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Trends in patient's use of sexual health services during COVID-19 in a network of STD clinics, STD Surveillance Network, 2019–2021

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Abstract

Background: The initial years of the COVID-19 pandemic disrupted sexual healthcare clinic's services. We describe use patterns by patient characteristics, and the use of telehealth (TH) services among a network of sexually transmitted disease (STD) clinics.

Methods: Data were collected using a survey to assess the impact of COVID-19 from March – December 2020 among seven jurisdictions who contribute STD visit-level data as part of the STD Surveillance Network. As a complement to the survey, retrospective data from January 2019 – December 2021 from these seven STD clinics in the same seven jurisdictions were examined for monthly utilization trends by overall visits, patient characteristics, and TH visits.

Results: Survey results indicated seven clinics prioritized patients for in-person visits and four jurisdictions reported urgent care centers were the most common referral location. In April 2020 (relative to April 2019) clinic visits and unique patients decreased by 68.0% and 75.8%,

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Disclaimer

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry.

Conflicts of Interest

None declared for any authors.

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respectively. TH were documented in four clinics, beginning in March 2020, peaking in December 2020, and tapering until December 2021. We observed the number of clinic visits (-12.2%) and unique patients presenting for care (-27.2%)in December 2021 had yet to return to levels to that seen in December 2019.

Conclusion: STD clinics showed fragility and resiliency in their adjustment to the pandemic; allowing for the continuation of services. Overall patient census has been slow to return to pre-pandemic levels, and many patients may still not be seeking timely care. This could result in missed opportunities to screen and treat STIs and increasing the possibility of harmful sequelae.

Keywords

COVID-19; STD clinics; sexual health; survey

Introduction

The declaration of the COVID-19 pandemic in March 2020 created unprecedented disruptions in the delivery of healthcare. The United States (US) government issued several directives including recommendations around physical distancing, stay-at-home orders, and minimizing in-person contact between patients and healthcare staff to prevent the novel coronavirus SARS-CoV-2 from spreading. [1–3] These COVID-19 measures, while considered necessary to mitigate and contain the spread of infection, severely restricted all non-urgent care, including those services provided in sexually transmitted disease (STD) clinics. To compensate for the disruptions in sexually transmitted infection (STI) care and treatment, CDC offered a few actions for clinics to consider, including prioritization of high-risk patient populations, deferring routine STI screenings, implementation of phone or telemedicine-based triage, home ornon-clinic-based testing programs, and the use of alternative clinical settings to provide recommended STI treatments.[4] Many STD clinics, like other health care facilities throughout the US, were compelled to reduce services, reduce hours of operation, reassign staff to COVID related work, and in some cases, close.[5–7] In addition, there were also widespread shortages of STI testing kits and laboratory supplies[8]. All these novel challenges were occurring simultaneously with CDC reporting all time rates of chlamydia, gonorrhea and syphilis in recent decades.[9,10]

Though reported cases of STIs in the US initially decreased at the onset of the COVID-19 pandemic in early 2020, there was a resurgence in reported cases of gonorrhea and primary and secondary syphilis by the end of the year.[11, 12] Although most STIs are diagnosed by private providers, STD clinics are contributors to the delivery of STI and sexual health services in the US.[13,14] STD clinics serve as a safety net for individuals who may be uninsured, underinsured or seeking confidential services; clinics also play a major role in HIV diagnosis, prevention, care and treatment.[15,16] Even before the COVID-19 pandemic, STD clinics experienced reductions in funding[17] and experienced strained infrastructures, but COVID-19 may have made conditions worse. Our objective was to study the impact of the initial years of the COVID-19 pandemic on a network of STD clinics participating in a sentinel surveillance project by documenting how clinics altered their operations and to describe their monthly trends in service from January 2020-December 2021 relative t trends observed in 2019.

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Methods

This cross-sectional study used data from the STD Surveillance Network (SSuN), a sentinel surveillance project that conducts facility-based surveillance in publicly funded, urban STD clinics run by state or county health departments. As a surveillance activity, SSuN received a Determination of Non-Research; data collected from the public for this activity is approved under Office of Management and Budget (OMB) control #0920–1072. We utilized two data sources for this analysis. The first data source included responses to a brief survey, deployed to participating 7 SSuN jurisdictions, and the second, visit-level data from participating SSuN STD clinics.

Clinic Survey

The survey consisted of 14 questions and was distributed to seven SSuN jurisdictions in the fall of 2021 (Appendix A). The participating jurisdictions included: Baltimore (Maryland), Miami (Florida), Multnomah County (Oregon), New York City (New York), Philadelphia (Pennsylvania), San Francisco (California), and Seattle (Washington). The survey was sent via electronic mail, with the request it be completed by an individual with knowledge of STD clinic services offered during January – December 2020. The objective of the survey was to better understand how the COVID-19 pandemic affected the availability of sexual health care services in 2020 and strategies adopted to continue to provide effective clinical care. We also assessed, STD patient visit-level data (both in-person and telehealth (TH)) from January 2019-December 2021 from the same 7 SSuN jurisdictions who participated in the survey. Five of the jurisdictions (Miami, Multnomah County, San Francisco, New York City, and Seattle) each contributed data from 1 STD clinic, while the two remaining jurisdictions (Baltimore, Philadelphia) provided data from 2 clinics in their respective jurisdictions.

