

# Chlamydial Infections Among Female Adolescents Screened in Juvenile Detention Centers in Washington State, 1998–2002

KATHRYN H. LOFY, MD,\* JO HOFMANN, MD,† DEBRA J. MOSURE, PhD,‡  
DAVID N. FINE, PhD,§ AND JEANNE M. MARRAZZO, MD, MPH||

**Objective:** The objective of this study was to assess trends in *Chlamydia trachomatis* positivity and associated risk factors among detained female adolescents.

**Goal:** The goal of this study was to determine trends in prevalence of chlamydia among detained female adolescents.

**Study Design:** We retrospectively reviewed risk factor data and chlamydia results collected by providers during 1998–2002 at four large juvenile detention centers in Washington State that routinely screen female adolescents for *C. trachomatis*.

**Results:** Of 3,593 tests, a total of 493 (13.7%) were positive for chlamydia. High chlamydia positivity was sustained throughout the 5-year period (range, 12.5–15.0%) with no statistically significant trends in positivity. Independent risk factors for chlamydial infection included report of more than one sex partner in the previous 60 days (adjusted odds ratio [OR] = 1.56, 95% confidence interval [CI] = 1.19–2.04) and previous chlamydial infection within 12 months (adjusted OR = 1.87, 95% CI = 1.45–2.40).

**Conclusions:** Efforts are needed to promote chlamydia screening programs in juvenile detention centers because these sites have access to high-risk sexually active female adolescents.

CHLAMYDIA TRACHOMATIS INFECTIONS ARE the most commonly reported sexually transmitted diseases (STDs) in the United States. In 2003, approximately 900,000 cases of chlamydia were reported to the Centers for Disease Control and Prevention (CDC), an estimated 300 infections per 100,000 population.<sup>1</sup> The estimated rate of infections among female adolescents aged 15 to 19 years was higher than any other group (>2,500 infections per 100,000 population).<sup>1</sup> Untreated chlamydial infections can lead to long-term sequelae (e.g., pelvic inflammatory disease, ectopic pregnancy, tubal infertility, and chronic pelvic pain).<sup>2</sup> Because the majority of infections in women are asymptomatic and do not necessarily cause visible signs of cervicitis, the U.S. Preventive Services Task Force and CDC recommend routine annual chlamydia screening of all sexually active women age ≤25 years.<sup>3,4</sup>

Female adolescents at detention centers are thought to be at higher risk for chlamydial infection and its complications than those not in detention. Factors thought to increase the risk in this

From the \*Washington State Department of Health and the Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, Georgia; the †Communicable Disease Epidemiology Section, Washington State Department of Health, Shoreline, Washington; the ‡Division of STD Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia; the §Center for Health Training, Seattle, Washington; and the ||Department of Medicine, University of Washington, Seattle, Washington

population include poor access to or unwillingness to access health care and a high prevalence of coexisting substance abuse, homelessness, depression, and previous sexual and physical abuse.<sup>5–9</sup> Despite recent efforts to expand chlamydial screening to detention centers in the Pacific Northwest (David Fine, unpublished data), few publications have described risk factors for or positivity of chlamydial infections in a large cohort of female adolescent detainees,<sup>10–13</sup> and no report to our knowledge has examined trends in positivity in this population over time.

The Region X Infertility Prevention Project (IPP) is a program that supports screening for chlamydial infections in the Pacific Northwest and Alaska.<sup>14</sup> Although screening for *C. trachomatis* has been well-established in family planning clinics participating in the Region X IPP since 1988, the inclusion of settings targeting female adolescent detainees for screening has only occurred since the mid-1990s. Among detention centers participating in the IPP, multiple centers have routinely offered *C. trachomatis* screening to sexually active female adolescents who enter the facility. Although declining trends in chlamydia positivity were observed in family planning clinics in Region X after the initiation of the IPP,<sup>1</sup> positivity trends have not been assessed among female adolescent detainees in this region. The objective of this analysis was to assess trends in chlamydia positivity and associated risk factors among female adolescents detained in Washington State from 1998–2002.

