HHS Public Access

Author manuscript

J Adolesc Health. Author manuscript; available in PMC 2023 April 28.

Published in final edited form as:

J Adolesc Health. 2021 July ; 69(1): 121–126. doi:10.1016/j.jadohealth.2020.10.024.

Chlamydia and Gonorrhea Screening Among Women Aged 15–24 Years Undergoing a Long-Acting Reversible Contraceptive Insertion

Chirag G. Patel, D.C., M.P.H.[a,*], **Shanna Cox, M.S.P.H.**[b], **Rui Li, Ph.D.**[b], **Karen Pazol, Ph.D., M.P.H.**[b], **Guoyu Tao, Ph.D.**[a]

[a]Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Atlanta, Georgia

[b]Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Atlanta, Georgia

Abstract

Purpose: This study aimed to evaluate the receipt of chlamydia and gonorrhea screening among women aged 15–24 years undergoing long-acting reversible contraception (LARC) insertion.

Methods: We used the 2016–2017 MarketScan commercial claims data set to identify sexually active women aged 15–24 years with LARC insertion in 2017 and had ≥12 months of insurance coverage before the date of LARC insertion. Sexual activity (defined by Healthcare Effectiveness Data and Information Set chlamydia testing measure) and LARC insertion, including intrauterine device (IUD) and implant insertion, were identified by applicable *International Classification of Disease, Tenth Revision*, *Healthcare Common Procedure Coding System*, and *Current Procedural Terminology* codes. We evaluated chlamydia and gonorrhea testing performed in the preceding 12 months or at the time of LARC insertion among sexually active women aged 15–24 years.

Results: We identified 37,331sexually active women aged 15–24 years with LARC insertion. Among these women, overall chlamydia testing was more frequent among women initiating an IUD (77.8%) than implant initiators (67.8%), $p < .001$. A similar pattern was seen for gonorrhea testing (80.0% for IUD users, 71.1% for implant users), $p < .001$. Among sexually active women without chlamydia and gonorrhea testing within the 12 months before the date of insertion, IUD users were more frequently tested for chlamydia (1,410 [20.9%] vs. 433 [9.2%]; $p < .001$) and for gonorrhea (1,206 [20.0%] vs. 374 [8.9%]; $p < .001$) than implant users on the day of LARC insertion.

Conclusions: Our results showed that approximately one in four sexually active women undergoing LARC insertion had not received recommended chlamydia and gonorrhea screening past year. Health care providers may use LARC-related visits as an opportunity to educate patients

[*]Address correspondence to: Chirag G. Patel, D.C., M.P.H., Division of STD Prevention, Centers for Disease Control and Prevention, 1600 Clifton Rd., MS-E80, Atlanta, GA 30316. wyp3@cdc.gov (C.G. Patel).

Conflicts of interest: None declared.

Disclaimer: The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

about, and to offer, chlamydia and gonorrhea screening if they had not been screened in the past 12 months.

Keywords

Chlamydia; Gonorrhea; Screening; Contraception; Intrauterine device (IUD); Implants; Long-acting reversible contraception (LARC); Commercially insured; Sexually active women

The Centers for Disease Control and Prevention (CDC) reported 1.8 million cases of chlamydia and 583,405 cases of gonorrhea in 2018, making them the most common reportable diseases in the U.S. [1,2]. The sequelae of chlamydial and gonococcal infection, such as pelvic inflammatory disease (PID), infertility, tubal ectopic pregnancy, and infant morbidity from perinatal transmission, have been well documented [3]. Because reported rates of chlamydia and gonorrhea are highest in young women and chlamydia and gonorrhea are frequently asymptomatic in women, the CDC and the U.S. Preventive Services Task Force recommend annual chlamydia and gonorrhea screening for all sexually active women aged ≤24 years [4,5]. Screening among older age women is based on risk for infection (e.g., those who have a new sex partner, more than one sex partner, or a sex partner who has a sexually transmitted infection [STI]) [4,5].

