HHS Public Access

Author manuscript

Sex Transm Dis. Author manuscript; available in PMC 2025 March 01.

Published in final edited form as:

Sex Transm Dis. 2024 March 01; 51(3): 146–155. doi:10.1097/OLQ.0000000000001917.

Factors associated with delays in presentation and treatment of gonorrhea, Massachusetts 2015–2019

Heather Elder, PhD MPH[1], **Laura Platt, MD**[1,2], **Dylan Leach, MPH**[1], **Cordelia Sheetoh, MS MPH**[1], **Victor M Ramirez, MPH**[1], **Lauren Molotnikov, MPH**[1], **Brenda Hernandez, MS**[1], **Kathleen Roosevelt, MPH**[1], **Katherine K. Hsu, MD MPH**[1,3]

[1]Division of STD Prevention, Bureau of Infectious Disease and Laboratory Science, Massachusetts Department of Public Health, Jamaica Plain, MA

[2]Division of Infectious Diseases, Brigham and Women's Hospital, Boston, MA

[3]Section of Pediatric Infectious Diseases, Boston University Medical Center, Boston, MA

Abstract

Background: Rates of gonorrhea are increasing across the United States. Understanding and addressing contributing factors associated with longer time to diagnosis and treatment may shorten the duration of infectiousness which in turn may limit transmission.

Methods: We used Massachusetts data from the CDC Sexually Transmitted Disease Surveillance Network collected between July 2015 and September 2019, along with routinely reported surveillance data, to assess time from gonorrhea symptom onset to presentation to care, and time from presentation to care to receipt of treatment. Factors associated with longer time to presentation (TTP) and time to treatment (TTT) were assessed using Cox proportional hazard models with a constant time variable.

Results: Among symptomatic patients (n=672), 31% did not receive medical care within 7 days of symptom onset. Longer TTP was associated with younger age, female gender, reporting cost as a barrier to care, and provider report of proctitis. Among patients with symptoms and/or known contact to gonorrhea (n=827), 42% did not receive presumptive treatment. Longer TTT was associated with female gender, non-Hispanic Other race/ethnicity, and clinics with less gonorrhea treatment experience. Among asymptomatic patients without known exposure to STI (n=235), 26% did not receive treatment within 7 days. Longer TTT was associated with STD clinic/family planning/reproductive health clinics and a test turnaround time of ≥3 days.

Conclusions: Delays in presentation to care and receipt of treatment for gonorrhea are common. Factors associated with longer TTP and TTT highlight multiple opportunities for reducing the infectious period of patients with gonorrhea.

SHORT SUMMARY:

Correspondence: Name: Heather Elder, Mailing Address: 305 South St., Stables Bldg., Jamaica Plain, MA 02130, Phone Number: 617-983-6952, heather.elder@mass.gov.

Conflict of Interest: There are no conflicts of interest to report.

Delays in care and treatment for gonorrhea are common, and may be associated with age, gender, reporting cost as barrier, certain clinical presentations and clinic types, and test turnaround time.

Keywords

Gonorrhea; delays; presentation to care; time to treatment

INTRODUCTION

Gonorrhea is the second most reported sexually transmitted infection, and third most reported notifiable disease overall within the United States. Since 2010, the annual number of reported cases has increased substantially. In 2019, over 600,000 cases were reported nationally to the Center for Disease Control and Prevention (CDC), which corresponded to an 88% increase since 2010.[1] At a state level, in 2019 7,396 cases were reported in Massachusetts (MA), representing a 54% increase since 2010 and a rate of 107.2 cases per 100,000.[2] This increasing number of cases of gonorrhea is concerning because untreated gonorrhea may facilitate transmission of other sexually transmitted infections (STIs) including HIV, and may lead to medical consequences such as pelvic pain, infertility, and disseminated gonococcal infection.[3] Prompt treatment for gonorrhea not only reduces the risk of such clinical sequelae, but also shortens the infectious period during which ongoing transmission may occur and can facilitate timely partner notification and treatment.[4]

Two time periods where care delays may occur include the time between gonorrhea acquisition and presentation to care, and the time between presentation to care and receipt of effective treatment.[5,6] CDC treatment guidelines for STIs do not specify a recommended treatment timeframe, however they specify that some symptomatic patients may benefit from empiric treatment, and those reporting exposure to gonorrhea should receive presumptive treatment upon presentation to care.[5,7]

While the provision of timely treatment is a cornerstone for preventing STIs, delays are common.[1] Literature assessing delays in patient access to care has found associations with sex, rurality, gender of sexual partners of male patients, income, education, and symptom characteristics.[8–13] Prior studies focusing on factors associated with delays in treatment found that males were less likely to receive adequate treatment within 30 days compared to females, while females were less likely to receive presumptive treatment compared to men.[14,15] Patients younger than 19 years were the least likely age group to receive adequate treatment in Virginia.[15] Further assessment is needed to better understand modifiable factors, patient, and clinical characteristics that may be associated with delays in presenting for care and treatment.

The objectives of this analysis were to (1) explore patient characteristics and clinical factors associated with delays in presentation to care among patients with symptomatic gonorrhea and (2) examine patient characteristics and clinical factors associated with delays in gonorrhea treatment after initial presentation, both for those who may have merited presumptive treatment based upon symptoms and/or exposures and those who merited treatment based upon results of asymptomatic screening.

METHODS

We conducted a retrospective analysis of a subset of cases of gonorrhea reported to the Massachusetts Department of Public Health (MDPH) between July 2015 and September 2019 utilizing information from CDC STD Surveillance Network (SSuN) interviews, supplemented by routine state public health surveillance data. The SSuN protocol has been described in detail elsewhere.[16] Briefly, SSuN is a CDC-funded initiative that includes standardized interviews conducted by competitively selected state and local health departments in order to provide more granular information about cases of gonorrhea. Interviews are conducted with both patients and providers, and interview topics include patient demographics, sexual risk behaviors, patient's clinical history, and treatment course.[6,17] Eighteen percent of reported cases of gonorrhea were randomized to receive SSuN patient and provider interviews. The supplementary public health surveillance data included patient address, HIV status, specimen collection date, date of lab result, and clinical facility. Cases were excluded if they had unknown or missing data for the covariates of interest.

