Trends in Receipt of Sexually Transmitted Disease Services Among Women 15 to 44 Years Old in the United States, 2002 to 2006–2010

Laura T. Haderxhanaj, MPH, MS, Thomas L. Gift, PhD, Penny S. Loosier, PhD, MPH, Ryan C. Cramer, JD, MPH, and Jami S. Leichliter, PhD

Background: To describe recent trends in the receipt of sexually transmitted disease (STD) services among women (age, 15–44 years) from 2002 to 2006–2010 using the National Survey of Family Growth.

Methods: We analyzed trends in demographics, health insurance, and visit-related variables of women reporting receipt of STD services (counseling, testing, or treatment) in the past 12 months. We also analyzed trends in the source of STD services and the payment method used.

Results: Receipt of STD services reported by women in the past 12 months increased from 2002 (12.6%) to 2006–2010 (16.0%; $P < 0.001$). Receipt of services did not increase among adolescents ($P = 0.592$). Among women receiving STD services from a private doctor/HMO, the percentage with private insurance decreased over time (74.6%–66.8%), whereas the percentage with Medicaid increased (12.8%–19.7%; $P = 0.020$). For women receiving STD services at a public clinic or nonprimary care facility, there were no statistically significant differences by demographics, except that fewer adolescents but more young adults reported using a public clinic over time ($P = 0.038$). Among women who reported using Medicaid as payment, receipt of STD services at a public clinic significantly decreased (36.8%–25.4%; $P = 0.019$). For women who paid for STD services with private insurance, the only significant difference was an increase in having a copay over time (61.3%–70.1%; $P = 0.012$).

Conclusions: Despite a significant increase in receipt of STD services over time, many women at risk for STDs did not receive services including adolescents. In addition, we identified important shifts in payment methods during this time frame.

Sexually transmitted diseases (STDs) continue to be a public health problem and are the most commonly reported infectious diseases in the United States.[1,2] Some curable bacterial STDs are associated with sequelae in women, including chronic pelvic pain, pelvic inflammatory disease, infertility, and ectopic pregnancy; however, many infections are asymptomatic.[1–3] Chlamydia infections are the most commonly reported notifiable disease in the United States, with 610.6 cases per 100,000 women reported for 2010.[3] Gonorrhea cases, the second most commonly reported disease in the United States, have recently increased.[4] To reduce the negative health impacts of STDs and identify asymptomatic infections, it is important that women receive timely STD services including screening, treatment, and counseling.[2,3]

One example of STD services is screening for chlamydia, recommended routinely by the US Preventive Services Task Force for sexually active young women and other women at high risk for infection, although few studies have focused on recent trends of these services at the national level.[5] The Healthcare Effectiveness Data and Information Set measure for chlamydia screening examined trends in the United States and found that screening increased from 29.8% in 2002 to 41.6% in 2007 among sexually active young women (age, 16–25 years) enrolled in private health insurance and Medicaid.[1] Although the trends increased, chlamydia screening in the United States remains at suboptimal levels, even among insured women. Similarly, chlamydia testing rates increased significantly from 220 tests per 1000 person-years in 1997 to 270 tests per 1000 person-years in 2007 among women (age, 15–44 years) enrolled in a private health plan.[6] However, data in both studies are limited to medical claims and exclude uninsured women.

One national study that included uninsured women found a statistically significant increase in use of STD services among women from 1995 (7.6%) to 2002 (12.6%),[7] but recent trends are unknown. Given the potential sequelae of STDs in women and the changing health care system in the United States, it is important to monitor trends in the receipt of STD services including patterns of use and payment for services. Thus, the purpose of this study is to examine recent trends in the receipt of STD services among reproductive-aged women using a national survey from 2002 to 2006–2010.

MATERIALS AND METHODS

The National Survey of Family Growth (NSFG) is a nationally representative, cross-sectional, in-person, household survey of noninstitutionalized men and women aged 15 to 44 years in the United States.[8–10] We analyzed data from the 2002 and 2006–2010 NSFG. In 2006 to 2010, the NSFG changed to continuous administration where interviews were conducted from June 2006 to June 2010.[8] The 2006 to 2010 continuous interviewing process contained the same primary sampling units as the 2002 survey.[8]

Given STD sequelae, analyses were restricted to women only. In the 2002 NSFG, 7643 women were interviewed, and in 2006 to 2010, 12,279 women were interviewed.[9,10] In 2002, the NSFG response rate for women was 80%, and in 2006 to 2010, the response rate was 78%.[9,10] The NSFG was approved by the Centers for Disease Control and Prevention National Center for Health Statistics Ethics Review Board. Participants provided informed consent; subsequent to parental consent, adolescent respondents provided assent.

