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Reported chlamydia and gonorrhea are decreasing among young Black women: Good news or bad news? A narrative review

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Abstract

Since 2010, reported chlamydia and gonorrhea rates decreased among Black women aged 15–19 years and were stable for Black women 20—24 in the United States. Rates increased for older Black women 25–39 and all White women. The Black:White rate ratio decreased across age groups. We examined whether trends in reported rates reflected changing prevalence or changing screening. We analyzed trends in reported chlamydia and gonorrhea rates during 2010 to 2018 among women in the United States aged 15–39 years by age and race/ethnicity subgroup, state, and reporting source. Most jurisdictions reported decreased chlamydia and gonorrhea rates among Black teens and increased rates among White teens and older women. Between 2010 and 2018, public clinics reported fewer cases, especially among young Black women, that were not restored by increases elsewhere. We reviewed literature on trends in screening, prevalence, and sequelae. Family planning clinics annual reports showed chlamydia tests among women <25 decreased by 541,573 tests (−38%) in 2018 compared with 2010 and the number of women visiting STD clinics had decreased 50% by 2016 compared with 2010. Prevalence of chlamydia in a sentinel population (Job Corps) was unchanged for Black women <25 and increased for Whites 20–24. Sequelae trends using data from a large all-payer ED database were mixed: PID decreased while ectopic pregnancy increased. Decreases in testing at public clinics likely missed diagnoses among young Black women, a group traditionally at highest risk, and in need of more testing. Innovative approaches to screening are needed.

Short Summary:

In this review, we considered whether trends in screening, prevalence, or other factors explain trends in reported rates of chlamydia or gonorrhea by race.

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Keywords

chlamydia; gonorrhea; screening; women; race

Introduction

In 2018, there were 1,145,063 cases of chlamydia and 241,074 cases of gonorrhea reported among women in the United States [1]. It is estimated that more than one-third of Black women are diagnosed with chlamydia at least one time before the age of 30 [2] and one-third of chlamydial infections among women aged 15–24 are never diagnosed or reported[3]. Chlamydial infection tends to be asymptomatic in women [4, 5], and when left untreated, approximately 10% develop pelvic inflammatory disease (PID) [6] which can lead to infertility, ectopic pregnancy, and other sequelae.

Screening and treatment prevents sequelae, such as PID [6, 7] so annual screening is recommended by the Centers for Disease Control and Prevention for sexually active women younger than 25 years old as well as those 25 and older who are at increased risk [8]. While screening is a cost-effective [9] and high-priority preventive service [10], it remains underutilized; approximately half of insured sexually active 16–24-year-old women who visited their primary care provider were screened in 2018 [11]. This estimate does not account for the increasing number of young women who did not visit a primary care provider [12].

In the United States, rates of chlamydia have been higher among non-Hispanic Black (“Black”) women compared to non-Hispanic White (“White”) women, but this disparity may be narrowing [1]. In 2010, the rate of chlamydia among Black women of all ages was 7.3 times the rate for White women; in 2018, the ratio had fallen to 5.0 (−36%); similarly, within each age group the Black:White ratio decreased by approximately 30%. Similar changes have been observed for gonorrhea. It is unclear what caused this changing racial disparity. Case rate data is influenced by multiple factors including screening, prevalence, and other factors such as test characteristics, and reporting. Possible explanations of this racial disparity in case rate data include a decrease in detection of infection among Black women, an increase in detected infection among White women, a decrease in the prevalence of infections among Black women, an increase in the prevalence of infections among White women, or a combination of these. Here, we evaluate trends in reported rates of chlamydia and gonorrhea among women aged 15–39 years in the United States from the National Notifiable Diseases Surveillance System (NNDSS) from 2010–2018 [13]. Trends in reported rates of chlamydia and gonorrhea were evaluated overall [1], and after stratification by jurisdiction (50 states and the District of Columbia), 5-year age group, and Black or White race/ethnicity subgroups. Trends by jurisdiction used bridged race for consistent race categorization over the entire study period, differing slightly from inconsistent race/ethnicity categorizations used for reported rates in the annual STD surveillance report [1]. We calculated the annual Black:White race rate ratio for each age group (the case rate among Black women divided by the case rate among White women). The relative percentage change from 2010–2018 was calculated as the rate in 2010 subtracted from the rate in

2018, divided by the rate in 2010. Trends were classified as increasing or decreasing if they changed by ≥10%, or stable if the changes were smaller (<10%).

Next, we reviewed the literature for studies that may identify trends in screening, prevalence, or sequelae of untreated chlamydia or gonorrhea and may explain changes in the narrowing racial disparity.

Findings

Trends in reported rates

Annual reported chlamydia and gonorrhea rates were higher among Black women compared to White women over the 2010–2018 study period (Table 1; Table 2). Among Black 15–19-year-old women, reported chlamydia rates decreased by 12% and reported gonorrhea rates decreased by 14%. Reported rates were stable among Black 20–24-year-olds, but increased for older Black women with larger percentage increases with older age; Compared to Black women, White women had percentage increases that were larger in scale across all age groups.

From 2010–2018, the annual Black:White chlamydia case rate ratio decreased by approximately 30% for every age group (range: −25.5%, −43.9%) while the annual Black:White gonorrhea case rate ratio decreased by approximately 50% for every age group (range: −46.1%, −66.3%). The Black:White case rate ratios were highest among 15–19-year-olds but decreased over time, from 6.6 to 4.5 for chlamydia and from 17.1 to 8.8 for gonorrhea.