Clinic Data from SSuN STD Clinics

We assessed the change in monthly volume of both in-person and TH clinic visits and unique patients in 2020 and 2021 compared to the same periods during 2019. The unit of analysis for all stratified analyses was a unique patient and demographic information was summed across all visits for an individual patient. Gender identity categories were male, female, transgender. Race/ethnicity was categorized as non-Hispanic (NH) White, NH Black, Hispanic, NH Asian/Native Hawaiian and other Pacific Islander (NHOPI), or NH other (includes American Indian/Alaska Native, multiple race, and unknown race). Age was based on age at last clinic visit of each year and was grouped into categories (<=24, 25–34, 35–44, >=45 years). Classification of male sexual behavior was based on the sex partners reported or self-identification of sexual behavior and categorized as gay, bisexual, and other men who have sex with men [referred to as MSM] (men who reported sex with a man ever or who self-identified as gay, homosexual or bi-sexual), men who have sex with women only (MSW) or unknown. were defined as MSM. as reported by the patient. Patients with missing data for gender, age or gender of sex partner(s) were included in the overall analyses but were excluded from stratified analyses. We also reviewed the monthly number of TH visits in 2020 and 2021 and compared them with total in-person monthly visits (restricted to four of the seven jurisdictions that could identify these visit types). Analyses were descriptive and

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completed with SAS version 9.4. This analysis was considered a public health surveillance activity and was not subject to human subject review.

Results

Clinic Survey results

All seven jurisdictions reported significant changes to their normal clinic processes beginning in March 2020. Three jurisdictions reported clinic closures: Baltimore closed one of two clinics in April 2020, and it did not reopen until April 2021. Philadelphia closed one of two clinics in April 2020, which remained closed throughout the observation period, and New York City closed their clinic in April 2020 and resumed seeing patients in May 2020. As a result, the survey data we report include respondents from the seven clinics that remained operational in 2020.

Individual STD clinics reported between a 30–100% monthly decrease (even excluding the clinic that closed for month of April)in the number of patient walk-in visits from March to June 2020. Reductions in walk-ins of greater than 30% continued through December 2020 for five (71%) of the seven clinics. Six of the seven clinics reported decreases in clinical staff during March 2020-December 2020, with half continuing to report at least a 30% reduction in clinical staff between October December 2020. When queried about reductions in STI services during the early part of the pandemic (March-June 2020), clinic staff from all seven jurisdictions indicated they were largely the result of COVID-19 preventative measures (e.g., social distancing, stay at home orders) and reduced patient demand that limited care-seeking by patients rather than due to shortages in STI test kits, or treatment, or availability of personal protective equipment.

All clinics reported triaging in-person visits during the timeframe of March-December 2020. Examples of patients who were prioritized for care included patients receiving HIV pre-exposure prophylaxis (PrEP), those reporting contact with a partner known to have an STI, those referred by disease intervention other specialists, those with an indication for STI treatment (e.g., symptoms, test results) and pregnant women. The most common alternative locations to which clinics referred patients for STI services were urgent care centers (n = 4 jurisdictions). Other referral sites included community providers, private lab or testing facilities, and retail health; some clinics instructed their patients to defer services for a few months. From March to December 2020, all seven clinics reported calling in prescriptions to pharmacies for patients who tested positive for STIs (in lieu of in-clinic treatment) and implementing TH PrEP visits (e.g., offering the flexibility to connect clinicians with patients via phone or computer to discuss their PrEP needs). Other strategies to minimize COVID-19 exposure risks included using second or third-line oral therapies over first-line injection-based therapies to treat STIs (n = 5), extending refills on PrEP prescriptions from 30- to 90-days allotments (n = 4) and expanding existing services for at-home self-collected or mailed specimens for STI testing (n = 4).

All STD clinics implemented TH appointments for a segment of their patient population in 2020. Five clinics indicated that TH appointments were conducted with patients mostly by phone and reported less than a 25% no-show rate. One clinic supported video-based TH

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visit and another used a combination of phone and video-based platforms. Six clinics used TH to assess and empirically treat symptomatic patients based on symptoms or exposure without requiring lab testing and a clinic used TH visits only for patients who had recently tested positive for chlamydia. Six of the seven clinics reported not prioritizing asymptomatic patients for TH but were either referred to mail-in self-collected specimen kits, county STI lab services, or counseled to defer or delay care temporarily. The top three benefits of implementing TH reported by the seven jurisdictions were convenience, continuity of care for existing patients, and patient satisfaction. The three most common challenges with TH were that it was less conducive to the diagnosis of STIs, the need for patients to return for follow-up laboratory tests, and the perception that patients prefer in-person physical examinations. Despite challenges, five clinic sites indicated that TH would likely continue to be offered; the remaining two sites reported being unsure.

