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# Comparison of Adherence to Chlamydia Screening Guidelines Among Title X Providers and Non-Title X Providers in the California Family Planning, Access, Care, and Treatment Program

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## Abstract

**Background:** Annual chlamydia screening is recommended for adolescent and young adult females and targeted screening is recommended for women  $\geq 26$  years based on risk. Although screening levels have increased over time, adherence to these guidelines varies, with high levels of adherence among Title X family planning providers. However, previous studies of provider variation in screening rates have not adjusted for differences in clinic and client population characteristics.

**Methods:** Administrative claims from the California Family Planning, Access, Care, and Treatment (Family PACT) program were used to (1) examine clinic and client sociodemographic characteristics by provider group—Title X-funded public sector, non-Title X public sector, and private sector providers, and (2) estimate age-specific screening and differences in rates by provider group during 2009.

**Results:** Among 833 providers, Title X providers were more likely than non-Title X public sector providers and private sector providers to serve a higher client volume, a higher proportion of clients aged  $\leq 25$  years, and a higher proportion of African American clients. Non-Title X public providers were more likely to be located in rural areas, compared with Title X grantees and private sector providers. Title X providers had the largest absolute difference in screening rates for young females vs. older females (10.9%). Unadjusted screening rates for young clients were lower among non-Title X public sector providers (54%) compared with private sector and Title X providers (64% each). After controlling for provider group, urban location, client volume, and percent African American, private sector providers had higher screening rates than Title X and non-Title X public providers.

**Conclusions:** Screening rates for females were higher among private providers compared with Title X and non-Title X public providers. However, only Title X providers were more likely to adhere to screening guidelines through high screening rates for young females and low screening rates for older females.

## Introduction

**C**H<sub>1</sub>AMYDIA TRACHOMATIS (CT) INFECTION is the most prevalent reportable bacterial sexually transmitted disease (STD) in the United States.<sup>1</sup> The highest rates are consistently among adolescent and young adult females who comprise approximately 50% of the total reported CT case burden.<sup>1,2</sup> Racial/ethnic minorities are also disproportion-

ately infected, so that African American females comprise nearly half of all female CT cases in the United States.<sup>1</sup> As up to 80% of CT infections are asymptomatic, a key prevention strategy is to screen young women in order to identify and treat infections that, if left untreated, can lead to preventable adverse reproductive health outcomes, such as pelvic inflammatory disease (PID), infertility, and chronic pelvic pain.<sup>3,4</sup>

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National and professional organizations, including the U.S. Preventive Services Task Force (USPSTF) and the Centers for Disease Control and Prevention (CDC), recommend annual CT screening for sexually active women  $\leq 25$  years.<sup>5,6</sup> Women aged  $\geq 26$  years consistently have lower rates of CT prevalence compared to that of younger women, and universal screening would not be cost-effective. Therefore, CDC recommends screening women  $\geq 26$  years if they report specific STD risk factors, including multiple partners, new partner, past STD history, or inconsistent condom use.<sup>6</sup> Clinician providers adhering to CDC screening guidelines should, therefore, screen older women at lower rates compared with younger women. Clinician providers serving women in family planning clinic settings are a key group to evaluate for adherence to CT screening guidelines.

The nation's largest publicly funded family planning program is the California Medicaid family planning expansion, Family Planning, Access, Care, and Treatment (Family PACT). Family PACT reimburses on a fee-for-service basis for direct clinical services to clients at or below 200% of the Federal Poverty Level. Public sector Family PACT providers can apply for Title X funding, a federal grant program administered by state health departments or regional agencies. Title X-funded providers are required to adhere to clinical and administrative guidelines as determined by the Federal Office of Population Affairs.<sup>7</sup> In an effort to expand access to family planning services, the Family PACT provider network includes a broad range of public sector providers (nonprofit and governmental) funded and not funded by Title X and private sector providers who are not eligible for Title X funding.<sup>8</sup>

Family PACT program standards for clinical care include adherence to national screening guidelines through routine provider training and data feedback in the form of semiannual provider profiles on quality measures related to family planning and STD care.<sup>9</sup> Data feedback regularly informs all clinician providers of relative performance over time and compared with that of their peers. Provider profiles for Family PACT providers since 2006 have included screening rates for both younger and older women in an effort to improve adherence to the full set of CT screening guidelines. The profiles have shown increasing trends or high levels of CT screening for both young and older women by most providers. In 2009, the CT screening rate for young women by Family PACT providers was 71%, far higher than by the Medicaid program in California (54%) and nationwide (56%) as reported in the Healthcare Effectiveness Data and Information Set (HEDIS) quality measures.<sup>9,10</sup> Closer examination of provider-specific rates, however, show variation in performance across providers and provider groups.

