

Association of Insurance Coverage With Chlamydia Screening

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Chlamydia trachomatis (CT) infection is the most commonly reported sexually transmitted disease (STD) in the United States.¹ Over the last decade, the Centers for Disease Control and Prevention, the US Preventive Services Task Force, and several professional organizations (eg, the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the American Medical Association) have recommended routine screening for CT infection for all sexually active women age 25 years and younger and for pregnant women of all ages, with a few variations in these recommendations.²⁻⁷ In addition, the National Committee for Quality Assurance (NCQA), a private, not-for-profit organization that monitors the quality of the majority of managed care organizations (MCOs) through voluntary reporting of performance measures, instituted CT screening as a performance measure into the Healthcare Effectiveness Data and Information Set (HEDIS); this measure calls for monitoring of annual CT screening of sexually active women age 16-25 years.⁸

Since 2000, NCQA has measured CT screening rates for sexually active female enrollees of MCOs by using medical claims and pharmacy data. Of the commercial plan female enrollees age 16-25 years, 22% to 34% were screened for CT infection in 2000-2005.⁹ Of Medicaid plan female enrollees age 16-25 years, 37% to 50% were screened in 2000-2005. Screening rates, as identified by HEDIS data, have increased marginally on a national basis since the initiation of the HEDIS measure. HEDIS data are not reported for all insured populations; given the voluntary nature of the reporting, and little is known about CT screening rates for sexually active women without health insurance.

Additionally, there is insufficient literature on the factors associated with the probability of CT screening for all sexually active young women, including insurance coverage. Despite the scarcity of information, a variety of efforts to increase CT screening have been undertaken to varying degrees of success. These efforts include educating sexually active young women to seek screening, encouraging health plans to promote CT screening, working with practitioners to increase awareness of guidelines recommending screening, and providing system support to clinical practices to routinely screen eligible women.

Information is emerging on MCOs' promotion of CT screening, although data that link MCO initiatives and CT screening rates of their enrollee population are limited. To date, few

Objectives: To examine the rates of self-reported *Chlamydia trachomatis* (CT) screening among young women and to examine the independent association of type of insurance and specific health plans with these rates.

Study design: Cross-sectional analyses of the 2003 California Health Interview Survey data.

Methods: Using bivariate analysis and logistic regression models, we assessed the CT screening rate of 1659 sexually active women age 18-25 years, given various factors including type of health insurance coverage. We further assessed the CT screening rate of the subset of 533 sexually active women age 18-25 years enrolled in a private health plan and reexamined the relationship of various factors with CT screening rates.

Results: Being older, an immigrant, or having 1 sexual partner reduced the likelihood of CT screening, while being a smoker, being single, or having had multiple doctor visits as well as a Pap test or clinical breast exam increased this likelihood. The uninsured had the lowest rate, and public managed care enrollees had the highest rate, of CT screening, but this insurance effect was superseded by other explanatory variables. A few differences in significantly associated factors were identified when private health plans were separately examined.

Conclusions: The results suggest that self-reported CT screening rates were low, particularly among the uninsured. However, these rates were primarily influenced by CT risk factors rather than insurance coverage. Continued efforts to increase CT screening rates are warranted.

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studies have assessed the reasons for low rates of CT screening at the population level, including demographics, risk factors, insurance coverage, and access to care. This study aims to address these gaps by answering the following 2 questions: (1) What is the self-reported CT screening rate of the entire population of sexually active women age 18-25 years, including the uninsured? (2) What individual factors are associated with these CT screening rates, both for the entire population and for individuals who belong to private MCOs?

METHODS

Data and Sample

We used the 2003 California Health Interview Survey (CHIS) for this study. CHIS is the largest state-level health survey, with more than 42,000 respondents, and is conducted in English, Spanish, and 4 Asian languages to capture the diverse populations of the state. Data collection methods are described elsewhere.¹⁰ CHIS is the first large-scale survey to include a specific question on CT screening for women age 18 years or older and includes health plan membership information that allows linkage with external MCO data. All sexually active women age 18-25 years (n = 1659) were included in the study sample. Women were classified as sexually active if they reported at least 1 sex partner in response to the following question in the 2003 CHIS: "In the past 12 months, how many sexual partners have you had?" Adolescents younger than age 18 years were not asked about their CT screening in CHIS and were thus excluded from the data analyses.

