STD testing among pregnant women in the United States, 2011-2015

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Abstract

Introduction: Sexually transmitted diseases (STDs) are increasing in the United States. Pregnant women and infants are susceptible to serious STD-related sequelae; however, some STDs can be cured during pregnancy with appropriate, timely screening.

Methods: We used data from the 2011–2015 National Survey of Family Growth to examine STD testing (in the past 12 months) among women who were pregnant in the past 12 months (n=1,155). In bivariate and multivariable analyses, we examined associations between demographics, health care access and two outcome variables – receipt of chlamydia test and receipt of other STD test.

Results: Among women who were pregnant in the past 12 months, 48% reported receiving a chlamydia test and 54% reported that they received a STD test other than chlamydia in the past 12 months. In adjusted analyses, non-Hispanic black women were more likely to receive a chlamydia test (aOR=2.82, 1.86–4.26) and other STD test (aOR=2.43, 1.58–3.74) than non-Hispanic white women. Women living in a metropolitan statistical area but not the principal city were less likely to report chlamydia (aOR=0.62, 0.44–0.86) and other STD testing (aOR=0.57, 0.40–0.81) than women living in a principal city. Women born outside of the U.S. were significantly less likely to have received a chlamydia test (aOR=0.35, 0.19–0.64) or other STD test (aOR=0.34, 0.20–0.58) while those who had received prenatal care were more likely to receive a chlamydia test (aOR=2.10, 1.35–3.28) or other STD test (aOR=2.32, 1.54–3.49).

Conclusions: Our findings suggest that interventions are needed to increase adherence to recommended STD screenings during pregnancy.

Summary

STD screening during pregnancy is important to prevent adverse pregnancy outcomes. Using national survey data from the United States, we found that many women are not receiving recommended STD screenings during pregnancy. Interventions may be needed to increase awareness of national STD testing recommendations among pregnant women and health care providers.

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Keywords

chlamydia test; national survey

Introduction

In 2017, several nationally reportable sexually transmitted diseases (STD) in the United States (U.S.) – chlamydia, gonorrhea, primary and secondary (P&S) syphilis, and congenital syphilis – increased for the fourth consecutive year.[1] Pregnant women and infants are among the subpopulations that may experience the most significant complications of STD. Among women, the 2017 STD rates per 100,000 population were 682.9 for chlamydia, 140.3 for gonorrhea and 2.3 for P&S syphilis.[1] Additionally, 23.3 congenital syphilis cases per 100,000 live births were reported in 2017 with cases increasing annually since 2012.[1] The prevalence of STDs among pregnant women, especially younger women, can be high. A survey from 2009–2011 of pregnant women in five U.S. states found that 3.3% reported having chlamydia, gonorrhea, syphilis or trichomoniasis during their pregnancy.[2] Women who had low incomes, lacked health insurance and had their first prenatal care visit subsequent to their first trimester were significantly more likely to report a STD during pregnancy.[2] A review of studies focusing on pregnancy in teens found that STD positivity ranged from 19–39% across the studies.[3] The STDs included in the overall positivity totals varied depending on the study but included chlamydia, gonorrhea, or trichomoniasis.[3]

Acquiring a STD during pregnancy is especially problematic as many STDs can be asymptomatic and they can result in a number of complications.[4] Vertical transmission of some STDs during pregnancy can cause significant sequelae, such as adverse pregnancy outcomes, low birth weight, blindness, neurological and developmental issues, and stillbirth. [5–7] However, congenital STDs are often preventable with appropriate access to, and use of, health services including STD testing and treatment. Thus, the U.S. Centers for Disease Control and Prevention (CDC) recommends screening pregnant women for several STDs with the goal of preventing perinatal infections and associated complications. At the first prenatal visit or early in pregnancy, the CDC recommends that all pregnant women should be tested for syphilis, and pregnant women < 25 years, or older pregnant women who are at increased risk for STDs, should be tested for chlamydia and gonorrhea.[8] For women who live in areas with high levels of syphilis or who are at high risk for acquiring syphilis, CDC recommends additional screening around 28 weeks (or early in the third trimester) and at delivery.[8] Prenatal syphilis screening is extremely important to prevent congenital syphilis, and a recent assessment of U.S. state policies found that 45 states (out of the 50 states plus the District of Columbia) have requirements for prenatal syphilis screening.[9] The majority of states (84%) required syphilis screening at the first prenatal visit and 33% required screening in the third trimester either for all pregnant women or those at high risk for syphilis.[9]