From the Division of STD Prevention, Centers for Disease Control and Prevention, Atlanta, GA

Acknowledgment: This research was supported, in part, by an appointment to the Research Participation Program at the Centers for Disease Control and Prevention (CDC) administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the US Department of Energy and CDC.

Disclosure: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC.

Conflict of interest: None declared.

Correspondence: Laura T. Haderxhanaj, MPH, MS, Division of STD Prevention, Centers for Disease Control and Prevention, 1600 Clifton Rd, Mailstop E-02, Atlanta, GA 30333. E-mail: LHaderxhanaj@cdc.gov.

Received for publication August 7, 2013, and accepted October 3, 2013.
DOI: 10.1097/OLQ.0000000000000058

We analyzed the demographic characteristics, health insurance, and visit-related variables of women reporting receipt of STD services in the 12 months before interview. Receipt of STD services was ascertained by asking women if they had received counseling for or been tested or treated for an STD in the past 12 months, with a dichotomized response (yes or no). The demographic characteristics included in analyses were age (15–19, 20–24, or 25–44 years), race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, or non-Hispanic other), and poverty-income ratio. The poverty-income ratio was calculated from the household income as a percentage of the federal poverty level (FPL; recoded as 0–132% or ≥133%).

Two health insurance variables were included in analyses. The first variable, current health insurance status, categorized

TABLE 1. Self-Reported Receipt of STD Service in the Past 12 Months Among Women (15–44 Years): Demographic and Visit-Related Characteristics, 2002 (n = 7633) and 2006–2010 (n = 12,272)

	Year		
	2002, % (SE)	2006–2010, % (SE)	*P*
Unweighted sample size	n = 7633	n = 12,272	
Population total estimate	61,500,000	61,700,000	
Receipt of STD service in past 12 mo			<0.001
Yes	12.6 (0.5)	16.0 (0.6)	
No	87.4 (0.5)	84.0 (0.6)	
Women who reported receipt of STD service in past 12 mo			
Unweighted sample size	n = 1092	n = 2230	
Population total estimate	7,700,000	9,800,000	
Demographics			
Age, y			<0.001
15–19	15.2 (1.1)	14.3 (1.1)	0.592
20–24	22.3 (1.4)	30.0 (1.8)	<0.001
25–44	9.7 (0.5)	12.8 (0.6)	<0.001
Race/ethnicity			<0.001
Hispanic	12.5 (1.0)	15.8 (1.0)	0.019
White (non-Hispanic)	12.0 (0.7)	14.7 (0.8)	0.010
Black (non-Hispanic)	16.1 (1.1)	23.7 (1.3)	<0.001
Other (non-Hispanic)	11.1 (1.9)	11.3 (1.5)	0.924
Poverty-income ratio			<0.001
0–132%	15.1 (0.9)	18.6 (0.9)	0.007
≥133%	11.6 (0.5)	14.7 (0.7)	<0.001
Health insurance status (current)			<0.001
Private insurance*	11.1 (0.5)	13.4 (0.7)	0.007
Medicaid, CHIP, state-sponsored health plan	18.6 (1.5)	25.0 (1.6)	0.004
Medicare, military, other government plan	17.6 (2.4)	23.4 (2.7)	0.117
No insurance†	13.9 (1.4)	15.7 (1.1)	0.302
Health insurance gap in past 12 mo			<0.001
Yes	15.6 (1.3)	19.0 (1.1)	0.040
No	11.7 (0.5)	14.9 (0.7)	<0.001
Visit-related characteristics			
Place received STD service			0.202
Private doctor/HMO	59.3 (1.8)	56.1 (1.9)	
Community health clinic, community clinic, public health clinic	19.5 (1.3)	18.3 (1.4)	
Family planning or Planned Parenthood	9.7 (1.3)	12.1 (1.1)	
Nonprimary care‡	11.5 (1.1)	13.4 (1.0)	
Payment method	n = 1060	n = 2162	0.021
Medicaid	18.5 (1.4)	24.9 (1.5)	
Insurance	54.1 (2.1)	49.9 (2.3)	
Out-of-pocket	14.9 (1.7)	14.2 (1.5)	
No payment required	12.5 (1.4)	11.0 (1.2)	
Clinic is a regular place for medical care§	n = 394	n = 910	0.077
Regular place	54.8 (3.0)	59.6 (3.0)	
Regular place, but go to >1 place regularly	5.5 (1.4)	4.3 (0.9)	
Usually go somewhere else	33.9 (3.3)	25.9 (2.3)	
No usual place	5.8 (1.4)	10.2 (1.8)	

Cochran–Mantel–Haenszel tests were used to compare trends in receipt of STD services for each subgroup.