Dependent Variable

Sexually active women age 18 years or older were asked if they had received any STD tests in the past year and were asked to report the specific test in an open-ended question with precoded responses available to interviewers only. Specifically, women in the 2003 CHIS were asked: "In the past 12 months, have you been tested for a sexually transmitted disease?" If yes, "what were you tested for?" The respondents could name any tests including chlamydia, gonorrhea, syphilis, HIV/AIDS, and trichomonas. A maximum of 7 responses were recorded. The final variable included all responses indicating a chlamydia test.

Independent Variables

Demographics, risk factors and socioeconomic characteristics, health status, and access to care were assessed for this group of young women. Age was dichotomized into 2 groups: 18-20 years and 21-25 years. Respondents were classified as

white, Latino, African American, Asian American, American Indian, or other. The education variable was dichotomized as 12 or fewer years versus more than 12 years. Immigrants were compared with the native born, and those with limited English proficiency were distinguished from those fluent in spoken English. Urban or rural area of residence was identified. Risk factors included a dichotomized variable about the number of sex partners (1 sexual partner in the past year vs 2 or more) and history of smoking tobacco (yes vs no). Socioeconomic factors included family type (married, single without children, and single with children), income less than 200% of the federal poverty level, and insurance status (uninsured, private MCO, private non-MCO, public MCO, and public non-MCO). Health status was self-assessed as fair/poor health versus excellent or good health. Indicators of access included usual source of care (none, private doctor, public provider/clinic), experiences of delay in obtaining needed care, a Pap test or a clinical breast exam in the past 12 months, or number of doctor visits (none, 1-4, and 5 or more) in the past 12 months. Visits to nurse practitioners or physician assistants who may perform CT screening were not included in the original variable in CHIS, allowing the inclusion of number of doctor visits in the models.

Analysis Methods

The association of individual characteristics with CT screening rates for all sexually active women age 18-25 years was examined in bivariate analyses and a logistic regression model. A second logistic regression model was constructed using the sample of private MCOs to more specifically examine the association of individual characteristics with CT screening among this insured population. All analyses were weighted and corrected for the design effect of the survey using SAS statistical software (SAS version 9.1.3, SAS Institute Inc, Cary, North Carolina).

RESULTS

The characteristics of the sample are reported in **Table 1**. Some characteristics of interest included a high rate of CT screening among individuals with a single sexual partner (83%), a relatively high rate of uninsurance (23%), and high rates of Pap tests (74%) and clinical breast exams (67%). The overall rate of self-reported CT screening was 25%, with differences in screening rates depending on demographics, risk factors and socioeconomic characteristics, and health status and access to care (Table 1). Specifically, significant variations by type of insurance existed. Those who were covered by non-MCO public insurance and those who were uninsured

had the lowest rates of CT screening (18% and 20%, respectively) compared with individuals who had the other types of coverage.

We examined the independent association of individual characteristics with CT screening rates in a multivariate regression model. As shown in **Table 2**, immigrant respondents were less likely than native-born respondents to be screened (odds ratio [OR] = 0.4), and those with a single sexual partner were less likely than those with 2 or more partners to be screened (OR = 0.5). Alternatively, those who had ever smoked (OR = 2.0), were single without children (OR = 1.8), and were single with children (OR = 1.9) were more likely to be screened than those who never smoked or were married. Furthermore, those with 5 or more doctor visits (OR = 3.0) were more likely than those without any visits to be screened, and those with a Pap test (OR = 5.6) or a clinical breast exam (OR = 1.9) were more likely than those who did not receive either of these services to be screened. Controlling for other variables of interest, type of insurance was not independently associated with CT screening.