Similarly, Family PACT provider profile trends in CT screening rates for women aged  $\geq 26$  years indicate that there is variation in screening rates, with overall levels that are consistently  $> 50\%$ , indicating potential overttesting.<sup>9</sup> High levels of screening among older women may reflect higher levels of sexual risk behaviors among women accessing care, but this has not been systematically explored. There are few data that describe how best practices in screening might vary as a result of clinic or client population characteristics, although variation in CT HEDIS rates by region may reflect differences in urban vs. rural access to reproductive health-care services and, by extension, the relative size of clinic populations served. Identifying provider characteristics that

are associated with adherence to CT screening guidelines may help inform targeted provider-specific interventions for STD care quality improvement.

Provider characteristics, such as clinic structure and receipt of Title X funding, a major source of funding for family planning services for low-income clients, may affect Family PACT provider adherence to clinical guidelines. Title X providers in Family PACT receive additional tools and technical assistance for the provision of high-quality healthcare services. Title X grantees are part of a network that coordinates quality of care standards; ongoing monitoring of services is enabled through standardized reporting of client use and clinical and laboratory services.<sup>11</sup> Title X follows (1) CDC guidelines for CT screening practices and (2) the performance standards of the Family Planning Councils of America, Inc., which specify annual CT screening of women  $\leq 25$  years of age as one of the performance measures.<sup>12</sup> Integration of STD prevention strategies is further evidenced by Title X participation in the CDC-funded Infertility Prevention Project effort to increase access to CT screening and to monitor prevalence.<sup>2</sup>

Title X quality improvement efforts have a potentially large impact within the Family PACT program. Although Title X providers constitute  $< 20\%$  of the Family PACT providers, they serve nearly half of all Family PACT clients and higher proportions of adolescent and young adult clients. Title X providers are located in communities with a high unmet need for reproductive health services and significant racial/ethnic health disparities. However, it is not known to what extent differences in screening rates among Title X clinics and non-Title X clinics may be influenced by clinic size, racial/ethnic composition of client populations served, or location in rural vs. urban areas.

Our study goal was to determine if Title X providers are more likely to adhere to the national and program CT screening guidelines compared to other Family PACT provider groups, after controlling for differences in clinic and client demographic characteristics. Our study aims were to (1) compare age-specific CT screening rates among three main Family PACT provider groups (Title X, non-Title X public, and private), (2) assess if rates for young female clients differed after adjusting for provider-level client socio-demographic confounders, and (3) compare the absolute difference in screening rates for younger vs. older female clients by provider group.

## Materials and Methods

We used a cross-sectional approach to analyze Family PACT administrative data, including client enrollment, provider enrollment; and paid and denied claims for clinical, laboratory, and pharmacy services. The client enrollment file includes unique Health Access Program identifier, date of birth, race/ethnicity, and ZIP code. The provider file includes a unique identifier (national provider number), provider location, and Medi-Cal provider type (public/private/laboratory/pharmacy). The claims data use standardized Evaluation and Management, Healthcare Common Procedure Coding System, and Common Procedural Terminology-4 code sets.

### Inclusion criteria

All clinician providers enrolled in Family PACT who served at least 20 female clients  $\leq 25$  years of age during

calendar year 2009 were included in this analysis. This minimum value was chosen to create more stable provider-level screening rates. Of the 2051 Family PACT providers serving at least 1 <26-year-old woman, 465 providers were excluded (28% of private providers, 21% of non-Title X public providers, and 2% of Title X providers) because they served <20 clients in the year.

#### *Exclusion criteria*

Because the CT screening occurs at the level of the clinician provider, female clients were excluded from denominators for screening rates if they had received only laboratory or pharmacy services during the study period.

