Sexually Transmitted Infections Diagnosed Among Sexual and Gender Minority Communities During the First 11 Months of the COVID-19 Pandemic in Midwest and Southern Cities in the United States

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Background: The COVID-19 pandemic adversely affected sexual health services. Given the burden of sexually transmitted infections (STIs) on sexual and gender minorities (SGMs), we estimated incidence of self-reported STI diagnoses and factors associated with STI diagnoses among SGMs during the pandemic's first year.

Methods: A cohort of 426 SGM persons, 25 years or older, recruited in Chicago, Milwaukee, Detroit, Minneapolis, and Houston completed 5 online surveys from April 2020 to February 2021. Persons self-reported on each survey all health care provider STI diagnoses. Kaplan-Meier was used to estimate the cumulative risk of STI diagnoses, stratified by human immunodeficiency virus (HIV) status. Factors associated with STI diagnoses were assessed with a longitudinal negative binomial regression.

Results: Median age was 37 years, and 27.0% were persons living with HIV (PLH). Participants reported 63 STIs for a cumulative incidence for PLH and HIV-negative persons of 0.19 (95% confidence interval [CI], 0.13–0.29) and 0.12 (95% CI, 0.09–0.17), respectively. Regardless of HIV, a younger age and changes in health care use were associated with STI diagnoses. Among HIV-negative persons, the rate of STI diagnoses was higher in Houston than the Midwest cities (adjusted relative risk, 2.37; 95% CI, 1.08–5.20). Among PLH, a decrease in health care use was also associated with STI diagnoses (adjusted relative risk, 3.53; 95% CI, 1.01–12.32 vs no change in health care services), as was Hispanic ethnicity and using a dating app to meet a sex partner.

Conclusions: Factors associated with STI diagnoses during the COVID-19 pandemic generally reflected factors associated with STI incidence before the pandemic like geography, HIV, age, and ethnicity.

The effects of the coronavirus disease 2019 (COVID-19) pandemic in the United States have included loss of employment, fear of contagion, adverse mental health outcomes, and disruption in health care use and availability, including sexual health services.[1–3] For example, starting in April 2020, resources and expertise in sexually transmitted infection (STI) prevention and contact tracing were redirected toward COVID-19 efforts.[4,5] The disruptions led to fewer visits to sexual health clinics and less STI testing in 2020 in the United States compared with before the start of stay-at-home orders.[2,6]

Concurrent with reduced services and other pandemic-related factors like reticence to go to health clinics,[7] there were sharp declines in the United States in reported cases of syphilis and gonorrhea during April and May 2020 followed by an increase in reported cases through the end of 2020. The increase in cases often matched or exceeded prepandemic levels in the overall population[7] with the possible exception of primary and secondary (P&S) syphilis cases among men who have sex with men (MSM), which Pagaoa et al[7] noted was 6.7% lower in 2020 than in 2019.

Men who have sex with men are particularly impacted by STIs[8,9] and in accord with a pandemic-related reduction in sexual health services, human immunodeficiency virus (HIV)-negative MSM reported difficulties accessing those services and MSM living with HIV reported reduced access to health care and HIV medications.[10–12] The effect of the COVID-19 pandemic also included changes in sexual behavior among MSM, including a reduced number of sex partners at the start of the pandemic in comparison to the months just before the pandemic.[13]

Since at least 1998, reported cases of some STIs had been increasing among MSM.[8,14,15] For example, in a review of 18 articles published between 2004 and 2015, P&S syphilis rates increased in the United States and western Europe among MSM and this increase was particularly pronounced in MSM with HIV[8]; however, there are few published reports of the rate of STI diagnoses among MSM during the COVID-19 pandemic.

We undertook a study to assess how pandemic-induced changes to sexual behavior (e.g., reduced number of sex partners) and health care among MSM might affect STI diagnoses in light of established historical trends in STI incidence driven by sexual orientation, race, ethnicity, and geography. The objectives of the current analysis were to (1) estimate the cumulative incidence of any reported STI in a cohort of sexual and gender minorities (SGMs) surveyed at 5 time points during the first year of the pandemic in 5 cities in the Midwest and Texas and, (2) determine factors associated with an STI diagnosis.

