.7)
Yes	95 (83.3)	48 (88.9)	47 (78.3)
Had Casual Sexual Partner(s) in Past 12 Months			
No	88 (77.9)	46 (85.2)	42 (71.2)
Yes	25 (22.1)	8 (14.8)	17 (28.8)
Had Sex Trade Partner(s) in Past 12 Months			
No	97 (86.6)	48 (88.9)	49 (84.5)
Yes	15 (13.4)	6 (11.1)	9 (15.5)
Female Sex Partners in the Past 12 Months			
No	56 (50.0)	46 (86.7)	10 (17.0)
Yes	56 (50.0)	7 (13.2)	49 (83.0)
Male Sex Partners in the Past 12 Months			
No	68 (61.3)	13 (25.0)	55 (93.2)
Yes	43 (38.7)	39 (75.0)	4 (6.8)
Transgender Female Sex Partners in the Past 12 Months			
No	111 (99.1)	53 (100.0)	58 (98.3)
Yes	1 (0.9)	0 (0.0)	1 (1.7)
Transgender Male Sex Partners in the Past 12 Months			
No	108 (96.4)	50 (94.3)	58 (98.3)
Yes	4 (3.6)	3 (5.7)	1 (1.7)
Experienced Violence from a Sex Partner in the Past 12 Months			
No	106 (92.2)	48 (88.9)	58 (95.1)
Yes	9 (7.8)	6 (11.1)	3 (4.9)
Potential STI Symptoms in the Past 12 Months			
No	85 (73.9)	36 (66.7)	49 (80.3)
Yes	30 (26.1)	18 (33.3)	12 (19.7)
Level of Worry about STI			
Little/Not at all	87 (79.8)	44 (86.3)	43 (74.1)
Moderately/A Lot	22 (20.2)	7 (13.7)	15 (25.9)
Using No/Ineffective STI Prevention Method in Past 12 Months			
No	31 (28.7)	12 (24.0)	19 (32.8)
Yes	77 (71.3)	38 (76.0)	39 (67.2)
Partners' Preference is a Barrier to Using STI Prevention Method of Choice			
No	103 (95.4)	47 (92.2)	56 (98.2)
Yes	5 (4.6)	4 (7.8)	1 (1.8)
Diagnosed with STI in Past 12 Months			
No	105 (96.3)	48 (94.1)	57 (98.3)
Yes	4 (3.7)	3 (5.9)	1 (1.7)
Received an STI Test from a Syringe Service Program in Past 12 Months			
No	112 (96.7)	53 (98.2)	59 (96.7)
Yes	3 (2.6)	1 (1.8)	2 (3.3)
Received an STI Test from an Opioid Treatment Program in Past 12 Months			
No	104 (90.4)	49 (90.7)	55 (90.2)
Yes	11 (9.6)	5 (9.3)	6 (9.8)
Ever Experienced Barriers to Receiving Sexual and Reproductive Health Care			
No	102 (92.7)	51 (98.1)	51 (87.9)
Yes	8 (7.3)	1 (1.9)	7 (12.1)

Characteristics	N (%) Total Sample	N (%) Among Females	N (%) Among Males
No			
Yes			
Would be Comfortable Receiving Sexual and Reproductive Health Care from a Syringe Service Program's Mobile Clinic			
No	44 (40.0)	18 (34.6)	26 (44.8)
Yes	66 (60.0)	34 (65.4)	32 (55.2)

* Asked at parent study baseline

** Values may not add to n=118/100% due to missing values

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Table 2.

Differences in STI Self-Collection Specimen Kit Requests by Sociodemographic and Behavioral Characteristics among People who Use Illicit Opioids in New York City in the Total Sample (n=118) and among Females (n=54) and Males (n=61) *