#### *Measures*

**Independent variables.** Provider type is used to categorize providers by sector. Public sector providers include community health centers, federally qualified health centers, rural health clinics, Native American health centers, and local health jurisdictions. Private sector providers comprise solo and group practices. As the administrative and service delivery changes required by the Title X funding require time to be implemented, only those providers that have received  $\geq 3$  years of Title X funding were classified as Title X providers for this analysis. As only public sector providers are eligible for Title X funding, provider sector and Title X status were combined to create a three-category variable (provider group): Title X public sector providers, non-Title X public sector providers, and private sector providers.

Providers were further characterized according to urban vs. rural location, the total number of Family PACT clients served in 2009, and the proportion of the provider's clients who were African American. Continuous variables were checked for normality, and data for variables with nonnormal distributions, for example, client volume, were transformed to the natural log to satisfy normality assumptions for statistical testing where appropriate.

**Dependent variable.** The provider group-specific CT screening rates were calculated as the proportion of women who had received a claim for a CT test in the period 12 months before and 7 days after the last date of Family PACT service in 2009.

#### *Statistical analysis*

**Univariate analyses.** CT screening rates were calculated and analyzed separately for women  $\leq 25$  years of age and those aged  $\geq 26$  by provider group. Client population characteristics were stratified in univariate analyses by provider group.

Comparisons of proportions were made with the chi-square test, and comparisons of means by provider group were made with analysis of variance (ANOVA), with statistical significance set at  $p < 0.05$ .

**Bivariate associations for screening rates.** We calculated correlation coefficients for the dependent and independent variables with separate analyses for Title X and provider sector variables, respectively. All independent variables that were significantly correlated with provider group CT

screening rates for women  $\leq 25$  years were considered for inclusion in the multivariable model. To check the assumption of homogeneity of regression, bivariate regression plots for client volume, urban/rural location, and percent African American were plotted against CT screening rates for each provider group.

**Multivariable modeling of factors associated with screening rates.** Analysis of covariance (ANCOVA) was used to compare mean CT screening rates of women  $\leq 25$  by the three-category provider group dependent variable (Title X, non-Title X public sector, and private sector). A Bonferroni method with alpha set at 0.10 tested each variable's contribution to the model.<sup>13</sup> ANCOVA was employed to model provider CT screening rates adjusted for covariates identified in the bivariate analysis. Levene's method tested the assumption of homogeneity of variance among the provider groups on the younger women's CT screening rates and client volume. The covariates in the final model were centered to assist with interpretation. Two estimates of the effect of provider group were constructed: one comparing Title X providers to non-Title X public sector providers and another comparing Title X providers to private sector providers. The estimates were constructed at the average values for the covariates, with the exception of client volume, which was set at the 75th percentile.

**Comparison of age-specific screening rates.** The difference between CT screening rates for women  $\leq 25$  years of age and those aged  $\geq 26$  by provider group was tested with a paired sample *t* test. Statistical Analysis System 9.2 (Cary, NC) was used for all analyses. The study protocol was reviewed and approved by the University of California Committee on Human Research and the California Department of Public Health Committee for the Protection of Human Subjects.

## **Results**

### *Provider characteristics*

Over half of the providers (52%,  $n = 833$  providers) were from the private sector. Non-Title X public sector providers comprised 29% ( $n = 461$ ), and the remaining 18% ( $n = 274$ ) were Title X providers (Table 1). High proportions of Title X and private sector providers were located in urban areas. Title X providers served a higher average number of Family PACT clients and a higher proportion of female clients who were  $\leq 25$  years of age than did non-Title X providers and had a higher percentage of clients who were African American than did non-Title X providers.

**Comparison of age-specific screening rates by provider group.** Table 2 compares the unadjusted CT screening rates among women  $\leq 25$  years of age with the screening rates of women  $\geq 26$  years of age for each provider group. Paired sample *t* tests show that both private sector providers and Title X providers tested older women at significantly lower rates than younger women ( $p < 0.001$ ). However, the magnitude of difference in age-specific screening rates was negligible among the private sector providers (2.8%) but substantial among Title X providers (10.9%). One-way ANOVA showed that unweighted CT screening rates among women < age 26 differed significantly by provider group ( $p < 0.0001$ ). Non-Title X public sector providers screened at a

TABLE 1. FAMILY PLANNING, ACCESS, CARE, AND TREATMENT PROVIDER AND CLIENT DEMOGRAPHIC CHARACTERISTICS BY PROVIDER GROUP, 2009

Characteristic	Provider group		
	Non-Title X		
	Title X n=274	Public n=461	Private n=833
% Urban location <sup>a</sup>	84%	57%	92%
Mean number clients served <sup>a</sup> (SD)	3544 (3522)	713 (884)	698 (998)
% Females age ≤25 <sup>a</sup> (SD)	53% (19%)	47% (18%)	42% (13%)
% African American clients served <sup>b</sup> (SD)	7.7% (9.7%)	5.2% (10.9%)	5.1% (11.3%)

Prepared by the California Department of Public Health.