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MATERIALS AND METHODS

Sample and Recruitment

The COVID-19, HIV, and Sexuality Study was designed to assess the longitudinal impact of the pandemic on an ongoing anal cancer screening study [NCT04090060] being conducted with SGMs regardless of HIV-status. To be eligible, persons were required to be (1) 25 years or older; (2) report being a man who has sex with men or a transgender or nonbinary person who has sex with men; and (3) reside with a mailing address in Chicago, Milwaukee, Detroit, Minneapolis, or Houston.

Participants were recruited online using geosocial dating apps and enrolled from April 18 to 24, 2020, approximately 4 weeks after stay-at-home orders began in these cities (specifically, March 21, 25, 24, 27, and 24 in Chicago, Milwaukee, Detroit, Minneapolis, and Houston, respectively). Persons clicked on an advertisement in an online dating app. After using ReCAPTCHA (Google, Mountain View, CA) to limit fraudulent survey takers, persons completed an eligibility survey. To provide consent, eligible persons read an informational letter and then were tested on it. Persons could retake the 5-question test twice after which persons not scoring 100% were not enrolled. Enrolled persons completed a baseline survey and had to provide a mailing address in 1 of the 5 cities to receive a reloadable debit card by mail. After receiving the debit card, it was loaded with $20. For each of the 4 follow-up surveys in May, August, November 2020 and February 2021, all participants were emailed a link to the survey. For each survey completed, the participant's debit card was reloaded with $20. All surveys were in English and used the REDCap platform (Vanderbilt University). All study procedures were approved by the Medical College of Wisconsin Human Research Protections Program and in accordance with the Helsinki Declaration of 1975, as revised in 2000.

Measures

The baseline survey was followed in May 2020 by the 1-month survey which also elicited experiences in the past 30 days. The August, November 2020 and February 2021 follow-up surveys elicited experiences in the past 30 or 90 days, depending on the survey item. All surveys asked about COVID-19 diagnoses, symptoms, and experiences, in addition to medical conditions, STI diagnoses, and sexual behavior. In all 5 surveys, scales from the Pandemic Stress Index[16] were used to elicit experiences and actions related to the COVID-19 pandemic, including, "In the past 30 days, did you do any of the following because of COVID-19 (coronavirus)? (Check all that apply): Had a change in use of health care services (e.g., calling your health care provider, going to urgent care, etc.)." Persons responding "yes" to a change in health care services were asked if the change was an increase or a decrease in services.

In the baseline and May 2020 follow-up survey, respondents were asked "In the past 30 days, have you been diagnosed with a sexually transmitted disease by a health care provider?" The question was repeated in the remaining follow-up surveys but with a time frame using the past 90 days. Persons reporting an STI diagnosis were asked which STIs were diagnosed: genital warts, anal warts, genital herpes, chlamydia, gonorrhea, syphilis, nongonococcal urethritis (NGU), and other. Human immunodeficiency virus status was assessed with a separate question.

Following COVID-19–related safer sex guidance which often suggested wearing masks during sex or not kissing,[17] respondents were asked if they missed kissing in the prior reporting period using a 4-point Likert scale (strongly agree, agree, disagree, and strongly disagree), which was collapsed to "agree" and "disagree" for analysis.

Statistical Analysis

Baseline observations missing HIV or STI status were removed from analysis. Analyses were stratified by HIV status at baseline,[18] after we observed that persons living with HIV (PLH) reported STI diagnoses at a higher rate compared with HIV-negative persons ($P = 0.046$) (Fig. 1). Associations between variable frequencies and HIV status were assessed using χ^2, Fisher exact test, or the Cochrane-Armitage test for trend. In order to compare persons in the 4 Midwest cities with Houston, the Midwest cities were combined. The Kaplan-Meier method was used to estimate the cumulative risk for an STI diagnoses. The Gehan-Breslow test compared survival curves stratified by HIV status and by geographic region.

