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High Volume and High Positivity of Chlamydia and Gonorrhea Tests by Anatomic Site from a Large National Laboratory in the United States, 2019–2023

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Abstract

Background: Chlamydia and gonorrhea are among the most commonly reported sexually transmitted infections (STIs) in the U.S. Testing for chlamydia and gonorrhea infection can be conducted by anatomic site (site-specific). Monitoring testing volume and positivity by anatomic site is important.

Methods: Using a large national laboratory dataset, we assessed chlamydia and gonorrhea test volume and positivity by anatomical site in patients aged 15–60 years.

Results: The data contained 45 million tests each for chlamydia and gonorrhea for 2019–2023. Of chlamydia tests, 71.6% were for women. Among women, 0.4%, 1.5%, and 98.1% were performed on rectal, pharyngeal, and urogenital specimens; chlamydia positivity was 7.3%, 2.0%, and 4.3%, respectively. Among men, 10.5%, 13.7%, and 75.8% were performed on rectal, pharyngeal, and urogenital specimens; chlamydia positivity was 8.0%, 1.4%, and 6.3%, respectively. Among people aged 15–24 years, chlamydia positivity was 12.8% for rectal, 3.4% for pharyngeal, and 8.7% for urogenital among women, and 11.6%, 2.4%, and 12.2% among men, respectively. Gonorrhea testing volume overall and by age and sex was similar to that of chlamydia. Gonorrhea rectal, pharyngeal, and urogenital positivity was 3.2%, 2.4%, and 1.0% among women; 6.8%, 5.2%, and 3.3% among men; and 4.3%, 3.0%, and 1.6% among women aged 15–24 years, and 10.5%, 7.2%, and 4.6% among men aged 15–24 years, respectively.

Conclusion: Although men accounted for <30% of overall chlamydia and gonorrhea testing, they accounted for a majority of extragenital testing. High rates of chlamydia and gonorrhea positivity by specimen type among many demographic groups, especially for extragenital specimens from men and young people, highlight the importance of STI prevention in the U.S.

Keywords

chlamydia and gonorrhea tests; positivity; specimen; anatomic site; laboratory data; extragenital testing

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Chlamydia and gonorrhea are among the most common reportable sexually transmitted infections (STIs) in the United States (U.S.). In 2022, a total of 1,649,716 cases of *Chlamydia trachomatis* infection and a total of 648,056 cases of gonorrhea were reported, making them the two most common nationally notifiable STIs in the U.S. for that year.(1) Asymptomatic chlamydial infection is common among both men and women.(2) To detect chlamydia or gonorrhea, healthcare providers frequently rely on screening and diagnostic testing. Annual chlamydia and gonorrhea screening among sexually active women aged <25 years, prenatal chlamydia and gonorrhea screening among pregnant women, and routine chlamydia and gonorrhea screening among sexually active men who have sex with men (MSM) are recommended.(2) Previous studies have shown that among patients who had access to healthcare, about 47%–62% of sexually active women aged 16–24 years were tested annually for chlamydia, 60%–77% of pregnant women were tested prenatally for chlamydia and gonorrhea, and 70% of MSM were routinely tested for chlamydia or gonorrhea. (3–7)