Similar changes in reported rates were seen in most of the 51 reporting jurisdictions in the United States (50 states and the District of Columbia) (Figures 1, 2). For young Black women, most jurisdictions reported decreased rates of chlamydia and gonorrhea, but for older Black women, most jurisdictions reported increased rates. For White women, all ages had increasing rates in most jurisdictions, but the largest increases were among older women. Gonorrhea had similar patterns of increases with White women having larger increases than Black women.

The source of report for chlamydia and gonorrhea cases shifted by age and race between 2010 and 2018 among jurisdictions with <30% missing source data (chlamydia, n=35; gonorrhea, n=33) (Figure 3; Figure 4). Reported chlamydia and gonorrhea decreased in three major types of public clinics: STD clinics, family planning clinics, and other health department clinics; increases were observed in other settings. However, these changes differed by age and race groups. For young Black women 15–24 years old, public clinics reported less than half the number of chlamydia or gonorrhea cases in 2018 compared to 2010 with each of those settings reporting at least 10,000 fewer chlamydia cases and at least 2,000 fewer gonorrhea cases among young Black women in 2018. Similarly, private physicians/HMOs reported 17% fewer chlamydia cases (at least 8,000 less) and 20% fewer gonorrhea cases (at least 2,000 less) in 2018 as compared to 2010 among young Black women 15–24. The gains elsewhere did not make up for the losses in public clinics and private physicians. Among older White women 25–39 years old, reported chlamydia

and gonorrhea changed relatively little among public providers but more than doubled among private providers. Results were similar when we included data from all 51 reporting jurisdictions.

Published studies of trends in screening and testing

Title X family planning clinics performed 541,573 (38%) fewer chlamydia tests in 2018 than in 2010 for women younger than 25 years old, as reported in the Family Planning Annual Report [14]; if 5.4% of these women would have had chlamydia, then this would represent a decrease of 29,244 infections detected per year [15]. The overall census of family planning users decreased between 2010 and 2018 by 25% (N= −1,285,113). In 2018, compared to 2010, these clinics served a population that was older, less often female, less often White, more often Hispanic/Latino, less often living below the poverty level, and less often uninsured.

The number of women tested in STD clinics was not available, but most women visiting an STD clinic are tested for chlamydia and gonorrhea, so trends in number of clinic visits should reflect trends in the number of tests. In a study of a sentinel group of STD clinics, between 2010 and 2016, there were decreases in all visits (−70,162; −29.7%) and in all patients (−60,876; −38.8%) [16]. Attendance by women decreased by approximately 50%, and the biggest decreases occurred among women younger than 25 years old. There were increases in the attendance by men-who-have-sex-with-men, with the biggest increase in 25–34-year-olds. Trends by race were not examined.

Some of the women who were previously tested for chlamydia in family planning clinics and STD clinics may have received chlamydia testing elsewhere. When sexually active women were asked about chlamydia testing from any provider in the past 12 months in the National Survey of Family Growth (NSFG), self-reported rates of testing were unchanged for young women <25 years for two study periods: 2006–2010 to 2015–2017 (Black: 57.6% to 54.2%; White: 37.3 to 34.3%) [17]. Among older (≥25 years) Black and White women, reported testing increased, regardless of race (Black: 37.6% to 50.6%; White: 15.4% to 24.3%). Though these data are based on a small sample, and self-reported testing may have led to under and or over-reporting based on desirability bias.

The rate of testing for chlamydia increased at a slower rate for 15–19-year-old girls after 2010 when the recommended age for initial pap tests was raised to age 21. An analysis of U.S. commercial medical billing data found chlamydia screening increased at 1.9% per year between 2005 and 2009, but by only 1.0% per year between 2010 and 2014 [18]. After Canada instituted similar changes to cervical cancer screening guidelines in 2012, chlamydia testing by commercial laboratories and STI clinics decreased by 25.5% for 15–19-year-old girls and chlamydia case reports decreased by 16.8% [19]. Thus, opportunities for chlamydia testing and evaluating sexual health may be diminishing in public and primary care settings. STD clinics have increasingly focused efforts away from women and on MSM, expanding PrEP, and gradually undertaking HIV prevention and treatment, leaving fewer resources for STDs among women. Following the Patient Protection and Affordable Care Act (PPACA), STD clinics faced reduced funding [20] and a smaller population in need of public care, possibly squeezing program resources dedicated to chlamydia screening. Private settings

are impacted by young people being less likely to have a primary care provider [21] and more likely to use walk-in clinics than older people [22]. The concurrent rise in urgent care clinics, where women will be unlikely to be screened annually for chlamydia, and will be tested only if symptomatic, may result in missed diagnoses of chlamydia.

Published studies of trends in prevalence

Prevalence has been measured in sentinel populations that have been used to reflect trends in the general population. Among enrollees in an educational vocation program (Job Corps), chlamydia prevalence was stable from 2010–2017 for Black women 16–24 years old and White women 16–19, but for 20–24 year old White women, prevalence increased by 62% (from 5.2% to 8.4%) [23]. The Black:White rate ratio based on these prevalence estimates decreased 14% for 16–19-year-olds (from 2.5 to 2.2) and 44% for 20–24-year-olds (from 2.3 to 1.3). Gonorrhea prevalence among Black women 16–24 years old increased by 52% (from 2.5% to 3.8%) between 2011 and 2017, and prevalence among White women increased but remained rare (<2%) for the entire study period [24].