	Total Sample		Females		Males	
	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test
	44 (37.3)	69 (58.5%)	24 (46.2)	28 (53.8)	19 (33.8)	39 (67.2)
Sociodemographic Characteristics						
Age, mean (SD) **	42.8 (1.8)	47.5 (1.3)	41.4 (2.3)	48.4 (2.0)	45.4 (2.9)	47.4 (1.8)
Race/Ethnicity **						
White	14 (41.2)	20 (58.8)	9 (60.0)	6 (40.0)	4 (23.5)	13 (76.5)
Black	12 (41.4)	17 (58.6)	6 (27.5)	10 (62.5)	6 (46.2)	7 (53.8)
Hispanic	17 (36.2)	30 (63.8)	9 (42.9)	12 (57.1)	8 (30.8)	18 (69.2)
Other	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)
Currently Homeless **						
No	32 (40.5)	47 (59.5)	15 (41.7)	21 (58.3)	17 (39.5)	26 (60.5)
Yes	12 (36.4)	21 (63.6)	9 (56.2)	7 (43.8)	2 (13.3)	13 (86.7)
Sexual Orientation **						
Heterosexual	34 (35.4)	62 (64.6)	17 (41.5)	24 (58.5)	17 (30.9)	38 (69.1)
Gay/Lesbian/Bisexual/Other	9 (60.0)	6 (40.0)	7 (63.6)	4 (36.4)	1 (50.0)	1 (50.0)
Marital Status **						
Not Married	30 (38.5)	48 (61.5)	15 (46.9)	17 (53.1)	14 (31.8)	30 (68.2)
Married/Cohabiting as Married	14 (41.2)	20 (58.8)	9 (45.0)	11 (55.0)	5 (35.7)	9 (64.3)
Saw a Healthcare Provider in the Past 12 Months **						
No	3 (33.3)	6 (66.7)	2 (66.7)	1 (33.3)	1 (20.0)	4 (80.0)
Yes	41 (40.2)	61 (59.8)	22 (44.9)	27 (55.1)	18 (34.6)	34 (65.4)
Substance Use History						
Opioid Use Disorder **						
Mild/Moderate	6 (46.2)	7 (53.8)	4 (44.4)	5 (55.6)	2 (50.0)	2 (50.0)
Severe	34 (39.1)	53 (60.9)	18 (46.2)	21 (53.8)	15 (32.6)	31 (67.4)
Visited a Syringe Service Program in the Past 12 Months						
No	28 (42.4)	38 (57.6)	13 (43.3)	17 (56.7)	14 (40.0)	21 (60.0)
Yes	16 (34.0)	31 (66.0)	11 (50.0)	11 (50.0)	5 (21.7)	18 (78.3)
Even Been to an Opioid Treatment Program						
No	10 (35.7)	18 (64.3)	5 (41.7)	7 (58.3)	4 (26.7)	11 (73.3)
Yes	34 (40.5)	50 (59.5)	19 (48.7)	20 (51.3)	15 (34.9)	28 (65.1)

	Total Sample		Females		Males	
	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test
Sexual and Reproductive Health History						
2 Sexual Partners in Past 12 Months						
No	30 (35.7)	54 (64.3)	17 (42.5)	23 (57.5)	13 (31.0)	29 (69.0)
Yes	14 (50.0)	14 (50.0)	7 (63.6)	4 (36.4)	6 (37.5)	10 (62.5)
New Partners in Past 12 Months						
No	32 (40.5)	47 (59.5)	17 (43.6)	22 (56.4)	15 (38.5)	24 (61.5)
Yes	12 (38.7)	19 (61.3)	7 (58.3)	5 (41.7)	4 (22.2)	14 (77.8)
Had a Main Partner in Past 12 Months						
No	5 (27.8)	13 (72.2)	1 (16.7)	5 (83.3)	4 (33.3)	8 (66.7)
Yes	39 (41.0)	56 (59.0)	23 (50.0)	23 (50.0)	15 (32.6)	31 (67.4)
Main Partner Has Other Partners ^{***}						
No	34 (42.5)	46 (57.5)	21 (53.8)	18 (46.2)	13 (32.5)	27 (67.5)
Yes	5 (33.3)	10 (66.7)	2 (28.6)	5 (71.4)	2 (33.3)	4 (66.7)
Used Drugs Before/During Sex with Main Partner ^{***}						
No	5 (26.3)	14 (73.7)	2 (28.6)	5 (71.4)	2 (18.2)	9 (81.8)
Yes	29 (46.0)	34 (54.0)	17 (56.7)	13 (43.3)	12 (38.7)	19 (61.3)
Main Partner Definitely/Probably Ever Had an STI ^{***}						
No	30 (37.5)	50 (62.5)	17 (44.7)	21 (55.3)	12 (30.8)	27 (69.2)
Yes	7 (58.3)	4 (41.7)	5 (71.4)	2 (28.6)	2 (40.0)	3 (60.0)
Had Sex Trade Partners in Past 12 Months						
No	35 (36.1)	62 (63.9)	20 (43.5)	26 (56.5)	14 (29.2)	34 (70.8)
Yes	9 (60.0)	6 (40.0)	4 (66.7)	2 (33.3)	5 (55.6)	4 (44.4)
Used Drugs Before/During Sex with Trade Partners ^{***}						
No	2 (66.7)	1 (33.3)	1 (100.0)	0 (0.0)	1 (50.0)	1 (50.0)
Yes	6 (54.6)	5 (45.4)	3 (60.0)	2 (40.0)	3 (50.0)	3 (50.0)
Trade Partners Definitely/Probably Ever Had an STI ^{***}						
No	6 (60.0)	4 (40.0)	3 (75.0)	1 (25.0)	3 (50.0)	3 (50.0)
Yes	3 (60.0)	2 (20.0)	1 (50.0)	1 (50.0)	2 (66.7)	1 (33.3)
Had Casual Partners in Past 12 Months						
No	30 (34.5)	57 (65.5)	18 (40.9)	26 (59.1)	12 (29.3)	29 (70.7)
Yes	14 (53.8)	12 (46.2)	6 (75.0)	2 (25.0)	7 (41.2)	10 (58.8)
Used Drugs Before/During Sex with Casual Partners ^{***}						
No	2 (22.2)	7 (77.8)	1 (100.0)	0 (0.0)	0 (0.0)	7 (100.0)
Yes	12 (70.6)	5 (29.4)	5 (71.4)	2 (28.6)	7 (70.0)	3 (30.0)