*Private insurance category includes participants enrolled in Medi-Gap.

†No insurance category includes participants with single-service plans or Indian Health Service.

‡Nonprimary care category includes employer or company clinic, school or school-based clinic, hospital outpatient clinic, hospital emergency department, hospital regular room, urgent care, urgi-care, or walk-in facility, or some other place.

§Item was applicable to those who had an STD service in the following clinics only: community health clinic, community clinic, or public health clinic; family planning or Planned Parenthood; school or school-based clinic; and hospital outpatient clinic.

STD service indicates counseling, testing, and/or treatment of STD.

TABLE 2. The Place Women (15–44 years) Received STD Services in the Past 12 Months by Demographic Characteristics, 2002 (n = 1092) and 2006–2010 (n = 2230)

	Private Doctor/HMO			Public Clinic*			Family Planning†			Nonprimary Care‡		
	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*
Age, y			0.870			0.038			0.154			0.455
15–19	13.7 (1.6)	13.3 (1.4)		28.4 (3.7)	18.2 (2.0)		33.8 (7.2)	18.1 (3.3)		20.7 (4.4)	17.0 (2.5)	
20–24	29.4 (2.5)	28.0 (2.1)		24.7 (3.6)	32.7 (3.1)		28.3 (5.7)	40.0 (4.9)		29.0 (4.9)	37.7 (4.9)	
25–44	56.9 (2.5)	58.8 (2.5)		47.0 (4.2)	49.1 (3.1)		37.9 (6.3)	41.9 (4.1)		50.2 (5.0)	45.3 (4.5)	
Race/Ethnicity			0.580			0.447			0.373			0.474
Hispanic	11.8 (1.4)	13.4 (1.7)		25.7 (3.2)	25.5 (3.9)		13.8 (3.1)	22.7 (3.6)		11.4 (2.7)	14.0 (2.9)	
White (non-Hispanic)	66.7 (2.6)	63.2 (2.5)		46.7 (4.8)	37.1 (4.7)		69.2 (5.8)	61.0 (4.2)		63.0 (4.8)	53.3 (4.4)	
Black (non-Hispanic)	16.5 (1.9)	19.3 (2.0)		22.9 (3.8)	30.3 (4.4)		13.8 (4.5)	13.1 (2.9)		19.4 (3.5)	26.1 (3.6)	
Other (non-Hispanic)	5.0 (1.1)	4.0 (1.0)		4.7 (1.6)	7.1 (2.9)		3.3 (1.9)	3.2 (1.0)		6.2 (2.8)	6.6 (1.8)	
Poverty-income ratio			0.369			0.574			0.228			0.621
0–133%	26.6 (1.8)	29.0 (1.9)		55.7 (4.1)	52.7 (3.5)		34.7 (6.5)	44.6 (4.5)		39.3 (5.1)	42.7 (4.6)	
≥133%	73.4 (1.8)	71.0 (1.9)		44.3 (4.1)	47.3 (3.5)		65.3 (6.5)	55.4 (4.5)		60.7 (5.1)	57.3 (4.6)	
Health insurance status			0.020			0.156			0.283			0.143
Private insurance§	74.6 (2.0)	66.8 (2.1)		29.0 (3.7)	27.2 (3.5)		48.5 (6.5)	35.7 (3.9)		53.8 (5.0)	38.7 (4.4)	
Medicaid ¶	12.8 (1.5)	19.7 (1.7)		29.4 (3.0)	37.6 (3.6)		12.6 (3.3)	20.1 (3.7)		15.9 (3.5)	25.0 (3.9)	
Medicare‖	3.1 (0.8)	3.1 (0.7)		8.4 (2.0)	4.0 (1.4)		1.8 (0.9)	2.1 (1.0)		12.4 (3.9)	14.3 (3.9)	
No insurance**	9.5 (1.4)	10.4 (1.4)		33.1 (3.6)	31.2 (3.2)		37.2 (6.5)	42.1 (4.7)		17.9 (3.4)	22.0 (4.2)	
Health insurance gap in past 12 mo			0.213			0.789			0.215			0.554
Yes	20.5 (1.9)	23.7 (1.9)		44.9 (41)	43.4 (3.7)		45.8 (5.5)	54.4 (4.1)		28.0 (5.5)	32.2 (4.4)	
No	79.5 (1.9)	76.3 (1.9)		55.1 (4.1)	56.6 (3.7)		54.2 (5.5)	45.6 (4.1)		72.0 (5.5)	67.8 (4.4)	