Examination of the independent association of individual characteristics within private MCOs with CT screening rates revealed a few differences from the previous model (**Table 3**). The ORs for age, immigration status, number of sexual partners, smoking status, being single without children, and a Pap test or clinical breast exam in the past year were significant and in the same direction as those in the previous model. Education, being single with children, and number of doctor visits in the past year were no longer signif-

■ **Table 1.** Characteristics of Sexually Active Women Age 18-25 Years, California 2003 (n = 1659)

Characteristic	Percentage	
	With Characteristic	Screened for CT
Overall rate of CT screening in past year	—	25
Demographics		
Age 21-25 y (vs 18-20 y)	69	23
Race/ethnicity		
White	42	28
Latino	35	20
African American	7	40
Asian American	10	13
American Indian/other	6	33
Has ≥12 y of education	84	27
Immigrant (vs native born)	26	10
Fluent in spoken English	76	28
Urban residence	91	25
Risk factors and socioeconomics		
Only 1 sexual partner in past year	83	21
Has ever smoked	27	36
Family type		
Married	29	16
Single, no children	59	28
Single with children	12	31
Income <200% of federal poverty level	51	23
Insurance status		
Uninsured	23	20
Private MCO	33	25
Public MCO	18	31
Private non-MCO	18	28
Public non-MCO	8	18
Health status and access to care		
Fair or poor health	13	19
Usual source of care		
None/emergency room/urgent care	18	22
Private doctor	52	27
Public clinic/provider	31	22
Experienced delay in obtaining care in past year	21	29
Number of doctor visits in past year		
None	12	7
1-4	59	24
≥5	29	34
Had a Pap test in past year	74	31
Had a clinical breast exam in past year	67	31
CT indicates <i>Chlamydia trachomatis</i> ; MCO, managed care organization.		

■ **Table 2.** Odds of Having a Chlamydia Test in Past Year Among Sexually Active Women Age 18-25 Years, California 2003 (n = 1659)

Characteristic	Odds Ratio	P	95% Confidence Interval
Demographics			
Age 21-25 y (vs 18-20 y)	0.6	<.05	0.5, 0.9
Race/ethnicity			
White (reference group)	—	—	—
Latino	1.4	—	0.8, 2.2
African American	1.6	—	0.9, 2.8
Asian American	1.0	—	0.5, 2.0
American Indian/other	1.7	—	1.0, 3.0
Has ≥12 y of education	1.9	<.05	1.02, 3.5
Immigrant (vs native born)	0.4	<.01	0.2, 0.7
Fluent in spoken English	0.8	—	0.4, 1.5
Urban residence	1.3	—	0.8, 2.0
Risk factors and socioeconomics			
Only 1 sexual partner in past year	0.5	<.001	0.3, 0.8
Has ever smoked	2.0	<.001	1.4, 2.8
Family type			
Married (reference group)	—	—	—
Single, no children	1.8	<.05	1.1, 2.7
Single with children	1.9	<.05	1.1, 3.4
Income <200% of federal poverty level	1.0	—	0.7, 1.5
Insurance status			
Uninsured (reference group)	—	—	—
Private MCO	0.9	—	0.5, 1.6
Public MCO	1.3	—	0.7, 2.4
Private non-MCO	1.1	—	0.6, 2.0
Public non-MCO	0.8	—	0.4, 1.6
Health status and access to care			
Fair or poor health	0.8	—	0.5, 1.3
Usual source of care			
None (reference group)	—	—	—
Private doctor	0.9	—	0.5, 1.6
Public clinic/provider	1.0	—	0.5, 1.7
Experienced delay in obtaining care in past year	1.4	—	0.9, 2.0
Number of doctor visits in past year			
None (reference group)	—	—	—
1-4	1.9	—	0.9, 4.0
≥5	3.0	<.01	1.4, 6.3
Had a Pap test in past year	5.6	<.05	2.7, 11.6
Had a clinical breast exam in past year	1.9	<.001	1.1, 3.0

MCO indicates managed care organization.