## Materials and Methods

### Site Selection

Healthcare providers at participating IPP juvenile detention centers routinely interview adolescents screened for *C. trachomatis* and complete a brief standardized form that includes data on demographics, sexual risk history, history of previous STD, and physical examination findings. Data are forwarded to a contractor for data entry and then routed to central IPP staff for management, analysis, and reporting. We analyzed deidentified data, including

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Correspondence: Jeanne M. Marrazzo, MD, MPH, Harborview Medical Center, Mailbox #359931, 325 Ninth Ave., Seattle, WA 98104. E-mail: jmm2@u.washington.edu.

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chlamydia test results, collected at detention centers in Washington State who participated in the Region X IPP screening project during 1998–2002. The population included all female detainees aged 10 to 17 years screened for *C. trachomatis* during this period.

During 1998–2002, a total of 17 detention centers in Washington State participated in the Region X IPP and screened female detainees aged 10 to 17 years for *C. trachomatis* infections. These 17 centers likely represent the majority of sites at which chlamydia screening occurs in Washington State. Of these 17 centers, 15 were juvenile detention centers, one was a correctional center for women, and one was a county jail. Because we were unable to access data on the total number of female adolescents admitted to these facilities during this time period and wanted to focus on facilities at which most detainees were offered screening, we excluded facilities that reported less than 50 chlamydia tests per year on average. Of the 17 detention centers that screened female adolescents during 1998–2002, only three detention centers contributed an average of 50 or more tests per year and therefore were selected for inclusion in the analysis.

In addition to data collected from detention centers participating in the Region X IPP, we reviewed deidentified data collected at the Seattle–King County (SKC) juvenile detention center from female adolescents screened for *C. trachomatis* during 1998–2002. Like in detention centers participating in the IPP, healthcare providers at the SKC juvenile detention center interviewed adolescents screened for chlamydia and completed a brief standardized form that included comparable data on demographics, sexual risk factors, history of STD, and physical examination findings. Data entry and management for these data were provided by the Public Health—Seattle & King County STD Program.

Our final analyses included data from adolescents screened at the SKC juvenile detention center and three detention centers that participate in the IPP. These four facilities are the largest facilities in the state in terms of chlamydia testing performed; correspondingly, they are located in parts of the state with highest population density and, not surprisingly, highest numbers of reported chlamydia cases as well. These sites are referred to subsequently as sites A, B, C, and D.

### Screening Protocols

We reviewed screening protocols for *C. trachomatis* at the four juvenile detention centers selected by interviewing healthcare providers who were responsible for chlamydia screening at the sites. Review of screening protocols revealed that all four sites routinely offered screening to female adolescent detainees for at least the majority of the analysis period.

The screening protocols differed at the four sites included in the analyses. Healthcare providers at sites A and D performed medical evaluations on adolescents on entry to the facility. At this initial medical evaluation, providers offered adolescents a screening test for *C. trachomatis*. Although site C also performed medical evaluations at the time of entry into the facility, providers did not screen for chlamydia at this time. Instead, one day during the week, providers made a list of all the new detainees who entered the facility over the past week and offered screening for chlamydia to these individuals. Providers at sites A, C, and D acknowledged that some adolescents were detained and released before screening for chlamydia was performed. The screening protocol at site B changed over the 5-year study period. Early in 2000, providers at this facility began offering screening for chlamydia to adolescents who were seen at the clinic for health issues unrelated to STD complaints. Over the subsequent 2 years, providers at site B increased the number of adolescents screened for chlamydia by offering screening during routine physical examinations. Through-

out the period, providers at all facilities performed chlamydia tests on symptomatic adolescents (defined as presentation with any genitourinary complaint or abdominal or pelvic pain).

### Laboratory Test Methodology

Detention centers used various diagnostic assays for *C. trachomatis*. Nucleic acid amplification tests (NAAT) comprised >90% of diagnostic tests used at all four sites, whereas cervical culture alone was occasionally used (9% of total) primarily at site D in 1998. Anatomic site of NAAT collection included the cervix for 86% and 80% of NAAT at sites A and B, respectively, and urine specimen for approximately 100% of NAAT at sites C and D.