Patients may have chlamydia and gonorrhea at different anatomic sites (rectal, pharyngeal, and urogenital), and infections at different anatomic sites may have different implications for chlamydia and gonorrhea transmission and treatment.(8–10) For example, anogenital or rectal infections are more likely to potentiate HIV transmission than pharyngeal infections, and pharyngeal gonorrhea is more difficult to cure than urogenital gonorrhea.(9, 10) In terms of chlamydia and gonorrhea infection at different anatomic sites, the current Centers for Disease Control and Prevention (CDC) guidelines also recommend that rectal chlamydia screening should be performed among men who report sexual activity at the rectal site and that MSM should be routinely screened at all anatomic sites of exposure for gonorrhea.(2) Previous studies have shown that a substantial proportion of chlamydial and gonococcal infections may be missed with only urogenital testing.(11, 12) Because the current national STI surveillance report does not report chlamydia and gonorrhea cases by anatomic site in the U.S. (1), only a few studies provide the limited information related to frequency of chlamydia and gonorrhea tests or positivity by anatomic site.(11, 13, 14) Those studies have shown that the proportion of chlamydia and gonorrhea tests that were from the rectal anatomic site among women was much lower than among men (<0.1% for women vs. 4% for men) in 2012–2015, and rectal chlamydia and gonorrhea positivity was high both among women (2.8% for gonorrhea and 8.8% for chlamydia) in 2012–2015 and among men (8.8% for gonorrhea and 11.0% for chlamydia) in 2013–2015, and especially high among MSM (13%–17% for rectal gonorrhea, 16%–18% for rectal chlamydia, 3%–4% for pharyngeal chlamydia, and 7%–15% for pharyngeal gonorrhea) in 2010–2018.(14) On May 23, 2019, the US Food and Drug Administration (FDA) cleared the first diagnostic tests for extragenital testing for chlamydia and gonorrhea.(15) With this FDA approval, healthcare providers and laboratories were broadly able to collect rectal and oropharyngeal specimens for chlamydia and gonorrhea testing from persons engaged in oral sex or receptive anal sex without having to find a laboratory that had gone through the Clinical Laboratory Improvement Amendments (CLIA) validation process for unapproved assays.(16) However, volume and positivity of chlamydia and gonorrhea tests by anatomic site have not been assessed after this FDA approval in the U.S.

In this study, we aimed to describe the volume/number and positivity of chlamydia and gonorrhea tests recently performed by anatomic site, and further stratified by patients' age, sex, healthcare provider type, and region, using data from a large national laboratory.

METHODS

Data were obtained from a large commercial U.S. laboratory that performs testing in all 50 states and the District of Columbia and were transferred to CDC's National Syndromic Surveillance Program (NSSP). These data arrive at NSSP via HL7 (Health Level Seven refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers) message every ten minutes; at the time a provider orders the test from the laboratory company. The result of the test is then updated when available. Testing data were identified using an encounter identifier (Accession_ID). Under a given Accession_ID, there may be multiple records for the given patient. For example, healthcare providers could collect and request testing for chlamydia and gonorrhea from rectal, pharyngeal, or urogenital sites and the data might contain 6 records under the assigned Accession_ID. However, there is no patient-level identifier that can be linked longitudinally. The data used in this study were from 2019 to 2023.

Because most chlamydia and gonorrhea cases were reported from persons aged 15–60 years in U.S., chlamydia and gonorrhea tests were included if specimens were from patients aged 15–60 years who resided in the U.S. and had results that were either positive or negative.⁽¹⁾ In general, chlamydia and gonorrhea tests were identified by a text field of 'C_Result_Test_Description', chlamydia and gonorrhea test results were identified by another text field of 'C_Result_Description', and specimen type was identified by a numeric field of 'C_Result_Test_Code' in the dataset. Among all test results, tests with other results, such as test not performed or inconclusive were excluded. For specimen type, 'C_Result_Test_Code' was corresponded with anatomic site, such as rectal, anal, pharyngeal, oral, throat, vaginal, endocervical, urine, blood, or serum. We excluded any blood or serum specimens for chlamydia or gonorrhea tests in this study to maintain the focus on specific anatomical site testing. We classified rectal or anal specimens as "rectal" testing, pharyngeal, oral, or throat specimens as "pharyngeal" testing, and vaginal, endocervical, urine, or urethral specimens as "urogenital" testing. For a given Accession_ID with chlamydia (gonorrhea) testing, the number of chlamydia (gonorrhea) tests ranged from 1 to 3, depended on which of rectal, pharyngeal, and urogenital specimens were collected.

