HHS Public Access

Author manuscript

Sex Transm Dis. Author manuscript; available in PMC 2023 February 01.

Published in final edited form as:

Sex Transm Dis. 2022 February 01; 49(2): 160–165. doi:10.1097/OLQ.0000000000001518.

Effectiveness of syphilis partner notification after adjusting for treatment dates, 7 jurisdictions

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Abstract

Introduction: Disease intervention specialists (DIS) prevent syphilis by assuring treatment for patients' sex partners through partner notification (PN). Different interpretations of how to measure partners treated due to DIS efforts complicates PN evaluation. We measured PN impact by counting partners treated for syphilis after DIS interviewed the patient.

Methods: We reviewed data from early syphilis cases reported during 2015–2017 in seven jurisdictions. We compared infected partners brought to treatment using: 1) DIS-assigned disposition codes or 2) all infected partners treated 0–90 days after the patient's interview (adjusted treatment estimate). Stratified analyses assessed patient characteristics associated with the adjusted treatment estimate.

Results: DIS interviewed 23,613 patients who reported 20,890 partners with locating information. Many of the 3,569 (17.1%) partners classified by DIS as brought to treatment were treated before the patient was interviewed. There were 2,359 (11.3%) partners treated 0–90 days after the patient's interview. Treatment estimates were more consistent between programs when measured using our adjusted estimates (range 6.1%−14.8% per patient interviewed) compared to DIS-assigned disposition (range 6.1%−28.3%). Treatment of ≥ 1 partner occurred after 9.0% of

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interviews and was more likely if the patient was a woman (17.9%), aged < 25 years (12.6%), interviewed ≤7 days from diagnosis (13.9%), HIV negative (12.6%), or had no reported history of syphilis (9.8%).

Conclusions: Counting infected partners treated 0–90 days after interview reduced variability in reporting and facilitates quality assurance. Identifying programs and DIS who are particularly good at finding and treating partners could improve program impact.

Short summary:

Counting infected partners treated 0–90 days after the patient's interview as opposed to using disposition code assignments reduced variability in reporting across jurisdiction and can facilitate quality assurance.

Introduction

Health departments use partner services to disrupt syphilis transmission by ensuring the treatment of recently diagnosed patients and notifying, testing, and treating potentially infected partners. (1) The effectiveness of this intervention is commonly assessed by calculating the number of new cases of syphilis that were found and brought to treatment due to partner services. (1–4) The average number of partners brought to treatment for each reported case of syphilis has varied over time (2–8). For example, it was reported to be as high as 0.46 in four rural Texas towns during a syphilis outbreak in 1992 and 0.4 in San Diego County in 1990–1992. (5, 6) However, recent estimates of the average number of partners brought to treatment per reported case of syphilis range from a high of 0.28 in Mississippi between 2014–2016 to a low of 0.15 in men who have sex with men (MSM) in Texas between 2013–2016. (7, 8) Since 2000, disease investigation specialists (DIS), the staff responsible for carrying out syphilis and HIV partner services, have reported a decrease in patients' willingness to report partners (3) combined with a proliferation of dating apps which has impeded identifying and treating partners. (9)

Measuring the outcome of partners services is challenging because outcomes can be subjective. (10) Opinions can vary as to whether a partner was treated due to intervention by the DIS or if they would have been treated without partner notification services and the standard data collected to assess partner notification does not allow for nuanced interpretations of these metrics. (4, 10, 11) For example, if a couple visits a clinic together and both are diagnosed with syphilis and interviewed about partners, then either, neither, or both, might be classified as brought-to-treatment due to partner notification. CDC guidance has not always been clear about how to classify the treatment status of partners in less straightforward scenarios, (12) which allows room for interpretation when assigning disposition codes. (10) This variability in defining outcomes makes it difficult to validate reported effectiveness and to track effectiveness over time or across programs.