	Total Sample		Females		Males	
	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test
Casual Partners Definitely/Probably Ever Had an STI***	11 (50.0) 3 (75.0)	11 (50.0) 1 (25.0)	5 (71.4) 1 (100.0)	2 (28.6) 0 (0.0)	5 (35.7) 2 (66.7)	9 (64.3) 1 (33.3)
Female Sex Partners in the Past 12 Months	23 (42.6) 31 (38.2)	31 (57.4) 34 (61.8)	20 (44.4) 4 (66.7)	25 (55.6) 2 (33.3)	3 (33.3) 16 (34.0)	6 (66.7) 31 (66.6)
Male Sex Partners in the Past 12 Months	25 (36.8) 18 (45.0)	43 (63.2) 22 (55.5)	5 (38.5) 18 (48.6)	8 (61.5) 19 (51.4)	19 (35.8) 0 (0.0)	34 (64.2) 3 (100.0)
Experienced Violence from a Sex Partner in the Past 12 Months	37 (35.6) 7 (77.8)	67 (74.4) 2 (22.2)	19 (41.3) 5 (83.3)	27 (58.7) 1 (16.7)	17 (30.9) 2 (66.7)	38 (69.1) 1 (33.3)
Experienced Potential STI Symptoms in the Past 12 Months	30 (36.1) 14 (46.7)	53 (63.9) 16 (53.3)	15 (44.1) 9 (50.0)	19 (55.9) 9 (50.0)	14 (30.4) 5 (41.7)	32 (69.6) 7 (58.3)
Worry about STI Little/Not at all Moderately/A Lot	35 (39.3) 8 (36.4)	54 (60.7) 14 (63.6)	19 (43.2) 4 (57.1)	25 (56.8) 3 (42.9)	15 (35.7) 4 (26.7)	27 (64.3) 11 (73.3)
Using No/Ineffective STI Prevention Method in Past 12 Months	14 (42.4) 29 (37.7)	19 (57.6) 48 (62.3)	5 (41.7) 18 (47.4)	7 (58.3) 20 (52.6)	8 (42.1) 11 (29.0)	11 (57.9) 27 (71.0)
Partners' Preference is a Barrier to Using STI Prevention Method of Choice	40 (38.1) 3 (60.0)	65 (61.9) 2 (40.0)	20 (42.6) 3 (75.0)	27 (57.4) 1 (25.0)	19 (34.6) 0 (0.0)	36 (65.4) 1 (100.0)
Diagnosed with STI in Past 12 Months	42 (39.2) 1 (25.0)	65 (60.8) 3 (75.0)	22 (45.8) 1 (33.3)	26 (54.2) 2 (66.7)	19 (33.9) 0 (0.0)	37 (66.1) 1 (100.0)
Ever Experienced Barriers to Receiving Sexual and Reproductive Health Care	39 (37.1) 5 (62.5)	66 (62.9) 3 (37.5)	23 (45.1) 1 (100.0)	28 (54.9) 0 (0.0)	15 (29.4) 4 (57.1)	36 (70.6) 3 (42.9)
Would be Comfortable Receiving Sexual and Reproductive Health Care from a Syringe Service Program's Mobile Clinic	15 (34.1) 29 (42.0)	29 (65.9) 40 (58.0)	7 (38.9) 17 (50.0)	11 (61.1) 17 (50.0)	8 (30.8) 11 (34.4)	18 (69.2) 21 (65.6)

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	Total Sample		Females		Males	
	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test	N (%) Requested at Least One Test	N (%) Did Not Request a Test
No						
Yes						

* Columns and rows may not sum to total sample sizes and 100% due to missing data

** Asked at parent study baseline

*** Asked only among those reporting that type of partner