Journal of Adolescent Health 71 (2022) 642–645

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Adolescent health brief

Patterns in Receipt and Source of STI Testing Among Young People in the United States, 2013–2019

Zoe H. Pleasure, M.P.H. [a,b,*], Laura D. Lindberg, Ph.D. [b], Jennifer Mueller, M.P.H. [c], and Jennifer J. Frost, Dr.P.H. [c]

[a] *Department of Health Systems & Population Health, University of Washington School of Public Health, Seattle, Washington*
[b] *Formerly of the Research Division, Guttmacher Institute, New York, New York*
[c] *Research Division, Guttmacher Institute, New York, New York*

Article history: Received December 2, 2021; Accepted April 25, 2022
Keywords: Care delivery; Sexually transmitted infections; Source of care; Inequities in STI testing

See Related Editorial on p.521

A B S T R A C T

Purpose: Rates of sexually transmitted infections (STIs) among adolescents and young adults (15–24) continue to increase. Limited national information exists about the frequency and source of STI testing among this population.
Methods: We performed a cross-sectional analysis of National Survey of Family Growth data from 2013–2019 to describe patterns in STI testing and assess associations with individual characteristics.
Results: We found that non-Hispanic Black women, non-Hispanic Black and Hispanic men, and individuals with public insurance are more likely to receive an STI test. The two sexes have different sources of care for STI testing and publicly supported providers provide the bulk of services to marginalized populations.
Discussion: STI testing frequencies of this age group fall below what national guidelines suggest. Multiple socioecological factors may affect the likelihood that a young person receives an STI test. All providers should be supported and encouraged to provide confidential and unbiased STI care.

IMPLICATIONS AND CONTRIBUTION

This nationally representative study highlights inequities in young people's receipt of sexually transmitted infections testing by sex, race and ethnicity, family income level, insurance status, and source of care. By understanding these patterns, policies, and programs to reduce STI cases can be better tailored and modified for the population.

Young people (aged 15–24 years) experience a disproportionate burden of sexually transmitted infections (STIs), acquiring almost half of new reported infections [1]. Barriers to accessing quality STI services are identified as one reason for the higher and increasing STI incidence [2]. A recent study found that the Affordable Care Act led to an increase in the proportion of young women obtaining STI care from private providers and a corresponding decrease served by publicly supported clinics [3]. Still, there is a little information on STI testing patterns among the population [4–6] and limited attention on STI testing inequities. We use nationally representative data to describe recent patterns in receipt of STI testing for sexually active people aged 15–24 years.

Materials & Methods

Background & study sample

We used the data from the National Survey of Family Growth (NSFG) continuously collected between September 2013 and

Conflicts of interest: The authors have no conflicts of interest to disclose.

* Address correspondence to: Zoe H. Pleasure, M.P.H., Department of Health Systems and Population Health, University of Washington School of Public Health, 1959 NE Pacific St, Box 357660, Seattle, WA 98195.
E-mail addresses: zoep2@uw.edu; zhypatiap@gmail.com (Z.H. Pleasure).

https://doi.org/10.1016/j.jadohealth.2022.04.014

September 2019 [7–9]. The NSFG is a nationally representative household survey of females and males (The NSFG does not ask each respondent directly about their sex assigned at birth or gender identity. A respondent receives either the female or male questionnaire depending on how they or a family member answered a question about sex assigned at birth of household members during the household report. We use female, male, women, and men throughout to match the language used by the NSFG. There is no information in the NSFG about non-binary individuals.) administered by the National Center for Health Statistics, which oversamples non-Hispanic Black and Hispanic individuals, and adolescents [9]. We limited our analytic sample to sexually-active (Sexually active is defined as sex with opposite or same-sex partner(s) in the 12 months preceding the interview. Male respondents were asked specifically about oral or anal sex with a male partner in all survey periods, and additionally asked about any other "sexual experience" with a male partner in 2015–2019; female respondents were asked to report oral sex or any other "sexual experience" with a female partner in all survey periods.) respondents aged 15–24. The National Center for Health Statistics Institutional Review Board's protections of human subjects approved data collection methods and dissemination of the public-use dataset.

Variable definitions

The primary outcome was receiving an STI test in the last 12 months, measured in both the computer-assisted personal interviews (CAPI) and audio computer-assisted self-interviews (ACASI). ACASI is designed to improve reporting of sensitive behaviors [10]. We also examined the source of STI test measured through CAPI (further source of care variable definitions available in Table A1) [3]. Demographic covariates include categorical measures of age, race and ethnicity, household poverty level, type of sexual partnerships, number of sexual partners, and insurance (see details in Table A1). All measures used are self-reported.