In a nationally representative sample of the United States, (the National Health and Nutrition Examination Survey, NHANES), chlamydia prevalence among sexually active 14–24-year-old women significantly decreased by 37% for Black women (from 13.5% during 2007—2012 [25] to 8.5% during 2013–2016) [1]. For White women, however, chlamydia prevalence increased by 17% (from 1.8% during 2007–2012 to 2.1% during 2013–2016). Using these estimates, the Black:White chlamydia rate ratio decreased by 45% from 7.5 to 4.1. Small samples limit subgroup analyses for chlamydia and preclude any analyses for gonorrhea.

Annual screening is recommended in the U.S. military. Although not all women are tested, both the number of positives and the number tested are collected, allowing calculation of the prevalence among those tested. Among women aged <25 years in the United States military, the annual rates of chlamydia were similar in 2010 and 2018 for Black women (exact values not reported), while there was an increase for White women, and a slight decrease for women ≥25 years in both racial/ethnic groups [26]. Gonorrhea rates increased slightly for women <20 years and women 20–24 years, while rates were stable or decreased for women ≥25 years.

Prevalence studies have found decreases in Black:White rate ratios, with most of the change attributable to increases in rates among white women.

Studies of trends in sequelae—The impetus behind gonorrhea and chlamydia control programs is the prevention of pelvic inflammatory disease (PID) which can lead to infertility, ectopic pregnancy, and chronic pelvic pain. If more cases were going undetected among young Black women [23], we would expect an increase in PID and related sequelae. However, PID trends are notoriously difficult to monitor due to the subjective nature of the diagnosis. Emergency Department visits for PID decreased for all groups from 2006–2013, with the strongest decreases among 15–19 year-olds (−40.6%) and those living in the southern region of the United States (−38.0%) [27]. Ectopic pregnancy diagnoses in these settings have increased for women aged 15–39 and were strongest in the northeast (56.0%)

and the south (30.4%) [28]. Initial visits to private physicians' offices for PID decreased from 2007–2014, and then increased through 2016, but these data were not stratified by age, race or sex so it is unclear whether PID was increasing most among young Black women [1].

Discussion

Since 2010, there have been widespread, modest decreases in reported rates of chlamydia and gonorrhea among 15–19-year-old Black women. This would be good news if it represented a true decrease in the prevalence of these infections, or bad news if less testing meant infections were being missed. The literature suggests screening decreased among young women (<25) and increased among older women (≥25) regardless of race, though only one study provided race-stratified trends. Studies suggest chlamydia prevalence was stable or decreasing among young Black women (while gonorrhea prevalence increased), and chlamydia was stable among White women <19 but increasing rates among older White women. Taken together, this suggests that decreasing reported case rates among Black women may be explained by a decrease in screening and that increasing reported case rates among White women may be explained by increasing prevalence. If true, sequelae should increase among Black women, but so far study findings have been mixed, with PID decreasing and ectopic pregnancy increasing.

We wondered whether changes in sexual behavior might have influenced the prevalence of chlamydia and gonorrhea. Data from the Youth Risk Behavior Surveillance System has shown varied trends, in which some behaviors may increase risk for STIs and others may decrease risk for STIs [29, 30]. We found limited information in the literature that might explain differences by race or increases in the prevalence among older women. Furthermore, rates of sexually transmitted infections are not easily explained by differences in sexual behavior [31s].

Our narrative review has several limitations. First, there were not many studies that analyzed trends by age, race, and sex subgroups, making it difficult to assess divergent case rate trends by race. Second, studies that we did find were not necessarily generalizable to all young Black and White women in the United States. Screening estimates using HEDIS are designed to measure screening among clinic attendees with continuous enrollment and flagged as sexually active based on claims, not the whole population, which can lead to over or underestimation of screening [18]. Our sentinel populations had higher prevalence rates than the general population, but eligibility criteria were stable, so trends over time should still be representative. Third, data on source of report were often missing and may not be classified the same way across jurisdictions due to several factors at the jurisdiction's discretion, including interpretation of coding guidance and mapping algorithms to link lab reports to a given category. We restricted our analysis to jurisdictions with consistently complete data for information source and limited our analysis to categories likely to have high specificity. Finally, there are other factors that might influence reported cases besides testing and prevalence, such as test characteristics and electronic case reporting but those appear to be relatively stable over the study period.