*Public clinic category includes community health clinic, community clinic, and public health clinic.
†Family planning category includes Planned Parenthood.
‡Nonprimary care category includes employer or company clinic, school or school-based clinic, hospital outpatient clinic, hospital emergency department, hospital regular room, urgent care, urgi-care, or walk-in facility, or some other place.
§Private insurance category also includes participants enrolled in Medi-Gap.
¶Medicaid category also includes CHIP and state-sponsored health plan.
‖Medicare category also includes military or other government plans.
**No insurance category also includes participants with single-service plans or Indian Health Service.
CHIP indicates Children's Health Insurance Program; STD service, counseling, testing, and/or treatment of STD.

TABLE 3. The Payment Method Women (15–44 years) Reported Using for Receipt of STD Services in the Past 12 Months by Demographic Characteristics, 2002 (n = 1060) and 2006–2010 (n = 2162)

	Medicaid			Insurance			Out-of-Pocket			No Payment Required		
	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*	2002, % (SE)	2006–2010, % (SE)	*P*
Age, y			0.165			0.802			0.102			0.088
15–19	25.4 (3.6)	19.4 (1.9)		14.7 (1.7)	14.3 (1.6)		19.6 (5.0)	8.7 (1.9)		32.1 (5.1)	18.8 (2.9)	
20–24	27.4 (3.1)	34.3 (2.9)		26.1 (2.4)	28.2 (2.2)		34.3 (5.7)	33.8 (4.6)		32.9 (5.3)	42.4 (5.0)	
25–44	47.2 (4.0)	46.3 (2.8)		59.3 (2.7)	57.6 (2.7)		46.1 (5.9)	57.5 (4.8)		35.1 (5.7)	38.8 (4.3)	
Race/Ethnicity			0.353			0.705			0.256			0.407
Hispanic	24.0 (3.0)	24.2 (3.6)		9.8 (1.0)	11.5 (1.5)		16.6 (3.9)	15.1 (2.8)		18.5 (3.4)	24.9 (5.9)	
White (non-Hispanic)	39.8 (4.4)	39.9 (3.6)		69.6 (2.3)	66.3 (2.4)		70.9 (5.1)	62.5 (3.9)		58.5 (5.1)	44.9 (5.7)	
Black (non-Hispanic)	31.1 (3.7)	33.7 (3.2)		15.5 (1.8)	17.7 (1.9)		8.9 (2.8)	16.1 (3.0)		17.6 (3.7)	20.0 (3.8)	
Other (non-Hispanic)	5.1 (1.4)	2.3 (0.8)		5.1 (1.2)	4.5 (1.2)		3.6 (1.6)	6.2 (2.2)		5.4 (2.4)	10.2 (5.0)	
Poverty-income ratio			0.061			0.649			0.916			0.479
0–132%	73.8 (3.0)	65.5 (3.2)		18.7 (2.0)	20.0 (1.9)		36.5 (5.7)	37.3 (4.2)		39.9 (5.7)	45.1 (4.4)	
≥133%	26.2 (3.0)	34.5 (3.2)		81.3 (2.0)	80.1 (1.9)		63.5 (5.7)	62.7 (4.2)		60.1 (5.7)	54.9 (4.4)	
Health insurance status			0.188			0.406			0.089			0.149
Private*	6.9 (2.1)	8.6 (1.8)		86.5 (1.8)	82.6 (1.8)		49.0 (5.6)	42.3 (4.6)		48.9 (5.2)	34.0 (4.7)	
Medicaid†	64.2 (3.8)	69.5 (3.1)		5.5 (1.1)	7.4 (1.3)		1.6 (1.2)	9.7 (2.9)		9.0 (3.1)	13.2 (3.8)	
Medicare‡	13.0 (2.8)	6.3 (1.5)		3.4 (0.9)	3.5 (0.9)		3.1 (1.7)	4.8 (2.3)		3.5 (1.7)	5.6 (1.7)	
No insurance§	15.9 (3.6)	15.6 (2.3)		4.7 (1.0)	6.5 (1.0)		46.3 (5.1)	43.2 (4.1)		38.6 (5.9)	47.2 (4.9)	
Health insurance gap in past 12 mo			0.756			0.912			0.170			0.210
Yes	32.5 (4.3)	34.0 (2.6)		16.0 (2.2)	15.7 (1.5)		53.5 (5.6)	64.2 (5.1)		42.1 (5.8)	51.5 (4.8)	
No	67.6 (4.3)	66.0 (2.6)		84.0 (2.2)	84.3 (1.5)		46.6 (5.6)	35.8 (5.1)		57.9 (5.8)	48.5 (4.8)	
Place for STD service			0.019			0.237			0.194			0.180
Private doctor/HMO	48.2 (3.5)	51.7 (2.9)		82.5 (2.1)	77.9 (2.2)		33.6 (5.3)	32.9 (4.0)		12.0 (3.9)	7.0 (2.5)	
Public clinic ¶	36.8 (3.5)	25.4 (2.3)		5.2 (1.2)	6.8 (1.4)		25.1 (4.1)	27.5 (4.6)		47.2 (4.8)	39.6 (4.7)	
Family planning‖	7.7 (1.8)	11.3 (1.8)		2.2 (0.6)	4.1 (0.8)		32.0 (5.0)	21.8 (3.4)		19.9 (4.2)	35.0 (5.3)	
Nonprimary care**	7.4 (1.7)	11.6 (1.8)		10.1 (1.5)	11.2 (1.5)		9.2 (3.1)	17.8 (3.4)		20.9 (3.5)	18.4 (3.5)	
Copay			0.304			0.012			NA			NA
Yes	1.4 (0.7)	2.5 (0.8)		61.3 (2.5)	70.1 (2.4)		NA	NA		NA	NA	
No	98.6 (0.7)	97.5 (0.8)		38.7 (2.5)	29.9 (2.4)		NA	NA		NA	NA	