Visit-Level Data from SSuN STD Clinics

From January 2019 through March 2020, there were 9 STD clinics from the seven jurisdictions contributing visit-level data to the STD Surveillance Network. However, two jurisdictions, Baltimore and Philadelphia, each experienced temporary closure of one of their STD clinics in March-April 2020. To ensure continuity of patient care and access to sexual health services, patients in those jurisdictions were directed to seek services in the clinic that remained open. To account for the potential of having the remaining clinics' census appear artificially high, we combined visit-level data from both clinics in each of these 2 jurisdictions for the entire observation period. Hence, for the purposes of this analysis, each of the 7 jurisdictions contributed visit-level data from 1 STD clinic/jurisdiction.

There were 224,053 total visits (both in-person and TH) from seven STD clinics over the three-year period. In 2019, there were 92,796 clinic visits, ranging from 5,101 to 19,711 per participating jurisdiction (Table 1). However, total visits declined by 37.7% in 2020. While all clinics saw reduced clinic volumes in 2020, there was variation across jurisdictions, with clinics in Baltimore and New York City experiencing declines by greater than half. In 2021, increases in visit volume were observed across six of the seven clinics compared to 2020, reaching a total of 69,914 clinic visits. However, visit volumes remained decreased by 27.9% when compared to annual 2019 visits.

The overall visit volume by month for all seven clinics is presented in Figure 1. Declines began in March 2020 (-31.8% in March) followed by the sharpest decline in April 2020 (-68.0%). Over time, the monthly trends in visit volume generally increased but moderate fluctuations were noted throughout the remaining observation period.

Unique Patients

The 224,053 total visits represented a total of 105,413 unique patients; however, when stratified by year,55,103 patients were seen in 2019, 36,253 in 2020, and 38,253 in 2021 (Table 2). As expected, declines in unique STD clinic patients followed a similar pattern observed with number of clinic visits, with declines in unique patient volume by 34.2% in 2020 and 30.6% in 2021 compared to 2019.

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We examined patient demographics to better understand if certain patient subgroups may have been more impacted by COVID-19 than others. Declines were observed across all age groups in 2020 and 2021 but less of return to baseline was noted among those patients ≤24 years (-38.9% in 2021 compared to 2019) and patients ≥45 years (-35.1% in 2021 compared to 2019) relative to the other age group. The percent change in the number of unique males and females were similar in magnitude for 2020 but females experienced a slower rebound than men in 2021 when compared to 2019. When comparing monthly trends in the percent change among MSM, MSW, and women (Figure 2), both women and MSW display a greater percent decrease and less recovery to pre-pandemic levels compared to MSM. Despite decreases in both males and females, transgender persons were the only patient subgroup in our analysis that showed an increase nearly 40% from 2019 to 2021 (Table 1). Though declines were noted in all race/ethnic groups, persistent and accelerating decreases were noted only for NH Black patients when comparing 2020 with 2021.

Telehealth Visits

Although 7 jurisdictions reported implementing a variety of TH models on the survey, only clinics in 4 jurisdictions (Multnomah County, Baltimore, San Francisco, and Philadelphia) were able to capture and transmit data on TH visits. These 4 clinics included 138,591 total visits, with 26,460 (19.1%) TH and 112,131 (80.9%) in-person visits for the 3-year period. All visits during January 2019-February 2020 were in-person. The emergence of TH visits began in March 2020 and increased over time (Figure 3). TH visits accounted for over 50% of the visits from November 2020 through February 2021 but slowly tapered throughout 2021 and accounted for only 15% of the total visits in December 2021.

Discussion

The COVID-19 pandemic altered the ability of STD clinics to provide sexual health services for patients. In our analysis of 105,413 clinic patients from seven STD clinics between January 2019 and December 2021, we observed declines, starting in March 2020, in the overall number of patient visits and unique patients. . At the nadir, beginning in April 2020, the number of unique patients presenting to clinics dropped by 75% and the number of clinic visits decreased by 68% relative to the same time in 2019. In contrast, TH use increased substantially from zero prior to the onset of the pandemic and peaked during the period of June 2020-June 2021. These visits enabled care that might not have been possible at all, or in a timely way, if reliant on in-person visits. Although it may still be too early to gauge the full impact of these changes in STD clinic patient volumes, it is concerning that the recovery to the numbers of patients and visits recorded in 2019 has been prolonged and appears to have resulted in overall fewer patients coming to SSuN STD clinics even by the end of 2021.

Our study highlights the fragility of the STD-specific clinical infrastructure, and of the populations they serve, in several ways. Once the pandemic was declared, health services were scaled down to the provision of only essential services (e.g., prioritizing patients with symptoms, those at risk for complications, and those reporting STD contact), in part because many clinics experienced reassignment of their staff to assist with COVID-19 testing, contact tracing, or vaccine administration.[18,19] Additionally, STD clinics prioritized

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services to patients with symptoms, likely reducing the ability to identify infections in asymptomatic patients.[20] This is particularly important for chlamydia where infections are predominantly asymptomatic in females and are detected primarily through screening.[21] This seems to be consistent with results of a recent study that analyzed the number of reported 2020 cases of chlamydia and compared it to counts for the same period in 2019. The authors reported continued declines in the number of reported chlamydia cases through 2020 (down 14% compared to 2019), while reported cases of syphilis and gonorrhea increased.[22] While changes in sexual behavior may have led to real declines in chlamydia cases, it is also plausible that differences noted were due to the de-prioritization of, and subsequent decreases, in chlamydia screening. Likewise, increases in syphilis and gonorrhea cases may have been the result of increased transmission and delayed care seeking due to reduced access to care.