<sup>a</sup> $p < 0.0001$  for difference by provider group.

<sup>b</sup> $p = 0.002$  for difference by provider group.  
SD, standard deviation.

lower overall rate (54%) than both the private sector providers and Title X providers (64% each).

Client volume was positively associated with CT screening rates, meaning that providers serving more clients also tend to have higher screening rates. The slopes for this relationship were not equal across groups, however, which indicated a significant interaction between client volume and provider group ( $p = 0.0172$ ).

**Multivariable analysis variable selection.** Univariate analysis of CT screening rates and log-transformed client volume indicated that these variables were approximately normally distributed, with no extreme outliers. Because of consistently reported higher STD rates for African Americans that may be associated with higher testing levels, we included this variable in all analyses. Bivariate analysis of screening rates indicated that the Pearson correlation coefficients for client volume, percent African American, and rural vs. urban location were statistically significant (data not shown).

**Multivariable analysis results.** The final ANCOVA model included rural vs. urban location (urban), the log of the number of Family PACT clients served (client volume), percentage of all Family PACT clients whose race/ethnicity was reported as African American (percent African American), and all the first-order interactions of these independent variables with provider

group. All independent variables were statistically significantly associated with CT screening rates as well as the interaction between client volume and provider group. Table 3 provides the  $F$  statistics and  $p$  values for all the variables in the final model. The  $R^2$  indicates that the variables in the final model accounted for 16.4% of the variance in CT screening rates.

After controlling for rural vs. urban location, Family PACT client volume, and percent African American, CT screening rates among private sector providers were 6.9% higher than that of Title X providers ( $p < 0.0001$ ). After controlling for the same covariates, however, CT screening rates for females age ≤25 years among Title X providers were 2.9% higher than that of non-Title X public sector providers ( $t = 1.89$ ), but this was not statistically significant ( $p = 0.059$ ). The difference between the CT screening rates of Title X and non-Title X public sector providers increased as client volume increased. At the median Title X client volume, the overall CT screening rate of Title X providers was 4% higher than that of non-Title X public sector providers ( $p = 0.014$ ).

## Discussion

### Provider group differences in screening rates for young women

This is the first study to show differences in adherence to screening guidelines by family planning provider groups. These differences persisted even after adjustment for provider and client characteristics that might impact the level of CT screening rates and bias comparisons. Whereas in the bivariate comparisons the screening rates among Title X and private sector providers for women ≤25 years were similar, private providers had higher screening rates compared with Title X providers after controlling for key clinic population characteristics. It is encouraging that the high level of screening from these two provider groups likely drives the overall high level of CT screening in the Family PACT program.

Further impact of high screening levels may also be evident by virtue of the high proportion of clients served by these providers. Nevertheless, ongoing program efforts to reduce missed opportunities are needed for increasing screening rates among young women. These efforts may include implementing innovative testing reminders for young clients and disseminating provider-specific screening data feedback. Ultimately, higher levels of screening by these provider groups will enable treatment of more asymptomatic infections and reduce ongoing transmission among clients and their partners.

This analysis also showed that among providers who serve a high volume of clients, Title X providers tend to have higher

TABLE 2. FAMILY PLANNING, ACCESS, CARE, AND TREATMENT PROVIDER AGE-SPECIFIC FEMALE CHLAMYDIA SCREENING RATES BY PROVIDER GROUP, 2009

Provider group	N	Age group				Difference between age group means	Paired t test of age group rate difference	
		≤25		≥26			t	p
		Mean	SD	Mean	SD			
Private	833	63.8%	(19.6%)	61.0%	(22.4%)	2.8%	5.15	<0.001
Non-Title X public	461	54.3%	(15.9%)	55.0%	(18.2%)	-0.6%	-0.99	0.325
Title X	274	64.4%	(14.5%)	53.5%	(15.9%)	10.9%	10.92	<0.001

Prepared by the California Department of Public Health.