An incident STI was defined as a participant report of an STI diagnosis. Generalized estimating equations regression was used to fit a longitudinal negative binomial regression to model the 30-day incidence of an STI diagnosis across the 5 surveys. The log of the reporting timeframe (30 or 90 days) was used as an offset to compare the incidence of STI reports between groups based on the absolute counts of STIs reported in each survey. Respondents were censored after their first incident STI report. Thirty-day risk ratios (RRs) for an incident STI were estimated. Age, sexual orientation, gender identity, race, Hispanic ethnicity and region were modeled as fixed covariates and the following variables as time-varying covariates: marital status, health insurance, changes in use of health care services in the past 30 days, a COVID-19 diagnosis, use of an app to try to meet a sexual partner in the past 30 days, missed kissing, any type of sexual activity in the past 30 days, and number of different anal sex partners in the past 30 days. Factors with a Wald $\chi^2 P$ value less than 0.20 in univariate regression were included in multivariable regression. Age was retained in multivariable models as a potential confounder. Factors with the largest Wald P value of 0.05 or greater were removed one by one until each remaining factor had a P value less than 0.05 to determine independent factors associated with an incident STI. Analyses were conducted using IBM SPSS Statistics, Version 26 (IBM Corp, Armonk, NY).

RESULTS

A total of 961 persons completed the eligibility survey during the enrollment period. Of these, 574 were eligible and correctly completed the human protections quiz about study participation, 457 completed the baseline survey, and 448 provided mailing addresses. Ten persons had addresses outside of targeted recruitment metro areas, and 1 person was removed after reporting to be younger than 25 years. Eleven respondents did not answer questions about HIV status or STI diagnoses, leaving 426 persons in the current analysis at baseline. Number of persons at risk after censoring for an incident STI was 333, 298, 266 and 269 for the 4 follow-up surveys.

Median age was 37 years, with a range of 25 to 76 years (Table 1). Just over 4 in 5 participants identified as gay (83.4%), and 95.8% were cisgender men. Sixty-five percent identified as White and 25.7% as Black/African American, whereas 13.9% reported Hispanic ethnicity.

At baseline, just over one-quarter of participants reported a health care provider diagnosis of HIV (27.0%; n = 115). A higher proportion of PLH reported being Black/African American compared with White ($P < 0.001$), having 12 years or less of education ($P < 0.001$), and living in Houston compared with the Midwest ($P = 0.04$). At baseline, a statistically nonsignificant but higher proportion of PLH reported an STI diagnosis in the past 30 days (4.3% vs 1.3% for HIV-negative respondents, $P = 0.06$).