### Statistical Analyses

Data were analyzed with SPSS version 11.5 (SPSS, Inc., Chicago, IL). Records with an unsatisfactory or unavailable *C. trachomatis* result were excluded from the analyses. We calculated the positivity of *C. trachomatis* infection at each site by year and positivity for all sites combined. Positivity trends over the time period were calculated by using binary logistic regression for the entire dataset and for each individual site. In addition, chlamydia positivity trends were analyzed by binary logistic regression for the following groups: age younger than 16 years versus 16 to 17 years and adolescents who were white versus nonwhite (black, American Indian/Alaska Native, Asian/Pacific Islander/Hawaiian, or multiracial/other).

We examined the relationship between individual factors associated with chlamydial infection by determining crude and adjusted odds ratios (ORs). Crude ORs were calculated for demographic characteristics, behavioral risk factors, and physical examination findings. Adjusted ORs were calculated with multiple logistic regression for demographic characteristics and behavioral risk factors that were significantly associated with infection in univariate analyses. Physical examination findings were not included in the logistic regression model because these findings were available for less than half of the observations and because they are indications for diagnostic testing, not screening. All tests for statistical significance were two-sided and a level of  $P < 0.05$  was considered significant.

## Results

### Characteristics of Adolescents Screened

In the study population, 3,651 screening tests for *C. trachomatis* were performed during the 5-year period. Of these screening tests, 3,593 (98.4%) had conclusive results and were included in the analyses. Site A performed 418 (11.6%) tests; site B, 458 (12.7%); site C, 542 (15.1%); and site D, 2,175 (60.5%).

Table 1 shows the characteristics of all female adolescent detainees screened for chlamydial infections. Of these adolescents, <1% were aged <12 years, 7.4% were aged 12 to 13 years, 43.9% were aged 14 to 15 years, and approximately one half (48.4%) were aged 16 to 17 years. Of those screened, 61.1% were white; 23.9% black; 5.1% American Indian/Alaska Native; and 4.6% Asian/Pacific Islander/Hawaiian. The racial breakdown of adolescents screened varied at each site: site C screened the highest proportion of whites (85.0%), and sites B and D screened the highest proportion of blacks (31.3% and 28.5%, respectively). Across all four sites, 938 (29.5%) adolescents who were screened reported more than one sex partner in the previous 60 days, and 1,187 (38.2%) reported a new sex partner in the previous 60 days. A total of 17.1% of all adolescents screened reported having tested positive for *C. trachomatis* in the previous year. Of 1,517 adoles-

TABLE 1. Characteristics of Detained Female Adolescents Screened for *Chlamydia trachomatis* Infections and Associated Risk Factors for Infection (n = 3,593)

	No. With Characteristic/Total Tests (%)	No. <i>C. trachomatis</i> Positive/No. With Characteristic (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)
Age group				
>15 y	1,738/3,588 (48.4)	223/1,738 (12.8)	Reference	N/A
≤15 y	1,850/3,588 (51.6)	267/1,850 (14.4)	1.15 (0.95–1.39)	N/A
Race				
White	2,137/3,500 (61.1)	240/2,137 (11.2)	Reference	Reference
Black	835/3,500 (23.9)	147/835 (17.6)	1.69 (1.35–2.11)	1.66 (1.32–2.08)
American Indian/Alaska Native	179/3,500 (5.1)	36/179 (20.1)	1.99 (1.35–2.94)	1.88 (1.27–2.79)
Asian/Pacific Islander/Hawaiian	161/3,500 (4.6)	28/161 (17.4)	1.66 (1.08–2.56)	1.64 (1.07–2.54)
Multiracial/other	188/3,500 (5.4)	30/188 (16.0)	1.50 (0.99–2.27)	1.42 (0.94–2.16)
Sexual risk history				
>1 partner (previous 60 d)	938/3,185 (29.5)	168/938 (17.9)	1.58 (1.28–1.95)	1.56 (1.19–2.04)
New partner (previous 60 d)	1,187/3,107 (38.2)	182/1,187 (15.3)	1.24 (1.01–1.52)	1.00 (0.76–1.30)
<i>C. trachomatis</i> infection previous 12 mo	518/3,031 (17.1)	110/518 (21.2)	2.03 (1.59–2.59)	1.87 (1.45–2.40)
Condom used at last sex	987/2,730 (36.2)	122/987 (12.4)	0.80 (0.64–1.01)	N/A
Examination findings				
Mucopurulent discharge	99/1,577 (6.3)	39/99 (39.4)	3.84 (2.50–5.89)	N/A
Cervical friability	192/1,541 (12.5)	51/192 (26.6)	2.12 (1.48–3.01)	N/A
Mucopurulent discharge or cervical friability	259/1,517 (17.1)	79/259 (30.5)	2.81 (2.06–3.83)	N/A