The 2016 U.S. Selected Practices Recommendations for Contraceptive Use and the 2016 U.S. Medical Eligibility Criteria for Contraceptive Use 2016 provide clinical guidance for health care providers on safe and effective initiation and the use of contraceptive methods [6,7]. These guidelines aim to reduce medical barriers to initiating and continuing contraceptive methods. Concern about STIs and PID may cause health care providers to not insert intrauterine devices (IUDs) in those deemed at higher risk, particularly adolescents [8,9]. The U.S. Medical Eligibility Criteria for Contraceptive Use classifies IUDs as safe to initiate for women without current purulent cervicitis or chlamydial infection or gonococcal infection [7]. Women who undergo same-day sexually transmitted disease screening and IUD insertion have low PID incidence [7]. If a woman has not been screened according to the sexually transmitted disease treatment guidelines, screening may be performed at the time of IUD insertion [7]. The contraceptive implant initiation can be safely initiated among women with current or suspected STIs [7].

Although long-acting reversible contraception (LARC) are highly effective contraceptive methods for pregnancy prevention, a previous study indicated that adolescent LARC users are more likely to engage in risky sexual behavior such as condomless sex than oral contraceptive users [10]. A recent report suggests lower rates of consistent condom use and increased incidence of STIs among LARC initiators [11]. Given that chlamydia and gonorrhea screening are recommended universally for sexually active women aged ≤24 years, in this study, we assessed the frequency of chlamydia and gonorrhea screening among women aged 15–24 years who undergo IUD or implant insertion.

Methods

IBM Watson Health MarketScan commercial claims data from 2016 to 2017 were used for this epidemiological study. The MarketScan commercial claims database consists of

approximately 26.1 million covered lives from about 100 large employers [12,13]. The claims data capture patient medical encounters for health services over time, both inpatient and outpatient, demographics, service date and location, diagnostic codes (*International Classification of Disease, Tenth Revision*) and procedural codes (*Physician's Current Procedural Terminology* [CPT] and *Healthcare Common Procedure Coding System*), pharmaceutical drug use, and other billing-related information. The patient receiving each service is identified by a unique enrollee ID. The commercial claims data include geographic variables, such as region and Metropolitan Statistical Area (MSA) [14]. The data provided are deidentified; therefore, this study is not considered human subject research and does not require institutional review board review.

Using the MarketScan database, women aged 15–24 years who received an LARC insertion (either IUD or implant) during 2017 were identified using *International Classification of Disease, Tenth Revision* codes (Z30.017, Z30.014, and Z30.430), CPT codes (58300 and 11981), and *Healthcare Common Procedure Coding System* codes (J7300, J7301, J7296, J7297, J7298, and J7307). We considered the earliest date of diagnosis or procedure for an LARC insertion as the date of LARC insertion for each woman. The analytical sample for women with LARC insertion was limited to those continuously enrolled for ≥12 months before the date of LARC insertion. Using Healthcare Effectiveness Data and Information Set (HEDIS) on chlamydia screening, women were considered as sexually active in the 12 months before the day of LARC insertion if they had diagnosis and procedure codes associated with reproductive or sexual health service visits. The reproductive and sexual health services in the HEDIS measure include cervical cancer screening (Papanicolaou test or smear) or pelvic examination, contraceptives, pregnancy, STI, or infertility services [15]. We used CPT codes to identify chlamydia or gonorrhea tests performed (chlamydia: 87490–87492, 87110, 87810, 86631, 87320, 86632, 87270 and gonorrhea: 87590–87592, 87081, 87077, 87205, and 87850).