Conclusion

Over the past decade, fewer cases of chlamydia and gonorrhea have been reported among Black women. Decreased testing and stable prevalence among young Black women, imply that we are missing more infections in the group at highest risk. Continued efforts to screen in primary care, STD, and family planning clinics are needed, but fewer young women are seeking care in these venues. New approaches are needed to reach young women for screening, especially young Black women.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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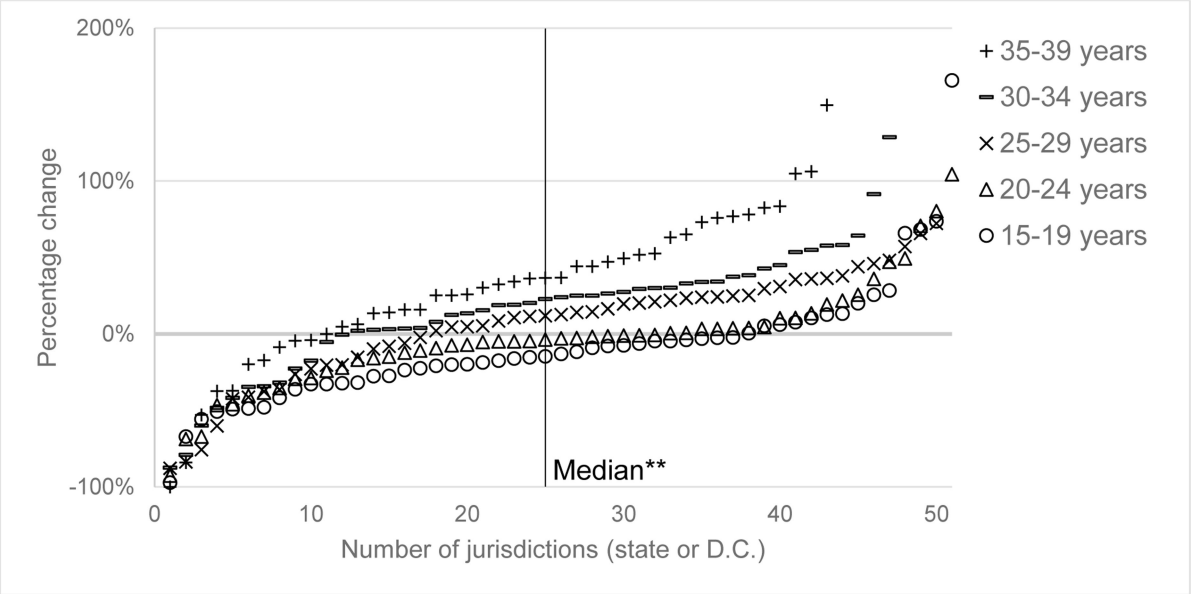
a. Chlamydia among Black women by age group†‡



b. Chlamydia among White women by age group†

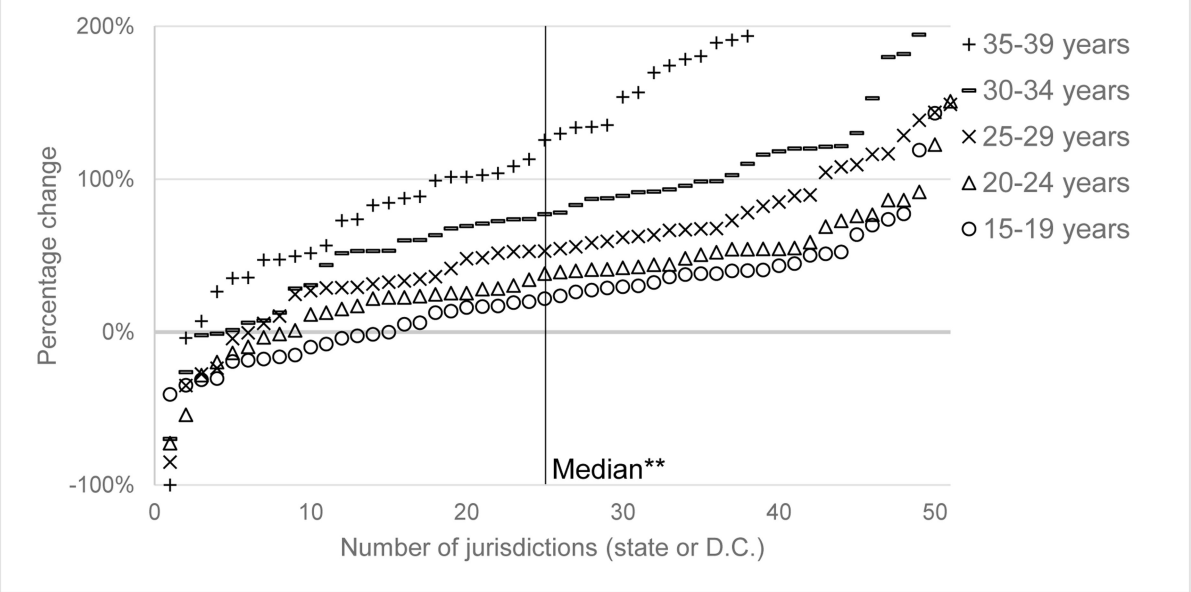


Figure 1.

Percentage change, from 2010 to 2018, in the rate of reported chlamydia among age and race* subgroups of women for each U.S. jurisdiction (state or D.C.). Jurisdictions are sorted by percentage change, in increasing order.

* Race based on bridged race categorization (limits to one race category).