This analysis evaluated two separate time periods: prior to accessing care and after care. Each time period had distinct inclusion criteria and analyses. For the period prior to accessing care, analyses were restricted to cases where there was a completed patient interview in which patients reported a defined duration of symptoms. Our outcome of interest was time to presentation (TTP) which was defined as the reported time from symptom onset to clinical evaluation by the patient. The outcome was dichotomized as longer TTP (reporting symptoms for seven days or more prior to seeing a clinician) and shorter TTP (reporting symptoms for six days or fewer prior to seeing a clinician). These definitions were consistent with prior studies.[8–13]

For the period after accessing care, analyses were restricted to cases with a completed patient interview and reported treatment date. Our outcome of interest was time to treatment (TTT), which was defined as the days between specimen collection for gonorrhea testing and reported date of treatment. This outcome was dichotomized as longer and shorter TTT. Our definition of longer and shorter TTT varied between those who may merit presumptive or empiric therapy and those whose treatment was based on laboratory diagnosis alone. In accordance with CDC STI treatment guidelines, patients merited presumptive therapy if they reported a known contact to gonorrhea, and they may merit empiric therapy if symptomatic (self-reported experiencing symptoms, or provider/surveillance reported urethritis, proctitis, or genital discharge).[5,18] For patients who may merit presumptive or empiric therapy, shorter TTT was defined as zero days or less (i.e. patients were treated on or before the date of specimen collection) while longer TTT was defined as one day or longer. For patients without STI symptoms or a known STI contact, we dichotomized TTT based upon an *a priori* determined duration of seven days. Patients were considered to have shorter TTT if they were treated in less than seven days from the date of specimen collection, and they were considered to have longer TTT if there were treated seven or more days after the date of specimen collection. For the calculation of the mean and median TTT, cases with a negative TTT (i.e. treatment prior to specimen collection date) were changed to a TTT of zero days.

We evaluated patient-level and clinic-level factors for associations with shorter versus longer TTP and shorter versus longer TTT. Patient-level factors included patient age, gender identity, race/ethnicity, social vulnerability index (SVI) as a proxy for socioeconomic status, identification as a man who has sex with men (MSM), HIV status, patient-reported pre-exposure prophylaxis (PrEP) use, sexual partner(s) indicated patient was STI exposed, reported history of transactional sex, reported cost as a barrier to care access during the past 12 months, and reason for selecting the facility where the gonorrhea test was done. For symptomatic patients we assessed types of symptoms, which were collected from clinician reported data. For the period after accessing care, we included the duration of symptoms prior to accessing care. SVI was determined based on the census tract of the patient's home address. The SVI incorporates 15 demographic and socioeconomic variables from the US census and was designed to characterize community ability to withstand external hazards but has been applied more broadly to health conditions including STIs.[19] Census tracts are given a percentile rank and grouped as low, moderately low, moderately high, and high, with higher percentile scores representing greater community vulnerability.[20,21]

Clinic-level factors included in both time periods were if the patient was seen by their primary care provider and whether the patient had a co-pay. For the period after accessing care, analyses also included type of clinical facility, clinician type, test turnaround time (days from specimen collection to result date), and the experience level of the ordering/treating clinic. Test turnaround time was dichotomized at greater than or equal to three days versus less than three days. This cut point was one day above the median. We defined experience level of the clinic as the number of gonorrhea cases reported to MDPH from a given clinic that calendar year. Clinics that reported 1–24 cases were categorized as having little experience, while those reporting 25–99 cases and at least 100 cases were considered moderately and very experienced, respectively. We did not have individual clinician experience level, nor clinic-level demographics (race/ethnicity, gender, or SVI) available for incorporation into models.

Factors associated with longer TTP and TTT were assessed using unadjusted and adjusted Cox proportional hazard models with a constant time variable, which estimated the prevalence ratios (PR) and 95% confidence intervals (CI). This method was selected because the outcome of interest was found to be common (>10%).[22] Factors associated with long TTT were run separately for those reporting STI symptoms and/or contact and those who were treated based upon laboratory diagnosis alone. Covariates were included in the adjusted models if the bivariate model had a p-value less than 0.2. Analyses were performed using SAS 9.4 (SAS Institute, Inc, Cary, NC).

RESULTS

During the study period of July 2015 – September 2019, 28,330 laboratory-confirmed cases of gonorrhea were reported to MDPH, among which 5,115 were randomized to undergo patient and provider interview through SSuN. Surveys were completed by 1,349 patients and their providers. Among these cases, 672 reported symptoms and were included in the analysis of TTP and 1,062 had full treatment information and were included in the analysis of TTT.

The study population was young with approximately one third (34.2%) under the age of 25 and over one half (57.6%) under the age of 30. The majority (76.6%) of patients identified as male, while one fifth (22.7%) identified as female and <1% identified as individuals of transgender experience. The most common patient race/ethnicity was non-Hispanic White (44.2%) followed by Hispanic (26.1%) and non-Hispanic Black (21.0%). Most patients were from high or moderately high vulnerability census tracts (45.5% and 26.9% respectively). Among patients, 8.0% had a history of HIV infection, and 28.3% of the HIV-negative patients reported a history of PrEP use (Table 1). Approximately half (51.2%) of the study population reported their initial visit being with their usual/regular care provider. The most reported reason for selecting a clinical site was promptness (34.2%) followed by proximity (29.5%) and privacy (23.3%). Among symptomatic cases, the most reported symptoms included genital discharge. During the post accessing care period, in those not reporting symptoms or STI contact, more reported longer test turnaround time (Table 1).

Thirty-one percent of patients reporting symptoms presented for care after experiencing symptoms for at least one week and were thus considered to have longer TTP. Among the sample included in the post accessing care analysis, the mean time to treatment was three days. Among those with a possible indication for presumptive or empiric treatment, the mean TTT was two days, median was zero or less days, and 42.1% were not treated on the same day and were thus considered to have longer TTT. Among those diagnosed with gonorrhea based upon asymptomatic screening, the mean time to treatment was six days, the median was four days, and 26.4% did not receive treatment within one week (Supplemental Table 1).

Factors associated with longer time to presentation

In the unadjusted analysis, multiple factors were significantly associated with longer TTP, however only five factors remained significant in the adjusted model. Patients who were younger than 25 years (PR_{adj}: 1.55; 95% CI: 1.01, 2.48), females (PR_{adj}: 1.66; 95% CI: 1.12, 2.47), experienced cost as a barrier to care (PR_{adj}: 1.50; 95% CI: 1.06, 2.08), and whose providers reported proctitis (PR_{adj}: 2.22; 95% CI: 1.06, 4.20) were significantly more likely to report a TTP of at least one week. Those who reported selecting a provider for promptness of visit (PR_{adj}: 0.66; 95% CI: 0.48, 0.89) were significantly less likely to report a TTP of at least one week (Table 2).

Factors associated with longer time to treatment

Among people with possible indications for presumptive or empiric treatment, adjusted analyses showed that females, non-Hispanic Other race/ethnicity, and those accessing care from clinics with little experience with gonorrhea were significantly more likely (PR_{adj}: 1.47; 95% CI: 1.12, 1.92, PR_{adj}: 1.61; 95% CI: 1.14, 2.25, and PR_{adj}: 1.45; 95% CI: 1.10, 1.93 respectively) to experience a longer TTT compared to males and those accessing care from very experienced clinics. Those who reported discharge were less likely to experience a longer TTT (PR_{adj}: 0.60; 95% CI: 0.47, 0.77) compared to those not reporting discharge (Table 2.)