Previous U.S. studies focusing on STD testing or screening among pregnant women using health insurance claims data or surveys of providers have been helpful; [10–13] however, they have had some limitations. The U.S. health care system is comprised of private and public health insurers with Medicaid serving as the public insurance option for non-elderly,

impoverished persons. Medicaid is a federal-state partnership and income-based eligibility can vary by state. In 2013, 13.3% of persons were uninsured, 64.1% had private insurance, 17.5% had Medicaid and the rest had Medicare (public health insurance for elderly persons) or military insurance.[14] Studies using health insurance claims data typically do not include data from all health plans or, when using Medicaid data, from all states. These studies also do not include uninsured women and have typically limited analyses to women who had received prenatal care. Some women who are uninsured may not meet the Medicaid eligibility requirements, such as being a legal U.S. resident, and others may not be aware that their pregnancy may qualify them for Medicaid. Even among women with health insurance, some receive late or no prenatal care—ranging from 2.7% of those with private insurance to 8.6% of women with Medicaid in 2016; among women who self-paid for medical care, 19.8% received late or no prenatal care.[15] To assess provider practices, surveys are often used as they can capture more information from a larger geographic area than medical chart reviews. However, provider surveys are limited in that they ask providers to generalize their STD testing and screening practices across groups of patients so they may not represent all clinical encounters.

Given recent increases in STDs and the gaps in the existing literature, it is important to assess STD-related testing received by all U.S. pregnant women, including those who are uninsured. Research has found that persons who lack health insurance are less likely to report having a usual place for medical care and seeing a medical provider.[16] Thus, we used data from a U.S. national survey of reproductive aged women to assess receipt of STD testing among women who were currently pregnant or had been pregnant in the past 12 months. We also aimed to determine if receipt of STD testing among pregnant women differed by demographics and health care access and use.

Methods

Data

We used data from women who participated in the 2011–2015 National Survey of Family Growth (NSFG). NSFG is a national probability survey of women and men aged 15–44 years and is representative of the US household population. The 2011–2015 NSFG included 11,300 women with a 72% response rate for women. Details on sampling for the NSFG have been published elsewhere.[17] NSFG used both computer assisted personal interview (CAPI) and audio computer assisted self-interview (ACASI) for data collection. The survey was approved by the National Center for Health Statistics research ethics review board; all respondents provided informed consent with assent and parental consent provided for those 15–17 years old. During the CAPI, women provided information on all pregnancies including timing. For this analysis, we included only women who reported a pregnancy in the past 12 months or who were pregnant at interview or (n=1,155).

Measures

We included two dependent variables collected via ACASI: 1) received chlamydia test in past 12 months, and 2) received STD test other than chlamydia (gonorrhea, syphilis or herpes were provided as examples) in past 12 months. We recoded "don't know" responses

as missing. "Don't know" responses represented less than one percent of responses. Our independent variables were collected via CAPI and included demographics and measures of health care access and use. Our primary pregnancy variable was whether the respondent was pregnant within 12 months of interview (pregnant in past 12 months). Given that CDC screening recommendations for pregnant women stress screening in early pregnancy or the first prenatal visit, we also calculated pregnancy-postpartum status at the time of interview (n=1,041) using 3 groups: 1) early pregnancy (first trimester); 2) late pregnancy (second and third trimester); and 3) postpartum (<=6 months from delivery). Women who had delivered > 6 months were not included. Demographic variables consisted of: 1) race/ethnicity (Hispanic, non-Hispanic black, non-Hispanic white, non-Hispanic other); 2) poverty income ratio, which is the ratio of household income to the federal poverty level and was coded using the Medicaid expansion cutoff (0–133%, 134% or higher); 3) age (15–24 years, 25–44 years); 4) living in a metropolitan statistical area (area with relatively high population density and economic connections), MSA (yes, principal city; yes, other MSA; not in MSA); and 5) born outside of the U.S. (yes, no). Measures of health care access and use included: 1) current health insurance (private, Medicaid/Medicare, none); 2) lacked health insurance at any time during past 12 months (yes, no); 3) has a usual place for medical care (yes, no); and received prenatal care in the past 12 months (yes, no). The coding for Medicaid/Medicare also included military and other government health care but will be referred to as Medicaid/Medicare. Usual place for care was included as a general measure of health care access and use; it was not used as a measure for having a place for prenatal care. For all variables, "refused" responses were coded as missing.