SSuN STD clinics also demonstrated resiliency by adjusting to the pandemic and allowing for the provision of at least limited STI services during the pandemic. We found that all seven SSuN STD clinics implemented some version of a triage/TH strategy, though data on TH visits was only available from 4 clinics that were able to extract these visit types from their electronic medical record (EMR) system. In 2020, STD Prevention and Control for Health Departments (STD PCHD) recipients responding to a survey about the impact of the COVID-19 pandemic on their STD control programs reported that about 50% of STD clinics implemented TH to continue to provide STI clinical services.[12] While these types of services didn't fully address the pre-pandemic demand, they appear to have enabled critical service delivery to continue. Although over half of the health departments expected TH delivery would continue beyond the COVID-19 pandemic[12], our data demonstrated a decrease in these types of visits through 2021. It remains to be seen if TH visits can be sustained or, is of continued interest to patients. Additional measures taken by SSuN STD clinics to serve their populations included referring patients to alternative settings (e.g., urgent care), calling in prescriptions to pharmacies for patients who tested positive for an STI, and expanded access to self-collected/mail-in specimen programs for STI testing.

One of the disadvantages of TH visits identified through our survey was the need for laboratory testing and specimen collection. Unlike self-HIV testing, there are currently no commercially available tests for gonorrhea and chlamydia for self-testing. However, the use of at-home kits, where the specimen is collected at home, mailed into a laboratory, and results are reported to a clinic and/or directly to the patient are currently available. Several studies have demonstrated patient-collected samples have similar test performances to provider-collected samples.[7,23–25] But there are other factors to consider including (but not limited to) pricing, insurance reimbursement, STI specimens requiring blood self-collection, and ensuring populations with the greatest need for testing can use these services.[26] While enabling access to self-collected STI tests served as a substitute for some clinics providing STI services during the pandemic, the continued interest in providing and using these approaches remains unclear.

Despite the availability of COVID-19 vaccines and repurposed antiviral therapies, the impacts of COVID-19 continue to be felt. Our observation that STD clinic patient census levels have not rebounded fully, and in certain groups even less so, is concerning. Although

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monthly visit counts appear to be trending towards a return to 2019 levels, unique patients presenting for care are still 27% lower in December 2021 compared to the same time in 2019. Moreover, the magnitude of the reduced impact was larger in MSW compared to MSM (-35.1% vs −24.3%). This difference may not be entirely unexpected since MSM are at increased risk for HIV[27] and may have been prioritized over other populations for STD services. In addition, MSM may also have a different level of engagement and perspective to seeking sexual health services, given the existing public health STD testing recommendations targeted to MSM.[28] Another concerning finding is the continued reduction in patients 24 years and younger (nearly a 40% decrease in 2021 when compared to 2019). Adolescents and young adults (ages 15–24 years) make up a disproportionate share of reported STI cases[11,29], with even higher rates for some subgroups (NH Black female adolescents).[30] Some of these decreases may be explained by a shift in care settings or perhaps true decreases in actual incidence. However, there are concerns that some patients may have forgone care and might continue to do so, leading to long-term sequelae on patients' health caused by undiagnosed STIs. In contrast, the only group that we noted an increase in the number of visit/unique patients were among transgender patients, underscoring the importance of access to care of transgender patients, even during a pandemic. Our findings have important public health implications and future research is needed to assess consequences of the patterns observed.

This was a retrospective study that utilized aggregate data from select STD clinics and is subject to several important limitations. First, while the clinics and jurisdictions reported in this study represent a diverse number of US STD clinics, our findings may not be representative of all STD clinics. Second, we were not able to determine whether patients visited other healthcare facilities or went completely untreated if infected. Third, since these data were extracted from EMRs, they are subject to potential data inconsistencies within and between clinic EMR systems. Finally, combining visit-level data between the clinic that closed and the one that remained open in two of the jurisdictions may have introduced some bias as it assumes that patients who would have normally sought care at one of the closed clinics would have gone to the open clinic. However, it is not unreasonable to assume that the closed clinics were more connected to the open STD clinic than other independent medical facilities to refer patients.

Recovery over the last couple of years from the COVID-19 pandemic has turned out to mean much more than controlling the spread of a virus. Sexual health programs were impacted, and the effects continue to be present. In the case of SSuN STD clinics, initial declines were observed in the majority of patient subgroups and a full recovery has not yet been realized. Certain subgroups, including MSW, women, and those ≤24 years of age appear to have had a slower recovery towards baseline than others. This raises the concern that patients may not be seeking timely care and we are missing opportunities to screen and treat STIs, creating a future scenario for increased long-term morbidity and complications.