Analyses were stratified by patient sex (men and women), age group (15–24 years, 25–34 years, 35–44 years, and 45–60 years), and U.S. Census region (Northeast, Midwest, South, and West). In addition, analyses were stratified by clinical setting and provider specialty: primary care providers (family practice, general practice, and internal medicine), obstetrics and gynecology, infectious disease, multiple specialty group, hospital/emergency department, public health, pediatrician, and others. The dates of chlamydia and gonorrhea tests were based on the dates the tests were received by the laboratory facility, not the dates of the results.

Overall percent positive or positivity was defined as the total number of tests that were positive divided by the total number of tests that were either positive or negative. Percent positive for a given anatomic site was defined as the total number of tests that were positive at the given anatomic site divided by the total number of tests that were either positive or negative for the given anatomic site.

SAS version 9.4 (Cary, NC) was used for analyses. A chi-squared test was used to test the statistical significance between number and positivity of specimen-related tests by patient characteristics. With large sample sizes used in this study, only the chi-squared test with $p < .0001$ was considered as statistically significant.

The database was originally created under the CDC's National Syndromic Surveillance Program- under federal law and CDC policy [Public Health Surveillance 45 CFR 46.102(l)(2)]. No Institutional Review Board (IRB) approval was needed for these analyses as these were deemed to be secondary data analysis of unidentifiable data.

RESULTS

Proportion of Encounters with Chlamydia or Gonorrhea Tests

About 181 million encounters (by Accession_ID) for people aged 15–60 years who resided in the U.S. were documented during 2019–2023 in this lab database: 66.7% for women and 33.3% for men. Of those 181 million encounters, 41 (22.3%) million encounters had specimens ordered for chlamydia or gonorrhea testing: specifically, 25.2% among women and 16.6% among men.

Among these 41 million encounters, there were about 46.0 million chlamydia tests and 45.8 million gonorrhea tests from rectal, pharyngeal, or urogenital sites of collection. Of these 46.0 million chlamydia tests and 45.8 million gonorrhea tests, about 45.3 million (98.4%) and 45.5 million (99.4%) had valid test results, respectively.

Number and Proportion of Chlamydia and Gonorrhea Tests by Anatomic Site

Based on the 45.3 million chlamydia tests with a valid test result, the annual number of chlamydia tests increased from 7.6 million in 2019 to 10.9 million in 2023. Of these 45.3 million chlamydia tests, 71.6% were for women; 30.4% and 36.9% for people aged 15–24 years and 25–34 years; 51.7% for people who resided in the South; 28.7%, 26.1%, and 8.1% for people who were cared for by providers specializing in primary care, obstetrics and gynecology, and infectious disease, respectively (Table 1).

The proportion of all chlamydia tests that were rectal, pharyngeal, and urogenital were 2.7%, 4.1%, and 93.2% in 2019, and 4.0%, 6.4%, and 89.6% in 2023 (Table 1). Of chlamydia tests, 10.5%, 13.7%, and 75.8% were performed on rectal, pharyngeal, and urogenital specimens among men, while 0.5%, 1.6%, and 97.9% among women ($p < .0001$). Of chlamydia tests, 2.5%, 3.9%, and 93.6% were performed on rectal, pharyngeal, and urogenital specimens among people who were cared for by primary care doctors, compared to 0.1%, 0.3%, and 99.6% by obstetrics and gynecology and 20.9%, 28.8%, and 50.3% by infectious disease

doctors ($p<.0001$). Of all rectal, pharyngeal, and urogenital tests performed among men and women, respectively, 91.4%, 78.1%, and 23.5% were collected from men.

The number of gonorrhea tests overall and by anatomic site, plus by age, sex, region, provider specialty, and year was similar to that of chlamydia tests.