Analyses

We used SAS-callable (Release 9.3, SAS Institute, Cary, North Carolina) SUDAAN (Release 11.0.1, Research Triangle Institute, Research Triangle Park, North Carolina) for data analyses. Our analyses accounted for the complex sampling methods (e.g., stratification and clustering) used by NSFG. For all analyses, weights were also used to represent sexually active women aged 15–44 years living in U.S. households who were pregnant in the past 12 months. First, among women who were pregnant at time of interview or had been pregnant in the past 12 months, we examined receipt of chlamydia test and receipt of other STD testing in the past 12 months by demographics and health care access and use. Next, we examined receipt of chlamydia and other STD testing among women pregnant-postpartum at time of interview. Wald's chi-square tests were used for bivariate analyses, separately for each dependent variable. Variables with p < .25 were included in separate adjusted logistic regression models for received chlamydia test and received other STD test in past 12 months. 95% confidence intervals (CI) were also calculated.

Results

Demographics

Among the 1,155 women who reported a pregnancy in the past 12 months, most (72%) were aged 25–44 years, half (51%) were non-Hispanic white and 45% had an income at or below the Medicaid expansion poverty level (Table 1). Half of pregnant women lived in a MSA but not the principal city, 36% lived in a principal city and 15% lived outside of a MSA. 18%

were born outside of the U.S. Regarding health care access, 15% of women who were pregnant in the past year were uninsured, 49% had private insurance and 36% had Medicaid or Medicare. Additionally, 23% lacked health insurance at any time during the past 12 months, while 85% had a usual place for medical care and 75% had received prenatal care in the past 12 months.

Chlamydia test among women pregnant in past 12 months

Almost half (48%) of women who were pregnant in the past 12 months reported that they received a chlamydia test in the past 12 months (Table 2). In bivariate analyses, several demographic factors were significantly associated with receipt of a chlamydia test among these women: race/ethnicity, poverty income ratio, age, living in a MSA, and born outside of the U.S. Specifically, non-Hispanic black women (68.9%, 61.0–75.9) had the highest reports of receipt of a chlamydia test among women who were pregnant in the past 12 months. Younger women (15–24 years) had significantly higher reports (58.3%, 50.7–65.5) of chlamydia testing than women aged 25–44 years (43.6%, 38.1–49.3), and women living below the Medicaid expansion poverty level had higher reports (55.8%, 50.3–61.2) than women who had household incomes above this level (41.4%, 35.0–48.1). For living in a MSA, women living in the principal city of a MSA had the highest reports of receipt of chlamydia testing (55.6%, 49.0–62.1). Conversely, women who were born outside the U.S. had significantly lower reports of chlamydia testing (28.7%, 18.2–42.0) compared to those born in the U.S. (51.5%, 46.2–56.8). Finally, in bivariate analyses, two of the health care access variables were significantly associated with chlamydia testing among women who were pregnant in the past 12 months – current health insurance and receipt of prenatal care in the past 12 months. Those who had Medicaid or Medicare had the highest reports of chlamydia testing (63.8%, 58.1–69.2), and half of those who had received prenatal care (51.4%, 46.1–56.7) received a chlamydia test. All of these variables were included in an adjusted model.

In the adjusted model, among women who had been pregnant in the past 12 months, several variables continued to significantly predict receipt of a chlamydia test in the past 12 months (Table 4). Non-Hispanic black women (aOR=2.82, 1.86–4.26) were significantly more likely to receive a chlamydia test than non-Hispanic white women. As compared to women living in the principal city of a MSA, women living in other areas of a MSA (aOR=0.62, 0.44–0.86) were less likely to have received a chlamydia test. Women who were born outside of the U.S. (aOR=0.35, 0.19–0.64) were significantly less likely than women born in the U.S. to have received a chlamydia test. As compared to uninsured women, those on Medicaid or Medicare (aOR=2.55, 1.52–4.28) were more likely to receive a chlamydia test. Finally, women who were pregnant in the past 12 months and reported receiving prenatal care (aOR=2.10, 1.35–3.28) were more likely to have received a chlamydia test than women who had not received prenatal care.