We identified two measures of chlamydia and gonorrhea screening: (1) overall annual screening performed anytime during the 12 months before IUD or implant insertion and/or on the day of an IUD or implant insertion; (2) among those not screened in the 12 months before insertion, proportion of them screened on the day of insertion. Some women with overall annual screening might be screened both on the day of insertion and in the 12 months before the day of insertion. We used the MSA variable to identify women who resided in precoded MSA (MSA>0; urban area) or non-MSA (MSA = 0; rural/nonurban area) localities. We categorized women by age groups, MSA, and geographic region and performed bivariate chi-square analysis to evaluate the association between each of our measures of chlamydia and gonorrhea screening and these demographic variables. We used SAS software version 9.4 (SAS Institute, Cary, NC, USA) for all statistical analyses and considered $p < .05$ to be statistically significant.

Results

We identified 47,918 women aged 15–24 years who had received IUD and implant insertion, respectively, between January 1, 2017, to December 31, 2017, and had ≥12 months of insurance coverage before the date of LARC insertion (Figure 1).Of those women, 37,331

(77.9%) were identified as sexually active based on reproductive or sexual health claims in the past 12 months before the day of LARC insertion.

Overall annual chlamydia and gonorrhea screening rates within 12 months of LARC insertion including the day of insertion for sexually active women aged 15–24 years were 74.3% and 76.9%, respectively. Chlamydia testing rates were significantly higher among IUD initiators than implant initiators (77.8% vs.67.8%; $p < .001$), and a similar pattern was observed for gonorrhea testing (80.0% for IUD initiators vs. 71.2% for implant initiators) for gonorrhea (Table 1).

Our analysis showed that MSA and region were associated with chlamydia or gonorrhea testing among sexually active women with IUD insertion, and women's age, MSA, and region were associated with chlamydia and gonorrhea testing among sexually active women with implant insertion (Table 1).

Similarly, chlamydia and gonorrhea screening rates were significantly higher among IUD users (13.2% and 13.4%, respectively) than implant users (6.1% and 6.4%, respectively) on the day of insertion and during the 12 months before the date of LARC insertion among sexually active women (Figure 2).

Among 11,455 sexually active women without chlamydia screening within the 12 months before the date of insertion, only 20.9% of IUD users and 9.2% of implant users were tested for chlamydia on the day of LARC insertion, and these estimates were significantly different ($p < .001$; Figure 2). Similarly, among 10,223 sexually active women without gonorrhea screening within the 12 months before the date of insertion, only 20.0% of IUD users and 8.9% of implant users were tested for gonorrhea on the day of LARC insertion, and these estimates were significantly different ($p < .001$; odds ratio: .64, confidence interval: .60–.68).

Discussion

Approximately three in four sexually active women with LARC insertion received recommended chlamydia and gonorrhea screening in the prior 12 months and/or day of LARC insertion. Screening rates were higher among IUD initiators compared with implant initiators as well as among sexually active women resided in MSA area versus non-MSA area and in northeast region versus west region. The results of our analysis of commercially insured cohort of women aged 15–24 years showed that overall annual chlamydia screening among sexually active women with LARC insertion was higher than the rates reported for sexually active women aged 16–24 years enrolled in commercial plans that report chlamydia measures to HEDIS, where approximately half were screened [16]. Among those without screening within the 12 months before the date of insertion, screening on the day of insertion was significantly higher among IUD users (20.9% and 20.0% for chlamydia and gonorrhea, respectively) than among implant users (9.2% and 8.9% for chlamydia and gonorrhea, respectively). Our findings suggest that providers should provide STI screening for all IUD and implant users rather than IUD users only if they were not screened in the 12 months before the date of LARC insertion based on the recommendation. Our findings highlight

that there is a missed opportunity for chlamydia and gonorrhea screening, an integration of family planning and STI services, during the LARC initiation visits, particularly for implant users.

The American College of Obstetrics and Gynecology notes that delivery of comprehensive sexual health care includes assessing sexual history, need for contraceptive service, and recommended screening, including for STIs [17]. Although evidence suggests increased risk of STI among LARC initiators [10,11], delivery of comprehensive sexual health care during family planning visits, such as taking sexual history and providing recommended annual screening for STI, would further improve sexual health among women [18].