Factors associated with longer TTT among patients not reporting STI symptoms or contact are shown in Table 3. The two significant factors associated with longer TTT in adjusted analyses were STD clinic/family planning/reproductive health clinic type and a test turnaround time of three days or more (PR_{adj}: 2.18; 95% CI: 1.07, 4.35 and PR_{adj}: 2.12; 95% CI: 1.24, 3.67, respectively).

DISCUSSION

Our analysis of evaluation and treatment for gonorrhea in Massachusetts found that delays are common. Almost a third of patients (31%) had symptoms for more than a week before accessing care. Among those with possible indications for presumptive or empiric treatment at time of presentation, 42% did not receive treatment on the day of presentation. For those who were diagnosed with gonorrhea based upon asymptomatic screening alone, the median time to treatment was four days, and 26% did not receive treatment within one week.

Decreasing the time during which patients experience symptoms prior to accessing care is one opportunity to reduce the duration of infectiousness. We found that female gender, younger age, non-Hispanic Other race/ethnicity, and cost as a barrier to care all were associated with longer TTP. Our results are consistent with studies that found that women tend to delay access to care for STIs longer than men.[10,23–26] This could be multifactorial including that some symptoms of STIs in women, such as vaginal discharge, could be mistaken for physiologic discharge or for conditions that are amenable to over-the-counter treatments, such as bacterial vaginosis or candidiasis.[10,27] The association between younger age and longer time to treatment may be related to less familiarity with, and access to, the health care system. It may also be related to less familiarity with STIs themselves including associated symptoms and benefits of treatment.[12,28] Lastly, it is possible that a sense of stigma around STIs impacted willingness to pursue care. Younger patients and female patients might be particularly vulnerable to STI-related stigma.[24] Strategies to decrease the time to treatment for patients might involve disseminating accessible, non-stigmatizing messaging about STI symptoms and effectiveness of treatment and ensuring availability of low-barrier and low-cost sexual health services.

Once patients present at a clinical visit, prompt treatment can reduce the duration of infectiousness. We found that among patients presenting with STI symptoms and/or known contact (i.e. those who may have merited presumptive or empiric therapy), a longer time to treatment was significantly more likely to occur among females than males, even after controlling for other factors. Presumptive or empiric treatment was also less likely when the provider practice had less experience diagnosing gonorrhea, in line with previous study demonstrating reduced guideline adherence in lower-incidence locations.[29] The gender differences that we found have been observed in prior studies.[15] As previously mentioned, symptoms of STIs in women can be non-specific making it harder for clinicians to treat empirically upon presentation. It is also possible that in clinical encounters, women less readily endorse sexual risk factors, making it less likely that clinicians would suspect an STI.[10,27] Clinics with less experience diagnosing gonorrhea were less likely to provide empiric or presumptive treatment, possibly due to less familiarity with the clinical presentation of gonorrhea, less routinely asking about sexual risk factors, or not having

resources on site to provide same-day treatment even if this is desired. It is also possible that clinics with less experience in diagnosing, see patients with a lower prevalence of STIs, and empiric treatment of patients with non-specific syndromes might result in over treatment in these settings. We also note that the benefits of empiric treatment based upon symptoms alone must be balanced against the harms of excess antibiotic exposure including facilitating antimicrobial resistance and altering the microbiome, and some delay in treatment may be needed to prevent overtreatment of others with non-antibiotic responsive conditions.

We found different associations with delayed treatment among patients who required treatment based upon the results of asymptomatic screening alone.[30, 31s, 32s] In our adjusted model, the factors that were significantly associated with longer time to treatment were ordering/treatment at a STD clinic/family planning/reproductive health clinic and a test turnaround time of longer than three days. The association between longer time to treatment and receiving care at an STD clinic/family planning/reproductive health clinic was an unexpected finding but may relate to challenges in scheduling asymptomatic visits in this setting or competing priorities of asymptomatic patients seeking reproductive and sexual health services. The finding of longer time to treatment associated with longer test turnaround time is supported by research showing that rapid tests may be able to shorten any delays in care, and multiple point-of-care tests for STIs are in development.[33s]

Our study has notable strengths and limitations. Use of patient interviews enabled us to account for patient characteristics that are not collected through routine surveillance activities, while use of public health surveillance data allowed us to account for health-systems details such as test turnaround time and provider experience. We were able to evaluate factors that occurred both before and after diagnosis. This combination of data sources and time periods allowed for a rich description of care delays in Massachusetts. However, our population was limited to people residing in Massachusetts and may not reflect circumstances in other locations. Furthermore, while our study sample was selected randomly from all laboratory-confirmed cases of gonorrhea in the state, there was an interview completion rate of only 23%. There may be differences in the factors impacting care and treatment timing for those who were and were not contactable and interviewed. Comparison between all laboratory-confirmed cases of gonorrhea and those with completed patient interviews found that while the age distribution was similar, the interviewed sample had a slightly higher proportion of males (data not shown). Due to small frequencies, we were not able to evaluate differences based upon certain gender, racial, and ethnic groups. Some clinical presentations such as epididymitis and pelvic inflammatory disease were also too infrequent to be evaluated in this analysis. We also note that the decision to empirically treat for gonorrhea is based upon multiple factors such as symptom type and severity, pretest probability of an STI, and the likelihood that someone would be able to be contacted with results and return for treatment at a later time. Because we do not have access to this granular information, we categorized all symptomatic patients as possibly meriting empiric treatment. This group likely includes some patients who were safely and appropriately managed without empiric treatment.

While we attempted to account for clinic-level experience with gonorrhea treatment using frequency of gonorrhea diagnosis at the clinic level, individual clinician experience may

be a better proxy measure. We were not able to account for patient demographics at the clinic level, and those factors may also have influenced clinical care. Our study collection period ended in 2019 and thus does not reflect any impact from the COVID-19 pandemic. Patients were asked about symptom duration, but the type of symptom was reported by providers who may not have had full information. As a result, patient symptoms may be underestimated and for female patients in particular we have limited ability to distinguish between symptoms that may merit empiric treatment from more non-specific symptoms that require additional diagnostics. Our analysis assessed factors impacting any index patient's time to presentation and treatment. The SSuN survey was not designed to assess if delays in care resulted in possible gonorrhea transmission. To reduce onward transmission of STIs, an analysis focused on those with new sexual partners during infectious periods may inform additional opportunities for public health intervention.

Making sexual health care more accessible to younger patients and female patients may have the greatest impact on reducing pre-diagnosis infectious periods. Improving timely treatment for female patients through developing and strengthening clinical skills within facilities caring for female patients and the development of rapid diagnostic tests might have the biggest impact on reducing infectious periods after someone presents to care. Improving presumptive treatment for gonorrhea patients who are symptomatic and/or report contact to an STI through further clinical messaging, particularly in lower incidence clinical settings, is likely to reduce infectivity following presentation. Future research can explore factors that facilitate care accessing among patients, such as knowledge and stigma interventions, and clinician reported barriers and facilitators to disease recognition, gonorrhea testing, and medication prescribing with a focus on female patients and younger patients.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding:

This work was supported by the Division of STD Prevention, US Centers for Disease Control and Prevention, through the STD Surveillance Network (CDC-RFA-PS13-1306).