\*The multiple logistic regression model included the following variables: race, more than one partner (previous 60 d), new partner (previous 60 d), and *C. trachomatis* infection previous 12 mo. OR indicates odds ratio; CI = confidence interval; N/A = .

cents with complete physical examination data (42.2% of all subjects), a total of 259 (17.1%) had mucopurulent discharge or friability of the cervix.

#### *Chlamydia* Positivity

During the 5-year period, 13.7% (493) tests performed for chlamydia were positive. The overall positivity of *C. trachomatis* infections varied by site (site A = 9.3%, site B = 21.0%, site C = 11.6%, and site D = 13.6%). Using binary logistic regression, we did not identify statistically significant trends in chlamydia positivity over the 5-year period in the overall population (Table 2), at any individual juvenile detention center, or by age group or race (data not shown). *C. trachomatis* positivity by demographic characteristic, behavioral risk, and physical examination findings are summarized in Table 1.

#### Risk Factors for Chlamydial Infection

Univariate analysis identified multiple risk factors associated with chlamydial infection (Table 1). Although mucopurulent cer-

vical discharge and friability of the cervix were statistically associated with chlamydial infection, 68% (170) of 249 female adolescents who tested positive for *C. trachomatis* and had available physical examination results showed no mucopurulent discharge or friability at the cervix.

In multivariate analysis, persons infected with *C. trachomatis* were more likely to be black, American Indian/Alaska Native, or Asian/Pacific Islander/Hawaiian (Table 1). Those infected were also more likely to have reported more than one sex partner in the previous 60 days or a positive test for *C. trachomatis* in the previous 12 months. Of 405 detainees infected with chlamydia, 27.2% (110) reported having had a positive test for *C. trachomatis* in the previous 12 months.

Binary logistic regression analysis indicated that the proportion of nonwhite adolescents screened increased over the study period (OR = 1.14, 95% confidence interval [CI] = 1.09–1.19); however, the proportion of younger adolescents and the prevalence of STD-related sexual behaviors did not change in this population over time. We found no significant trends across the 5-year timeframe in the proportion of detainees aged ≤15 years or who reported more than one sex partner or a new sex partner in the previous 60 days, condom use at the last sexual encounter, or *C. trachomatis* infection in the previous 12 months (data not shown).

#### Discussion

In this large retrospective analysis, we identified sustained high positivity of *C. trachomatis* infection (13.7% overall; range, 12.5–15.0%) among female juvenile detainees over a 5-year period. The adolescents screened commonly reported recent STD-related risk behaviors and many reported a history of chlamydial infection within the previous year. Risk factors found to be independently associated with chlamydial infection were nonwhite race, reporting more than one sex partner in the previous 60 days, and reporting a positive test for *C. trachomatis* in the previous 12 months. Importantly, the latter finding conferred an increase of approxi-

TABLE 2. Number of Tests Performed and Positivity of *Chlamydia trachomatis* Infection in Female Adolescent Detainees, 1998–2002

	No. of Tests Performed	Positivity of <i>C. trachomatis</i> Infections (%)*
1998	602	14.5
1999	717	12.8
2000	714	15.0
2001	755	12.5
2002	805	14.0
Total	3,593	13.7

\*The trend in chlamydia positivity during 1998–2002 was not statistically significant (odds ratio = 1.0, 95% confidence interval = 0.93–1.06).

mately twofold in the risk for *C. trachomatis* positivity at the visit we assessed. Chlamydia positivity remained unchanged over the entire study period, although the proportion of younger adolescents, and of those who reported behavioral risks, did not increase. However, we did detect an increase in the proportion of nonwhite adolescents screened over time. Because nonwhite adolescents were at higher risk for chlamydial infection overall, this increase may in part have contributed to the sustained level of chlamydia positivity that we observed.