There may be several reasons that may explain why providers did not screen young women for chlamydia and gonorrhea during the LARC initiation visits. These reasons may include clinician's lack of knowledge on patient's past-year screening status, additional privacy concern for STI/HIV services, clinicians' prioritizing services in the limited-time encounter, and low reimbursement for STI testing [17,19–22]. For example, a study concluded that parent-insured young women were less likely to receive reproductive health services or chlamydia testing than self-insured women [23]. Further studies may elucidate the reasons why many women were not screened for chlamydia and gonorrhea during the LARC initiation visits if screening in the past 12 months was not performed.

The size of the MarketScan database, although it constitutes a sample of persons who have employer-based health insurance, presents a unique opportunity to longitudinally investigate screening patterns because of its size (i.e., 40 million patients). In addition, it allows for comprehensive assessment of the health outcomes using medical claims data as opposed to self-report to document detailed observation of the event by provider on what, when, and how the medical services rendered. Health care outcomes and services rendered reported on administrative claims data help measure health care quality and adherence to standards of care given to patients [24]. The database has its limitations. The MarketScan databases include commercially insured patients; and therefore, our results may not be representative of women who receive STI screening or LARC services, particularly those who are publicly insured. Many adolescent and young women obtain sexual health services, including contraception and STI screening, through school health centers or publicly funded clinics [25]. Some women may have been offered chlamydia and gonorrhea screening per guidelines but declined testing. Accuracy of the administrative data may have impact on the algorithms that are used to identify sexual activity and LARC insertion. Although the proportion of women aged 15–24 years who were identified as sexually active by HEDIS measure has been shown to be not much different from self-report [16,26], the HEDIS criteria to determine sexually active women may misclassify women's sexual activity status if women seek contraceptives for menstrual bleeding issues or received Pap test for reasons other than sexual activity or if sexually active women did not have any reproductive health–related visit in the past 12 months [27]. Because of the changes in cervical screening guidelines [4], the cervical screening criteria of HEDIS measure may be an outdated approach to classify sexually active patients. The data also have limited laboratory testing result, limited information on provider specialty, and no information on patient's race/ethnicity or education level [12,13]. Our analysis was further restricted to those patients

with continuous enrollment for ≥12 months before IUD insertion to capture previous year screening service encounters; therefore, a small number of patients with lapses in coverage were excluded. Furthermore, the data lack patient's sexual history information such as whether in a monogamous relationship. Although such sexual risk factors may influence STI screening and contraceptive counseling practices, CDC STI guidance recommends that all sexually active women aged 15–24 years receive chlamydia and gonorrhea screening annually.

Among sexually active women aged 15–24 years with an LARC insertion, approximately one in four had no documented screening for chlamydia or gonorrhea in the 12 months before or at the health care visit at which they received their LARC insertion. These results suggest missed opportunities for STI screening at the time of LARC insertion: among those with no indication of screening before insertion, less than one in six were screened on the day of insertion. When women present for contraceptive services, providers are encouraged to follow recommended STI screening guidelines and, when indicated, use the opportunity to appropriately screen women for chlamydia and gonorrhea. Future analyses may assess barriers to providing recommended screening, assess annual STI screening during routine preventive services for continuous LARC users, and identify opportunities for improvement of integration of contraceptive and STI services.

Acknowledgments

Oral presentation of this study was presented at the 2018 National Sexually Transmitted Disease Prevention Conference, Washington, DC.

References

[1]. National Notifiable Diseases Surveillance System. 2017 Annual tables of infectious disease data. Atlanta, GA: CDC Division of Health Informatics and Surveillance; 2018. Available at: https://wonder.cdc.gov/nndss/nndss_annual_tables_menu.asp?mmwr_year=2017. Accessed June 1, 2019.

[2]. National Center for HIV/AIDS Viral Hepatitis STD and TB Prevention (U.S.); Division of STD Prevention, Centers for Disease Control and Prevention (U.S.). Sexually transmitted disease surveillance 2018. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of STD Prevention; 2018.