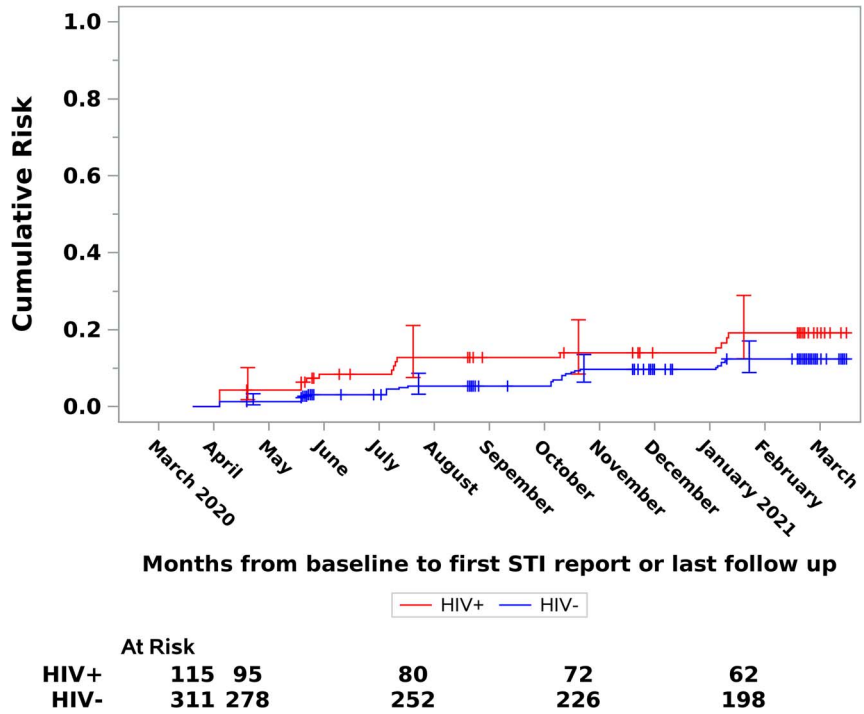

Figure 1. Kaplan-Meier estimates and 95% confidence intervals of the cumulative incidence of reports of a sexually transmitted infection by HIV status in the COVID-19, HIV, and Sexuality Study, April 2020 to March 2021. Note, HIV+ error bars are shifted to the right by 3 days for visibility. Breslow test, $P = 0.046$.

Regardless of HIV status, a total of 50 respondents reported 63 incident STIs in any of the 5 surveys: chlamydia (25), gonorrhea (22), syphilis (13), genital herpes (2), and anal warts (1). Multiple incident STIs during a single survey time period were reported by 8 respondents. There were 4 incident HIV infection reports, 2 each at the 4-month and 7-month follow-up surveys.

Total follow-up time for HIV-negative persons and PLH was 2711 and 890 person-months, respectively. In Kaplan-Meier analysis, time to report of an STI diagnosis was shorter among PLH compared with HIV-negative participants ($P = 0.046$) (Fig. 1). Cumulative incidence among PLH was 0.19 (95% confidence interval [CI], 0.13–0.29) and among HIV-negative persons was 0.12 (95% CI, 0.09–0.17). After stratifying HIV-negative persons by geographic region, the unadjusted incidence of reported STIs among Houston participants was not significantly higher than among Midwest participants ($P = 0.11$) (Fig. 2). Among PLH, there was no statistical difference in STI diagnoses by region ($P = 0.53$) (data not shown).

Univariate Analysis

Regardless of HIV status, an increase in use of health care services was associated with an incident STI diagnosis in the prior reporting period in univariate analysis (Table 2). Among PLH, those reporting an increase in health care services were 4.4 times more likely to report an incident STI diagnosis from a health care provider compared with persons reporting no change in health care services (RR, 4.40; 95% CI, 1.53–12.67). Among HIV-negative persons, those reporting an increase in health care services were 3.2 times more likely to report an incident STI diagnosis from a health care provider compared with persons reporting no change in health care services (RR, 3.23; 95% CI, 1.44–7.23).

Multivariable Analysis

In multivariable analysis among PLH, increasing age was associated with a decreased likelihood of reporting an STI (adjusted relative risk [aRR], 0.90; 95% CI, 0.86–0.95), whereas an increased use of health care services was associated with increased risk for reporting an STI (aRR, 7.91; 95% CI, 3.07–20.37 vs no change in health care services). However, a decreased use of health care services was also associated with increased risk for reporting an STI (aRR, 3.53; 95% CI, 1.01–12.32 vs no change in health care services). In addition, Hispanic individuals (aRR, 4.35; 95% CI, 1.19–15.97) and persons using a dating app to meet sex partners in the past 30 days (aRR, 6.67; 95% CI, 1.68–26.51) had increased risk of reporting an STI.

Among HIV-negative persons, increasing age was also associated with a decreased risk of an STI diagnosis, whereas those who reported an increased use of health care services also had increased risk of reporting an STI (aRR, 3.22; 95% CI, 1.45–7.11, compared with people with no change in health care service use) (Table 2). The HIV–negative SGM in Houston had more than double the risk for reporting an incident STI (aRR, 2.37; 95% CI, 1.08–5.20 compared with Midwest persons).

DISCUSSION

During the first year of the pandemic, we observed a higher rate of STI diagnoses among SGM living with HIV compared with HIV-negative SGM. Regardless of HIV, an increased use of health care services was associated with an increased incident detection of an STI, after controlling for other factors; however, among PLH, a decreased use of health care services was also associated with increased incident report of an STI.