The lack of decline in chlamydia positivity we found in juvenile detention centers in Washington State is consistent with positivity trends in other testing venues in Region X. Family planning clinics in Region X saw dramatic declines in chlamydia positivity in the early 1990s in concert with increasing rates of selective screening in this population. However, chlamydia positivity did not decline during 1998–2002 despite sustained screening efforts during this time.<sup>1</sup> The sustained high positivity among female adolescent detainees accords with these trends and further highlights the need for innovative approaches to control chlamydial infections in this population.

Our finding of high chlamydia positivity is consistent with previous studies of female juvenile detainees. An analysis from detention centers in California, Maryland, and Texas found the median chlamydia positivity among female adolescents was 15.6% (range, 8.0–19.5%).<sup>10</sup> More recently, analyses of chlamydia screening programs in juvenile detention centers in Hawaii and California identified positivity of 13.9% and 13.0%, respectively.<sup>12,15</sup> Numerous studies have reported consistently higher chlamydia prevalence in juvenile detention centers relative to other testing venues. For example, chlamydia positivity among female adolescents aged 10 to 19 years screened in teen and school-based clinics participating in the Region X IPP in Washington during 1998–2002 was 6.6%, less than one half of the positivity we reported during this same period.<sup>16</sup> Bauer and colleagues also reported that prevalence of chlamydial infections among youth and young adults was higher in correctional settings compared with other nonclinical settings (e.g., school and community-based settings),<sup>12</sup> demonstrating that incarcerated youth continue to be a population at substantially high risk for chlamydial infections.

Because female adolescent detainees are at high risk for chlamydial infections and associated sequelae, correctional facilities are critical and convenient screening sites for youth. In addition, screening women in jail with urine-based screening tests is feasible and acceptable.<sup>17</sup> Unfortunately, screening for chlamydia is not occurring in multiple correctional facilities around the country,<sup>18,19</sup> an observation substantiated by the fact that multiple sites reviewed for eligibility in our analysis performed <50 tests per year. Although the extent of screening coverage was not the principal focus of our analysis, the data we analyzed are consistent with the observation that <70% of young, sexually active females are offered screening for *C. trachomatis* in other healthcare settings.<sup>20</sup> Rates of screening were even lower in health maintenance organizations and point-of-service plans, sites that have traditionally emphasized preventive and primary care.<sup>21</sup> Compared with juvenile detention centers, these healthcare settings are considerably more likely to have resources available for screening. Additional barriers to increasing screening coverage at detention centers might include associated costs, staffing concerns, limited infrastructure to support testing (for example, relationships with local laboratories), privacy concerns, and relative lack of priority given detainees' often pressing and competing needs for social support.

Although implementing universal screening programs for young women at juvenile detention centers poses formidable challenges, several published analyses suggest that universal screening is

likely to be cost-effective in centers with a prevalence above 5%, a threshold easily reached in all analyses of *C. trachomatis* in young female detainees to date.<sup>22–24</sup> Mrus and colleagues recently demonstrated that when the prevalence of chlamydial infections is 5% to 16%, screening and treatment based on urine NAAT was the preferred strategy relative to no screening, empiric treatment, selective screening, or screening and treating based on cervical NAATs.<sup>25</sup> A cost-effectiveness study by Kraut-Becher and colleagues also supports universal screening for *C. trachomatis* infections in jail settings.<sup>26</sup>

In addition to universal screening of female adolescents entering juvenile detention centers, other strategies are needed to decrease the rates of chlamydial infections in this population. The high prevalence of risky sexual behaviors and low prevalence of reported condom use in our study highlight the need for continued primary prevention programs both in detention facilities and in other healthcare settings that serve youth at high risk for adverse health outcomes, including STD acquisition. In our study, 27.2% of detainees with chlamydia reported testing positive for chlamydia in the previous 12 months. Although implementation presents logistic challenges, repeat testing of female adolescents 4 to 6 months after initial diagnosis is likely to yield detection of female adolescents at substantially elevated risk for recurrent disease.<sup>27,28</sup> These efforts should be coupled with efforts to enhance management of sex partners of persons with chlamydial infection, which can be especially challenging when dealing with incarcerated youth. Finally, screening of males in selected detention centers might indirectly support efforts to control disease in young women.<sup>29,30</sup>