[3]. Carolyn D, Ward C, Rosanna P, Anna W. Long-term clinical sequelae of sexually transmitted infections in women. Emerg Infect Dis 2004;10:e2.

[4]. Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep 2015;64:1–137.

[5]. LeFevre ML, Force USPST. Screening for chlamydia and gonorrhea: U.S. preventive services task force recommendation statement. Ann Intern Med 2014;161:902–10. [PubMed: 25243785]

[6]. Curtis KM, Jatlaoui TC, Tepper NK, et al. U.S. selected practice recommendations for contraceptive use, 2016. MMWR Recomm Rep 2016;65:1–66.

[7]. Curtis KM, Tepper NK, Jatlaoui TC, et al. U.S. medical eligibility criteria for contraceptive use, 2016. MMWR Recomm Rep 2016;65:1–103.

[8]. Russo JA, Miller E, Gold MA. Myths and misconceptions about long-acting reversible contraception (LARC). J Adolesc Health 2013;52:S14–21.

[9]. Kohn JE, Hacker JG, Rousselle MA, Gold M. Knowledge and likelihood to recommend intrauterine devices for adolescents among school-based health center providers. J Adolesc Health 2012;51:319–24. [PubMed: 22999831]

[10]. Steiner RJ, Liddon N, Swartzendruber AL, et al. Long-acting reversible contraception and condom use among female us high school students: Implications for sexually transmitted infection prevention. JAMA Pediatr 2016;170:428–34. [PubMed: 26974492]

[11]. McNicholas CP, Klugman JB, Zhao Q, Peipert JF. Condom use and incident sexually transmitted infection after initiation of long-acting reversible contraception. Am J Obstet Gynecol 2017;217:672.e1–6.

[12]. MarketScan Databases User Guide and Database Dictionary. MarketScan commercial database. 2016. Armonk, New York: Truven Health Analytics Inc.; 2016.

[13]. White paper - health research data for the real world: The MarketScan databases. Armonk, New York: Truven Health Analytics; 2012. Available at: https://www.ibm.com/downloads/cas/6KNYVVQ2. Accessed June 1, 2019.

[14]. Metropolitan and micropolitan population change: 2000 to 2010. 2017. Available at: https://www.census.gov/library/publications/2012/dec/c2010sr-01.html. Accessed June 1, 2018.

[15]. The National Committee for Quality Assurance (NCQA).. HEDIS 2013 volume 2: Technical specifications for health plans. Washington, DC: National Committee for Quality Assurance; 2013.

[16]. Chlamydia screening in women - NCQA. 2019. Available at: https://www.ncqa.org/hedis/measures/chlamydia-screening-in-women/. Accessed June 1, 2018.

[17]. Sexual health - ACOG. 2017. Available at: https://www.acog.org/-/media/project/acog/acogorg/clinical/files/committee-opinion/articles/2017/07/sexual-health.pdf. Accessed August 6, 2019.

[18]. Centers for Disease Control and Prevention (U.S.). A guide to taking a sexual history. Atlanta, GA: Centers for Disease Control and Prevention (U.S.); 2005.

[19]. Alexander SC, Fortenberry JD, Pollak KI, et al. Disclosure of sexual intercourse by teenagers: Agreement between telephone survey responses and annual visit disclosures. Clin Pediatr (Phila) 2015;54:529–33. [PubMed: 25857726]

[20]. Córdova D, Lua FM, Ovadje L, et al. Adolescent experiences of cliniciane—patient HIV/STI communication in primary care. Health Commun 2018; 33:1177–83. [PubMed: 28686489]

[21]. Walker D, Friderici J, Skiest D. Primary care providers have limited knowledge about STI screening and HIV PrEP in men who have sex with men. Open Forum Infect Dis 2017;4:S667.