We assessed the use of a new objective measure of partners brought to treatment by counting all infected partners treated on or within 90 days after the patient was interviewed based on dates recorded by DIS in local surveillance systems. Using data from seven jurisdictions in the United States, we compared this new approach to the traditional approach that uses

DIS-assigned disposition codes to see if these two measures produced different results in different jurisdictions. Using dates that are objectively captured by STD programs better assures we are uniformly measuring the same thing across jurisdictions. The new objective approach was then used to determine if patient characteristics were associated with finding and treating an infected partner using the new date-adjusted measure.

Methods

State and local jurisdictions require laboratories to report all tests with reactive results for syphilis to state or local health departments. (13) Newly diagnosed syphilis patients are offered partner services in the form of an interview with DIS to ensure treatment and obtain information about their sex partners who are at risk of infection so they can be notified of their exposure and linked to testing and/or treatment. The partners are considered to be at risk for syphilis if they had sex with the patient during (or after) the time in which the patient likely acquired infection. DIS attempt to assure all named partners are tested and treated for syphilis either at the local health department clinic or with the partner's private provider. DIS then assign all partners a disposition code based on their syphilis test result and treatment status. Jurisdictions prioritize which patients receive partner services based on local syphilis epidemiology, DIS staff availability, risk of transmission (with primary and secondary syphilis being the most infectious), and prevention of serious sequelae (such as congenital syphilis). All case reports and investigational data are captured in unique electronic data systems developed to meet the needs of each local or state jurisdictions.

We previously described the program data used for this analysis in a paper that focused on partners who were not found. (14) Briefly, the de-identified dataset consisted of cases of all primary, secondary, and early latent syphilis reported during 2015–2016 in New York City (NYC), San Francisco (SF), Florida, Louisiana, Michigan, and North Carolina (NC), and during 2016–2017 in Virginia. We requested demographics, diagnosis and treatment dates, gender of sex partners, partner services interview date, HIV/STD diagnosis history (as determined by either self-report or documentation in surveillance), and the number of sex partners reported during the patient's infectious period (the infectious period for primary syphilis was three months prior to the onset of symptoms; secondary was six months prior to the onset of symptoms; and early latent was 12 months prior to diagnosis). Sex partners for whom the patient provided enough information to initiate a partner services investigation were classified as "named." All other reported partners were considered "unnamed." For named partners, a separate "partner dataset" was created that included partner demographics, the DIS-assigned partner services disposition code indicating if the partner was located by DIS and the syphilis infection and treatment status of the partner, and the partner's diagnosis and treatment dates (if applicable). A linking identifier connected each partner in the partner dataset to the patient with syphilis who named them.

We compared the following partner outcomes: 1) "infected, brought-to-treatment" dispositions recorded by the DIS (Disposition C) and 2) all infected partners treated for syphilis 0–90 days after the patient's interview date. We assumed that the date the patient was interviewed was the earliest timepoint that a DIS could have been made aware of the partner and thus begin investigating the partner. In this method, we considered partners

diagnosed with syphilis to be untreated if there was no recorded treatment date, to be previously treated if the partner's treatment date was prior to the patient's interview date, and to be treated due to partner services if the partner's treatment date was the same day or within 90 days after the patient's interview date.

We used this new measure of infected partners treated within 90 days to assess outcomes of syphilis patient interviews for the seven programs. We anchored our analyses using the patient with syphilis, and we calculated the proportion of interviews with at least 1 partner with the outcome of interest. We compared two outcomes of interest: the traditional measure of DIS disposition "infected, brought to treatment"; and the new objective measure of "infected, treated 0–90 days after the patient's interview date" to see how inter-jurisdictional variability was influenced by our new approach. We assumed less inter-jurisdictional variability provided evidence for the accuracy of the data collected and subsequently allowed for comparison of outcomes across jurisdictions. We then compared success in bringing partners to treatment based on characteristics of the patients who were interviewed, including the patient's age, sex (and sex of sex partners), stage of syphilis, and time delay between syphilis diagnosis and interview.