To our knowledge, STI incidence among SGM stratified by HIV has not been reported during the COVID-19 pandemic; however, our observation of increased diagnoses among SGM with HIV mirrors

TABLE 1. Baseline Characteristics of Persons Enrolled in the COVID-19, HIV, and Sexuality Study, April 18–24, 2020

Characteristics	Total, N = 426	HIV-Negative, n = 311	PLH, n = 115	*P**
Age, y				0.11†
25–34	183 (43.0)	141 (45.3)	42 (36.5)	
35–44	117 (27.5)	83 (26.7)	34 (29.6)	
45–76	126 (29.6)	87 (28.0)	39 (33.9)	
Age: median (IQR), y	37 (31–49)	36 (31–47)	42 (31–49)	0.18‡
Sexual orientation				0.11
Gay	351 (83.4)	248 (81.0)	103 (89.6)	
Bisexual	51 (12.1)	42 (13.7)	9 (7.8)	
Other§	19 (4.5)	16 (5.2)	3 (2.6)	
Missing	5	5	0	
Gender identity				0.42¶
Man	408 (95.8)	296 (95.2)	112 (97.4)	
Other gender‖	18 (4.2)	15 (4.8)	3 (2.6)	
Race				<0.001
White	265 (65.0)	205 (68.8)	60 (54.6)	
Black/African American	105 (25.7)	60 (20.1)	45 (40.9)	
Other**	38 (9.3)	33 (11.1)	5 (4.6)	
Missing††	18	13	5	
Hispanic ethnicity				0.06
No	365 (86.1)	260 (84.1)	105 (91.3)	
Yes	59 (13.9)	49 (15.9)	10 (8.7)	
Missing	2	2	0	
Marital status				0.91
Married, cohabitating or living together	87 (20.5)	64 (20.6)	23 (20.2)	
Divorced, separated or widowed	26 (6.1)	18 (5.8)	8 (7.0)	
Single with no steady partner	253 (59.5)	184 (59.2)	69 (60.5)	
Single with steady partners	59 (13.9)	45 (14.5)	14 (12.3)	
Missing	1	0	1	
Education, y				<0.001†
≤12	58 (13.7)	31 (10.0)	27 (23.7)	
13–16	195 (45.9)	142 (45.7)	53 (46.5)	
>16	172 (40.5)	138 (44.4)	34 (29.8)	
Missing	1	0	1	
Region				0.04
Midwest	359 (84.3)	269 (86.5)	90 (78.3)	
Houston	67 (15.7)	42 (13.5)	25 (21.7)	
Health insurance				0.11
No	59 (14.0)	48 (15.6)	11 (9.6)	
Yes	363 (86.0)	259 (84.4)	104 (90.4)	
Missing	4	4	0	
Diagnosed with COVID-19 in the past 30 d				0.74¶
No	414 (97.2)	303 (97.4)	111 (96.5)	
Yes	12 (2.8)	8 (2.6)	4 (3.5)	
Changes in use of health care services in the past 30 d				0.62
No change	324 (76.8)	240 (77.9)	84 (73.7)	
Increased use	25 (5.9)	18 (5.8)	7 (6.1)	
Decreased use	73 (17.3)	50 (16.2)	23 (20.2)	
Missing	4	3	1	
Use of an app for meeting a sexual partner in the past 30 d				0.63
No	155 (36.7)	111 (36.0)	44 (38.6)	
Yes	267 (63.3)	197 (64.0)	70 (61.4)	
Missing	4	3	1	
Since COVID-19, missed kissing				0.45
Disagree	84 (20.2)	59 (19.3)	25 (22.7)	
Agree	331 (79.8)	246 (80.7)	85 (77.3)	
Missing	11	6	5	
Diagnosed with an STI by a HCP in the past 30 d				0.06¶
No	417 (97.9)	307 (98.7)	110 (95.7)	
Yes	9 (2.1)	4 (1.3)	5 (4.3)	
Any sexual activity in the past 30 d				0.58
No	71 (16.8)	50 (16.2)	21 (18.4)	
Yes	352 (83.2)	259 (83.8)	93 (81.6)	
Missing	3	2	1	

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TABLE 1. *(Continued)*

Characteristics	Total, N = 426	HIV-Negative, n = 311	PLH, n = 115	*P**
No. different anal sex partners in the past 30 d				0.12†
0	251 (59.9)	194 (63.2)	57 (50.9)	
1–3	134 (32.0)	90 (29.3)	44 (39.3)	
4 or more	34 (8.1)	23 (7.5)	11 (9.8)	
Missing	7	4	3	