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Table 3. Odds of Having a Chlamydia Test in Past Year Among Sexually Active Women Age 18-25 Years Enrolled in Private Managed Care Organizations, California 2003 (n = 533)

Characteristic	Odds Ratio	P	95% Confidence Interval
Demographics			
Age 21-25 y (vs 18-20 y)	0.5	<.05	0.2, 0.9
Race/ethnicity			
White (reference group)	—	—	—
Latino	2.8	<.05	1.3, 6.2
African American	3.3	<.05	1.2, 9.4
Asian American	3.2	—	0.8, 12.8
American Indian/other	1.3	—	0.5, 3.6
Has ≥12 y of education	1.6	—	0.3, 7.3
Immigrant (vs native born)	0.2	<.05	0.05, 0.7
Fluent in spoken English	3.6	—	0.7, 18.2
Urban residence	1.1	—	0.5, 2.6
Risk factors and socioeconomic			
Only 1 sexual partner in past year	0.3	<.01	0.1, 0.6
Has ever smoked	2.2	<.05	1.2, 4.2
Family type			
Married (reference group)	—	—	—
Single, no children	2.2	<.05	1.04, 4.6
Single with children	1.4	—	0.5, 4.5
Income <200% of federal poverty level	0.9	—	0.5, 1.9
Health status and access to care			
Fair or poor health	1.0	—	0.3, 3.1
Usual source of care			
None (reference group)	—	—	—
Private doctor	0.6	—	0.2, 1.9
Public clinic/provider	0.6	—	0.2, 2.5
Experienced delay in obtaining care in past year	2.7	<.01	1.4, 5.5
Number of doctor visits in past year			
None (reference group)	—	—	—
1-4	4.2	—	0.5, 37.3
≥5	8.0	—	0.9, 75.8
Had a Pap test in past year	11.4	<.001	2.8, 47.1
Had a clinical breast exam in past year	4.6	<.01	1.6, 13.8

MCO indicates managed care organization.

icant. Being Latino or African American and experiencing delay in care were significant in this model, although not in the previous one. Being Latino (OR = 2.8) or African American (OR = 3.3) and having experienced delays in care (OR = 2.7) increased the likelihood of screening among those enrolled in private MCOs.

DISCUSSION

The findings indicate that despite existing guidelines and various efforts to disseminate information and encourage annual screening, CT screening rates as reported by individuals and private MCOs remain low. The higher likelihood of

Take-away Points

Examination of self-reported *Chlamydia trachomatis* (CT) screening rates among insured and uninsured California women age 18-25 years indicated that:

- The screening rates were primarily influenced by CT risk factors rather than insurance coverage.
- The overall rate of CT screening was low.
- Continued efforts to increase CT screening are warranted.

CT screening given higher risk behavior and being single was as anticipated. Also as expected, there was a higher likelihood of screening among individuals who had a Pap test or a clinical breast exam. The higher likelihood of screening among respondents with 5 or more doctor visits likely reflects the fact that there were more opportunities for screening when respondents had a potentially extended illness episode or more acute or chronic conditions. The lower likelihood of screening among immigrants independent of English fluency may be a reflection of cultural norms and values associated with sexual activity and receipt of gynecology services if unmarried.¹¹ Alternatively, this lower likelihood may be a consequence of other unmeasured barriers to overall access to care, including barriers to care seeking and preventive screening.

Lack of a significant independent association between CT screening and type of insurance coverage in the multivariate model indicates the relative importance of risk factors in CT screening, as opposed to insurance coverage. Free or low-cost CT screening is readily available and accessible in California.

Examining indicators of CT screening among the subset of the population enrolled in private MCOs confirmed a number of the same relationships identified in the overall model, but with exceptions. Lack of the effects of education and number of office visits most likely indicated increased homogeneity and utilization levels of those enrolled in private MCOs. The relationship between delayed care and CT screening was unexpected. The cross-sectional nature of the data did not allow us to determine whether the delay was in relation to CT screening, and if so, if it had occurred before or after the CT screening. Further research is needed to examine whether delays in obtaining CT screening may lead to obtaining screening outside the MCO. The higher likelihood of screening among Latino and African Americans in private MCOs is puzzling. Other data indicate a higher and increasing rate of CT among African Americans in California, but not Latinos (Jas Nihalani, MPH, oral communication with the director of the CA Chlamydia Action Coalition and Managed Care Liaison, California Department of Public Health, STD Control Branch, January 7, 2008). Further research is needed

to examine whether these higher rates reflect risk factors that were not examined in these data or indicate other systematic differences in CT screening among these specific populations.