*Private insurance category also includes participants enrolled in Medi-Gap.
†Medicaid category also includes Children's Health Insurance Program and state-sponsored health plan.
‡Medicare category also includes military or other government plans.
§No insurance category also includes participants with single-service plans or Indian Health Service.
¶Public clinic category includes community health clinic, community clinic, and public health clinic.
‖Family planning category includes Planned Parenthood.
**Nonprimary care category includes employer or company clinic, school or school-based clinic, hospital outpatient clinic, hospital emergency department, hospital regular room, urgent care, urgi-care, or walk-in facility, or some other place.
STD service indicates counseling, testing, and/or treatment of STD.

women into 4 insurance groups: (1) private health insurance or Medi-Gap ("private"); (2) Medicaid, Children's Health Insurance Program, or state-sponsored health plan ("Medicaid"); (3) Medicare, military health care, or other government health care ("Medicare"); or (4) currently covered only by a single-service plan, only by the Indian Health Service, or currently not covered by health insurance ("no insurance"). Respondents chose from health insurance options, which included the name of the Medicaid program specific to their state (eg, Medi-Cal in California). The second health insurance variable identified if women had a gap in health insurance coverage in the past 12 months (yes or no).

Visit-related variables included the self-reported type of clinic where women reported receipt of the STD service (recoded as "private doctor/HMO," "public clinic," "family planning," or "nonprimary care" location) and payment method for the STD service (Medicaid, private insurance, out-of-pocket, or no payment required). The nonprimary care location for the type of clinic that a respondent received STD services includes employer or company clinic, school or school-based clinic, hospital outpatient clinic, hospital emergency department, hospital regular room, urgent care, urgi-care, walk-in facility, or some other place. Payment method for the STD service was a "mark all that apply" variable that we recoded into a categorical variable with priority given to responses in the following order: Medicaid, private insurance, out-of-pocket, or no payment required. Medicaid was prioritized because STDs are higher among this population.[11] The final visit-related variable included in our analyses was whether or not the clinic where the respondent received STD services was the regular place for their medical care with 4 response options: (1) yes, regular place; (2) yes, regular place but go to more than 1 place regularly; (3) usually go somewhere else; or (4) not the usual place for medical care. The place for regular medical care was applicable for women who reported receipt of STD services in the following clinics only: community health clinic, community clinic, or public health clinic; family planning or Planned Parenthood; school or school-based clinic; or hospital outpatient clinic.

We further analyzed the place where women reported receipt of STD services in the past 12 months by demographic characteristics and health insurance variables. Then, the payment methods for STD services were analyzed by demographics and health insurance variables. Finally, we analyzed payment methods for STD services by the place where the service was received and whether or not the women had a copay.

Analyses were conducted using SAS-callable SUDAAN, release 11.0.0 (Research Institute, Research Triangle Park, NC) to account for the complex sample design, multistage sample procedures, and sampling weights.[12,13] Analyses were weighted to represent US women aged 15 to 44 years.[14] Cochran-Mantel-Haenszel and χ^2 tests were conducted to compare receipt of STD services in the past 12 months over time, from 2002 to 2006–2010.