REFERENCES

1. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2019 (CDC Publication). Available at: https://www.cdc.gov/std/statistics/2019/std-surveillance-2019.pdf. Accessed January 26, 2023.
2. Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory, Sciences. 2019 Integrated HIV/AIDS, STD and Viral Hepatitis Surveillance Report (MDPH Web site). Available at: https://archives.lib.state.ma.us/bitstream/handle/2452/841748/on1001960194-2019.pdf?sequence=1&isAllowed=y. Accessed January 26, 2023.
3. Unemo M, Seifert HS, Hook EW, et al. Gonorrhoea. Nat Rev Dis Primers. 2019; 5(1):1–23. [PubMed: 30617281]
4. Garnett GP, Mertz KJ, Finelli L, et al. The transmission dynamics of gonorrhoea: modelling the reported behaviour of infected patients from Newark, New Jersey. Philosophical Transactions of the Royal Society of London Series B: Biological Sciences. 1999; 354(1384):787–97. [PubMed: 10365404]

5. Center for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep., 2015; 64(RR-03):1.
6. Weston EJ, Kirkcaldy RD, Stenger M, et al. Narrative Review: Assessment of Neisseria gonorrhoeae Infections Among Men Who Have Sex With Men in National and Sentinel Surveillance Systems in the United States. Sex Transm Dis. 2018; 45(4):243–9. [PubMed: 29465702]
7. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. MMWR Recomm Rep. 2021; 70(4):1–187.
8. Thu HT, Ziersch A, Hart G. Healthcare-seeking behaviours for sexually transmitted infections among women attending the National Institute of Dermatology and Venereology in Vietnam. Sexually Transmitted Infections. 2007; 83(5):406–10. [PubMed: 17314126]
9. Fortenberry JD. Health care seeking behaviors related to sexually transmitted diseases among adolescents. Am J Public Health. 1997; 87(3):417–20. [PubMed: 9096544]
10. Leenaars PEM, Rombouts R, Kok G. Seeking medical care for a Sexually Transmitted Disease: Determinants of delay-behavior. Psychology & Health. 1993; 8(1):17–32.
11. Hook EW, Richey CM, Leone P, et al. Delayed Presentation to Clinics for Sexually Transmitted Diseases by Symptomatic Patients: A Potential Contributor to Continuing STD Morbidity. Sex Transm Dis. 1997; 24(8):443–8. [PubMed: 9293606]
12. Jayapalan S Determinants of delay in the health care seeking behaviour of STD patients. Clinical Epidemiology and Global Health. 2015; 3:S69–74.
13. Aaron KJ, Van Der Pol B, Jordan SJ, et al. Delay in Seeking Healthcare Services Following Onset of Urethritis Symptoms in Men. Sex Transm Dis. 2019; 46(5):317–20. [PubMed: 30985634]
14. Llata E, Braxton J, Asbel L, et al. Presumptive and Follow-Up Treatment Associated With Gonorrhea and Chlamydia Testing Episodes in Sexually Transmitted Disease Clinics: Impact of Changing Treatment Guidelines for Gonorrhea, Sexually Transmitted Disease Surveillance Network, 2015–2018. Sex Transm Dis. 2023; 50(1):5. [PubMed: 36194764]
15. Pugsley RA, Peterman TA. Presumptive and Follow-up Treatment for Gonorrhea and Chlamydia Among Patients Attending Public Health Department Clinics in Virginia, 2016. Sex Transm Dis. 2019; 46(3):199. [PubMed: 30742592]
16. Kerani RP, Stenger MR, Weinstock H, et al. Gonorrhea Treatment Practices in the STD Surveillance Network, 2010–2012: Sex Transm Dis. 2015; 42(1):6–12. [PubMed: 25504294]
17. Centers for Disease Control and Prevention. Enhanced STD Surveillance Network (eSSuN) Protocol and Project Implementation Guide. 2015. Available from: https://www.cdc.gov/std/ssun/protocol_v8.2_508.pdf. Accessed February 09, 2022.
18. Barrow RY, Ahmed F, Bolan GA, et al. Recommendations for Providing Quality Sexually Transmitted Diseases Clinical Services, 2020. MMWR Recomm Rep. 2020; 68(5):1–20. [PubMed: 31899459]
19. Copen CE, Haderxhanaj LT, Renfro KJ, et al. County-Level Chlamydia and Gonorrhea Rates by Social Vulnerability, United States, 2014–2018. Sex Transm Dis. 2022; 49(12):822. [PubMed: 35794819]
20. Flanagan BE, Hallisey EJ, Adams E, et al. Measuring Community Vulnerability to Natural and Anthropogenic Hazards: The Centers for Disease Control and Prevention's Social Vulnerability Index. J Environ Health. 2018; 80(10):34–6.
21. Flanagan BE, Gregory EW, Hallisey EJ, et al. A Social Vulnerability Index for Disaster Management. Journal of Homeland Security and Emergency Management. 2011; 8(1). p.000010220215477355179 2
22. Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. BMC Medical Research Methodology. 2003; 3(1):21. [PubMed: 14567763]
23. Malek AM, Chang CCH, Clark DB, Cook RL. Delay in Seeking Care for Sexually Transmitted Diseases in Young Men and Women Attending a Public STD Clinic. Open AIDS J. 2013; 7:7–13. [PubMed: 24078858]
24. Meyer-Weitz A, Reddy P, Van den Borne HW, et al. Health care seeking behaviour of patients with sexually transmitted diseases: determinants of delay behaviour. Patient Education and Counseling. 2000; 41(3):263–74. [PubMed: 11042429]

25. Vaidya V, Partha G, Karmakar M. Gender Differences in Utilization of Preventive Care Services in the United States. Journal of Women's Health. 2012; 21(2):140–5.

26. Thompson AE, Anisimowicz Y, Miedema B, et al. The influence of gender and other patient characteristics on health care-seeking behaviour: a QUALICOPC study. BMC Family Practice. 2016; 17(1):38. [PubMed: 27036116]

27. Platt R, Rice PA, McCormack WM. Risk of Acquiring Gonorrhea and Prevalence of Abnormal Adnexal Findings Among Women Recently Exposed to Gonorrhea. JAMA. 1983; 250(23):3205–9. [PubMed: 6417362]

28. Voeten HACM O Hara HB, Kusimba J, et al. Gender Differences in Health Care-Seeking Behavior for Sexually Transmitted Diseases: A Population-Based Study in Nairobi, Kenya. Sex Transm Dis. 2004; 31(5):265–72. [PubMed: 15107627]

29. Swails J, Smock L, Hsu K. Provider Characteristics Associated With Guideline-Nonadherent Gonorrhea Treatment, Massachusetts, 2010. Sex Transm Dis. 2014; 41(2):133–6. [PubMed: 24413495]

30. Gaydos CA, Melendez JH. Point-by-Point Progress: Gonorrhea Point of Care Tests. Expert Review of Molecular Diagnostics. 2020; 20(8):803–13. [PubMed: 32500764]

Table 1.