All analyses were conducted using SAS version 9.4 (Cary, NC). This evaluation of public health program data was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy: 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

Results

Cases, patients, and partners

Overall, 27,719 primary, secondary, and early latent syphilis cases were reported in the seven jurisdictions during the 2-year analysis period. In some jurisdictions nearly all patients reported with syphilis were interviewed, while in others (NYC and San Francisco) about half of reported case patients were interviewed. (14) In all, 23,613 (79.5%) patients were interviewed (range 50.1% in San Francisco to 99.5% in Florida). These patients reported 84,224 partners, including 20,890 (24.8%) named partners with enough locating information for DIS to initiate partner services.

Partner outcomes—Partner services dispositions for the 20,890 named partners who were sought for notification were: 29.8% syphilis infected (17.1% brought to treatment, 12.5% previously treated, and 0.2% not treated), 28.6% preventively treated because of recent exposure, 10.1% found not to be infected, 13.2% unable to be located, 17.2% assigned other dispositions based on the DIS investigation (e.g., refusal, out of jurisdiction, other locally used dispositions), and 0.9% missing (Table 1).

Considering all named partners from all jurisdictions, 17.0% (N=3569) had a DIS disposition of "infected and brought-to-treatment" (Disposition C on the field record). (Table 2) However, 7.0% of all named partners were classified as brought to treatment even though they had a treatment date that was prior to the patient's interview date, and 0.3% were treated more than 90 days after the patient's interview, suggesting that they

were not treated due to intervention by the DIS and should be subtracted from the partners classified as “infected, brought to treatment” by DIS disposition codes. On the other hand, 1.5% of partners were not assigned a brought-to-treatment disposition by DIS but had a treatment date within 90 days after the syphilis patient’s interview date, suggesting they should be added to the “infected, brought to treatment” estimate. Subtracting and adding partners that were misclassified based on dates results in an estimated 11.3% of named partners (N=2359) being treated 0–90 days after the patient was interviewed. The proportion of partners treated 0–90 days after the patient was interviewed was more uniform across programs than the proportions classified as “brought-to-treatment” using only disposition codes. The range across jurisdictions was 6.1%−14.8% for partners treated 0–90 days after the patient interview and was about twice as broad, 6.1%−28.3%, for partners brought to treatment (Disposition C on field record). This resulted in an overall percent change in the brought to treatment estimate from the disposition code to the adjusted date method of −34.1% (range per jurisdiction: −48.2% to +14.3%).

Patient interview outcomes

The 23,613 patient interviews were assessed to identify patient characteristics associated with having a partner treated 0–90 days after that patient was interviewed. Overall, 78.7% of interviewed patients reported having ≥ 1 partner (either named or anonymous), 49.8% reported ≥ 1 named partner, and 44.5% reported ≥ 1 named partner that was found by a DIS (data not shown). A total of 23.0% of interviewed patients reported ≥ 1 named partner who had syphilis: 10.0% had ≥ 1 named partner identified as treated for syphilis prior to DIS intervention (Disposition E on the field record), 14.0% had ≥ 1 partner who was classified as brought to treatment due to DIS intervention (Disposition C on the field record). In addition, 17.9% reported ≥ 1 named partner who was preventatively treated due to recent exposure (Disposition A on the field record). Using the date-adjusted approach, 9.0% (N=2131) had ≥ 1 named partner that was treated 0–90 days after the patient interview. The 2,131 patients named 2,359 infected partners treated 0–90 days after the interview, so nearly all patients with ≥ 1 partner treated had only one partner treated. The percentage of interviewed patients with ≥ 1 partner treated 0–90 days after the interview varied across programs, (range 4.7%−15.2%), but this range was narrower than the range would have been using the DIS disposition (range 4.9%−23.3%).

Stratified analyses identified characteristics of interviewed patients that were associated with having ≥1 named and infected partner who was treated 0–90 days after the interview. (Table 3) Overall, 9.0% of interviews resulted in a syphilis-infected partner being treated due to partner services. The patients who were most likely to have at least one named and infected partner that was treated 0–90 days after the interview were women (17.9%), aged < 25 years (12.6%), interviewed within seven days of their diagnosis (13.9%), HIV negative (12.6%), and had no previous diagnosis of syphilis (9.8%). There were no major differences in the likelihood of having ≥ 1 named and infected partner who was treated 0–90 days after the interview date by the patient’s race, stage of syphilis or previous diagnosis of another STD (as determined by either self-report or documented in a surveillance data system). These findings were consistent across all seven jurisdictions.