RESULTS

Receipt of STD services reported by women in the past 12 months increased from 12.6% in 2002 to 16.0% in 2006 to 2010 ($P < 0.001$; Table 1). However, receipt of STD services did not significantly increase from 2002 to 2006–2010 among certain subgroups of women including the following: adolescents aged 15 to 19 years ($P = 0.592$); women who identified as "other" (non-Hispanic) racial/ethnic groups ($P = 0.924$); women currently enrolled in Medicare, military, or other government health insurance plans ($P = 0.117$); or among women who were not currently enrolled in health insurance ($P = 0.302$). In post hoc analyses (data not show in tables), among sexually active (reported sex in the past 12 months) respondents only, adolescents who reported receipt of STD services did not significantly increase from 2002 to 2006–2010 (27.2%–28.2%; $P = 0.701$). Among women who reported receiving STD services in the past 12 months, visit-related characteristics did not significantly increase over time for the place where the STD service was received ($P = 0.202$) or for the clinic being the regular place for medical care ($P = 0.077$), but there were significant differences in payment method ($P = 0.021$) from 2002 to 2006–2010 (Table 1).

Trends in the type of health care provider or clinic where women received STD services were examined by demographics (Table 2). Among women receiving STD services from a private doctor/HMO, the percentage who had private insurance decreased from 74.6% in 2002 to 66.8% in 2006 to 2010, whereas the percentage who had Medicaid increased from 12.8% in 2002 to 19.7% in 2006 to 2010 ($P = 0.020$). However, among these women, there were no significant differences by age, race/ethnicity, poverty-income ratio, or health insurance gap in the past 12 months. For women receiving STD services at a public or family planning clinic, there were no statistically significant differences by race/ethnicity, poverty-income ratio, health insurance status, and health insurance gap in the past 12 months. However, as compared with 2002, fewer adolescent women (15–19 years) but more young adult women (20–24 years) reported using a public clinic ($P = 0.038$) for STD services. Findings for women who received STD services at a family planning clinic were similar to those for public clinic. For nonprimary care locations (eg, employer or company clinic, school or school-based clinic, hospital outpatient clinic, hospital emergency department, hospital regular room, urgent care, urgi-care, walk-in facility, or some other place) where women received STD services, there were no significant differences between 2002 and 2006–2010 for all characteristics measured (age, race/ethnicity, poverty-income ratio, health insurance status, and health insurance gap in past 12 months).

Owing to sample sizes for the nonprimary health care setting where women reported receiving STD services, we were unable to statistically compare the health insurance status among women who received STD services at different clinics during the same time frame. However, there seemed to be different patterns in health insurance status among women attending public clinics or family planning clinics and those who received STD services from private doctors/HMOs (Table 2). In 2006 to 2010, only 27.1% of women attending public health clinics and 35.7% attending family planning clinics were currently enrolled in private health insurance as compared with 66.8% of women attending a private doctor/HMO. Also in 2006 to 2010, approximately half of women who attended public clinics (43.4%) and family planning clinics (54.4%) for STD services had a gap in health insurance status in the past 12 months compared with only 23.7% who attended a private doctor/HMO.

Finally, trends in reported methods of payment for STD services from 2002 to 2006–2010 were examined by demographic and visit-related variables (Table 3). Among women who reported using Medicaid as the payment method for STD services, there was a slight decrease in the percentage who had a household income less than 133% of FPL (73.8% in 2002 to 65.5% in 2006–2010; $P = 0.061$). Also among these women, receipt of services at a public clinic significantly decreased (36.8% in 2002 to 25.4% in 2006–2010; $P = 0.019$), with smaller increases for receipt of services at private doctors/HMOs, family planning, and nonprimary care locations. There were no significant differences for women who paid for STD services with Medicaid by the remaining demographics.

Conversely, for women who paid for STD services with private insurance, the only significant difference across time was an increase in having a copay from 2002 (61.3%) to 2006–2010 (70.1%) ($P = 0.012$). There were no other differences across time for women who paid with private insurance. Also, there were no significant differences among women who paid out of pocket or who reported that no payment was required.

DISCUSSION

We found that the number of reproductive-aged women who reported receiving STD services in the past 12 months increased from 2002 to 2006–2010, continuing an earlier trend in increased use of STD services observed from 1995 to 2002.[7] Increases in receipt of STD services were observed for all payer types; however, these increases were not statistically significant for Medicare recipients or the uninsured. More than half of uninsured Americans have incomes less than 200% of the FPL,[15] and low-income patients tend to be disproportionately affected by STDs such as chlamydia.[11] Therefore, it is important for private providers and HMOs to be aware of the needs of this subpopulation, especially in a changing health care system.