Patient and clinic characteristics* by care time period, stratified by shorter and longer times to presentation and treatment.

		Prior to accessing care		Post accessing care			
	Overall Sample	Reported Symptoms (n=672)		Reported Symptoms and/or STI Contact (n=827)		No Reported Symptoms or STI Contact (n=235)	
	N=1,095	Shorter TTP n=461 (68.6%)	Longer TTP n=211 (31.4%)	Shorter TTT n=479 (57.9%)	Longer TTT n=348 (42.1%)	Shorter TTT n=173 (73.6%)	Longer TTT n=62 (26.4%)
Age Groups							
Less than 25 years	374 (34.2%)	148 (32.1%)	96 (45.5%)	153 (31.9%)	131 (37.6%)	51 (29.5%)	24 (38.7%)
25–29 years	256 (23.4%)	109 (23.6%)	44 (20.8%)	122 (25.5%)	74 (21.3%)	43 (24.9%)	13 (21.0%)
30–39 years	277 (25.3%)	114 (24.7%)	46 (21.8%)	114 (23.8%)	90 (25.9%)	48 (27.7%)	15 (24.2%)
40+ years	188 (17.2%)	90 (19.5%)	25 (11.8%)	90 (18.8%)	53 (15.2%)	31 (17.9%)	10 (16.1%)
Gender Identity							
Male	839 (76.6%)	398 (86.3%)	139 (65.9%)	419 (87.5%)	232 (66.7%)	117 (67.6%)	51 (82.3%)
Female	249 (22.7%)	62 (13.4%)	70 (33.2%)	59 (12.3%)	113 (32.5%)	54 (31.2%)	10 (16.1%)
Transgender	7 (0.6%)	1 (0.2%)	2 (0.9%)	1 (0.2%)	3 (0.9%)	2 (1.2%)	1 (1.6%)
Reported as MSM							
Yes	577 (52.7%)	224 (48.6%)	84 (39.8%)	244 (50.9%)	162 (46.5%)	115 (66.5%)	49 (79.0%)
No	518 (47.3%)	237 (51.4%)	127 (60.2%)	235 (49.1%)	186 (53.4%)	58 (33.5%)	13 (21.0%)
Race/Ethnicity							
Non-Hispanic White	484 (44.2%)	186 (40.3%)	73 (34.6%)	209 (43.6%)	137 (39.4%)	94 (54.3%)	34 (54.8%)
Non-Hispanic Black	230 (21.0%)	110 (23.9%)	55 (26.1%)	116 (24.2%)	72 (20.7%)	23 (13.3%)	11 (17.7%)
Hispanic	286 (26.1%)	118 (25.6%)	66 (31.3%)	127 (26.5%)	92 (26.4%)	41 (23.7%)	12 (19.3%)
Non-Hispanic Other	95 (8.7%)	47 (10.2%)	17 (8.1%)	27 (5.6%)	47 (13.5%)	15 (8.7%)	5 (8.1%)
HIV-Infected							
Yes	88 (8.0%)	28 (6.1%)	8 (3.8%)	36 (7.5%%)	24 (6.9%)	18 (10.4%)	10 (16.1%)
No	1,007 (92.0%)	433 (93.9%)	203 (96.2%)	443 (92.5%)	324 (93.1%)	155 (89.6%)	52 (83.9%)
SVI Category							
Low Vulnerability	136 (12.4%)	58 (12.6%)	25 (11.8%)	52 (10.9%)	49 (14.1%)	24 (13.9%)	7 (11.3%)
Moderately Low Vulnerability	166 (15.2%)	60 (13.0%)	28 (13.3%)	63 (13.1%)	60 (17.2%)	31 (17.9%)	8 (12.9%)

		Prior to accessing care		Post accessing care			
	Overall Sample	**Reported Symptoms (n=672)**		**Reported Symptoms and/or STI Contact (n=827)**		**No Reported Symptoms or STI Contact (n=235)**	
	N=1,095	**Shorter TTP n=461 (68.6%)**	**Longer TTP n=211 (31.4%)**	**Shorter TTT n=479 (57.9%)**	**Longer TTT n=348 (42.1%)**	**Shorter TTT n=173 (73.6%)**	**Longer TTT n=62 (26.4%)**
Moderately High Vulnerability	295 (26.9%)	112 (24.3%)	57 (27.0%)	138 (28.8%)	85 (24.4%)	48 (27.7%)	19 (30.6%)
High Vulnerability	498 (45.5%)	231 (50.0%)	101 (47.9%)	226 (47.2%)	154 (44.2%)	70 (40.5%)	28 (45.2%)
Reported exchanging sex for money or drugs							
Yes	28 (2.6%)	12 (2.6%)	6 (2.8%)	13 (2.7%)	8 (2.3%)	2 (1.2%)	4 (6.4%)
No	1,067 (97.4%)	449 (97.4%)	205 (97.2%)	466 (97.3%)	340 (97.7%)	171 (98.8%)	58 (93.5%)
Sexual partner(s) indicated STI exposure							
Yes	223 (20.4%)	58 (12.6%)	43 (20.4%)	128 (26.7%)	92 (26.4%)	-	-
No	872 (79.6%)	403 (87.4%)	168 (79.6%)	351 (73.3%)	256 (73.6%)	-	-
Report any PrEP use [§]							
Yes	285 (28.3%)	80 (18.5%)	45 (22.2%)	103 (23.2%)	71 (21.9%)	77 (49.7%)	29 (55.8%)
No	722 (71.7%)	353 (81.5%)	158 (77.8%)	340 (76.7%)	253 (78.1%)	78 (50.3%)	23 (44.2%)
Reported cost as a barrier to care							
Yes	143 (13.1%)	50 (10.8%)	46 (21.8%)	62 (12.9%)	51 (14.7%)	18 (10.4%)	9 (14.5%)
No	952 (86.9%)	411 (89.1%)	165 (78.2%)	417 (87.1%)	297 (85.3%)	155 (89.6%)	53 (85.5%)
Urethritis							
Yes	327 (29.9%)	221 (47.9%)	69 (32.7%)	215 (44.9%)	103 (29.6%)	-	-
No	768 (70.1%)	240 (52.1%)	142 (67.3%)	264 (55.1%)	245 (70.4%)	-	-
Proctitis							
Yes	22 (2.0%)	7 (1.5%)	10 (4.7%)	12 (2.5%)	10 (2.9%)	-	-
No	1,073 (98.0%)	454 (98.5%)	201 (95.3%)	467 (97.5%)	338 (97.1%)	-	-
Discharge							
Yes	359 (32.8%)	228 (49.5%)	83 (39.3%)	248 (51.8%)	104 (29.9%)	-	-
No	736 (67.2%)	233 (50.5%)	128 (60.7%)	231 (48.2%)	244 (70.1%)	-	-
Abdominal Pain/PID							
Yes	35 (3.2%)	14 (3.0%)	10 (4.7%)	14 (2.9%)	20 (5.7%)	-	-
No	1,060 (96.8%)	447 (97.0%)	201 (95.3%)	465 (97.1%)	328 (94.2%)	-	-