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REFERENCES

1. CMS releases recommendations on adult elective surgeries, non-essential medical, surgical, and dental procedures during COVID-19 response. Centers for Medicare & Medicaid Services. March 18, 2020. Available at: https:www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf Accessed October 20, 2022.
2. The White House. 30 Days to Slow the Spread. 2020. Available at: https://www.whitehouse.gov/wp-content/uploads/2020/03/03.16.20_coronavirus-guidance_8.5x11_315PM.pdf. Accessed October 20, 2022.
3. Kates J, Michaud J, Tolbert J. Stay-at-home orders to fight COVID-19 in the United States: the risks of a scattershot approach. 2020. Available: https://www.kff.org/coronavirus-policy-watch/stay-at-home-orders-to-fight-covid19/. Accessed October 20, 2022.
4. Bachman LH. Dear colleague letter - clarification. Washington, DC: HHS, Public Health Service, Centers for Disease Control and Prevention. Available at: https://www.cdc.gov/std/dstdp/dcl-clarification-may2020.pdf. Accessed October 20, 2022.
5. Nagendra G, Carnevale C, Neu N, et al. The Potential Impact and Availability of Sexual Health Services During the COVID-19 Pandemic. Sex Transm Dis 2020; 47(7):434–436. [PubMed: 32520878]
6. National Coalition of STD Directors (NDCSD). COVID-19 and the state of the STD field. Available at: https://www.ncsddc.org/resource/covid-19-and-the-state-of-the-std-field/. Accessed October 20, 2022.
7. Carnevale C, Richards P, Cohall R, et al. At-home testing for sexually transmitted infections during the COVID-19 pandemic. Sex Transm Dis 2021; 48(1): e11–e14. [PubMed: 33009279]
8. Bachmann L, Bolan G. Dear colleague letter: DSTDP lab and drug shortages. Washington, DC: HHS, Public Health Service, Centers for Disease Control and Prevention. Available at: https://www.cdc.gov/std/general/DCL-Diagnostic-Test-Shortage.pdf. Accessed October 20, 2022.
9. Sexually transmitted disease surveillance 2019: National overview – Sexually Transmitted Disease Surveillance, 2019. National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (U.S.). Division of STD Prevention. Available at: https://stacks.cdc.gov/view/cdc/1051137. Accessed October 20, 2022.
10. STDs continue to rise in the U.S. Press Release. Centers for Disease Control and Prevention. Available at: https://www.cdc.gov/nchhstp/newsroom/2019/2018-STD-surveillance-report-press-release.html. Accessed October 20, 2022.
11. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2020. Atlanta: U.S. Department of Health and Human Services, 2022.
12. Wright SS, Kreisel KM, Hitt JC, et al. Impact of the COVID-19 Pandemic on Centers for Disease Control and Prevention-Funded Sexually Transmitted Disease Programs. Sex Transm Dis 2022; 49(4): e61–e63. [PubMed: 34654769]
13. Leichliter JS, O'Donnell K, Kelley K, et al. Availability of Safety-net Sexually Transmitted Disease Clinical Services in the U.S., 2018. Am J Prev Med. 2020; 58(4):555–561. [PubMed: 32001050]
14. Montgomery MC, Raifman J, Nunn AS, et al. Insurance Coverage and Utilization at a Sexually Transmitted Disease Clinic in a Medicaid Expansion State. Sex Transm Dis 2017; 44(5):313–317. [PubMed: 28407650]
15. Romaguera R STD Clinics contribute to Ending the HIV Epidemic in the United States. Washington, DC: HHS, Public Health Service, Centers for Disease Control and Prevention. Available at: https://www.hiv.gov/blog/std-clinics-contribute-ending-hiv-epidemic-united-states Accessed October 19, 2022.