[22]. Hoover KW, Leichliter JS, Torrone EA, et al. Chlamydia screening among females aged 15–21 years–multiple data sources, United States, 1999–2010. MMWR Suppl 2014;63:80–8. [PubMed: 25208262]

[23]. Loosier PS, Hsieh H, Cramer R, Tao G. Young adults' access to insurance through parents: Relationship to receipt of reproductive health services and chlamydia testing, 2007–2014. J Adolesc Health 2018;63:575–81. [PubMed: 30115507]

[24]. DiVasta AD, Trudell EK, Francis M, et al. Practice-based quality improvement collaborative to increase chlamydia screening in young women. Pediatrics 2016;137.

[25]. Frost JJ. Trends in US women's use of sexual and reproductive health care services, 1995–2002. Am J Public Health 2008;98:1814–7. [PubMed: 18703443]

[26]. Tao G, Hoover KW, Leichliter JS, et al. Self-reported chlamydia testing rates of sexually active women aged 15–25 years in the United States, 2006–2008. Sex Transm Dis 2012;39:605–7. [PubMed: 22801342]

[27]. Mangione-Smith R, McGlynn EA, Hiatt L. Screening for chlamydia in adolescents and young women. Arch Pediatr Adolesc Med 2000;154:1108–13. [PubMed: 11074851]

IMPLICATIONS AND CONTRIBUTION

This study showed approximately one in four sexually active women aged 15–24 years undergoing long-acting reversible contraception insertion had not received recommended chlamydia and gonorrhea screening in the previous 12 months and/or at the time of insertion.