Positivity of Chlamydia and Gonorrhea Tests by Anatomic Site

Overall, chlamydia rectal, pharyngeal, and urogenital positivity was 8.0%, 1.5%, and 4.8%, respectively (Table 2). Positivity was 7.3% for rectal, 2.0% for pharyngeal, and 4.3% for urogenital among women, and 8.0% for rectal, 1.4% for pharyngeal, and 6.3% for urogenital among men. Positivity was 8.2% for rectal, 1.5% for pharyngeal, and 3.5% for urogenital among people who were cared for by infectious disease doctors, and 8.6% for rectal, 2.0% for pharyngeal, and 3.5% for urogenital among people who were cared for by obstetrics and gynecology doctors. Of chlamydia tests among people aged 15–24 years, positivity was 12.8% for rectal, 3.4% for pharyngeal, and 8.7% for urogenital among women, and 11.6% for rectal, 2.4% for pharyngeal, and 12.2% for urogenital among men (Figure 1).

Of all chlamydia positive tests, 64.2%, 28.7%, and 5.0% were from female urogenital, male urogenital, and male rectal specimens, respectively.

Overall, gonorrhea rectal, pharyngeal, and urogenital positivity was 6.4%, 4.6%, and 1.5%, respectively (Table 2). Positivity was 3.2% for rectal, 2.4% for pharyngeal, and 1.0% for urogenital among women, and 6.8% for rectal, 5.2% for pharyngeal, and 3.3% for urogenital among men. Positivity was 7.1% for rectal, 4.9% for pharyngeal, and 2.0% for urogenital among people who were cared for by infectious disease doctors, and 5.4% for rectal, 3.4% for pharyngeal, and 0.6% for urogenital among people who were cared for by obstetrics and gynecology doctors. Of gonorrhea tests among people aged 15–24 years, positivity was 4.3% for rectal, 3.0% for pharyngeal, and 1.6% for urogenital among women, and 10.5% for rectal, 7.2% for pharyngeal, and 4.6% for urogenital among men (Figure 2).

Of all gonorrhea positive tests, 38.7%, 36.7%, 11.4%, and 11.1% were from male urogenital, female urogenital, male pharyngeal, and male rectal specimens, respectively.

Coinfections among encounters with both chlamydia and gonorrhea tests by a given anatomic site among patients aged 15–60 years were presented in Table 3. Of 78,785 encounters that had both chlamydia rectal specimens and genital specimens among women, 1.26% were positive for genital infection only, 2.48% for rectal infection only, and 4.72% for both rectal and genital infection. Similarly, of 79,010 encounters that had both gonorrhea rectal specimens and genital specimens among women, 0.38% were positive for genital infection only, 1.44% for rectal infection only, and 1.61% for both rectal and genital infection.

Discussion

This large database of chlamydia and gonorrhea testing from diverse practice settings can provide insights into chlamydia and gonorrhea testing practices in the U.S. For example, although men accounted for <30% of overall chlamydia and gonorrhea testing, they

accounted for a majority of extragenital testing (91.4% of all rectal tests and 78.1% of all pharyngeal tests). The high number of tests among women aged 15–34 years and the high proportion of tests that were extragenital among men who were cared for by infectious disease doctors may be corresponding to routine chlamydia and gonorrhea screening among young sexually active women aged <25 years, among pregnant women, and among MSM. Although there are limited data available on sexual behaviors of persons reported with chlamydia and gonorrhea from this lab data and at the national level, enhanced data from jurisdictions participating in a sentinel surveillance system, the STD Surveillance Network (SSuN), suggests that the rectal chlamydia and rectal gonorrhea testing rates were 55.0% and 58.4% among MSM who attended STD clinics in 2018.(14) Our data show that extragenital testing was most commonly ordered by infectious disease providers (49.7% of all chlamydia and gonorrhea tests ordered were pharyngeal or rectal), and least commonly ordered by OB/GYN providers (0.4% of all chlamydia and gonorrhea tests ordered were pharyngeal or rectal). These results showed not only specific populations served for each type of healthcare provider, but also may indicate gaps in whether sexual risk assessments were conducted by type of provider.(2)