TABLE 3. FINAL ANALYSIS OF COVARIANCE MODEL FOR PROVIDER CHLAMYDIA SCREENING RATES AMONG FEMALES AGED  $\leq 25$  YEARS ( $n = 1568$ )

Characteristic	DF	F value	Probability >F
Provider group	2	30.72	<0.0001
Urban	1	25.25	<0.0001
Log client volume	1	100.01	<0.0001
% African American	1	9.70	0.0019
Client volume–provider group interaction	2	4.07	0.0172

Prepared by the California Department of Public Health. DF, degrees of freedom.

screening rates than non-Title X public sector providers. However, this relationship reverses among low-volume providers. The majority of Title X providers are high-volume; nearly 75% of Title X providers fall above the 75th percentile (1200 clients served annually). Thus, the behavior of large-volume Title X providers has a potentially large impact upon the Family PACT program as a whole.

#### Potential overscreening of older women

We also found high screening rates for older women served by private and non-Title X providers, suggesting either lack of targeted screening or a high prevalence of high-risk older women who warrant screening. These findings do not reflect adherence to national recommendations to limit chlamydia screening to women with selected risk factors. Overscreening of women with low prevalence of disease causes unnecessary costs to the healthcare system and is associated with treatment of false positive results and emotional distress for clients.<sup>14</sup> It is possible that high rates of testing are due to higher rates of visits to evaluate lower genital tract symptoms and high-risk sexual behaviors among older clients seeking care. However, evaluation of behavioral risk factors among older women seen in California Family PACT settings indicates that prevalence of sexual risk behaviors and lower genital tract symptoms is well below 50%.<sup>15,16</sup> As a result, we would not expect screening rates among older women to exceed 50%.

We also found little difference in age-specific screening rates among non-Title X public providers, compared with a 10.9% difference for Title X providers. These findings suggest a synergistic relationship between Title X and Family PACT standards that results in higher adherence to CT screening guidelines. Ongoing quality indicator measurement and accountability based on Family Planning Annual Report data are reinforced by concurrent provider quality improvement initiatives in Family PACT. As a result, Family PACT providers have achieved an impressive level of CT screening rates in the younger age group compared to commercial and other publicly funded programs in California, including non-Title X Medi-Cal public providers, and nationwide.<sup>17–24</sup> Additional analysis provided here shows that only Title X providers were screening older women at significantly lower rates compared with those of younger women. This difference in provider behavior may be attributable to the additional reinforcement of screening guidelines throughout the Title X provider network. Differences in the degree of centralized provider quality oversight as well as billing practices among all three

provider groups may partly explain the observed variations in screening practices. Implementation of structural interventions to reduce overscreening among older women may be effective, especially if tailored to the unique organizational structure of and relationships with these three provider groups. For example, changes to include reason for test on CT test laboratory requisition forms (risk behaviors and symptoms) resulted in a 24% decrease in testing of older women in San Francisco family planning clinics.<sup>25</sup>

#### Limitations

There were limitations to this analysis. First, use of claims data may not reflect actual clinical practice and may underestimate the true screening rate, especially if test claims were not submitted or testing was done outside the program. If underascertainment of testing were more common in non-Title X public providers, differences in screening rates would not be reliable. Second, we did not have access to behavioral information for older women tested by non-Title X and private providers. Higher screening rates for high-risk older women may be justified, but we would expect correspondingly high positivity. In a sample of Family PACT clients tested by Quest Diagnostics, however, CT positivity among women aged  $\geq 26$  years has been consistently  $< 2\%$ . Thus, it is unlikely that the current levels of testing in this age group are justified.<sup>17</sup>

#### Conclusions

High overall CT screening rates among Family PACT providers likely reflect ongoing efforts to support best screening practices among young women served by Title X and private providers. However, high screening rates in Title X also likely reflect the synergistic effect of clinical support resources from two family planning programs. This may be the case when interpreting differences in screening practices among older women. To the extent that each Family PACT provider group serves a distinctly different client population, it is necessary to customize quality interventions to maximize effectiveness. Both Title X and Family PACT programs synergistically provide resources for provider training and monitoring of quality indicators, such as CT screening, to achieve quality reproductive healthcare while reducing unnecessary services.

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#### Disclosure Statement

The authors do not acknowledge any commercial associations; therefore, no competing financial interests exist. The authors have no conflicts of interest to report.

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