In addition, there was no increase in receipt of STD services among adolescents (15–19 years), nor was there a significant increase among sexually active adolescents (reported sex in the past 12 months). These findings are important because adolescents have the highest burden of STDs.[2] Although the Centers for Disease Control and Prevention recommends screening sexually active women younger than 26 years for chlamydia on an annual basis, screening remains at suboptimal levels.[2,16–18] Furthermore, we found a significant decrease in adolescents who reported that they received services in public clinics and a nonsignificant declining trend for family planning clinics; however, the percentage of adolescents who received STD services at private providers, family planning clinics, and nonprimary care clinics did not change.

The health care setting where women receive STD services is important, especially public and family planning clinics. Among the women reporting STD services in public, family planning, school, or hospital outpatient clinics having a usual place for medical care decreased but did not significantly differ from 2002 to 2006–2010. Similar findings are seen in the National Health Interview Study, where having a usual place for medical care decreased from 2003 to 2010 among Americans of all ages.[19] Thus, public clinics may serve as a "safety net" for STD services.[20] Furthermore, there may be anonymity and confidentiality concerns with STD screening,[21,22] and at least one study found that women seek services from family planning clinics for confidentiality reasons including receiving services without using insurance.[23]

Our findings also highlight the insurance status of reproductive-aged women who received STD services at different health care settings. First, there was a significant increase in the number of reproductive-aged women with Medicaid who received STD services from private providers or HMOs in 2006 to 2010. Furthermore, of women who reported using Medicaid to pay for their service, fewer reported receiving services from a public clinic. Finally, a substantial proportion of women who received STD services from public or family planning clinics did not have health insurance in either time frame.

It is important for public and private providers to be aware of how having insurance coverage changes women's access to, payment of, and health seeking behaviors for STD services. As of May 2013, the Congressional Budget Office estimated that in 2014, the first year in which many of the Affordable Care Act's provisions will be inaugurated, the effect of the law will reduce the nonelderly uninsured population by 14 million persons.[24] The law is projected to further reduce the number of persons uninsured in subsequent years; after 5 years postimplementation in 2019, 30 million nonelderly Americans, including undocumented immigrants, will remain uninsured.[24] In addition, some states have proposed, or have begun, to close their publicly funded clinics that specialize in STD-related services because of budgetary shortfalls, eliminating a safety net for STD services.[25] We found that approximately 1 in 5 women sought STD services in these safety net clinics.

Finally, we found a significant increase in copays for women who paid for their STD service using private insurance. In 2006 to 2010, 7 in 10 privately insured women paid a copay for their STD service. The Affordable Care Act provision mandating first dollar coverage of certain recommended preventive services (not including treatment) may alleviate this burden on women, particularly for some STD screening and counseling services.[26] By 2012, 41% of workers were covered by employer-sponsored health plans that expanded preventive services because of the Affordable Care Act.[27] However, the requirement applies only to non–grandfathered private plans, so cost sharing remains for some individuals with private insurance.[28]

There are some limitations to this study. The survey item for receipt of STD services included 3 topics (STD counseling, testing, or treatment); therefore, it was not possible to examine only women who received an STD test. In addition, the variable was self-reported, and it is possible that some women may not always know when they are tested for an STD if the visit occurred during other preventive services such as birth control, annual pelvic examinations, or Papanicolaou testing. However, there is no evidence that the self-report bias has changed over time. Because it is not possible to parse out the specific STD service (counseling, testing, or treatment), we are not able to determine which visits were for preventive services rather than for treatment. Finally, given relatively small sample sizes, we were not able to look at other clinic types such as school-based clinics and hospital emergency departments.

This study presents the most recent, national-level trends for receipt of STD services among reproductive-aged women. Although self-reported receipt of STD services in the past 12 months significantly increased among women of childbearing age from 2002 to 2006–2010, less than 1 in 5 women (age, 15–44 years) and less than 1 in 3 young adult women (age, 20–24 years) received STD services. In addition, less than 1 in 6 adolescents (age, 15–19 years) overall and 1 in 4 sexually active adolescents received STD services. Our findings highlight important changes in the use and payment of STD services among reproductive-aged women and may be useful for health care providers (public and private), health departments, and public health programs.