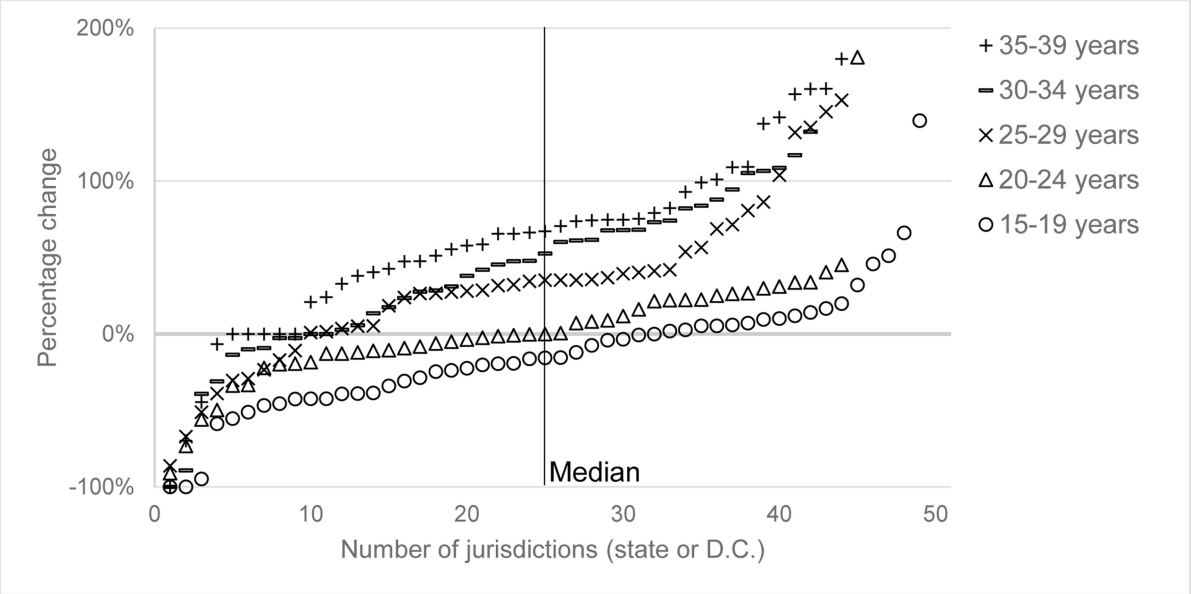
** Median indicates the 25th jurisdiction after sorting by percentage change

(a) 15–19 (−15%), 20–24 (−4%), 25–29 (+12%), 30–34 (+23%), 35–39 (+37%).

(b) 15–19 (+22%); 20–24 (+38%); 25–29 (+53%); 30–34 (+77%); 35–39 (+126%).

† Jurisdictions with change ≥200% are not shown for the following age groups.
(a) 25–29 (1); 30–34 (3); 35–39 (4).
(b) 15–19 (1); 30–34: (2); 35–39 (13).
‡ Jurisdictions that reported 0 cases in 2010 but non-zero cases in 2018 were assumed to have 0.1 cases in 2010 in order to calculate percentage increases.
(a) 30–34 (3); 35–39 (7).
(b) No groups affected.

a. Gonorrhea among Black women by age group †‡



b. Gonorrhea among White women by age group †‡

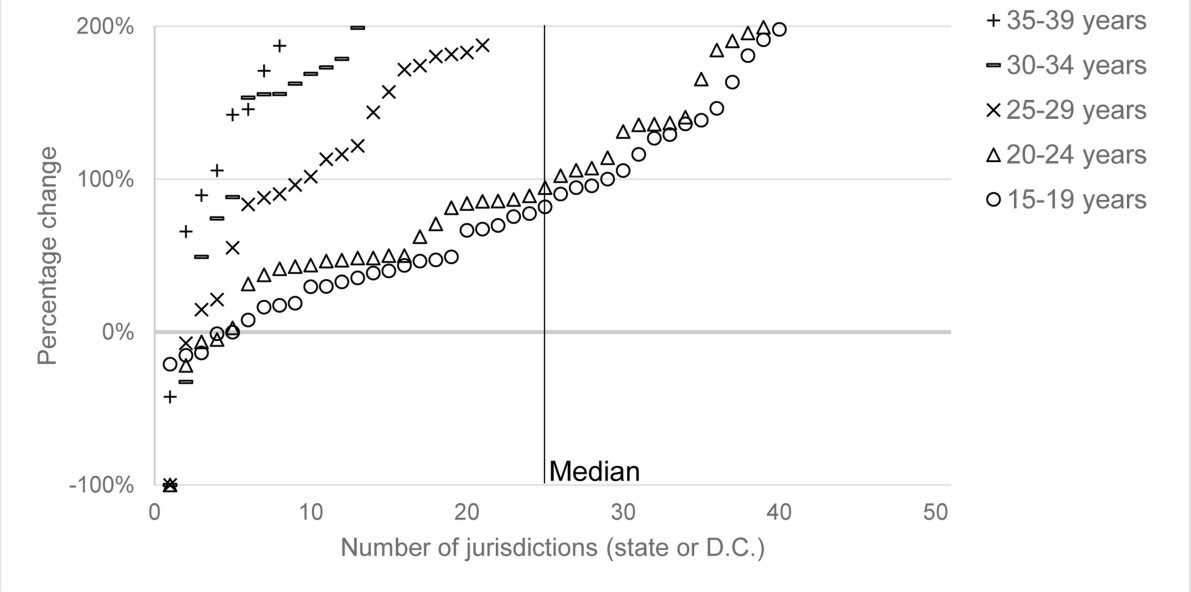


Figure 2.

Percentage change, from 2010 to 2018, in the rate of reported gonorrhea among age and race* subgroups of women for each U.S. jurisdiction (state or D.C.). Jurisdictions are sorted by percentage change, in increasing order.

* Race based on bridged race categorization (limits to one race category).

** Median indicates the 25th jurisdiction after sorting by percentage change

(a) 15–19 (−16%), 20–24 (0%), 25–29 (+35%), 30–34 (+53%), 35–39 (+67%).