Discussion

In this multi-jurisdictional analysis, we found over one-third of partners infected with syphilis who were classified with a disposition code of “brought-to-treatment” (Disposition C on field records) were actually treated before the patient was interviewed. This misclassification was present to varying degrees across all jurisdictions. However, in some jurisdictions nearly half of the partners classified as “brought-to-treatment” using disposition codes appeared to be misclassified whereas other jurisdictions had very few misclassifications. Assessing partner treatment based on when the patient was interviewed will help standardize partner services evaluations over time and across jurisdictions and clarify the meaning behind the metric. After adjustment for dates, the variability among the seven programs in the percentage of partners brought to treatment was cut almost in half.

STD programs must have the ability to accurately and consistently measure outcomes over time to understand how changes to partner services interventions impact effectiveness. Recent issues related to staff turnover or COVID-19 social distancing restrictions have impacted the provision of traditional in-person partner services. Only through accurate measurement can we quantify how these and other changes impact partner services. Studies have suggested that syphilis partner notification is less effective at bringing partners in for treatment than it was in the past, but some of the differences over time might be due to changes in classification rather than changes in effectiveness. Problems with coding dispositions have been noted in the past, (4, 10, 11) but there is rarely sufficient information reported by programs to determine if dispositions were assigned correctly, so we do not know if misclassification has gotten better or worse. The reasons for these misclassifications likely vary from jurisdiction to jurisdiction and may be attributable to training deficiencies, the complexity of the investigation, issues with quality assurance of the data, or possibly intentional misrepresentation of the data because DIS are sometimes evaluated on the proportion of partners that they brought to treatment. The lack of clear updated guidelines and training opportunities from CDC may also contribute to inconsistent and inaccurate data collection across jurisdictions. Two programs that were included in our study were also analyzed previously, (4) and the number of patients with ≥ 1 partner brought to treatment according to the DIS dispositions was almost the same in 2009–2010 (NYC 4.0%, Virginia 10.7%) and in 2015–2017 (NYC 4.9% and Virginia 9.4%).

Still, there are reasons to believe that partner notification is not working as well as in the past, and there is room for improvement. Every patient with syphilis should have at least one partner who was recently infected (the source of the infection) but only 23.0% of interviewed patients we studied had a located partner with recent past or present syphilis. Syphilis is increasingly diagnosed outside of heath department clinics, decreasing the opportunity for early interviews by DIS. Most patient interviews in our study occurred more than a week after the patient’s diagnosis, and the later interviews were about half as likely to find and treat an infected partner as interviews done within seven days. We also found interviews with women were over two times as likely to lead to having ≥1 partner treated compared to MSM (17.9% of interviews with women versus 7.8% of interviews with MSM). This difference is greater than the difference observed in a similar study conducted in 2009–2010, where 14.8% of women and 8.9% of MSM had a partner classified as brought

to treatment. Our updated estimates may reflect greater health department emphasis on partner notification for women to prevent congenital syphilis (15) or increases in the number of unnamed or unreported sex partners among MSM.

Our findings provide much needed benchmarks which can help programs set priorities for partner services investigations. Patient interviews are more likely to lead to the treatment of an infected partner when the patient is female, young, tested HIV-negative, interviewed soon after diagnosis, and had not been previously diagnosed with syphilis. Previous reports suggest these patients may have had less experience with partner notification services provided by DIS and may be more forthcoming with information about their partners during interviews. (16) We found little difference in success by the patient's stage of early syphilis. Similar findings have been previously reported. (4, 8) Decisions on how much to emphasize partner notification will also depend on available alternatives for finding and treating infected persons. When syphilis prevalence is high in a population, the risk of infection increases (as is currently true for MSM) and screening is a recommended strategy to find new infections. (17) However, screening is less efficient, and partner notification more important, when infections are relatively rare (as is currently true for heterosexuals in the United States).