Analysis

We describe patterns in receipt and source of STI test in the last 12 months among sexually-active young people aged 15–24. We estimate associations with these outcomes and the demographic covariates using logistic regression and chi-squared. We applied 6-year sampling weights for the pooled 2013–2019 period.

Results

Receipt of STI test by demographics

During 2013–2019, 53% of women aged 15–24 reported receiving an STI test compared to 22% of men in the combined CAPI and ACASI measure (Table 1). Receipt of STI test varied by survey mode and respondents' characteristics. For men, the reported STI testing rates were consistently higher via ACASI than CAPI. We use the combined CAPI and ACASI measure for the remainder of this logistic regression analysis.

A higher proportion of individuals aged 18–24 years received STI testing (odds ratio OR = 2.6, 57% women; OR = 1.9, 24% men) than those aged 15–17 (33% women, 14% men). For women, those with a family income of over 100% of the federal poverty level (FPL) (OR = 0.7, 52% FPL 100%–249%; OR = 0.6, 49% FPL ≥250%) were less likely to receive an STI test compared to those

Table 1
Results from unadjusted logistic regressions predicting receipt of STI test reported using CAPI or ACASI among U.S. women and men ages 15–24 who had any sexual partner in the last 12 months, National Survey of Family Growth, 2013–2019

Characteristic	Female (N = 3,508)						Male (N = 3,054)					
	CAPI		ACASI		CAPI + ACASI		CAPI		ACASI		CAPI + ACASI	
	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Overall	47		45		53		12		20		22	
Age group												
15–17 (ref)	26	1.0	29	1.0	33	1.0	6	1.0	12	1.0	14	1.0
18–24	50	2.9 (2.1–3.9)[a]	48	2.2 (1.6–3.1)[a]	57	2.6 (2.0–3.5)[a]	14	2.3 (1.5–3.6)[a]	21	1.9 (1.3–2.6)[a]	24	1.9 (1.4–2.6)[a]
Income level, % of FPL												
<100% (ref)	51	1.0	51	1.0	60	1.0	13	1.0	22	1.0	25	1.0
100%–249%	47	0.8 (0.7–1.1)	42	0.7 (0.6–0.9)[a]	52	0.7 (0.6–1.0)[a]	12	1.0 (0.7–1.4)	20	0.9 (0.6–1.2)	23	0.9 (0.7–1.3)
≥250%	42	0.7 (0.5–0.9)[a]	43	0.7 (0.6–0.9)[a]	49	0.6 (0.5–0.8)[a]	12	1.0 (0.7–1.4)	18	0.7 (0.5–1.0)	21	0.8 (0.6–1.1)
Race and ethnicity												
Non-Hispanic white (ref)	45	1.0	42	1.0	51	1.0	8	1.0	13	1.0	15	1.0
Non-Hispanic Black	60	1.8 (1.4–2.4)[a]	62	2.3 (1.7–2.9)[a]	70	2.2 (1.7–2.9)[a]	23	3.3 (2.2–4.9)[a]	36	3.6 (2.6–5.0)[a]	41	3.8 (2.7–5.3)[a]
Hispanic	43	0.9 (0.7–1.2)	39	0.9 (0.7–1.2)	49	0.9 (0.7–1.2)	15	1.9 (1.3–2.8)[a]	23	1.9 (1.4–2.7)[a]	27	2.0 (1.5–2.8)[a]
Non-Hispanic other or multiple race	41	0.8 (0.6–1.2)	47	1.2 (0.9–1.7)	50	1.0 (0.7–1.4)	12	1.5 (0.8–2.5)	19	1.5 (0.9–2.5)	21	1.5 (0.9–2.4)
Type of sexual partners[b]												
Opposite sex partner (ref)	46	1.0	44	1.0	53	1.0	12	1.0	18	1.0	21	1.0
Same sex partner	49	1.1 (0.9–1.4)	49	1.3 (1.0–1.6)[a]	56	1.2 (0.9–1.4)	25	2.6 (1.6–4.3)[a]	41	3.1 (2.0–4.8)[a]	43	2.9 (1.9–4.4)[a]
Number of partners[b]												
One partner (ref)	42	1.0	39	1.0	48	1.0	9	1.0	13	1.0	16	1.0
Multiple partners	55	1.7 (1.3–2.1)[a]	56	2.0 (1.6–2.4)[a]	62	1.8 (1.4–2.2)[a]	18	2.2 (1.6–3.0)[a]	29	2.8 (2.1–3.8)[a]	33	2.6 (2.0–3.5)[a]
Insurance coverage												
Private insurance/military (ref)	45	1.0	44	1.0	51	1.0	11	1.0	18	1.0	20	1.0
Medicaid/public	52	1.3 (1.1–1.6)[a]	49	1.3 (1.0–1.6)	59	1.4 (1.1–1.7)[a]	16	1.5 (1.0–2.1)[a]	24	1.5 (1.1–2.0)[a]	29	1.6 (1.2–2.1)[a]
Uninsured	42	0.9 (0.7–1.1)	42	0.9 (0.7–1.3)	50	1.0 (0.7–1.3)	12	1.1 (0.7–1.6)	21	1.2 (0.8–1.7)	24	1.3 (0.9–1.8)