		Prior to accessing care		Post accessing care			
	Overall Sample	Reported Symptoms (n=672)		Reported Symptoms and/or STI Contact (n=827)		No Reported Symptoms or STI Contact (n=235)	
	N=1,095	Shorter TTP n=461 (68.6%)	Longer TTP n=211 (31.4%)	Shorter TTT n=479 (57.9%)	Longer TTT n=348 (42.1%)	Shorter TTT n=173 (73.6%)	Longer TTT n=62 (26.4%)
Symptom Duration							
1 Day	125 (11.4%)	122 (26.5%)	0 (0.0%)	87 (18.2%)	30 (8.6%)	-	-
2–6 Days	346 (31.6%)	339 (73.5%)	0 (0.0%)	208 (43.4%)	127 (36.5%)	-	-
1–2 Weeks	163 (14.9%)	0 (0.0%)	160 (75.8%)	80 (16.7%)	72 (20.7%)	-	-
2+ Weeks	51 (4.7%)	0 (0.0%)	51 (24.2%)	19 (4.0%)	29 (8.3%)	-	-
Symptomatic, unknown duration	76 (6.9%)	-	-	37 (7.7%)	39 (11.2%)	-	-
Asymptomatic but STI contact reported	99 (9.0%)	-	-	48 (10.0%)	51 (14.7%)	-	-
No symptoms or reported STI contact	235 (21.5%)	-	-	-	-	173 (73.6%)	62 (26.4%)
Initial visit was with usual/regular care provider							
Yes	561 (51.2%)	197 (42.7%)	95 (45.0%)	213 (44.5%)	173 (49.7%)	129 (74.6%)	37 (59.7%)
No	534 (48.8%)	264 (57.3%)	116 (55.0%)	266 (55.5%)	175 (50.3%)	44 (25.4%)	25 (40.3%)
Type of Clinician[◊,≠]							
MD/DO	461 (43.4%)	-	-	220 (45.9%)	137 (39.4%)	84 (48.5%)	20 (32.3%)
APPs (PAs and NPs)	331 (31.2%)	-	-	161 (33.6%)	105 (30.2%)	50 (28.9%)	15 (24.2%)
Other	270 (25.4%)	-	-	98 (20.5%)	106 (30.5%)	39 (22.5%)	27 (43.5%)
Ordering/Treating Clinic Type [†]							
Primary Care	454 (41.5%)	152 (33.0%)	81 (38.4%)	172 (35.9%)	143 (41.1%)	99 (57.2%)	31 (50.0%)
STD Clinic/FP/Reproductive Health	121 (11.0%)	34 (7.4%)	31 (14.7%)	40 (8.3%)	47 (13.5%)	16 (9.2%)	16 (25.8%)
Outpatient Private Provider	99 (9.0%)	46 (10.0%)	23 (10.9%)	36 (7.5%)	40 (11.5%)	18 (10.4%)	1 (1.6%)
Hospital	233 (21.3%)	123 (26.7%)	45 (21.3%)	131 (27.3%)	66 (19.0%)	19 (11.0%)	6 (9.7%)
Other	188 (17.2%)	106 (23.0%)	31 (14.7%)	100 (20.9%)	52 (14.9%)	21 (12.1%)	8 (12.9%)
Experience of Ordering/Treating Clinic [◊]							
Little	461 (43.4%)	-	-	188 (39.2%)	189 (54.3%)	62 (35.8%)	22 (35.5%)
Moderate	231 (21.7%)	-	-	123 (25.7%)	62 (17.8%)	34 (19.6%)	12 (19.3%)
A lot	370 (34.8%)	-	-	168 (35.1%)	97 (27.9%)	77 (44.5%)	28 (45.2%)

		Prior to accessing care		Post accessing care			
	Overall Sample	Reported Symptoms (n=672)		Reported Symptoms and/or STI Contact (n=827)		No Reported Symptoms or STI Contact (n=235)	
	N=1,095	Shorter TTP n=461 (68.6%)	Longer TTP n=211 (31.4%)	Shorter TTT n=479 (57.9%)	Longer TTT n=348 (42.1%)	Shorter TTT n=173 (73.6%)	Longer TTT n=62 (26.4%)
Had to pay a co-pay at visit							
Yes	411 (37.5%)	186 (40.3%)	79 (37.4%)	186 (38.8%)	141 (40.5%)	59 (34.1%)	18 (29.0%)
No	684 (62.5%)	275 (59.6%)	132 (62.6%)	293 (61.2%)	207 (59.5%)	114 (65.9%)	44 (71.0%)
Selected clinic because: seen for free							
Yes	111 (10.1%)	35 (7.6%)	24 (11.4%)	46 (9.6%)	34 (9.8%)	19 (11.0%)	8 (12.9%)
No	984 (89.9%)	426 (92.4%)	187 (88.6%)	433 (90.4%)	314 (90.2%)	154 (89.0%)	54 (87.1%)
Selected clinic because: privacy							
Yes	255 (23.3%)	116 (25.2%)	42 (19.9%)	104 (21.7%)	90 (25.9%)	46 (26.6%)	9 (14.5%)
No	840 (76.7%)	345 (74.8%)	169 (80.1%)	375 (78.3%)	258 (74.1%)	127 (73.4%)	53 (85.5%)
Selected clinic because: insurance							
Yes	229 (20.9%)	81 (17.6%)	45 (21.3%)	91 (19.0%)	70 (20.1%)	48 (27.7%)	13 (21.0%)
No	866 (79.1%)	380 (82.4%)	166 (78.7%)	388 (81.0%)	278 (79.9%)	125 (72.2%)	49 (79.0%)
Selected clinic because: proximity							
Yes	323 (29.5%)	154 (33.4%)	63 (29.9%)	148 (30.9%)	111 (31.9%)	44 (25.4%)	9 (14.5%)
No	772 (70.5%)	307 (66.6%)	148 (70.1%)	331 (69.1%)	237 (68.1%)	129 (74.6%)	53 (85.5%)
Selected clinic because: promptness							
Yes	375 (34.2%)	211 (45.8%)	66 (31.3%)	200 (41.7%)	119 (34.2%)	30 (17.3%)	8 (12.9%)
No	720 (65.7%)	250 (54.2%)	145 (68.7%)	279 (58.2%)	229 (65.8%)	143 (82.7%)	54 (87.1%)
Selected clinic because: STD specialty							
Yes	175 (16.0%)	64 (13.9%)	24 (11.4%)	75 (15.7%)	50 (14.4%)	37 (21.4%)	12 (19.3%)
No	920 (84.0%)	397 (86.1%)	187 (88.6%)	404 (84.3%)	298 (85.6%)	136 (78.6%)	50 (80.6%)
≥3 Days Test Turnaround Time [§§]							
Yes	85 (36.2%)	-	-	-	-	48 (27.7%)	37 (59.7%)
No	150 (63.8%)	-	-	-	-	125 (72.2%)	25 (40.3%)

[*] Age, HIV status, and SVI were ascertained from routine surveillance data. Gender identity, race/ethnicity, MSM status, exchanging sex, STI exposure, PrEP use, and cost as a barrier were ascertained from patient surveys. Provider reported symptoms were ascertained from routine surveillance data and the provider surveys. The type of clinician was ascertained from provider surveys. Symptom duration, initial visit provider, co-payment, and reasons for clinic selection were ascertained from patient surveys. Clinic type, clinic experience, and test turnaround time were ascertained from routine surveillance data.