(b) 15–19 (+82%); 20–24 (+95%); 25–29 (+243%); 30–34 (+316%); 35–39 (+505%).

† Jurisdictions with change ≥200% are not shown for the following age groups.
(a) 15–19 (2), 20–24 (5), 25–29 (3), 30–34 (6), 35–39 (5).
(b) 15–19 (11); 20–24 (13); 25–29 (30); 30–34 (38); 35–39 (42).
‡ Jurisdictions that reported 0 cases in 2010 but non-zero cases in 2018 were assumed to have 0.1 cases in 2010 in order to calculate percentage increases.
(a) 15–19 (1); 20–24 (3); 25–29 (6); 30–34 (4); 35–39 (4).
(b) 30–34 (2); 35–39 (2).

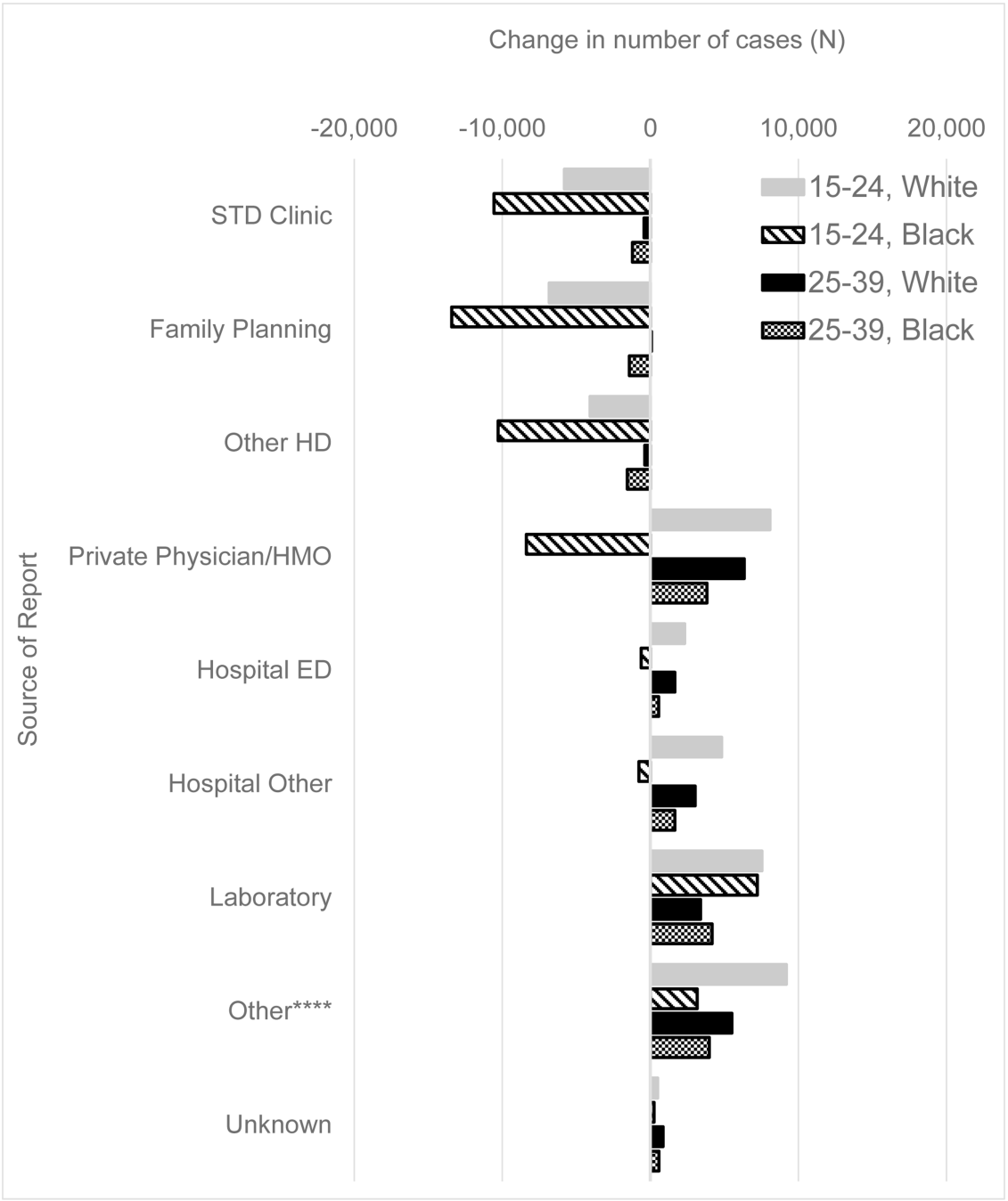


Figure 3.

Change in number of chlamydia cases reported by different providers in 35 jurisdictions*, for age-race** subgroups of women*** (2010–2018). * Excluded jurisdictions with jurisdictions*, for age-race** subgroups of women*** (2010–2018). * Excluded jurisdictions with ≥30% unknown/missing source of report in either year (2010 or 2018) for any subgroup (Black 15–39, White 15–39): Alaska, Colorado, Connecticut, Georgia, Indiana, Louisiana, Massachusetts, Michigan, Mississippi, Montana, Nevada, New Jersey, Ohio, Oregon, Virginia, Wisconsin.