Other STD tests among women pregnant in past 12 months

Just over half (54%) of women who were pregnant in the past 12 months reported that they received a STD test other than chlamydia in the past 12 months (Table 3). In bivariate analyses, findings were similar to the findings for chlamydia testing with the following

variables being significant predictors of receipt of other STD test: race/ethnicity, poverty income ratio, age, living in a MSA, born outside of U.S, current health insurance and received prenatal care. Within subgroups containing significant differences, the highest reports of receipt of other STD test were for non-Hispanic black women (71.2%, 64.1–77.4), women with an income of < 134% of the federal poverty level (60.0%, 54.5–65.3), younger women (65.2%, 58.2–71.5), women who had Medicaid or Medicare (66.0%, 59.9–71.6) and women who had received prenatal care in the past 12 months (58.2%, 39.9–52.4). The lowest reports of receipt of STD test other than chlamydia, where there were significant differences, were for women born outside of the U.S. (34%) and women who lived in a MSA but not a principal city (46%).

In adjusted analyses for other STD test in past 12 months, findings were mostly similar to the adjusted model for chlamydia testing. Among women who were pregnant in the past 12 months, non-Hispanic black women (aOR=2.43, 1.58–3.74) were more likely to have received other STD testing than non-Hispanic white women. Women living in a MSA but not the principal city (aOR=0.57, 0.40–0.81) were less likely to report testing than women living in a principal city. Also, women born outside of the U.S. (aOR=0.34, 0.20–0.58) were less likely to have received other STD testing than women born in the U.S. Finally, women who had received prenatal care in the past 12 months (aOR=2.32, 1.54–3.49) were more likely to have received other STD testing than women who did not receive prenatal care. Unlike the adjusted model for chlamydia testing, current health insurance was not a significant predictor of receiving other STD testing.

STD testing among women pregnant-postpartum at interview

Among women who were pregnant or postpartum at the time they were interviewed, 49.5% had received a chlamydia test and 58.0% had received other STD testing in the past 12 months (refer to Table S1). Reports of testing were lowest for women who were in early pregnancy (32–38%), when CDC guidelines recommend screening, followed by women who were in late pregnancy (50–60%) and postpartum (54–62%).

Discussion

In our study, overall screening estimates for women who were pregnant or postpartum at interview and who had been pregnant in the past 12 months were similar. These screening estimates were lower than estimates from studies that use health insurance plan data and focus on women who received prenatal care.[10,11] However, our findings included insured women as well as women who were uninsured and those who had health insurance but did not have prenatal care (e.g., women who may have been underinsured). Furthermore, our estimates for some subgroups are similar to those from other studies. For example, our study estimate for chlamydia testing among women who had Medicaid and had been pregnant in the past year was similar to findings from a 2013 study.[18] Our study findings also expand those from a previous study that found prenatal syphilis screening rates to be "suboptimal" among insured women who had a stillbirth.[12] All pregnant women should be screened for syphilis.[8] Finally, consistent with previous research on STD testing among women on Medicaid by race/ethnicity,[19] we found that non-Hispanic black women had higher reports

of chlamydia and other STD testing than other women, among those who were pregnant in the past year.

One of the advantages of our study is that we were able to provide national estimates of STD testing among pregnant women across several subpopulations. Specifically we found lower testing rates (chlamydia and other STD) for women who lived in MSAs but outside of the principal city (e.g., suburban areas) than women who lived in other areas. These results were somewhat surprising given research demonstrating lower access to health care in rural areas of the U.S than in MSAs[20] and fewer health care workers in rural settings.[21] Furthermore, one report found that persons living in suburban areas tended to have better health indicators than those living in other areas and had lower infant mortality rates.[21] We also found that STD testing among women who were pregnant in the past 12 months was substantially lower among women who were not U.S. natives. These findings are consistent with research on general health care access and immigrants. In the U.S., immigrants are less likely to have health insurance and a usual place for health care than U.S. natives.[22] A study of Latino immigrants in Los Angeles examined various barriers to health care access.[23] Frequently cited barriers to care included financial issues including lacking health insurance, issues with communication and long delays at public clinics or hospitals.[23]