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16. Leichliter JS, Cuffe KM, Kelley KR, et al. Availability of Sexually Transmitted Disease and HIV Clinical Services: Ending the HIV Epidemic Versus Non–Ending the HIV Epidemic Jurisdictions, 2018. Sex Transm Dis 2022; 49(1): e13–e16. [PubMed: 34030153]
17. Leichliter JS, Heyer K, Peterman TA, et al. US Public Sexually Transmitted Disease Clinical Services in an Era of Declining Public Health Funding: 2013–14. Sex Transm Dis 2017; 44(8):505–509. [PubMed: 28703733]
18. Berzkalns A, Thibault CS, Barbee LA, et al. Decreases in Reported Sexually Transmitted Infections During the Time of COVID-19 in King County, WA: Decreased Transmission or Screening? Sex Transm Dis 2021; 48(8S): S44–S49. [PubMed: 33967230]
19. Tao J, Napoleon SC, Maynard MA, et al. Impact of the COVID-19 Pandemic on Sexually Transmitted Infection Clinic Visits. Sex Transm Dis 2021; 48(1): e5–e7. [PubMed: 33181578]
20. Barbee LA, Dombrowski JC, Hermann S, et al. "Sex in the time of COVID": clinical guidelines for sexually transmitted disease management in an era of social distancing. SexTransm Dis 2020; 47(7):427–430.
21. Wiesenfeld HC. Screening for Chlamydia trachomatis Infections in Women. N Engl J Med 2017; 376(8):765–773. [PubMed: 28225683]
22. Pagaoa M, Grey J, Torrone E, Kreisel K, et al. Trends in Nationally Notifiable Sexually Transmitted Disease Case Reports During the US COVID-19 Pandemic, January to December 2020. Sex Transm Dis 2021; 48(10):798–804. [PubMed: 34224523]
23. Melendez JH, Hamill MM, Armington GS, et al. Home-based testing for sexually transmitted infections: leveraging online resources during the COVID-19 pandemic. Sex Transm Dis 2021; 48(1): e8–e10. [PubMed: 33229964]
24. Ogale Y, Yeh PT, Kennedy CE, et al. Self-collection of samples as an additional approach to deliver testing services for sexually transmitted infections: a systematic review and meta-analysis. BMJ Glob Health 2019; 4(2): e001349.
25. Gaydos CA. Let's take a "selfie": self-collected samples for sexually transmitted infections. Sex Transm Dis 2018; 45:278–279. [PubMed: 29528988]
26. Kersh EN, Shukla M, Raphael BH, et al. At-Home Specimen Self-Collection and Self-Testing for Sexually Transmitted Infection Screening Demand Accelerated by the COVID-19 Pandemic: a Review of Laboratory Implementation Issues. J Clin Microbiol 2021; 59(11): e0264620.
27. Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2010–2016. 2019. Available at: https://www.cdc.gov/hiv/ppt/library/slidesets/cdc-hiv-incidence-prevalence-2010-2016.pptx. Accessed October 20, 2022.
28. Workowski KA, Bachmann LH, Chan PA, et al. Sexually transmitted infections treatment guidelines, 2021. MMWR Recomm Rep 2021;70(4):1–187.
29. Shannon CL, Klausner JD. The growing epidemic of sexually transmitted infections in adolescents: a neglected population. Curr Opin Pediatr 2018; 30(1):137–143. [PubMed: 29315111]
30. Torrone E, Papp J, Weinstock H. Prevalence of Chlamydia trachomatis genital infection among persons aged 14–39 years — United States, 2007–2012. MMWR Morb Mortal Wkly Rep 2014; 63(38):834–838. [PubMed: 25254560]

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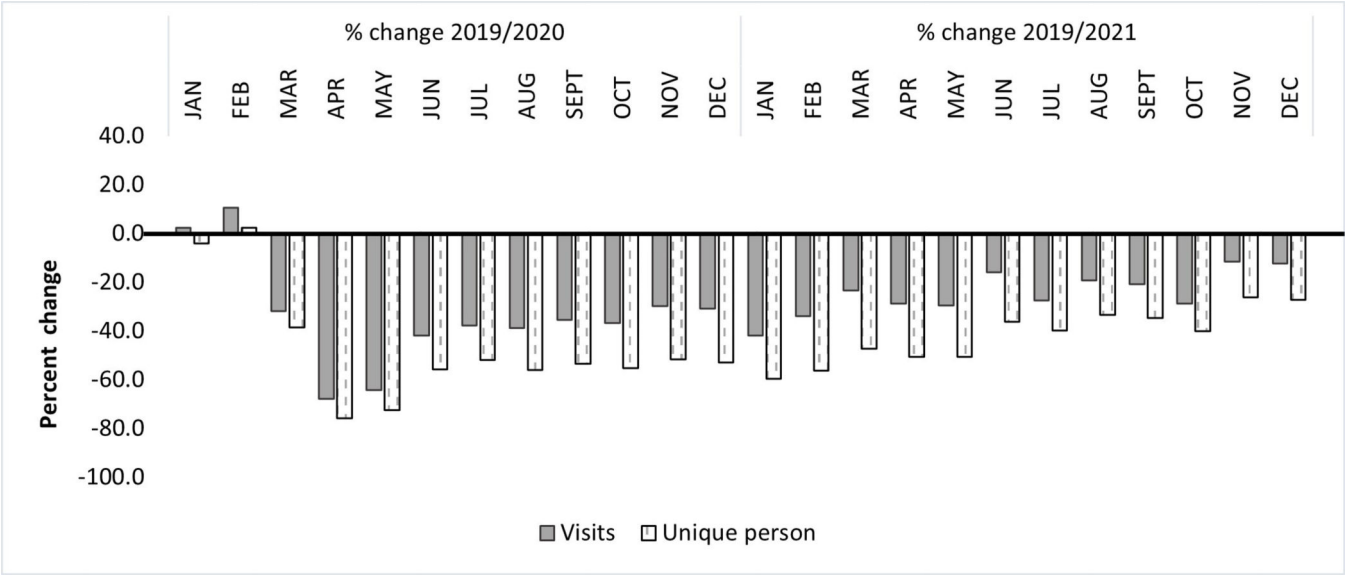

Figure 1.