ACASI = audio computer-assisted self-interviews; CAPI = computer-assisted personal interview; FPL = federal poverty level; STI = sexually transmitted infection.
[a] Significantly different from the reference group in respective category at $p < .05$.
[b] Type of partner(s) in last 12 months.

with a family income below 100% of FPL (60%). More than two-thirds of non-Hispanic Black women (OR = 2.2, 70%) received an STI test, a proportion significantly higher than that of non-Hispanic White women (51%). For men, both non-Hispanic Black (OR = 3.8, 41%) and Hispanic (OR = 2.0, 27%) men received STI tests at higher proportions than non-Hispanic White men (15%). Men who had same sex partners (43%) were more likely to receive an STI test compared to those with only opposite sex partners (OR = 2.9, 21%). The share of women and men receiving an STI test was greater among those with multiple partners (OR = 1.8, 62% women; OR = 2.6, 33% men) than those who had one partner (48% women, 16% men). A larger proportion of individuals with Medicaid (OR = 1.4, 59% women; OR = 1.6, 29% men) received STI testing than those with private insurance (51% women, 20% men).

Receipt of STI test by source of care

In 2013–2019, 66% of women and 39% of men who obtained an STI test (CAPI measure for women, combined measure for men) were served by private providers (Table 2). In contrast, a higher percentage of men (43%) relied on publicly supported clinics than women (28%). Eighteen percent of men visited some other place for care, while only 7% of women did. Use of publicly supported clinics for STI testing was most common among those who were uninsured (55% women, 57% men), men who had Medicaid or other public insurance (58%), men under 100% of the FPL (58%), and non-Hispanic Black (53%) and Hispanic men (50%).

Discussion

STI testing is a vital component of quality sexual health care for young people [11]. Our study found that STI testing is substantially below Centers for Disease Control and Prevention guidelines for testing of sexually-active women [12]. Testing rates are also low for men, which may be due to national guidelines not recommending STI testing for all sexually-active young men. The lack of comparability between the ACASI and CAPI measures of STI testing among males raises concerns for measurement quality; future analyses should incorporate the ACASI measures when possible. Our findings that non-Hispanic Black women, non-Hispanic Black and Hispanic men, and individuals with public insurance are more likely to receive an STI test align with previous patterns observed [13,14]. More work should be done to investigate these trends further.

These data show that private providers play a central role in providing STI testing for young people and should be supported in these efforts. Still, publicly supported clinics should be expanded to continue serving young people who face barriers to care. In addition, to provider and systems-level reasons why someone may not be screened for STIs, individual-level factors, such as desire to not be tested and concerns about

Table 2
Weighted number and percent distribution, of U.S. women and men ages 15–24 who had any sexual partner in the last 12 months receiving any STI test[b] in the prior year, National Survey of Family Growth, 2013–2019

Characteristics	Female (N = 1,715)				Male (N = 762)			
	Weighted No. receiving STI services (in 000s)	Type of provider visited			Weighted No. receiving STI services (in 000s)	Type of provider visited		
		Private provider	Publicly supported clinic	Other[c]		Private provider	Publicly supported clinic	Other[c]
		%	%	%		%	%	%
Overall	6,113	66	28	7	2,900	39	43	18
Age group								
15–17	503	63	29	7	319	34	48	18
18–24	5,609	66	27	7	2,581	40	42	18
Income level, % of FPL				[a]				[a]
<100%	2,115	60	32	8	705	26	58	16
100%–249%	2,090	67	28	5	983	40	43	17
≥250%	1,908	71	22	7	1,212	47	33	20
Race/ethnicity				[a]				[a]
Non-Hispanic white	3,130	73	22	5	1,020	54	27	19
Non-Hispanic Black	1,219	54	36	10	794	34	53	13
Hispanic	1,265	59	35	6	840	29	50	21
Non-Hispanic other or multiple race	498	62	27	12	246	34	48	18
Type of sexual partners[d]								
Opposite sex partner	4,481	67	27	6	2,525	40	41	18
Same sex partner	1,629	62	29	9	375	32	53	15
Number of partners[b]				[a]				[a]
One partner	3,438	71	23	6	1,193	41	36	22
Multiple partners	2,669	59	34	8	1,707	38	48	15
Insurance coverage				[a]				[a]
Private insurance/ military	3,406	75	19	7	1,676	50	32	19
Medicaid/public	1,941	61	33	6	750	31	58	11
Uninsured	765	36	55	9	474	16	57	27