High chlamydia and gonorrhea positivity by anatomic site among many demographic groups highlights the importance of STI prevention in the U.S. (Figure 1 and 2). For example, high rectal positivity may be closely related to diagnostic testing or patients who are at increased likelihood for HIV/STI infection. Our study is consistent with other previous studies: chlamydia pharyngeal positivity was lower than gonorrhea pharyngeal positivity among men, and gonorrhea positivity, regardless of specimen type, was much higher among men than women, especially among young men than young women.(11, 13) With current practices, our study also showed that the highest number of chlamydia positive tests were from women urogenital (64.2%), men urogenital (28.7%), and men rectal (5.0%) specimens, while the highest number of gonorrhea positive tests were from men urogenital (38.7%), women urogenital (36.7%), men pharyngeal (11.4%), and men rectal (11.1%) specimens. Although the numbers of rectal or pharyngeal tests were much lower than that of urogenital tests among women, the overall rectal infection rates for both chlamydia and gonorrhea were high if patients were tested, regardless of where patients received care, indicating they either had STI-related symptoms or were at increased likelihood for STI infection. Furthermore, although we were not certain women with rectal chlamydia tests had involved in rectal sex or women who involved in rectal sex had not been tested with rectal specimen in this database, it seems high chlamydia and gonorrhea infections with both genital and rectal specimens among women were partially due to autoinoculation.

There were several limitations in this study. First, as we mentioned previously, the data are not amenable to longitudinal analysis. Reinfection or repeat testing cannot be assessed. Second, the data had limited information on pregnancy and STI symptom and had no sexual behavior information. We could not identify persons who were at increased likelihood for STI infection or distinguish screening versus diagnostic testing. Third, because most records had missing information with race/ethnicity, we are unable to report any results by race/ethnicity. Finally, due to lack of data prior to the FDA approval of extragenital chlamydia and gonorrhea tests, this study cannot directly assess the impact of this FDA approval on the proportion of all chlamydia or gonorrhea tests that were extragenital. However, the

proportion of all chlamydia and gonorrhea tests that were extragenital increased from 2019–2023 in this study, and the proportion of all chlamydia and gonorrhea tests that were rectal specimens was much higher in this study than that reported in previous studies (0.4% among women and 10.5% among men in this study vs. <0.1% among women and 4% among men in previous studies), indicating that healthcare providers are likely ordering extragenital chlamydia and gonorrhea tests more often.

This study presents empiric evidence on the current practice of chlamydia and gonorrhea tests by anatomic sites ordered by various healthcare providers across the U.S., showing much lower extragenital chlamydia and gonorrhea testing among women than men, and high positivity among many demographic groups and healthcare provider settings, suggesting that some healthcare providers are closely following the current guidelines. Our study also indicates potential gaps in research and patient care. With FDA approval of extragenital chlamydia and gonorrhea tests in 2019, more extragenital chlamydia and gonorrhea tests have been expected. It also provides opportunity to assess the value of detection and treatment of extragenital chlamydia and gonorrhea that has not been well-established yet, particularly among asymptomatic individuals in which direct long-term sequelae need to be further assessed. With high chlamydia and gonorrhea pharyngeal and rectal positivity among young people and men of all ages, and potential practice changes after FDA approval of extragenital chlamydia and gonorrhea tests, it is warranted to routinely assess the number and positivity of chlamydia and gonorrhea tests by anatomic site, as well as by patient demographics, and by healthcare provider type, to assess patterns in STD incidence and care practices.