§ Only among HIV-negative (n=1,007).

□ Variable was only included in the post accessing care period (n=1,062).

≠ Other = nurses, health educators, navigators

† Other = Hospital ED/ER/Urgent Care, school-based clinic, public/tribal/government clinics

§§ The percentage is based on those with no reported symptoms or STI contact.

APP indicates advance practice provider; ED/ER, emergency department/emergency room; FP, family planning.

Table 2.

Unadjusted and adjusted models assessing associations with longer time to care and treatment among patients with reported symptoms with or without STI contact.*

	Prior to accessing care		Post accessing care	
	Reported Symptoms		Reported Symptoms and/or STI Contact	
	Unadjusted PR (95% CI)	Adjusted PR (95% CI)	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Age Groups				
Less than 25 years	**1.81 (1.19, 2.87)**	**1.55 (1.01, 2.48)**	1.24 (0.91, 1.73)	-
25–29 years	1.32 (0.82, 2.19)	1.24 (0.76, 2.06)	1.02 (0.72, 1.46)	-
30–39 years	1.32 (0.82, 2.18)	1.18 (0.72, 1.95)	1.19 (0.85, 1.68)	-
40+ years	1.00	1.00	1.00	-
Gender				
Male	1.00	1.00	1.00	1.00
Female	**2.05 (1.53, 2.72)**	**1.66 (1.12, 2.47)**	**1.84 (1.47, 2.30)**	**1.47 (1.12, 1.92)**
Transgender	2.58 (0.43, 8.07)	1.73 (0.28, 5.76)	2.10 (0.52, 5.51)	1.52 (0.37, 4.16)
Reported MSM Status				
MSM	1.00	1.00	1.00	-
Non-MSM	1.28 (0.97, 1.69)	1.17 (0.81, 1.69)	1.11 (0.90, 1.37)	-
Race/Ethnicity				
Non-Hispanic White	1.00	-	1.00	1.00
Non-Hispanic Black	1.18 (0.83, 1.67)	-	0.97 (0.72, 1.28)	0.95 (0.71, 1.27)
Hispanic	1.27 (0.91, 1.77)	-	1.06 (0.81, 1.38)	1.01 (0.77, 1.33)
Non-Hispanic Other	0.94 (0.54, 1.56)	-	**1.60 (1.14, 2.22)**	**1.61 (1.14, 2.25)**
HIV Status				
HIV-infected	0.70 (0.31, 1.32)	-	0.95 (0.61, 1.40)	-
Not HIV-infected	1.00	-	1.00	-
SVI Category				
Low Vulnerability	0.99 (0.63, 1.51)	-	1.20 (0.86, 1.64)	-
Moderately Low Vulnerability	1.05 (0.68, 1.57)	-	1.20 (0.89, 1.61)	-
Moderately High Vulnerability	1.11 (0.80, 1.53)	-	0.94 (0.72, 1.22)	-
High Vulnerability	1.00	-	1.00	-
Reported exchanging sex for money or drugs				
Yes	1.06 (0.42, 2.19)	-	0.90 (0.41, 1.70)	-
No	1.00	-	1.00	-
Sexual partner(s) indicated STI exposure				
Yes	**1.45 (1.02, 2.00)**	1.21 (0.85, 1.71)	0.99 (0.78, 1.25)	-
No	1.00	1.00	1.00	-
Report any PrEP use §				
Yes	1.16 (0.83, 1.61)	-	0.96 (0.73, 1.24)	-

	Prior to accessing care		Post accessing care	
	Reported Symptoms		Reported Symptoms and/or STI Contact	
	Unadjusted PR (95% CI)	Adjusted PR (95% CI)	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
No	1.00	-	1.00	-
Reported cost as a barrier to care				
Yes	**1.67 (1.19, 2.30)**	**1.50 (1.06, 2.08)**	1.08 (0.80, 1.45)	-
No	1.00	1.00	1.00	-
Symptom Duration ‡				
1 Day	-	-	1.00	1.00
2–6 Days	-	-	**1.48 (1.01, 2.24)**	1.26 (0.85, 1.92)
1–2 Weeks	-	-	**1.85 (1.22, 2.87)**	1.42 (0.92, 2.24)
2+ Weeks	-	-	**2.36 (1.41, 3.93)**	1.51 (0.87, 2.61)
Symptomatic with unknown duration	-	-	**2.00 (1.25, 3.24)**	1.59 (0.96, 2.64)
Asymptomatic but STI contact reported	-	-	**2.01 (1.29, 3.19)**	1.21 (0.74, 2.00)
Provider reported syndromes ◊				
Urethritis	**0.64 (0.48, 0.85)**	0.81 (0.59, 1.10)	**0.67 (0.53, 0.84)**	0.82 (0.63, 1.06)
Proctitis	**1.92 (0.95, 3.42)**	**2.22 (1.06, 4.20)**	1.08 (0.54, 1.92)	-
Genital Discharge	**0.75 (0.57, 0.99)**	0.85 (0.64, 1.13)	**0.57 (0.45, 0.72)**	**0.60 (0.47, 0.77)**
Abdominal Pain/PID	1.34 (0.66, 2.40)	-	1.42 (0.88, 2.17)	0.86 (0.51, 1.38)
Initial visit was with usual/regular care provider				
Yes	1.07 (0.81, 1.40)	-	1.13 (0.91, 1.39)	-
No	1.00	-	1.00	-
Type of Clinician‡,ǂ				
MD/DO	-	-	1.00	1.00
APPs (PAs and NPs)	-	-	1.03 (0.80, 1.32)	1.04 (0.80, 1.35)
Other	-	-	**1.35 (1.05, 1.74)**	1.28 (0.97, 1.68)
Ordering/Treating Clinic Type †				
Primary Care	1.00	1.00	1.00	1.00
STD Clinic/FP/Reproductive Health	1.37 (0.89, 2.05)	1.16 (0.74, 1.77)	1.19 (0.85, 1.64)	0.94 (0.66, 1.33)
Outpatient Private Provider	0.96 (0.59, 1.50)	0.82 (0.50, 1.30)	1.16 (0.81, 1.63)	1.00 (0.69, 1.44)
Hospital	0.77 (0.53, 1.10)	0.78 (0.53, 1.15)	**0.74 (0.55, 0.98)**	0.78 (0.57, 1.05)
Other	**0.65 (0.42, 0.97)**	0.73 (0.47, 1.10)	0.75 (0.54, 1.03)	0.72 (0.51, 1.02)
Experience of Ordering/Treating Clinic ‡				
Little	-	-	**1.37 (1.07, 1.76)**	**1.45 (1.10, 1.93)**
Moderate	-	-	0.92 (0.66, 1.25)	0.97 (0.69, 1.35)
A lot	-	-	1.00	1.00
Had to pay a co-pay at visit				
Yes	0.92 (0.69, 1.21)	-	1.04 (0.84, 1.29)	-
No	1.00	-	1.00	-