Partner notification has many potential outcomes that can be monitored (e.g., patients interviewed, partners named, partners located, partners tested, partners infected and brought to treatment) and many denominators e.g., (per patient reported, per patient interviewed, per partner sought) The best outcomes to monitor are those that are objective, verifiable, and informative for decision making. We used all available data about partners named during DIS interviews. However, there is likely error in the brought-to-treat estimate, regardless of how it is calculated (with dates or by DIS disposition codes) due to errors incomplete or inaccurate data collection and entry. That said, our date-adjusted classification of persons treated due to partner notification is objective and verifiable, although it does include some partners whose treatment was unrelated to action of the DIS. Partners treated in the 90 days after the patient interview would be attributed to partner services even if they were treated before they were contacted by the DIS. For instance, the 509 partners treated on the same day as the patient interview in this analysis are counted as treated due to partner notification even if they were treated before the patient was interviewed. Furthermore, partners treated 31–90 days after the patient was interviewed (N=393; 16.7% of the partners brought to treatment using the date-adjusted method in this analysis) may not be due to direct DIS intervention. However, it is possible that the patient's interview with a DIS was the motivating factor for the patient to self-notify their partner of exposure and recommend testing and treatment. It is difficult to verify the proportion of partners treated due to the efforts of the DIS under these scenarios and we have accepted the potential for misclassification by our approach as a compromise between what is true and what is objective and verifiable.

We found 9.0% of patient interviews led to ≥ 1 infected partner treated for syphilis using date-adjusted approach, meaning 11 interviews were needed to bring an infected partner to treatment. DIS interviews with syphilis patients provide many benefits to prevent or intervene upon syphilis other than bringing infected partners to treatment. Treating

recently exposed partners who have negative tests can cure incubating infections. Studies of persons who recently (within the past month) had sex with someone with primary or secondary syphilis found that 15.9–30.3% developed infection if left untreated. (18, 19) On average, 17.9% of patient interviews led to identification of ≥ 1 partner who was given prophylactic treatment (Disposition A). We did not attempt to standardize the accounting of partners that were prophylactically treated in this analysis because we cannot assess the exact dates that a partner was exposed and DIS and providers likely have different thresholds for recommending prophylactic treatment. Future analyses that incorporate a standardized estimate of prophylactic treatment will give a more complete estimate of DIS-associated intervention on syphilis spread. Interviews also help DIS understand syphilis transmission networks even when partners were previously treated, were uninfected, or were never found. These interviews also provide an opportunity for DIS to provide referrals to social services (e.g., food stamps, mental health support) that could help lower syphilis transmission risk at both the personal and population level. Thus, every partner notification interview can contribute to the control of syphilis, albeit indirectly. Partner notification for syphilis also frequently identifies partners with HIV or other sexually transmitted infections and links them to care and treatment, extending its benefits beyond helping to control syphilis. (7, 20) Finally, DIS communication with patients, providers, and members of other community organizations helps bolster awareness for the importance of partner notification and hopefully leads to the diagnosis and treatment of more persons with syphilis.

Partner notification is one of only a few tools available to control syphilis so identifying key metrics of effectiveness and uniformly measuring them is of the utmost importance. Syphilis rates have been increasing for 20 years, so we need new tools and better ways of using existing tools. For decades DIS have formed the backbone of the public health response to syphilis. Their unique perspective could be incorporated into routine training opportunities at the local, state, and federal levels that emphasize uniform and accurate data collection. We think the use of an objective and verifiable approach to standardizing partner treatment outcomes, such as the one we present that uses dates, will help accurately identify successful partner services practices and facilitate quality improvement. By focusing on the areas where partner services can be successful, health departments can more effectively control syphilis.

Acknowledgement:

We would like to thank the Disease Investigation Specialists in each jurisdiction who work to prevent the transmission of syphilis through partner services. All information presented in this manuscript is a result of their tireless work.