Our analysis has several limitations. Although we limited our study population to detention centers that reported routinely screening female adolescents and interviewed healthcare providers responsible for STD evaluation at these facilities, we were not able to assess the true extent of screening at these facilities. In addition, because our data included no patient identifiers, we were not able to determine the number of individuals diagnosed with *C. trachomatis* over the 5-year study period. Therefore, the positivity of chlamydial infection we report only estimates the prevalence in our study population. Second, different NAAT tests were used in each center and culture was the test used in 9% of subjects by one facility, primarily in 1998 before urine screening was available. However, the NAAT tests have comparable sensitivities and specificities,<sup>31</sup> and the results of our analyses did not change when we excluded the subjects tested by culture (data not shown). Finally, because all of the data were collected from four detention centers in Washington, the results may not be generalizable to other areas of the country, particularly because prevalence of *C. trachomatis* varies substantially across regions in the United States.<sup>1</sup>

Our finding that the positivity of chlamydial infections among female adolescents tested in detention centers in Washington State was persistently high during 1998–2002 indicates that additional strategies to control this common STD are urgently needed in this population. Resources should be directed to juvenile detention facilities for urine-based chlamydial screening programs aimed at female adolescent detainees and to address barriers to implementing such programs. Although the availability of urine-based testing presents a major advance, a concerted effort is needed to increase adherence to universal screening recommendations in detention centers, develop feasible strategies for the management of sex partners of detainees, and improve continuity of care at release from the facility so that rescreening for *C. trachomatis* can occur 4 months after the initial diagnosis.<sup>32</sup>