Percent change in the proportion of visits* and unique patients attending 7 STD clinics participating in the STD Surveillance Network** in 2020–2021 compared to 2019 by month

*Includes both in-person and telehealth visits

**Includes STD clinics in Baltimore, Maryland; Miami, Florida; Multnomah County, Oregon; Philadelphia, Philadelphia; New York City, New York; San Francisco, California; Seattle, Washington

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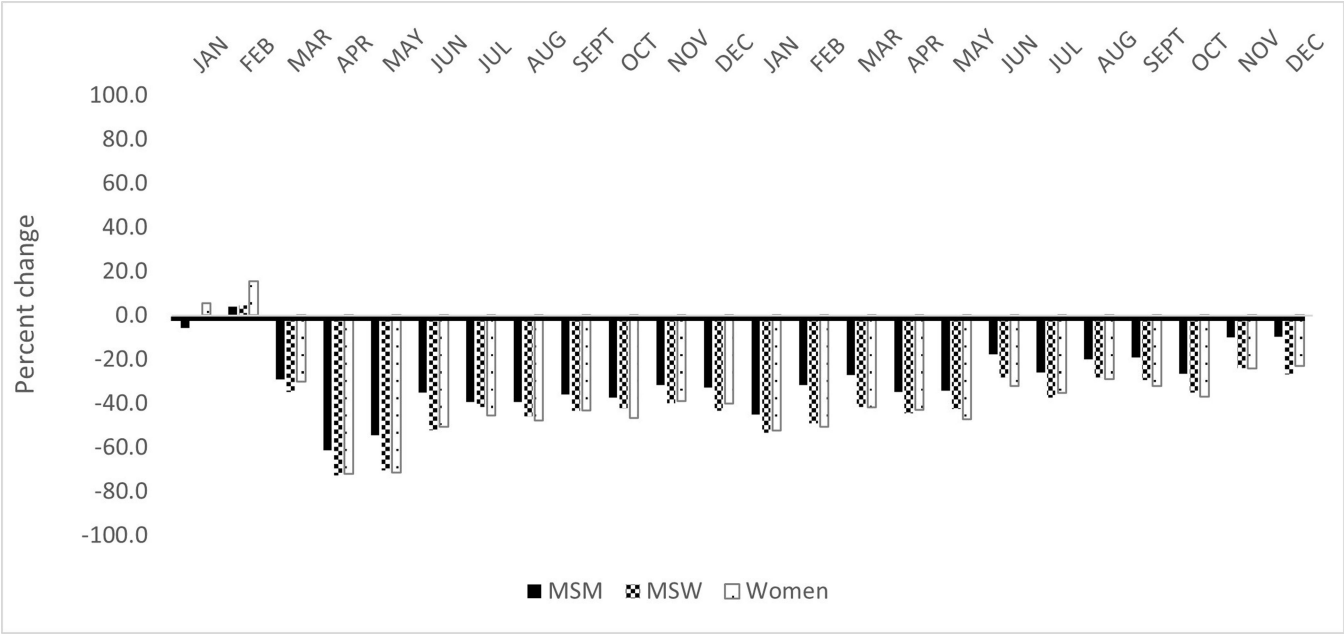

Figure 2.

Percent change in unique MSM, MSW and women attending 7 STD clinics participating in the STD Surveillance Network* in 2020–2021 compared to 2019 by month *Includes STD clinics in 7 jurisdictions (Baltimore, Maryland; Miami, Florida; Multnomah County, Oregon; Philadelphia, Philadelphia; New York City, New York; San Francisco, California; Seattle, Washington)

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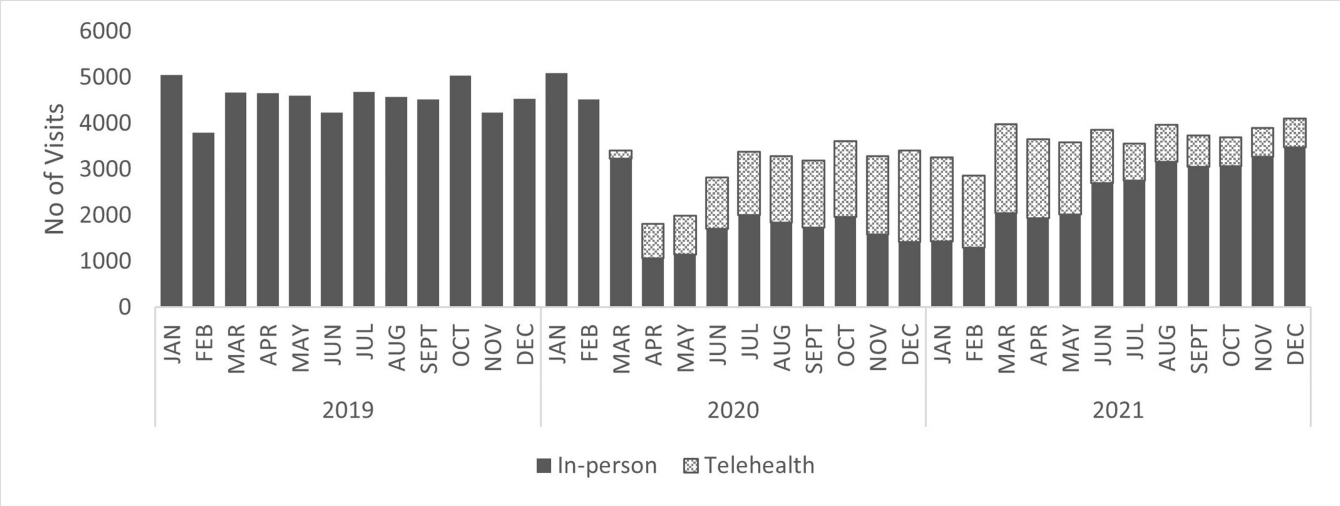

Figure 3.