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Table 1.

Percentage of partners named by interviewed patients with early syphilis[1] who were sought for notification as recorded by Disease Intervention Specialists (DIS) disposition codes, 7 US jurisdictions (2015–2017)

Partner Disposition	Total N=20890	Florida N=7194	Louisiana N=1931	Michigan N=1756	North Carolina N=4523	Virginia N=1298	NYC N=2263	San Francisco N=1925
Infected, brought to treatment (C Disposition)	17.1	24.4	28.3	19.0	10.0	9.2	10.8	6.1
Infected, not treated (D Disposition)	0.2	0.3	0.6	0.5	0.0	0.2	0.1	0.0
Previously treated for this infection (E Disposition)	12.5	9.1	12.1	15.7	16.5	17.3	13.2	9.5
Preventive treatment (A Disposition)	28.6	24.6	21.1	30.1	36.3	25.3	23.6	39.8
Not infected (F Disposition)	10.1	12.4	9.3	5.5	11.1	12.0	6.9	6.4
Unable to locate (H Disposition)	13.2	11.9	14.2	14.6	14.3	10.8	19.9	6.6
Other	17.3	14.9	14.1	12.0	10.6	21.0	24.9	30.5
Missing	0.9	0.0	0.3	2.6	1.3	4.2	0.6	1.0

1. Early Syphilis=Patient diagnosed with primary, secondary, or early latent syphilis

Sex Transm Dis. Author manuscript; available in PMC 2023 February 01.

Table 2.

Percentage of partners named by interviewed early syphilis patients[1] classified as infected and brought to treatment as assessed by both DIS disposition codes and by partner treatment dates 0–90 days after the patient's interview date with a DIS in 7 US Jurisdictions (2015–2017)

	Total	Florida	Louisiana	Michigan	North Carolina	Virginia	NYC	San Francisco
	N=20890	N=7194	N=1931	N=1756	N=4523	N=1298	N=2263	N=1925
Infected, brought to treatment (C Disposition)	17.1	24.4	28.3	19.0	10.0	9.2	10.8	6.1
- treated before patient	7.0	11.6	13.6	8.7	2.8	2.1	1.8	0.9
- treated >90 days after patient	0.3	0.4	0.3	0.1	0.2	0.2	0.5	0.2
+ Other disposition, but treated ≤ 90 days after patient interview	1.5	0.3	0.4	2.1	3.3	3.6	1.8	1.1
Total treated 0--90 days after patient interview[2]	11.3	12.6	14.8	12.2	10.2	10.5	10.3	6.1
Percent Difference in the "Brought to treatment" estimates	*−33.9*	*−48.2*	*−47.8*	*−35.7*	*2.7*	*14.3*	*−4.5*	*0.0*

1. Early Syphilis=Patient diagnosed with primary, secondary, or early latent syphilis

2. Calculated by subtracting partners treated before or >90 days after the patient's interview date and adding partners with non-C disposition codes treated 0–90 days after the patient's interview date

Table 3.

Number and percentage of interviewed patients who had ≥ 1 named, infected partner who was treated 0–90 days after the patient's interview, by characteristics of the patient in 7 US Jurisdictions (2015–2017)