*P value derived from χ^2 test unless otherwise noted.
†Cochrane-Armitage test for trend.
‡Student t test.
§Other includes heterosexual and queer.
¶χ^2 exact test.
‖Includes woman, transman, transwoman, nonbinary, other, and I don't know.
**Includes Asian, Pacific Islander, Native Hawaiian, American Indian/Alaskan native and multiracial.
††Includes other, I don't want to answer, and I don't know.
HCP, health care provider.

prepandemic STI trends.[14] It is possible that pandemic-related suboptimal staffing of STI programs may have influenced this observation. For example, some jurisdictions were required to redeploy STI testing staff for pandemic tasks and may have directed remaining STI program resources only for the highest priority STI cases.[19] This prioritization could result in increased detection of STIs among PLH[19] if HIV-negative persons were considered a lower priority population for STI detection. In this case, we might have also observed lower health care utilization among HIV-negative persons; however, there was no significant difference by HIV status in the trajectory of participants' reported use of health care services across the 5 surveys ($P = 0.25$, data not shown).

The National Coalition of Sexually Transmitted Disease Directors reported the proportion of STI program staff diverted to COVID-19 tasks had declined from 78% in May 2020 to 37% in January 2021,[3] which infers increasing capacity for STI testing. The established association between increased STI testing and increased STI incidence[14,20] is consistent with our observation that study participants' self-reported increased use of health care services was associated with increased incidence of STI diagnoses. For HIV-negative persons and PLH reporting an incident STI, a majority (88% and 81%, respectively) reported either no change in health care use or an increase in health care use in the same survey period as the incident STI (data not shown).

Although there are several reports of disruptions in HIV medical care for PLH, including reduced access to HIV medications that resulted in, for example, decreased HIV viral suppression rates,[10,21–23] our observation of an inverse association between STI diagnoses and health care services use among PLH is not intuitive unless the lack of STI testing in an initial

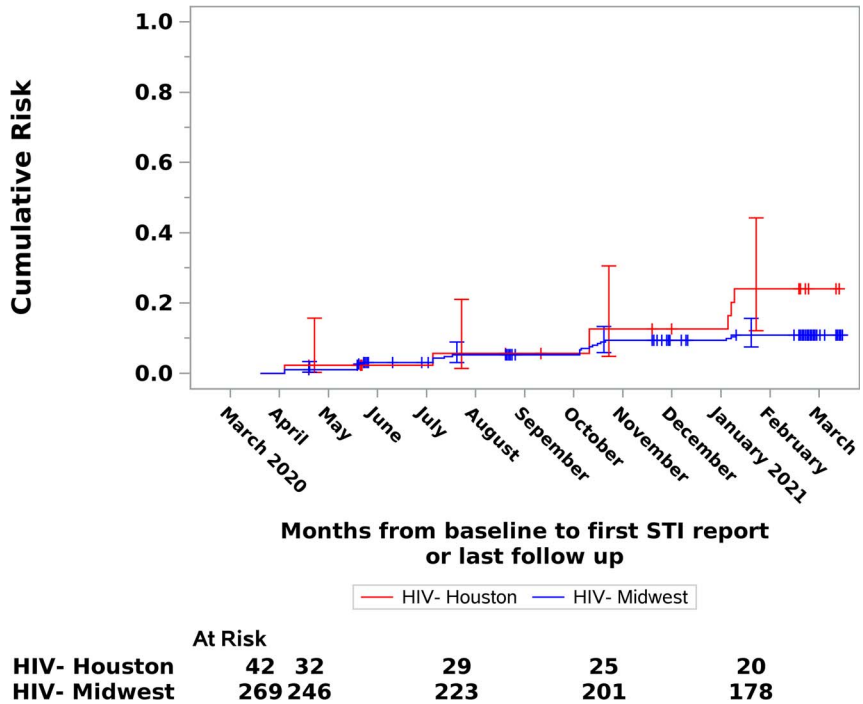

Figure 2. Kaplan-Meier estimates and 95% confidence intervals of the cumulative incidence of reports of a sexually transmitted infection by geographic region for HIV-negative persons in the COVID-19, HIV, and Sexuality Study, April 2020 to March 2021. Note, Houston error bars are shifted to the right by 3 days for visibility. Breslow test, $P = 0.114$.