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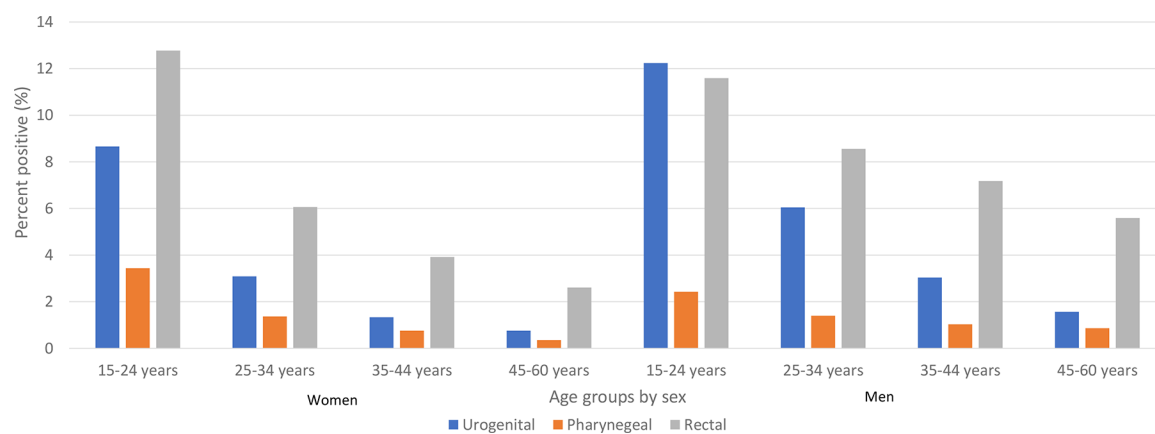


Figure 1.
Chlamydia test percent positive by specimen type, sex, and age

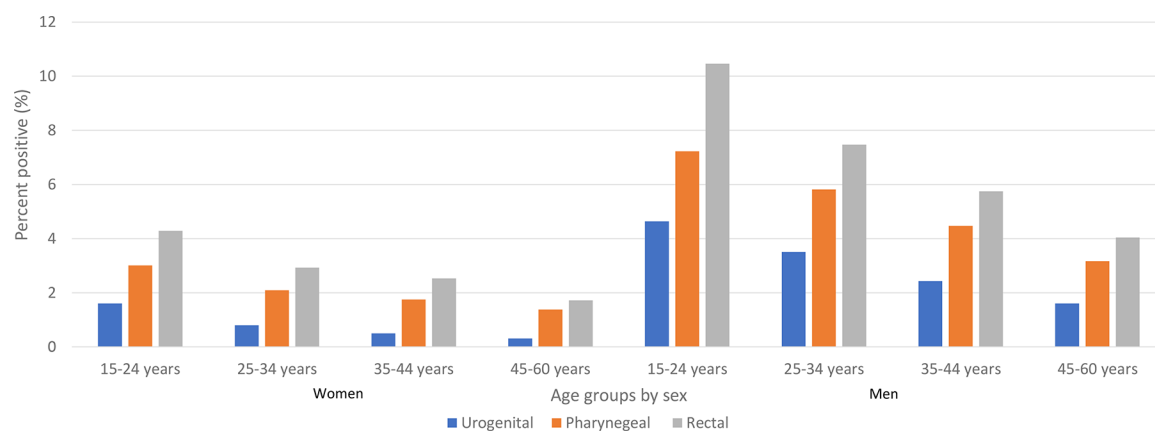


Figure 2.
Gonorrhea test percent positive by specimen type, sex, and age

Table 1.

Number and proportion of chlamydia tests by specimen type among patients aged 15–60 years served in the United States, 2019–2023, using a national laboratory database