** Race classification consistent with the annual STD surveillance reports [1].
*** Total number of cases, average for 2010–2018: 15–24, White (124,298); 15–24, Black (152,200); 25–39, White (42,065); 25–39, Black (44,246).
**** “Other” collapsed various values for this field, including Blood Bank, Correctional Facility, Drug Treatment, HIV Counseling and Testing Site, Indian Health Service, Labor and Delivery, Mental Health Provider, Military, Job Corps, Prenatal, Retired Hospital—Inpatient, Retired Prenatal/Obstetrics, School-based Clinic, and Tuberculosis Clinic.

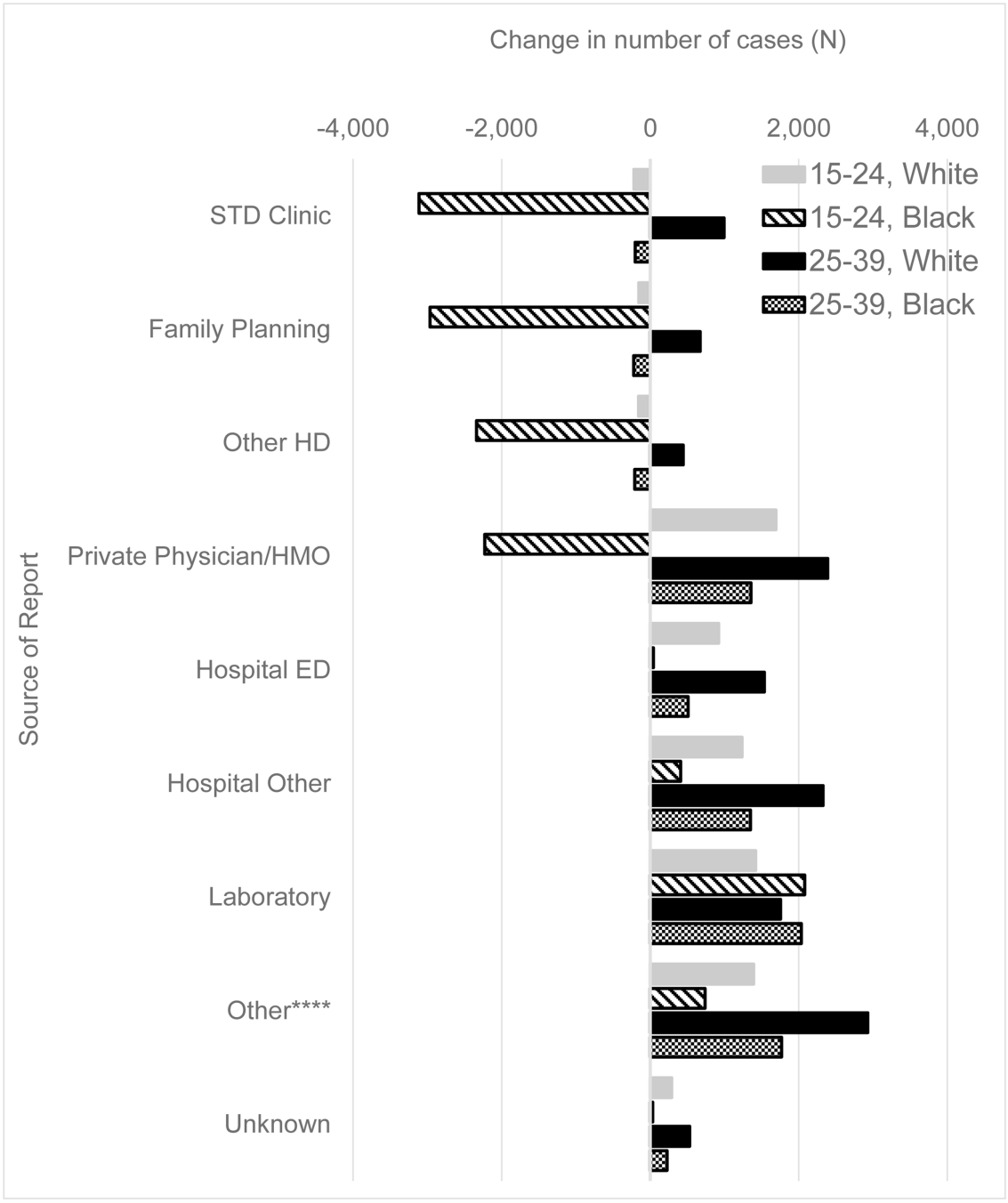


Figure 4.

Change in number of gonorrhea cases reported by different providers in 33 jurisdictions*, for age-race** subgroups of women*** (2010–2018).

* Excluded jurisdictions with ≥30% unknown/missing source of report in either year (2010 or 2018) for any subgroup (Black 15–39, White 15–39): Alaska, Colorado, Connecticut, Georgia, Indiana, Louisiana, Massachusetts, Michigan, Mississippi, Montana, Nevada, New Jersey, Ohio, Oregon, Utah, Virginia, Wisconsin, Wyoming.

** Race classification consistent with the annual STD surveillance reports [1].

*** Total number of cases, average for 2010–2018: 15–24, White (15,688); 15–24, Black (40,874); 25–39, White (12,524); 25–39, Black (15,565).

**** “Other” collapsed various values for this field, including Blood Bank, Correctional Facility, Drug Treatment, HIV Counseling and Testing Site, Indian Health Service, Labor and Delivery, Mental Health Provider, Military, Job Corps, Prenatal, Retired Hospital—Inpatient, Retired Prenatal/Obstetrics, School-based Clinic, and Tuberculosis Clinic.