## References

- Sexually Transmitted Disease Surveillance, 2003. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, September 2004.
- Stamm WE. *Chlamydia trachomatis*—The persistent pathogen: Thomas Parran Award Lecture. *Sex Transm Dis* 2001; 28:684–689.
- US Preventative Services Task Force. Screening for chlamydial infection: recommendations and rationale. *Am J Prev Med* 2001; 20:90–94.
- Centers for Disease Control and Prevention. Appendix E *Chlamydia trachomatis* screening recommendations. *MMWR Morb Mortal Wkly Rep* 2002; 51:37.
- Lichtenstein B. HIV risk and healthcare attitudes among detained adolescents in rural Alabama. *AIDS Patient Care STDs* 2000; 14: 113–124.
- Shafer MA, Hilton JF, Ekstrand M, et al. Relationship between drug use and sexual behaviors and the occurrence of sexually transmitted diseases among high-risk male youth. *Sex Transm Dis* 1993; 20: 307–313.
- Morris RE, Harrison EA, Knox GW, et al. Health risk behavioral survey from 39 juvenile correctional facilities in the United States. *J Adolesc Health* 1995; 17:334–344.
- Mason WA, Zimmerman L, Evans W. Sexual and physical abuse among incarcerated youth: Implication for sexual behavior, contraceptive use, and teenage pregnancy. *Child Abuse Negl* 1998; 22: 987–995.
- Crosby R, Salazar LF, Diclemente RJ, et al. Health risk factors among detained adolescent females. *Am J Prev Med* 2004; 27: 404–410.
- Mertz KJ, Voigt RA, Hutchins K, et al. Findings from STD screening of adolescents and adults entering correction facilities. *Sex Transm Dis* 2002; 29:834–839.
- Kelly PJ, Bair RM, Baillargeon J, et al. Risk behaviors and the prevalence of chlamydia in a juvenile detention facility. *Clin Ped* 2000; 39:521–527.
- Bauer HM, Chartier M, Kessell E, et al. Chlamydia screening of youth and young adults in non-clinical settings throughout California. *Sex Transm Dis* 2004; 31:409–414.
- Kahn RH, Mosure DJ, Blank S, et al. *Chlamydia trachomatis* and *Neisseria gonorrhoeae* prevalence and coinfection in adolescents entering selected US juvenile detention centers, 1997–2002. *Sex Transm Dis* 2005; 32:255–259.
- Britton TF, Delisle S, Fine D. STDs and family planning clinics: A regional program for chlamydia control that works. *Am J Gynecol Health* 1992; 6:80–87.
- Katz AR, Lee MVC, Ohye RG, et al. Prevalence of chlamydial and gonorrheal infections among females in a juvenile detention facility, Honolulu, Hawaii. *J Community Health* 2004; 29:265–269.
- Palmer NB, Fine D, Patrick E, et al. Trends in chlamydia positivity among adolescent females attending school-based and teen clinics in Washington, 1998–2002. Presented at the 2004 National STD Prevention Conference, Philadelphia, PA, March 2004.
- Mertz KJ, Schwabke JR, Gaydos CA, et al. Screening women in jails for chlamydial and gonococcal infection using urine tests. *Sex Transm Dis* 2002; 29:271–276.
- Parece MS, Herrera GA, Voigt RF, et al. STD testing policies and practices in US city and county jails. *Sex Transm Dis* 1999; 26:431–437.
- Centers for Disease Control and Prevention. Assessment of sexually transmitted diseases services in city and county jails—United States, 1997. *MMWR Morb Mortal Wkly Rep* 1998; 47:429–431.
- Levine WC, Dicker LW, Devine O, et al. Indirect estimation of chlamydia screening coverage using public health surveillance data. *Am J Epidemiol* 2004; 160:91–96.
- Centers for Disease Control and Prevention. Chlamydia screening among sexually active young female enrollees of health plans—United States, 1999–2001. *MMWR Morb Mortal Wkly Rep* 2004; 53:983–985.
- Howell MR, Quinn TC, Gaydos CA. Screening for *Chlamydia trachomatis* in asymptomatic women attending family planning clinics: A cost-effectiveness analysis of three strategies. *Ann Intern Med* 1998; 128:277–284.
- Hu D, Hook EW 3rd, Goldie SJ. Screening for *Chlamydia trachomatis* in women 15 to 29 years of age: A cost-effectiveness analysis. *Ann Intern Med* 2004; 141:501–513.
- Marrazzo JM, Celum CL, Hillis SD, et al. Performance and cost-effectiveness of selective screening criteria for *Chlamydia trachomatis* infection in women. *Sex Transm Dis* 1997; 24:131–141.
- Mrus JM, Biro FM, Huang B, et al. Evaluating adolescents in juvenile detention facilities for urogenital chlamydial infection. *Arch Pediatr Adolesc Med* 2003; 157:696–702.
- Kraut-Becher JR, Gift TL, Haddix AC, et al. Cost-effectiveness of universal screening for chlamydia and gonorrhea in US jails. *J Urban Health* 2004; 81:453–471.
- Burstein GR, Zenilman JM, Gaydos CA, et al. Predictors of repeat *Chlamydia trachomatis* infections diagnosed by DNA amplification testing among inner city females. *Sex Transm Infect* 2001; 77:26–32.
- Whittington WL, Kent C, Kissinger P, et al. Determinants of persistent and recurrent *Chlamydia trachomatis* infection in young women: Results of a multicenter cohort study. *Sex Transm Dis* 2001; 28: 117–123.
- Ginocchio RH, Veenstra DL, Connell FA, et al. The clinical and economic consequences of screening young men for genital chlamydial infection. *Sex Transm Dis* 2003; 30:99–106.
- Blake DR, Gaydos CA, Quinn TC. Cost-effectiveness analysis of screening adolescent males for chlamydia on admission to detention. *Sex Transm Dis* 2004; 31:85–95.
- Gaydos CA, Theodore M, Dalesio N, et al. Comparison of three nucleic acid amplification tests for detection of *Chlamydia trachomatis* in urine specimens. *J Clin Microbiol* 2004; 42:3041–3045.
- Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines—2002. *MMWR Morb Mortal Wkly Rep* 2002; 51:1–80.