TABLE 2. Factors Associated With Incident Reports of a Newly Diagnosed Sexually Transmitted Infection Among Participants in the COVID-19, HIV, and Sexuality Study April 2020–March 2021, Univariate and Multivariable Analyses, n = 426

	HIV-Negative (n = 311)		PLH (n = 115)	
Characteristics	**RR (95% CI)**	**aRR (95% CI)***	**RR (95% CI)**	**aRR (95% CI)***
Age, y				
25–34	1.0	—	1.0	
35–44	0.63 (0.28–1.42)	—	0.75 (0.26–2.16)	
45–76	**0.28 (0.10–0.80)**[†]	—	0.32 (0.09–1.17)	
Age (continuous), y	**0.95 (0.92–0.99)**	**0.95 (0.91–0.99)**	0.95 (0.90–1.01)	**0.90 (0.86–0.95)**
Sexual orientation				
Gay	1.0	—	—	—
Bisexual	1.49 (0.64–3.50)	—	—	—
Another[‡]	2.09 (0.67–6.48)	—	—	—
Gender identity				
Man	0.42 (0.16–1.07)	—	—	—
Another gender[§]	1.0	—	—	—
Race				
White	1.0	—	—	—
Black/African American	1.12 (0.47–2.70)	—	—	—
Another[¶]	1.56 (0.60–4.05)	—	—	—
Hispanic ethnicity				
No	1.0	—	1.0	1.0
Yes	1.74 (0.79–3.80)	—	**4.23 (1.25–14.37)**	**4.35 (1.19–15.97)**
Marital status				
Married, cohabitating or living together	1.0	—	1.0	—
Divorced, separated or widowed	1.12 (0.13–9.58)	—	2.08 (0.23–19.24)	—
Single with no steady partner	1.43 (0.57–3.59)	—	1.51 (0.42–5.40)	—
Single with steady partners	1.50 (0.49–4.63)	—	3.84 (0.98–15.01)	—
Region				
Midwest	1.0	1.0	1.0	—
Houston	2.19 (0.98–4.90)	**2.37 (1.08–5.20)**	1.63 (0.57–4.63)	—
Health insurance				
No	1.0	—	0.61 (0.08–4.54)	—
Yes	0.55 (0.24–1.25)	—	1.0	—
Diagnosed with COVID-19 in the past 30 d				
No	1.0	—		—
Yes	3.13 (1.15–8.47)	—		—
Changes in use of health care services in the past 30 d				
No change	1.0	1.0	1.0	1.0
Increased use	**3.23 (1.44–7.23)**	**3.22 (1.45–7.11)**	**4.40 (1.53–12.67)**	**7.91 (3.07–20.37)**
Decreased use	0.72 (0.17–3.03)	0.80 (0.19–3.43)	1.98 (0.56–7.07)	**3.53 (1.01–12.32)**
Use of an app for meeting a sexual partner in the past 30 d				
No	1.0	—	1.0	1.0
Yes	1.31 (0.60–2.85)	—	**3.74 (1.09–12.84)**	**6.67 (1.68–26.51)**
Since COVID-19, missed kissing				
Disagree	1.0	—	1.0	—
Agree	2.55 (0.79–8.16)		1.29 (0.44–3.82)	
Any sexual activity in the past 30 d				
No	1.0	—	1.0	—
Yes	1.41 (0.43–4.66)	—	4.04 (0.61–26.80)	—
No. different anal sex partners in past 30 d				
0	1.0	—	1.0	—
1–3	1.88 (0.90–3.93)	—	0.81 (0.25–2.65)	—
4 or more	1.59 (0.47–5.41)	—	**3.29 (1.06–10.22)**	—

*Multivariable model is adjusted by variables remaining in the model.

[†]Bold indicates the 95% CI excludes unity.

[‡]Other includes heterosexual and queer.