REFERENCES

1. Centers for Disease Control and Prevention. Chlamydia screening among sexually active young female enrollees of health plans—United States, 2000–2007. MWMR Morb Mortal Wkly Rep 2009; 58:362–365.
2. Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines, 2010. Atlanta, GA: CDC; 2010.
3. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2010. Atlanta, GA: CDC; 2011.
4. Centers for Disease Control and Prevention. CDC Fact Sheet: STD Trends in the United States—2011 National Data for Chlamydia, Gonorrhea, and Syphilis. In: Prevention DoS, editor. 2013.
5. US Preventive Services Task Force. Screening for chlamydial infection. In: Guide to clinical preventive services: An assessment of

the effectiveness of 169 interventions. Report of the US Preventive Services Task Force. Baltimore, MD: Williams and Wilkins; 1989.
6. Scholes D, Satterwhite CL, Yu O, et al. Long-term trends in *Chlamydia trachomatis* infections and related outcomes in a U.S. managed care population. Sex Transm Dis 2012; 39:81–88.
7. Frost JJ. Trends in US women's use of sexual and reproductive health care services, 1995–2002. Am J Public Health 2008; 98: 1814–1817.
8. Groves RM, Mosher WD, Lepkowski JM, et al. Planning and development of the continuous National Survey of Family Growth. Vital Health Stat 1 2009; 1–64.
9. Lepkowski JM, Mosher WD, Davis KE, et al. The 2006–2010 National Survey of Family Growth: Sample design and analysis of a continuous survey. Vital Health Stat 2 2010; 1–36.
10. Lepkowski JM, Mosher WD, Davis KE, et al. National Survey of Family Growth, cycle 6: Sample design, weighting, imputation, and variance estimation. Vital Health Stat 2 2006; 1–92.
11. Datta SD, Sternberg M, Johnson RE, et al. Gonorrhea and chlamydia in the United States among persons 14 to 39 years of age, 1999 to 2002. Ann Intern Med 2007; 147:89–96.
12. SAS institute Inc. SAS/STAT 9.3 User's Guide. 1st ed. Cary, NC: SAS Institute Inc; 2011.
13. Research Triangle Institute. SUDAAN Language Manual, Release 9.0. 1st ed. Research Triangle Park, NC: Research Triangle Institute; 2004.
14. Lepkowski JM, Mosher WD, Groves RM, et al. Responsive design, weighting, and variance estimation in the 2006–2010 National Survey of Family Growth. Vital Health Stat 2 2013; 1–52.
15. Kaiser Family Foundation. Wgo Are the Uninsured: A Consistent Profile Across National Survey? Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2006.
16. Tao G, Hoover KW, Kent CK. Chlamydia testing patterns for commercially insured women, 2008. Am J Prevent Med 2012; 42:337–341.
17. 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; 39:605–607.
18. Eugene JM, Hoover KW, Tao G, et al. Higher yet suboptimal chlamydia testing rates at community health centers and outpatient clinics compared with physician offices. Am J Public Health 2012; 102:e26–e29.
19. Barnes PM, Ward BW, Freeman G, et al. Early Release of Selected Estimates Based on Data From the January-September 2011 National Health Interview Survey. National Center for Health Statistics; 2012.
20. Sizemore JM Jr, Sanders WM, Lackey PC, et al. Comparison of STD burden and risk among men with and without regular doctors attending a southern urban STD clinic. Sex Transm Dis 2003; 30:512–515.
21. Spillane HC, McNulty AM, Wand H, et al. Who declines to give a name at a sexual health service? Sex Transm Infect 2007; 83:160–162.
22. Celum CL, Bolan G, Krone M, et al. Patients attending STD clinics in an evolving health care environment. Demographics, insurance coverage, preferences for STD services, and STD morbidity. Sex Transm Dis 1997; 24:599–605.
23. Frost JJ, Gold RB, Bucek A. Specialized family planning clinics in the United States: Why Women choose them and their role in meeting women's health care needs. Womens Health Issues 2012; 22:e519–25.
24. Congressional Budget Office. CBO's May 2013 Estimate of the Effects of the Affordable Care Act on Health Insurance Coverage 2013.
25. National Coalition of STD Directors. Fact Sheet: STD Program Capacity and Preparedness in the United States: Results of a National Survey, 2009. Washington, DC: NCSC; NCSD 2011.
26. Patient Protection and Affordable Care Act of 2010, 42 U.S.C § 300gg-13. 2010.
27. Kaiser Family Foundation, Health Research & Educational Trust, NORC. Employer Health Benefits 2012 Annual Survey; Chicago, IL; 2012.
28. Health Policy Brief: Preventive Services without Cost Sharing; 2010.