Our study also identified two health care access factors associated with STD testing including receipt of prenatal care (chlamydia and other STD test) and health insurance status (chlamydia test only). Our findings that pregnant women on Medicaid or Medicare were more likely to have received a chlamydia test than women who were uninsured were similar to a previous analysis of the 2006–08 NSFG that found that young women who had Medicaid were twice as likely as women with private insurance to have received a chlamydia test in the past 12 months.[24] Insurance status is also important given that some populations (e.g., those who are not legal U.S. residents) may not qualify for Medicaid during pregnancy. We also found that pregnant women who had received prenatal care were more likely than those who did not receive prenatal care to have received chlamydia and other STD testing. Timely prenatal care is important for timely and appropriate prenatal syphilis screening. A study of pregnant women attending an emergency department who had not received prenatal care found an 11% syphilis prevalence among this group.[25] Even pregnant women who have health insurance may not have timely access to care. A study in Louisiana found that the lack of availability of prenatal health care providers who accepted Medicaid may have led to delays in prenatal care.[26] Some pregnant women also reported barriers in getting to prenatal care appointments given lack of transportation and childcare; others who obtained prenatal care may not have received CDC recommended screenings.[26]

Regardless of screening recommendations, our findings of different reports of testing among some subpopulations suggest that it is possible that these groups or their health care providers may perceive some to be at increased risk for STD. For instance, non-Hispanic black women are at disproportionate risk for reportable STDs in the U.S.[1] Poverty, a key factor in eligibility for Medicaid, has also been associated with STDs.[27] However, access to and use of care is also important with pregnant women who received prenatal services having higher reports of STD testing.

Our study has some limitations. The primary limitation is that information on chlamydia and other STD testing was obtained via self-report which is subject to recall bias. Women may have been tested for chlamydia or other STDs but were not aware. This type of underreporting may be especially relevant for pregnant women as they may undergo multiple tests at the same time. It is also possible that respondents assumed that they had received testing when testing had not been conducted or they did not fully understand which STI tests they received. For example, HIV testing is also recommended for all pregnant women. Very few women in our analytic sample reported "don't know" to either of our outcome measures but reports of "don't know" were slightly higher for chlamydia testing (n=9) than other STD testing (n=7). Another limitation of our study was that the timeframe for our STD testing related outcome measures focused on the past 12 months rather than during pregnancy; thus, some testing may have occurred outside of pregnancy. The chlamydia and other STD testing that was reported could have been received prior to pregnancy for some women. Conversely, some of the women who were pregnant may not have obtained prenatal care prior to interview which would not have given them the opportunity to have received STD testing. However, our estimates for testing for women pregnant during the past 12 months were similar to those for women who were pregnant or postpartum at time of interview. Our measure of pregnancy may include women whose pregnancies may have ended before a first prenatal care visit. Finally, we were not able to include a measure that focused specifically on syphilis testing and were not able to examine when a woman received prenatal care in relation to when she received STD testing.

Our study of self-reported chlamydia and other STD testing among women who had been pregnant in the past year found less than ideal levels of recommended STD testing as all women should receive a test for syphilis at the first prenatal visit. Even if underreporting is present in our data, rates of testing are suboptimal for a population who is especially vulnerable to the sequelae of STDs. In the U.S., congenital syphilis has increased 153% from 11.6 cases per 100,000 live births in 2013 to 23.3 in 2017.[1] Timely prenatal STI screening and appropriate treatment can prevent some poor pregnancy and birth outcomes. Interventions may be needed to increase awareness of CDC's STD testing recommendations among pregnant women and health care providers. Departments of health and other public health programmes may want to provide targeted interventions or education to providers who see a high volume of pregnant women. Our findings also highlight the importance of obtaining prenatal care to receive recommended STD screenings during pregnancy.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1.

Demographics and health care access among women who were pregnant in the past 12 months, 2011–15 (n=1155)

Note. Percentages are weighted. CI = confidence interval. Ns for each variable may not total 1155 due to missing values. MSA is an area with relatively high population density and economic connections.