	Number of chlamydia tests [†] (Col %)	Proportion of tests that were rectal (%)	Proportion of tests that were pharyngeal (%)	Proportion of tests that were urogenital (%)
Total	45,269,159 (100)	3.3	5.0	91.7
Sex				
Women	32,412,946 (71.6)	0.4	1.5	98.1 *
Men	12,856,213 (28.4)	10.5	13.7	75.8
Age groups				
15–24 years	13,757,329 (30.4)	1.4	3.2	95.4 *
25–34 years	16,693,176 (36.9)	3.9	5.8	90.3
35–44 years	9,087,083 (20.1)	4.2	5.7	90.1
45–60 years	5,731,571 (12.6)	4.5	5.9	89.7
Region				
Northeast	8,206,605 (18.1)	3.6	5.1	91.3 *
Midwest	5,073,810 (11.2)	1.9	3.5	94.6
South	23,405,797 (51.7)	3.1	5.0	91.9
West	8,582,947 (19.0)	4.2	5.7	90.1
Provider type				
Primary care	12,959,444 (28.7)	2.5	3.9	93.6 *
Hospital/ER	3,459,477 (7.6)	1.9	2.8	95.2
Infectious disease	3,678,705 (8.1)	20.9	28.8	50.3
Multiple specialty groups	2,565,485 (5.7)	3.6	5.1	91.2
OB/GYN	11,821,656 (26.1)	0.1	0.3	99.6
Pediatrician	1,064,152 (2.3)	0.3	0.6	99.2
Public health	1,621,831 (3.6)	4.1	11.9	84.0
Others	8,098,411 (17.9)	1.8	2.8	95.4
Year of tests performed				
2019	7,631,203 (16.9)	2.7	4.1	93.2 *
2020	7,695,248 (17.0)	2.4	3.6	94.0
2021	9,248,202 (20.4)	3.1	4.5	92.4
2022	9,802,565 (21.6)	3.7	5.7	90.6
2023	10,891,941 (24.1)	4.0	6.4	89.6

* p<.0001 between the distribution of chlamydia tests by specimen type and demographic or another variable.

[†] The number of chlamydia tests was the sum of the number of chlamydia tests for all encounters with chlamydia testing, and at each encounter the number of chlamydia tests ranged from one to three, depended on which of rectal, pharyngeal, and urogenital specimens were collected for chlamydia testing.

Table 2.

Number and positivity of chlamydia and gonorrhea tests by anatomic site among patients aged 15–60 years served in the United States, 2019–2023, using a national laboratory database