California State efforts to improve CT screening seem to have led to significantly higher MCO reported screening rates from 1994-2004 (Jas Nihalani, MPH, oral communication with the director of the CA Chlamydia Action Coalition and Managed Care Liaison, California Department of Public Health, STD Control Branch, January 7, 2008). However, these rates can be dramatically different given specific MCOs, ranging from 53% at Kaiser to 17% at Blue Cross.¹² Differences in the self-reported rate of CT screening in this study and the rate reported in publicly available administrative data may have several explanations. For example, there may be lack of communication between the healthcare provider and the patient. The providers may not provide a full explanation of all tests being ordered when specimens were collected. Also, some providers might routinely provide CT screening, whereas other providers might give the patients the opportunity to accept or decline CT screening. In addition, private MCOs differ in their capabilities to collect CT screening data, even when they submit data to NCQA for HEDIS. It is likely that the low rates of CT screening reported by some MCOs such as Blue Cross do not match the higher individual reported rates because these MCOs depend on reporting by medical groups or individual physicians with various capabilities for capturing and reporting CT screening rates. MCOs like Kaiser are known to have an infrastructure that allows for the most efficient capturing of CT and other screening data. Other MCOs with diverse and widespread networks of providers may not have such capabilities. Furthermore, the measure on CT screening rates in this study was different from that used in HEDIS reports. In the HEDIS measure, which uses administrative claims data, women were classified as sexually active if they had a Pap test or pelvic examination, a contraceptive service, a pregnancy-related service, or screening or treatment for STDs in the past 12 months.⁸ In contrast, in CHIS data used in this study, sexual activity is based on self-reports of having at least 1 sexual partner in the past 12 months. Evidence seems to indicate that claims data might underestimate the number of women who are sexually active.¹³ This difference in classification of women as sexually active leads to potentially different denominators and differential rates of screening between claims and self-reported data.

This study has limitations and strengths. It is likely that the data are not representative of the MCO enrollee popula-

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tion age 18-25 years, though administrative data are generally not available to extensively examine whether these data are representative. Recall bias may be a factor, as explained above. Alternatively, CT screening may be underreported due to the sensitive nature of the question.¹¹ Data from a national survey of sexually active women age 16-25 years indicated a rate of 42% for self-reported STD tests, a rate that is relatively close to 49% reported by sexually active female CHIS respondents age 18-25 years.¹⁴ Other limitations of self-reported data are discussed earlier.

However, beyond HEDIS reported data, information on CT screening among the general population (particularly among the uninsured) is unavailable. These data fill an essential gap in the knowledge of the current level of CT screening in California and are a starting point in evaluating the types and magnitude of work still to be done to increase CT screening rates for the general population. The California data were used in this study, and the results may not be applicable to the rest of the United States. However, this limitation is more likely to apply to screening rates rather than the associations of individual characteristics or types of MCOs with CT screening rates.

Over the last decade, STD and family planning clinics have focused on increasing rates of CT screening in their clinic populations. Although initial results indicated declining rates of CT infection, in many regions of the country prevalence of CT infection has either plateaued or increased.¹⁵ Further research is needed to explore the reasons for the discrepancies in CT screening rates based on self-reports and MCO HEDIS reports to inform quality improvement efforts. If providers conduct the test without telling their patients, the opportunity for education of female patients and their sex partners to prevent and control CT infection may be lost. Similarly, if providers conduct CT screening most frequently for the high-risk groups, but not systematically for the lower risk groups despite recommendations for annual screening of all sexually active females in the target age groups, further provider education and MCO intervention may be warranted. If subgroups such as immigrants are less frequently screened, further outreach and targeted, culturally specific education in such groups should be considered. Potential lack of awareness of MCO efforts at increasing CT screening among their enrollee population also may be addressed by further patient education efforts.

CT screening is shown to be cost-effective because of the high burden of the disease.¹⁶ A few studies also showed that some system interventions could significantly improve CT screening rates in MCOs.^{17,18} In addition, the higher-than-expected rates of self-reported CT screening among the unin-

sured young women is encouraging and indicates either a certain level of awareness of the need for this screening or the success of public health efforts to screen uninsured populations. Additional examination of factors identifying the source of CT screening among the uninsured also can help increase CT screening rates. Further effort to increase CT screening rates in the general population is the best available tool to reduce the burden of this disease.

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