	N	% (95% CI)
Overall		
Demographics		
Race/ethnicity		
Hispanic/Latino	323	22.9 (19.1–27.2)
Non-Hispanic white	460	50.9 (46.2–55.6)
Non-Hispanic black	302	18.8 (15.5–22.5)
Non-Hispanic other	70	7.4 (5.0–10.9)
Poverty income ratio		
0–133%	607	44.9 (40.2–49.8)
134% or higher	548	55.1 (50.2–59.9)
Age		
15–24 years	365	28.2 (24.3–32.3)
25–44 years	790	71.9 (67.7–75.7)
Metropolitan statistical area (MSA)		
Yes, principal city of MSA	482	35.5 (30.0–41.4)
Yes, other MSA	497	49.7 (43.4–56.1)
Not MSA	176	14.8 (11.0–19.7)
Born outside of the U.S.		
Yes	207	17.5 (14.2–21.5)
No	948	82.5 (78.5–85.8)
Health care access		
Current health insurance		
Private	451	49.3 (44.1–54.4)
Medicaid or Medicare	530	36.2 (31.9–40.9)
None	174	14.5 (11.5–18.0)
Lacked health insurance at any time (past 12 months)		
Yes	282	22.7 (19.2–26.6)
No	873	77.3 (73.4–80.8)
Has a place for usual medical care		
Yes	959	85.3 (82.1–88.1)
No	196	14.7 (11.9–17.9)
Received prenatal service in past 12 months		
Yes	841	75.2 (70.9–79.1)
No	313	24.8 (20.9–29.2)

Table 2.

Receipt of chlamydia test (past 12 months) among women who were pregnant in past 12 months by demographics and health care access, 2011–15 (n=1129)

Data are weighted and presented as % (95%CI). CI = confidence interval. MSA is an area with relatively high population density and economic connections.

	Received chlamydia test	Did not receive chlamydia test	P value
Overall	47.8 (43.2–52.4)	52.2 (47.6–56.8)	
Demographics			
Race/ethnicity			<0.001
Hispanic/Latino	48.2 (38.7–57.8)	51.8 (42.2–61.3)	
Non-Hispanic white	42.3 (36.0–48.9)	57.7 (51.1–64.0)	
Non-Hispanic black	68.9 (61.0–75.9)	31.1 (24.1–39.0)	
Non-Hispanic other	29.7 (17.5–45.8)	70.3 (54.2–82.5)	
Poverty income ratio			0.001
0–133%	55.8 (50.3–61.2)	44.2 (38.8–49.7)	
134% or higher	41.4 (35.0–48.1)	58.6 (51.9–65.0)	
Age			0.003
15–24 years	58.3 (50.7–65.5)	41.7 (34.5–49.3)	
25–44 years	43.6 (38.1–49.3)	56.4 (50.7–62.0)	
Metropolitan statistical area (MSA)			0.003
Yes, principal city of MSA	55.6 (49.0–62.1)	44.4 (37.9–51.0)	
Yes, other MSA	40.5 (34.4–46.9)	59.5 (53.1–65.6)	
Not MSA	53.3 (42.5–63.8)	46.7 (36.2–57.5)	
Born outside of the U.S.			<0.001
Yes	28.7 (18.2–42.0)	71.4 (58.0–81.8)	
No	51.5 (46.2–56.8)	48.5 (43.2–53.8)	
Health care access			
Current health insurance			<0.001
Private	39.6 (32.7–46.9)	60.4 (53.1–67.3)	
Medicaid or Medicare	63.8 (58.1–69.2)	36.2 (30.8–41.9)	
None	36.8 (28.6–46.0)	63.2 (54.0–71.4)	
Lacked health insurance at any time (past 12 months)			0.289
Yes	43.7 (36.3–51.3)	56.3 (48.7–63.7)	
No	49.0 (43.4–54.6)	51.0 (45.4–56.7)	
Has a place for usual medical care			0.396
Yes	48.4 (43.3–53.5)	51.6 (46.5–56.7)	
No	44.1 (35.4–53.1)	55.9 (46.9–64.6)	
Received prenatal service (past 12 months)			0.008
Yes	51.4 (46.1–56.7)	48.6 (43.3–54.0)	
No	37.0 (29.1–45.7)	63.0 (54.3–70.9)	

Table 3.

Receipt of any STD testing other than chlamydia (past 12 months) among women who were pregnant in the past 12 months by demographics and health care access, 2011–15 (n=1136)

Data are weighted and presented as % (95%CI). CI = confidence interval. MSA is an area with relatively high population density and economic connections.