	Chlamydia				Gonorrhea		
	Number and positivity of rectal tests N (%)	Number and positivity of pharyngeal tests N (%)	Number and positivity of urogenital tests N (%)		Number and positivity of rectal tests N (%)	Number and positivity of pharyngeal tests N (%)	Number and positivity of urogenital tests N (%)
Total	1,477,532 (8.0)	2,260,359 (1.5)	41,531,268 (4.8)		1,489,145 (6.4)	2,335,256 (4.6)	41,723,691 (1.5)
Sex							
Women	127,476 (7.3) *	495,613 (2.0) *	31,789,857 (4.3) *		129,252 (3.2) *	525,624 (2.4) *	31,864,117 (1.0) *
Men	1,350,056 (8.0)	1,764,746 (1.4)	9,741,411 (6.3)		1,359,893 (6.8)	1,809,632 (5.2)	9,859,574 (3.3)
Age groups							
15–24 years	196,586 (11.8) *	440,264 (2.9) *	13,120,479 (9.4) *		200,635 (9.3) *	465,746 (5.4) *	13,080,607 (2.2) *
25–34 years	646,341 (8.4)	966,493 (1.4)	15,080,342 (3.7)		651,516 (7.1)	998,710 (5.0)	15,155,786 (1.4)
35–44 years	378,251 (7.0)	517,049 (1.0)	8,191,783 (1.8)		379,873 (5.5)	527,802 (4.1)	8,286,465 (1.0)
45–60 years	256,354 (5.5)	336,553 (0.8)	5,138,664 (1.0)		257,121 (3.9)	342,998 (3.0)	5,200,833 (0.7)
Region							
Northeast	294,660 (7.3) *	421,126 (1.2) *	7,490,819 (3.2) *		295,983 (5.8) *	424,526 (4.6) *	7,539,668 (0.8) *
Midwest	94,153 (9.5)	178,570 (1.6)	4,801,087 (5.4)		94,377 (7.1)	179,187 (4.4)	4,833,504 (1.7)
South	729,429 (8.4)	1,172,699 (1.7)	21,503,669 (5.4)		732,448 (7.1)	1,217,486 (4.7)	21,541,762 (1.8)
West	359,290 (7.3)	487,964 (1.4)	7,735,693 (4.2)		366,337 (5.6)	514,057 (4.5)	7,808,757 (1.3)
Provider type							
Primary care	323,474 (6.6) *	507,784 (1.2) *	12,128,184 (5.2) *		324,749 (5.0) *	511,857 (4.1) *	12,322,857 (1.7) *
Hospital/ER	66,664 (8.9)	97,805 (1.6)	3,295,008 (7.7)		66,976 (7.3)	98,294 (5.3)	3,297,533 (4.1)
Infectious disease	769,033 (8.2)	1,059,391 (1.5)	1,850,281 (3.5)		769,999 (7.1)	1,091,517 (4.9)	1,852,335 (2.0)
Multiple groups	93,562 (7.1)	131,167 (1.2)	2,340,756 (5.2)		94,736 (5.6)	134,417 (4.9)	2,343,675 (1.6)
OB/GYN	12,562 (8.6)	34,596 (2.0)	11,774,498 (3.5)		12,579 (5.4)	34,714 (3.4)	11,758,285 (0.6)
Pediatrician	2,945 (9.0)	5,923 (2.1)	1,055,284 (5.7)		2,953 (6.7)	6,040 (4.8)	1,027,382 (1.1)
Public health	65,759 (10.0)	193,176 (2.0)	1,362,896 (6.6)		72,703 (7.7)	216,461 (4.3)	1,363,102 (2.1)
Others	143,533 (8.8)	230,517 (1.7)	7,724,361 (4.6)		144,450 (5.9)	241,956 (4.2)	7,758,522 (1.2)

	Chlamydia				Gonorrhea		
	Number and positivity of rectal tests N (%)	Number and positivity of pharyngeal tests N (%)	Number and positivity of urogenital tests N (%)	Number and positivity of urogenital tests N (%)	Number and positivity of rectal tests N (%)	Number and positivity of pharyngeal tests N (%)	Number and positivity of urogenital tests N (%)
Year of tests							
2019	206,714 (8.9) *	315,741 (1.7) *	7,108,748 (5.0) *		208,066 (6.2) *	335,157 (4.4) *	7,135,761 (1.3) *
2020	187,218 (9.3)	273,765 (1.7)	7,234,265 (5.3)		188,134 (7.2)	285,022 (5.2)	7,266,753 (1.9)
2021	286,340 (8.6)	412,880 (1.6)	8,548,982 (5.0)		289,018 (6.9)	429,637 (5.1)	8,603,704 (1.7)
2022	364,405 (7.4)	561,568 (1.5)	8,876,592 (4.6)		367,722 (6.2)	577,497 (4.4)	8,924,189 (1.4)
2023	432,855 (7.0)	696,405 (1.3)	9,762,681 (4.3)		436,205 (6.2)	707,943 (4.3)	9,793,284 (1.2)

* p<.0001

Table 3. Coinfections among encounters with both chlamydia and gonorrhea tests by a given anatomic site among patients aged 15–60 years served in the United States, 2019–2023, using a national laboratory database

	Number of encounters	Both chlamydia and gonorrhea positive (%)	Chlamydia positive only	Gonorrhea positive only
Urogenital site	36,063,687	151,888 (0.42)	1,502,429 (4.17)	367,512 (1.02)
Pharyngeal site	1,957,029	3,502 (0.18)	25,112 (1.28)	82,590 (4.22)
Rectal site	1,270,608	19,338 (1.52)	78,538 (6.18)	58,973 (4.64)