Monthly number of STD clinic visits in 4 jurisdictions participating in the STD Surveillance Network* by visit type, January 2019-December 2021.

*Includes STD clinics in 4 jurisdictions (Baltimore, Maryland; Multnomah County, Oregon; Philadelphia, Philadelphia; San Francisco, California)

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Table 1.

Percent change in STD clinic visits and unique patients by jurisdiction, January 2019-December 2021

	Baltimore, MD		Miami, FL		Multnomah County, OR		New York City, NY		Philadelphia, PA		San Francisco, CA		Seattle, WA		Total	
	#	% change from 2019	#	% change from 2019	#	% change from 2019	#	% change from 2019	#	% change from 2019	#	% change from 2019	#	% change from 2019	#	% change from 2019
2019 (January-December)																
Visits	14,804	--------	8,299	--------	5,101	--------	16,520	--------	19,711	--------	14,977	--------	13,384	--------	92,796	--------
Unique patients	8,902	--------	5,574	--------	3,047	--------	10,537	--------	11,531	--------	7,884	--------	7,628	--------	55,103	--------
2020 (January-December)																
Visits	6,886	−53.5	5,238	−36.9	4,310	−15.5	7,928	−52.0	14,685	−25.5	13,953	−6.8	8,343	−37.7	61,343	−33.9
Unique patients	4,705	−47.1	3,718	−33.3	2,597	−14.8	5,789	−45.1	9,295	−19.4	5,429	−31.1	4,720	−38.1	36,253	−34.2
2021 (January-December)																
Visits	9,001	−39.2	5,943	−28.4	4,623	−9.4	10,159	−38.5	14,099	−28.5	16,441	9.8	9,648	−27.9	69,914	−24.7
Unique patients	3986	−55.2	3,998	−28.3	2,760	−9.4	6,992	−33.6	8,898	−22.8	6,306	−20.0	5,313	−30.3	38,253	−30.6

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Table 2:

Demographic characteristics of the unique patients (n= 105,413) that presented for STI services in STD clinics* by year participating in the STD Surveillance Network (SSuN), January 2019-December 2021

Demographic characteristics					
Total	**2019 (n = 55,103)**	**2020 (n =36,253)**		**2021 (n = 38,253)**	
Age	N (%)	N (%)	**% Δ from 2019**	N (%)	**% Δ from 2019**
Mean age, years	31 (IQR 25–40)	31 (IQR 25–40)	-------	31 (IQR 26–39)	-------
Age Group					
≤24	12,403 (22.5)	7,760(21.4)	**−37.4**	7,576(19.8)	**−38.9**
25–34	22,702(41.0)	15,029(41.5)	**−33.8**	16,599(43.4)	**−26.9**
35–44	10,073(18.3)	7,139(19.7)	**−29.1**	7,640(20.0)	**−24.2**
≥45	9,916(18.0)	6,321(17.4)	**−36.3**	6,432(16.8)	**−35.1**
Missing	9(0.0)	4(0.0)	-------	6(0.0)	-------
Females	16,368(29.7)	10,559 (29.1)	**−35.5**	10,732(28.1)	**−34.4**
Males					
Total	38,495 (70.0)	25,441 (70.2)	**−33.9**	27,183 (70.2)	**−29.4**
MSM	15,168 (27.5)	10,671 (29.4)	**−29.6**	11,488(30.1)	**−24.3**
MSW	19,777(35.9)	12,534(34.6)	**−36.6**	12,839(33.6)	**−35.1**
Unknown	3,550(6.4)	2,236(6.2)	**−37.0**	2,856(7.5)	**−19.5**
Transgender	240(0.4)	253(0.7)	**5.4**	338(0.9)	**40.8**
Race/ethnicity					
Hispanic	9,781(17.8)	6,770(18.7)	**−30.8**	7,814(24.0)	**−20.1**
NH-White	13,007(23.6)	8,138(22.5)	**−37.4**	9,176(24.0)	**−29.5**
NH-Black	23,991(43.5)	16,363(45.1)	**−31.8**	15,237(39.8)	**−36.5**
NH Asian or PIH	2,850(5.2)	1,728(4.8)	**−39.4**	2,146(5.6)	**−24.7**
NH-Other**	5,474(9.9)	3,254(9.0)	**−40.6**	3,880(10.1)	**−29.1**

NH = Non-Hispanic; MSM = men who have sex with men; MSW = men who have sex with women only; PIH = Pacific Islander/Hawaiian; Δ = change

*Includes nine STD clinics in seven jurisdictions (Baltimore, Maryland; Miami, Florida; Multnomah County, Oregon; Philadelphia, Pennsylvania; New York City, New York; San Francisco, California; Seattle, Washington)

**Other includes Alaskan Native/American Indian, Multi-race, Unknown, Other race