ACASI = audio computer-assisted self-interviews; CAPI = computer-assisted personal interview; FPL = federal poverty level.
[a] Statistically significant Pearson chi-squared test at $p < .05$.
[b] Responses to CAPI question are used for females. Combined responses to CAPI + ACASI are used for males.
[c] Other providers include hospital inpatient care, emergency room, urgent care center, in-store clinic, employer-based clinic, or some other place.
[d] Type of partner(s) in last 12 months.

confidentiality, may affect STI testing [15,16]. Providers need to be sensitive to these issues and support young people in feeling they have safe access to STI testing.

Acknowledgments

This study was made possible by an anonymous donor. The views expressed are those of the authors and do not necessarily reflect the positions and policies of the donor.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2022.04.014.

References

[1] Adolescents and Young Adults. Centers for Disease Control and Prevention. Available at: https://www.cdc.gov/std/life-stages-populations/adolescents-youngadults.htm. Published April 8, 2021. Accessed July 27, 2021.
[2] Tilson EC, Sanchez V, Ford CL, et al. Barriers to asymptomatic screening and other STD services for adolescents and young adults: Focus group discussions. BMC Public Health 2004;4:21.
[3] Frost JJ, Mueller J, Pleasure ZH. Trends and differentials in receipt of sexual and reproductive health services in the United States: Services received and sources of care, 2006–2019. New York, NY: Guttmacher Institute; 2021. Available at: https://www.guttmacher.org/report/sexual-reproductive-health-services-in-us-sources-care-2006-2019. Accessed August 3, 2021.
[4] Sharma A, Wang LY, Dunville R, et al. HIV and sexually transmitted disease testing behavior among adolescent sexual minority males: Analysis of pooled youth risk behavior survey data, 2005–2013. LGBT Health 2017;4:130–40.
[5] Mustanski B, Moskowitz DA, Moran KO, et al. Factors associated with HIV testing in teenage men who have sex with men. Pediatrics 2020;145:e20192322.
[6] Cuffe KM, Newton-Levinson A, Gift TL, et al. Sexually transmitted infection testing among adolescents and young adults in the United States. J Adolesc Health 2016;58:512–9.
[7] Public-use data file documentation 2013-2015 user's guide: National survey of family growth. Hyattsville, MD: National Center for Health Statistics; 2016. Available at: https://www.cdc.gov/nchs/data/nsfg/NSFG_2013_2015_UserGuide_MainText.pdf. Accessed May 11, 2021.
[8] Public-use data file documentation 2015-2017 user's guide: National survey of family growth. Hyattsville, MD: National Center for Health Statistics; 2018. Available at: https://www.cdc.gov/nchs/data/nsfg/NSFG_2015_2017_UserGuide_MainText.pdf. Accessed May 30, 2022.
[9] Public-use data file documentation 2017-2019 user's guide: National survey of family growth. Hyattsville, MD: National Center for Health Statistics; 2020. Available at: https://www.cdc.gov/nchs/data/nsfg/NSFG-2017-2019-UG-MainText-508.pdf. Accessed April 5, 2021.
[10] Lindberg L, Scott RH. Effect of ACASI on reporting of abortion and other pregnancy outcomes in the U.S. National survey of family growth. Stud Fam Plann 2018;49:259–78.
[11] Barrow RY, Ahmed F, Bolan GA, Workowski KA. Recommendations for providing quality sexually transmitted Diseases clinical services, 2020. MMWR Recomm Rep 2020;68:1–20.
[12] Screening recommendations and considerations referenced in treatment guidelines and original sources - sexually transmitted infections treatment guidelines, 2021. Atlanta, GA: Centers for Disease Control and Prevention; 2021. Available at: https://www.cdc.gov/std/treatment-guidelines/screening-recommendations.htm. Accessed February 17, 2021.
[13] Goyal MK, Witt R, Hayes KL, et al. Clinician adherence to recommendations for screening of adolescents for sexual activity and sexually transmitted infection/human immunodeficiency virus. J Pediatr 2014;165:343–7.
[14] Wiehe SE, Rosenman MB, Wang J, et al. Chlamydia screening among young women: Individual- and provider-level differences in testing. Pediatrics 2011;127:e336–44.
[15] Keller L. Adolescents deserve better: What the biden-harris administration and congress can do to bolster young people's sexual and reproductive health. New York, NY: Guttmacher Institute; 2021.
[16] Hoopes AJ, Benson SK, Howard HB, et al. Adolescent perspectives on patient-provider sexual health communication: A qualitative study. J Prim Care Community Health 2017;8:332–7.