[§]Includes woman, transman, transwoman, nonbinary, other, and I don't know.

[¶]Includes Asian, Pacific Islander, Native Hawaiian, American Indian/Alaskan Native, and multiracial.

period contributes to an increased burden of STIs that are later detected. It is also possible that some study participants may have considered health care services as distinct from sexual health services or STI testing and, for example, reported a decreased use of health care services with regard to primary care physicians while still seeking STI testing at a sexual health or STI clinic. Contrasting changes in health care use depending on the service was observed in a Southern United States clinic where total patient encounters among PLH in the initial phase of the COVID-19 pandemic decreased (along with decreased viral suppression compared with prior years), whereas the total number of mental health encounters increased in the same period.[12]

Among HIV-negative SGM, the relative risk for reporting an incident STI was higher in Houston than in the Midwest cities, which is consistent with prepandemic STI surveillance indicating increased rates of chlamydia, gonorrhea, and P&S syphilis in the South compared with the Midwest from 2015 to 2019.[24] However, since the pandemic, Pagaoa et al[7] reported no clear differences by US region in the magnitude of increase or decrease in STI case reporting from 2019 to 2020. The risk of an incident STI among PLH was also higher in Houston than the Midwest cities although it was not significant.

A younger age in this cohort was associated with an increased risk for reporting an STI regardless of HIV status, which is consistent with the epidemiology of gonorrhea and chlamydia, in which the highest incidence is in adolescents and young adults.[24] Of note, between 2004 and 2015, there have been increasing trends in P&S syphilis cases in younger MSM, especially those aged 20 to 29 years.[8]

A key limitation of these data is that incidence estimates may include STIs acquired before the pandemic. In addition, these estimates may be low given that these self-reported data would select for symptomatic STIs and thus not reflect asymptomatic STI incidence.

For PLH, we also observed an association between incident STI diagnoses and use of dating apps. Frequent use of dating apps has been associated with an increased number of sex partners and condomless sex.[25] Dating apps have also been associated with an increasing number of syphilis cases in large metro areas[26] and may be the most prevalent means by which MSM with early syphilis meet each other.[27]

Although the study sample was highly educated, it was also diverse with regard to race and ethnicity. Sexual and gender minorities with HIV and reporting Hispanic ethnicity had 4 times higher risk of reporting an STI. These results are consistent with the disproportionate burden of syphilis cases among Hispanic MSM in the United States before the pandemic[8,28] and also consistent with a San Francisco study's observation of an increased risk for Hispanic MSM with chlamydia, gonorrhea or early syphilis to have HIV coinfection.[29] During the pandemic, California surveillance data indicated that one of the largest declines in STI case reporting occurred in Hispanic persons with fewer cases of chlamydia, gonorrhea, nonprimary/nonsecondary syphilis, and unknown/late syphilis cases reported in the first half of 2020 compared with the same time period in 2019.[4] Decreased access to STI testing and sexual health services among Hispanic MSM due to the pandemic may exacerbate existent health care access disparities.[30]

The pandemic experience of these self-selected persons in these 5 cities may be different than a population-based sample and may be different in other regions of the country. It is a strength that these data come from both mid-sized and large metro areas in noncoastal cities.

The online nature of the survey completion increases the risk of duplicate survey completion or other fabricated survey completion; however, the study required participants to provide postal addresses which should increase validity compared with anonymous surveys.

Even in periods of lockdown, STIs continue to occur among SGM and therefore access to STI testing, treatment, and counseling is needed, regardless of HIV status. In this COVID-19 pandemic cohort of SGM we observed a higher incidence of STI diagnoses among PLH compared with HIV-negative persons. We also observed an increased incidence among those reporting a change in health care use compared with those reporting no change. In addition, we observed associations between STI incident diagnoses and HIV, age, ethnicity, and region that were consistent with published associations before the pandemic. As the pandemic continues to disrupt health care systems, existing disparities in health care access for some populations may be exacerbated with the potential to worsen STI-related outcomes. Thus, populations with an increased burden of STIs should continue to be prioritized for STI testing and treatment. Finally, the continuing pandemic generates a need to reevaluate longer-term disparate effects of the pandemic on sexual health.

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