Table 1.

Chlamydia: reported rates, Black:White rate ratio, and percentage change in reported rates and rate ratio, by age group and Black or White race*, United States (2010–2018).

	15–19 years old	20–24 years old	25–29 years old	30–34 years old	35–39 years old
Black **					
2010	7719.1	7262.8	2506.9	1017.2	369.3
2011	7507.1	7680.2	2726.8	1061.0	387.9
2012	7719.1	7836.3	2922.4	1112.1	434.4
2013	6907.6	7342.7	2873.6	1092.6	448.6
2014	6371.5	7122.5	2987.7	1121.6	471.4
2015	6340.3	6782.5	2995.5	1115.3	479.8
2016	6485.2	6747.6	3065.4	1149.8	489.3
2017	6771.6	6971.7	3149.2	1210.6	516.2
2018	6817.3	7087.7	3105.5	1248.1	513.6
Percentage change ***	−11.7%	−2.4%	+23.9%	+22.7%	+39.1%
White **					
2010	1172.1	1357.9	458.0	180.0	64.6
2011	1301.5	1595.5	544.1	209.6	76.4
2012	1458.3	1778.4	629.0	239.0	97.7
2013	1383.3	1774.2	663.6	261.3	107.1
2014	1291.6	1728.2	686.6	273.3	119.1
2015	1339.1	1737.8	704.0	279.0	129.1
2016	1433.3	1836.2	734.9	298.0	143.2
2017	1518.5	1936.0	758.0	317.0	155.2
2018	1520.1	1935.8	749.8	329.9	158.6
Percentage change ***	+29.7%	+42.6%	+63.7%	+83.3%	+145.5%
Black:White rate ratio					
2010	6.6	5.4	5.5	5.7	5.7
2011	5.8	4.8	5.0	5.1	5.1
2012	5.3	4.4	4.7	4.7	4.5

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	15–19 years old	20–24 years old	25–29 years old	30–34 years old	35–39 years old
2013	5.0	4.1	4.3	4.2	4.2
2014	4.9	4.1	4.4	4.1	4.0
2015	4.7	3.9	4.3	4.0	3.7
2016	4.5	3.7	4.2	3.9	3.4
2017	4.5	3.6	4.2	3.8	3.3
2018	4.5	3.7	4.1	3.8	3.2
Percentage change ***	−31.8%	−31.5%	−25.5%	−33.3%	−43.9%

* Race classification consistent with the annual STD surveillance reports [1].

** Chlamydia case rates per 100,000 population based on the 2010–2018 STD Surveillance Reports [1].

*** Percentage change in chlamydia case rates or Black:White rate ratio comparing relative change from 2010 to 2018.

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Table 2.

Gonorrhea: reported rates, Black:White rate ratio, percentage change in reported rates and rate ratio, by age group and Black or White race*, United States (2010–2018).

	15–19 years old	20–24 years old	25–29 years old	30–34 years old	35–39 years old
Black **					
2010	2032.4	1997.6	774.6	349.9	139.0
2011	1929.6	2050.4	794.1	347.6	142.9
2012	2032.2	2172.6	898.3	370.3	166.8
2013	1768.5	1949.1	863.2	366.4	158.5
2014	1541.0	1799.9	848.5	343.8	164.0
2015	1547.3	1760.5	883.3	364.1	173.0
2016	1663.1	1856.5	982.0	424.7	206.5
2017	1843.8	2066.8	1104.4	489.9	245.2
2018	1756.4	2040.3	1085.9	533.7	245.3
Percentage change ***	−13.6%	+2.1%	+40.2%	+52.5%	+76.5%
White **					
2010	119.0	156.7	74.8	38.1	17.4
2011	121.2	169.2	85.2	40.7	19.1
2012	134.5	194.9	107.1	52.8	25.9
2013	130.1	190.3	115.3	63.4	31.7
2014	121.3	188.7	125.3	69.2	35.7
2015	136.4	195.8	137.6	79.7	42.5
2016	161.9	232.0	172.7	103.5	60.6
2017	197.5	280.0	205.8	134.6	81.4
2018	200.1	297.5	217.4	154.0	91.4
Percentage change ***	+68.2%	+89.9%	+190.6%	+304.2%	+425.3%
Black:White rate ratio					
2010	17.1	12.8	10.4	9.2	8.0
2011	15.9	12.1	9.3	8.5	7.5
2012	15.1	11.2	8.4	7.0	6.4

	15–19 years old	20–24 years old	25–29 years old	30–34 years old	35–39 years old
2013	13.6	10.2	7.5	5.8	5.0
2014	12.7	9.5	6.8	5.0	4.6
2015	11.3	9.0	6.4	4.6	4.1
2016	10.3	8.0	5.7	4.1	3.4
2017	9.3	7.4	5.4	3.6	3.0
2018	8.8	6.9	5.0	3.5	2.7
Percentage change ***	−48.5%	−46.1%	−51.9%	−62.0%	−66.3%

* Race classification consistent with the annual STD surveillance reports [1].

** Gonorrhea case rates per 100,000 population based on the 2010–2018 STD Surveillance Reports [1].

*** Percentage change in gonorrhea case rates or Black:White rate ratio comparing relative change from 2010 to 2018.

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