	Prior to accessing care		Post accessing care	
	Reported Symptoms		Reported Symptoms and/or STI Contact	
	Unadjusted PR (95% CI)	Adjusted PR (95% CI)	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Selected clinic because: seen for free	1.33 (0.85, 2.00)	1.17 (0.74, 1.79)	1.01 (0.70, 1.42)	-
Selected clinic because: privacy	0.81 (0.57, 1.12)	-	1.14 (0.89, 1.44)	-
Selected clinic because: insurance	1.17 (0.84, 1.62)	-	1.04 (0.80, 1.34)	-
Selected clinic because: proximity	0.89 (0.66, 1.19)	-	1.03 (0.82, 1.28)	-
Selected clinic because: promptness	**0.65 (0.48, 0.86)**	**0.66 (0.48, 0.89)**	0.83 (0.66, 1.03)	0.96 (0.75, 1.21)
Selected clinic because: STD specialty	0.85 (0.54, 1.27)	-	0.94 (0.69, 1.26)	-

Bold font indicates $P < 0.005$.

*Age, HIV status, and SVI were ascertained from routine surveillance data. Gender identity, race/ethnicity, MSM status, exchanging sex, STI exposure, PrEP use, and cost as a barrier were ascertained from patient surveys. Provider reported symptoms were ascertained from routine surveillance data and provider surveys. Type of clinician was ascertained from provider surveys. Symptom duration, initial visit provider, co-payment, and reasons for clinic selection were ascertained from patient surveys. Clinic type, clinic experience, and test turnaround time were ascertained from routine surveillance data.

§Only among HIV-negative

ǂVariable was only included in the post accessing care period.

◊Each of the symptom types are assessed separately with the reference group being “not endorsing this symptom”.

ǂOther = nurses, health educators, navigators

†Other = Hospital ED/ER/Urgent Care, school-based clinic, public/tribal/government clinics

APP indicates advance practice provider; ED/ER, emergency department/emergency room; FP, family planning.

Table 3.

Unadjusted and adjusted models assessing associations with longer time to treatment among patients with no reported symptoms or STI contact *

	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Age Groups		
Less than 25 years	1.31 (0.65, 2.87)	-
25–29 years	0.95 (0.42, 2.23)	-
30–39 years	0.98 (0.44, 2.24)	-
40+ years	1.00	-
Gender		
Male	1.00	1.00
Female	0.51 (0.25, 0.97)	0.30 (0.07, 2.13)
Transgender	1.10 (0.06, 5.00)	1.09 (0.05, 12.78)
Reported MSM Status		
MSM	1.00	1.00
Non-MSM	0.61 (0.32, 1.09)	1.73 (0.26, 6.87)
Race/Ethnicity		
Non-Hispanic White	1.00	-
Non-Hispanic Black	1.22 (0.59, 2.33)	-
Hispanic	0.85 (0.42, 1.60)	-
Non-Hispanic Other	0.94 (0.32, 2.20)	-
HIV Status		
HIV-infected	1.42 (0.68, 2.67)	-
Not HIV-infected	1.00	-
SVI Category		
Low Vulnerability	0.79 (0.32, 1.71)	-
Moderately Low Vulnerability	0.72 (0.30, 1.50)	-
Moderately High Vulnerability	0.99 (0.55, 1.76)	-
High Vulnerability	1.00	-
Reported exchanging sex for money or drugs		
Yes	2.63 (0.80, 6.40)	1.61 (0.46, 4.30)
No	1.00	1.00
Report any PrEP use §		
Yes	1.20 (0.70, 2.10)	-
No	1.00	-
Reported cost as a barrier to care		
Yes	1.31 (0.60, 2.52)	-
No	1.00	-
Initial visit was with usual/regular care provider		

	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Yes	0.61 (0.37, 1.03)	0.96 (0.53, 1.76)
No	1.00	1.00
Type of Clinician ‡		
MD/DO	1.00	1.00
APPs (PAs and NPs)	1.20 (0.60, 2.33)	1.24 (0.61, 2.51)
Other	**2.13 (1.20, 3.84)**	1.56 (0.84, 2.95)
Ordering/Treating Clinic Type †		
Primary Care	1.00	1.00
STD Clinic/FP/Reproductive Health	**2.10 (1.12, 3.78)**	**2.18 (1.07, 4.35)**
Outpatient Private Provider	0.22 (0.01, 1.03)	0.33 (0.02, 1.65)
Hospital	1.01 (0.38, 2.25)	1.24 (0.46, 2.86)
Other	1.16 (0.49, 2.40)	1.18 (0.48, 2.58)
Experience of Ordering/Treating Clinic		
Little	0.98 (0.56, 1.71)	-
Moderate	0.98 (0.48, 1.88)	-
A lot	1.00	-
Had to pay a co-pay at visit		
Yes	0.84 (0.47, 1.43)	-
No	1.00	-
Selected clinic because: seen for free	1.14 (0.50, 2.26)	-
Selected clinic because: privacy	0.56 (0.26, 1.07)	0.79 (0.35, 1.61)
Selected clinic because: insurance	0.76 (0.39, 1.35)	-
Selected clinic because: proximity	0.58 (0.27, 1.12)	0.54 (0.23, 1.15)
Selected clinic because: promptness	0.77 (0.34, 1.52)	-
Selected clinic because: STD specialty	0.91 (0.46, 1.65)	-
≥3 Days Test Turnaround Time	**2.61 (1.58, 4.39)**	**2.12 (1.24, 3.67)**

Bold font indicates $P < 0.005$.

* Age, HIV status, SVI, clinic type, clinic experience, and test turnaround time were ascertained from routine surveillance data. Gender identity, race/ethnicity, MSM status, exchanging sex, STI exposure, PrEP use, cost as a barrier, symptom duration, initial visit provider, co-payment, and reasons for clinic selection were ascertained from patient surveys. Type of clinician was ascertained from provider surveys. Provider reported symptoms were ascertained from routine surveillance data and provider surveys.

§ Only among HIV-negative

‡ Other = nurses, health educators, navigators

† Other = Hospital ED/ER/Urgent Care, school-based clinic, public/tribal/government clinics

APP indicates advance practice provider; ED/ER, emergency department/emergency room; FP, family planning.