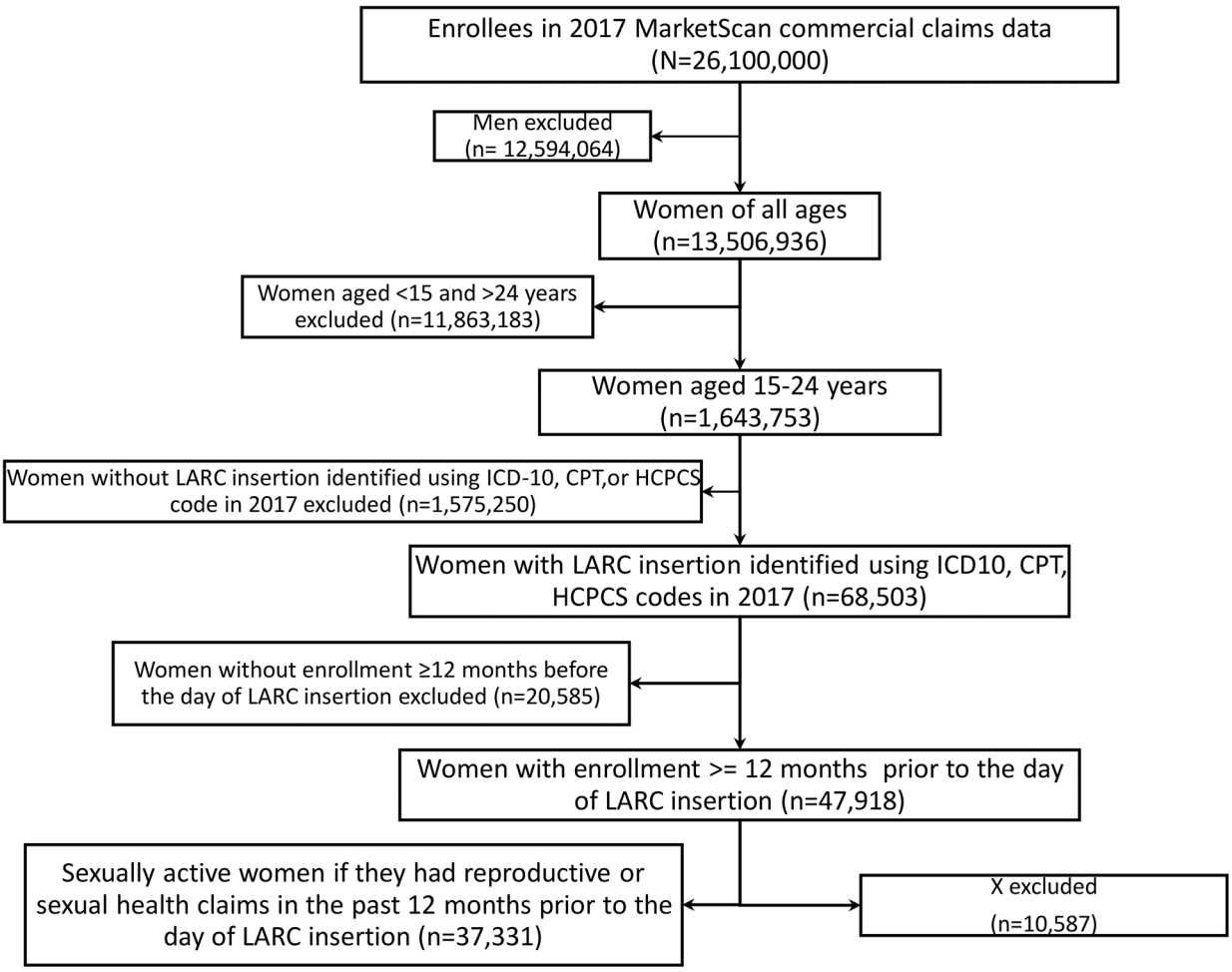

Figure 1:

Flow chart of distribution of all women and presumably sexually active women aged 15−24 years receiving long-acting reversible contraception (LARC) insertion in 2017. ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th Revision; CPT, Current Procedural Terminology; HCPCS, Healthcare Common Procedure Coding System.

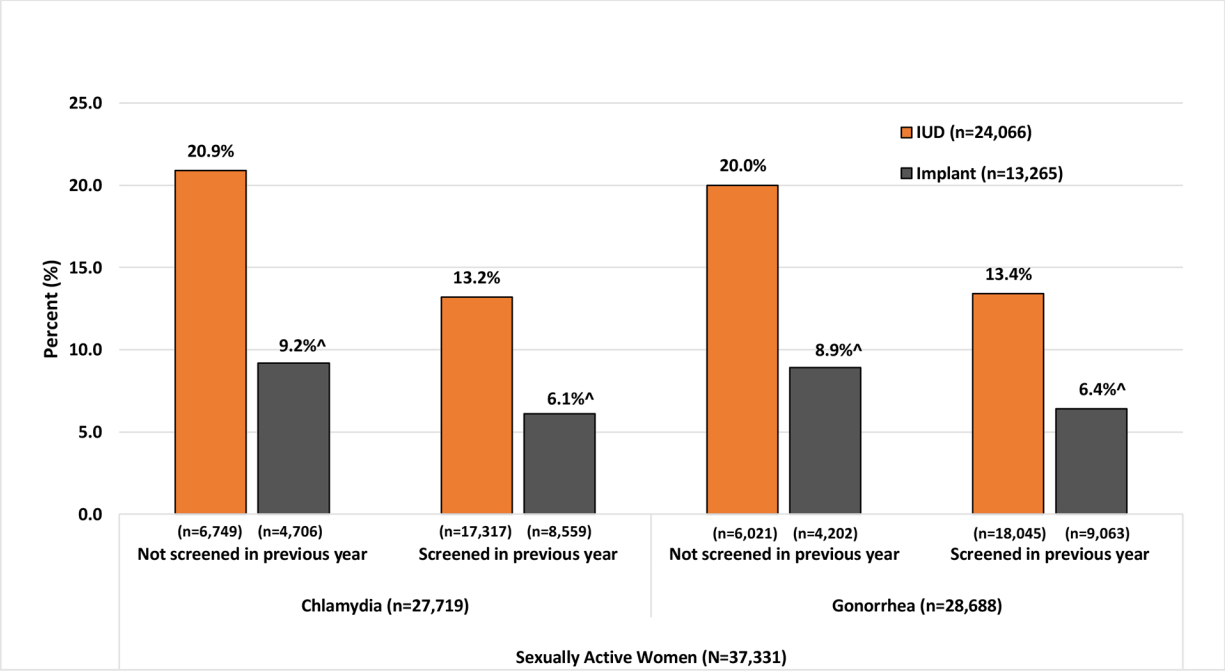

Figure 2:

Proportions of women with chlamydia and gonorrhea testing on the day of long-acting reversible contraceptive (LARC) insertion, stratified by women's chlamydia and gonorrhea testing status during the 12 month before the day of LARC insertion, among sexually active women aged 15–24 years with LARC insertion performed in 2017 in MarketScan commercial claims database 2016−2017.

Note: IUD- intrauterine device, LARC- long-acting reversible contraceptive. ^P<.05 for either chlamydia or gonorrhea screening by the type of LARC

Table 1:

Chlamydia and gonorrhea screening performed in the 12 months prior to and/or the day of LARC insertion, among sexually active 15–24 years old women**, MarketScan Commercial Claims database, 2017

	Total sex active women with LARC (%)	Chlamydia testing	%	Confidence interval	Gonorrhea testing	%	Confidence interval
	37,331 (100)	27,719	74.3		28,688	76.9	
Women with IUD	24,066 (64.5)	18,727	77.8	(0.77–0.78)	19,251	80.0	(0.79–0.81)
Age Groups+							
15–19	5,519 (20.9)	4,286	77.7	(0.77–0.79)	4,400	79.7	(0.79–0.81)
20–24	18,547 (77.1)	14,441	77.9	(0.77–0.78)	14,851	80.1	(0.79–0.81)
Area^							
Non-MSA	2,486 (10.3)	1,805	72.6	(0.71–0.74)	1,875	75.4	(0.74–0.77)
MSA	18,840 (78.3)	14,801	78.6	(0.78–0.79)	15,169	80.5	(0.80–0.81)
Region*							
North-east	4,720 (19.6)	4,099	86.8	(0.86–0.88)	4,107	87.0	(0.86–0.88)
North-central	5,249 (21.8)	4,134	78.8	(0.78–0.80)	4,241	80.8	(0.80–0.82)
South	9,556 (39.7)	7,102	74.3	(0.73–0.75)	7,438	77.8	(0.77–0.79)
West	4,450 (18.5)	3,317	74.5	(0.73–0.76)	3,389	76.2	(0.75–0.77)
Women with Implant	13,265 (35.5)	8,992	67.8	(0.67–0.69)	9,437	71.1	(0.70–0.72)
Age Groups+							
15–19	5,454 (41.1)	3,463	63.5	(0.62–0.65)	3,689	67.6	(0.66–0.69)
20–24	7,811 (58.9)	5,529	70.8	(0.70–0.72)	5,748	73.6	(0.73–0.75)
Area^							
Non-MSA	1,668 (12.6)	1,048	62.8	(0.60–0.65)	1,125	67.5	(0.65–0.70)
MSA	10,204 (76.9)	7,033	68.9	(0.68–0.70)	7,334	71.9	(0.71–0.73)
Region*							
North-east	1,503 (11.3)	1,180	78.5	(0.76–0.81)	1,190	79.2	(0.77–0.81)
North-central	2,864 (21.6)	1,969	68.8	(0.67–0.70)	2,085	72.8	(0.71–0.74)
South	6,379 (48.1)	4,312	67.6	(0.66–0.69)	4,538	71.1	(0.70–0.72)
West	2,465 (18.6)	1,493	60.6	(0.59–0.63)	1,587	64.4	(0.62–0.66)

Note: Differences presented here (e.g. +, *, ^)as a result of chi square bivariate analysis of Intrauterine device vs. Implant by chlamydia or gonorrhea testing; “Other” group from MSA category due to missing values and “Unknown” group from region category were removed due to non-specific category.

** who were continuously enrolled (≥ 12 months) in health insurance plans prior to the day of LARC insertion