	Received STD test other than chlamydia	Did not receive STD test other than chlamydia	P value
Overall	53.9 (49.3–58.4)	46.1 (41.6–50.7)	--
Demographics			
Race/ethnicity			<.001
Hispanic/Latino	55.3 (47.4–62.9)	44.8 (37.1–52.6)	
Non-Hispanic white	49.5 (42.6–56.4)	50.6 (43.7–57.4)	
Non-Hispanic black	71.2 (64.1–77.4)	28.8 (22.6–35.9)	
Non-Hispanic other	34.9 (22.6–49.6)	65.1 (50.4–77.4)	
Poverty income ratio			.018
0–133%	60.0 (54.4–65.3)	40.1 (34.7–45.6)	
134% or higher	49.0 (42.3–55.8)	51.0 (44.2–57.7)	
Age			<.001
15–24 years	65.2 (58.2–71.5)	34.8 (28.5–41.8)	
25–44 years	49.4 (43.8–55.0)	50.6 (45.0–56.2)	
Metropolitan statistical area (MSA)			.002
Yes, principal city of MSA	62.1 (55.9– 67.9)	37.9 (32.1–44.1)	
Yes, other MSA	46.1 (39.9–52.4)	53.9 (47.6–60.1)	
Not MSA	60.1 (47.8–71.2)	39.9 (28.8–52.2)	
Born outside of the U.S.			<.001
Yes	34.0 (24.4–45.1)	66.0 (54.9–75.6)	
No	57.8 (52.4–63.0)	42.2 (37.0–47.6)	
Health care access			
Current health insurance			<.001
Private	47.4 (40.0–55.0)	52.6 (45.1–60.0)	
Medicaid or Medicare	66.0 (59.9–71.6)	34.0 (28.4–40.1)	
None	46.7 (36.2–57.5)	53.3 (42.5–63.8)	
Lacked health insurance at any time (past 12 months)			
Yes	54.5 (46.0–62.9)	45.5 (37.2–54.0)	.870
No	53.7 (48.2–59.1)	46.3 (40.9–51.8)	
Has a place for usual medical care			.651
Yes	53.5 (48.6–58.3)	46.5 (41.7–51.4)	
No	56.1 (45.5–66.2)	43.9 (33.9–54.5)	
Received prenatal service (past 12 months)			.001
Yes	58.2 (53.4–62.9)	41.8 (37.1–46.7)	
No	40.9 (32.6–49.7)	59.1 (50.3–67.4)	

Table 4.

Adjusted analyses for receipt of chlamydia testing and receipt of STD testing other than chlamydia (past 12 months) among women who were pregnant in the past 12 months, 2011–15

Data are presented as aOR (95%CI). Note. ref = reference group. aOR = adjusted odds ratio. CI = confidence interval. MSA is an area with relatively high population density and economic connections.

	Received chlamydia test (n=1129)		Received STD test other than chlamydia (n=1136)	
Demographics				
Race/ethnicity				
Hispanic/Latino	1.47	(0.90–2.42)	1.52	(0.99–2.33)
Non-Hispanic white (ref)	1.00		1.00	
Non-Hispanic black	2.82	(1.86–4.26)	2.43	(1.58–3.74)
Non-Hispanic other	0.92	(0.49–1.71)	0.88	(0.47–1.66)
Poverty income ratio				
0–133%	1.37	(0.92–2.06)	1.24	(0.82–1.85)
134% or higher (ref)	1.00		1.00	
Age				
15–24 years	1.05	(0.70–1.59)	1.24	(0.86–1.79)
25–44 years (ref)	1.00		1.00	
Metropolitan statistical area (MSA)				
Yes, principal city of MSA (ref)	1.00		1.00	
Yes, other MSA	0.62	(0.44–0.86)	0.57	(0.40–0.81)
Not MSA	0.87	(0.51–1.49)	0.84	(0.46–1.53)
Born outside of the U.S.				
Yes	0.35	(0.19–0.64)	0.34	(0.20–0.58)
No (ref)	1.00		1.00	
Health care access				
Current health insurance				
Private	1.39	(0.87–2.23)	--	--
Medicaid or Medicare	2.55	(1.52–4.28)	--	--
None (ref)	1.00		--	--
Received prenatal service (past 12 months)				
Yes	2.10	(1.35–3.28)	2.32	(1.54–3.49)
No (ref)	1.00		1.00	