Characteristics[1]	Total		Florida		Louisiana		Michigan		North Carolina		Virginia		NYC		San Francisco	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
OVERALL	**2131**	**9.0%**	**833**	**8.9%**	**270**	**11.5%**	**196**	**15.2%**	**404**	**10.8%**	**124**	**16.8%**	**209**	**2.1%**	**95**	**10.6%**
Gender																
Female	512	17.9%	194	18.2%	124	18.6%	28	21.4%	74	15.3%	39	21.1%	47	17.0%	6	13.0%
Male	1605	7.8%	639	7.7%	146	8.7%	160	14.3%	327	10.1%	85	8.1%	161	3.9%	87	7.9%
MSM	1302	7.8%	522	7.6%	82	7.9%	141	14.2%	268	10.7%	62	7.4%	142	4.2%	85	8.1%
MSW Only	303	11.1%	117	10.7%	64	13.0%	19	17.9%	59	11.6%	23	13.4%	19	6.1%	2	5.3%
Age Group																
<25 years	682	12.6%	226	12.1%	131	13.7%	65	17.3%	140	14.5%	41	12.7%	67	8.1%	12	11.8%
25–34 years	830	9.5%	321	10.3%	93	11.2%	80	17.1%	162	11.7%	51	10.1%	95	4.5%	28	7.6%
35–44 years	326	6.8%	141	7.6%	27	8.9%	24	11.3%	58	8.7%	21	9.3%	32	2.6%	23	7.8%
45 years and up	285	6.2%	145	5.7%	19	7.3%	19	9.6%	44	6.2%	11	5.8%	15	4.9%	32	7.8%
Time, Diagnosis to Interview																
≤7 days	940	13.9%	370	14.3%	81	16.8%	84	20.3%	174	16.5%	67	15.1%	111	7.9%	53	12.9%
8–14 days	493	9.6%	213	9.6%	45	12.2%	55	20.3%	102	11.1%	24	9.8%	40	4.5%	14	6.3%
15–30 days	396	7.2%	154	6.1%	80	14.1%	23	9.0%	74	8.7%	16	7.4%	31	3.9%	18	5.6%
>30 days	226	4.3%	69	3.9%	53	6.1%	21	8.2%	41	6.8%	11	3.6%	22	1.8%	9	5.1%
Race																
White, Non-Hispanic	524	8.0%	228	7.6%	49	9.9%	69	14.7%	84	8.6%	27	10.0%	21	3.0%	46	7.8%
Black, Non-Hispanic	1086	10.5%	316	10.0%	219	12.3%	95	14.0%	287	12.1%	78	11.1%	80	5.4%	11	7.8%
Hispanic	407	8.2%	258	9.2%	2	4.0%	20	28.2%	21	8.5%	8	6.1%	73	5.2%	25	9.1%
Other Race/Ethnicity	80	5.7%	19	8.8%	0	0.0%	3	10.0%	12	9.3%	1	3.7%	33	4.0%	12	7.5%
Stage of Syphilis																
Primary	358	9.3%	129	10.2%	43	10.8%	42	16.2%	73	10.4%	17	10.2%	25	3.9%	29	7.2%
Secondary	829	9.5%	284	8.8%	118	11.2%	62	12.8%	183	12.1%	50	12.6%	90	5.6%	42	8.9%
Early Latent	944	8.6%	420	8.6%	109	12.1%	92	16.8%	148	9.8%	57	8.4%	94	4.3%	24	8.0%
HIV Status																

Characteristics[1]	Total		Florida		Louisiana		Michigan		North Carolina		Virginia		NYC		San Francisco	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Positive (New or Previous)	717	6.4%	314	6.6%	55	7.8%	67	12.3%	142	8.6%	27	5.4%	62	2.5%	50	8.9%
Tested Negative	718	12.6%	0	--	195	14.8%	84	17.9%	208	14.3%	75	14.3%	111	8.2%	45	7.6%
Unknown	696	10.5%	519	11.3%	20	6.2%	45	16.1%	54	8.6%	22	9.9%	36	6.2%	0	0.0%
Previous STD diagnosis ever [2]																
Yes	1125	8.3%	381	8.2%	157	12.3%	64	12.7%	273	10.6%	71	10.8%	108	3.7%	71	8.4%
No	998	9.9%	452	9.6%	113	10.6%	124	16.6%	131	11.3%	53	9.1%	101	6.8%	24	7.3%
Previous Syphilis diagnosis ever [2]																
Yes	332	5.2%	143	5.0%	--	--	--	--	100	8.3%	15	6.1%	39	2.3%	35	9.0%
No	1333	9.8%	690	10.6%	--	--	--	--	304	12.1%	109	10.9%	170	6.2%	60	7.6%

1. Missing/unknown values not shown.

2. As determined by either self-report or documented in a surveillance data system