

Kaposi's sarcoma. Since the trend analysis was restricted to White men ages 25–49, it is highly likely that the registered patients with Kaposi's sarcoma also had AIDS.

When cases from other demographic subgroups (i.e., females and Blacks) were included in the analysis, the ratio of Kaposi's sarcoma to AIDS decreased somewhat in the later two years, from 0.19 in 1983 to 0.16 in 1986. The occurrence of Kaposi's sarcoma and AIDS in these other demographic subgroups, however, was too small and too recent to permit the identification of any meaningful associations.

The findings of this study suggest that the proportion of AIDS patients with concomitant Kaposi's sarcoma in young White males has not changed over time. Since these results differ from those in earlier reports, further analyses in other populations are warranted.

#### ACKNOWLEDGMENTS

The authors express their appreciation to the staff of the Georgia Department of Human Resources and the Georgia Center for Cancer Statistics who collected, coded, edited, and processed these data, and to the hospitals and physicians who provided information on patients for this analytic research. This work was supported in part by Contract N01-CN-55429 from the National Cancer Institute. In addition, Dr. Chow was supported by the Winship Cancer Center, Emory University.

#### REFERENCES

- Jaffe HW, Bregman DJ, Selik RM: Acquired immune deficiency syndrome in the United States: the first 1,000 cases. *J Infect Dis* 1983; 148:339–345.
- Peterman TA, Drotman DP, Curran JW: Epidemiology of the acquired immunodeficiency syndrome (AIDS). *Epidemiol Rev* 1985; 7:1–21.
- Des Jarlais DC, Stoneburner R, Thomas P: Declines in proportion of Kaposi's sarcoma among cases of AIDS in multiple risk groups in New York City. (Letter) *Lancet* 1987; 2:8566.
- Selik RM, Starcher T, Curran JW: Opportunistic diseases reported in AIDS patients: frequencies, associations, and trends. *AIDS* 1987; 1:175–182.
- Mirvish SS, Haverkos HW: Butyl nitrite in the induction of Kaposi's sarcoma in AIDS. (Letter) *N Engl J Med* 1987; 317:1603.
- Hardy AM, Allen JR, Morgan M, Curran JW: The incidence rate of acquired immunodeficiency syndrome in selected populations. *JAMA* 1985; 253:215–220.
- Selik RM, Haverkos HW, Curran JW: Acquired immune deficiency syndrome (AIDS) trends in the United States, 1978–1982. *Am J Med* 1984; 76:493–500.
- Biggar RJ, Nasca PC, Burnett WS: AIDS-related Kaposi's sarcoma in New York City in 1977. (Letter) *N Engl J Med* 1988; 318:252.
- Biggar RJ, Horn J, Fraumeni JF, Greene MH, Goedert JJ: Incidence of Kaposi's sarcoma and mycosis fungoides in the United States including Puerto Rico, 1973–81. *JNCI* 1984; 73:89–94.
- Centers for Disease Control: Human immunodeficiency virus infection in the United States: a review of current knowledge. *MMWR* 1987; 36: (Suppl).
- Centers for Disease Control, Task Force on Kaposi's Sarcoma and Opportunistic Infections: Epidemiologic aspects of the current outbreak of Kaposi's sarcoma and opportunistic infections. *N Engl J Med* 1982; 306: 248–252.
- Centers for Disease Control: Update on acquired immune deficiency syndrome (AIDS)—United States. *MMWR* 1982; 31:507–514.
- Young JL Jr, Percy CL, Asire AJ: Surveillance, Epidemiology, and End Results: Incidence and Mortality Data, 1973–77. Monograph 57. Washington, DC: National Cancer Institute, 1981.
- Child MA, Lynn MJ: Georgia cancer facts. *J Med Assoc Ga* 1983; 72:561–562.
- Chang CL: Standard error of the age-adjusted death rate. *Vital Stat Spec Rep* 1961; 47:275–285.
- Centers for Disease Control: Summary of Notifiable Disease, United States, 1986. *MMWR* 1986; 35:52.
- Chamberland ME, Allen JR, Monroe JM, et al: Acquired immunodeficiency syndrome in New York City: evaluation of an active surveillance system. *JAMA* 1985; 254:383–387.
- Hardy AM, Starcher ET, Morgan WM, et al: Review of death certificates to assess completeness of AIDS case reporting. *Public Health Rep* 1987; 102:386–391.

## The Hawaii Chlamydia Network Project: A Successful Program Incorporating Close Intra-agency Cooperation

ALAN R. KATZ, MD, MPH

**Abstract:** The Hawaii State Department of Health's Chlamydia Network Project screened 272 asymptomatic females for chlamydia; 20 (7.4 per cent) were found to be positive. When interviewed, 75 per cent (15/20) of the cases gave information such that their sexual partner(s) could be located. Ninety per cent (14/16) of the locatable partners were brought to examination within seven days. Keys to success were the training of family planning clinic staff in STD (sexually transmitted disease) control methods, and close intra-agency cooperation. (*Am J Public Health* 1989; 79:505–507.)

#### Introduction

In October 1986, the Hawaii State Department of Health began a Chlamydia Network Project. The purposes of this project were to:

- Ascertain the prevalence of clinically inapparent chlamydial infections in female family planning patients;
- Develop screening protocols for chlamydia in all state-subsidized family planning clinics; and
- Develop a "network" between the Office of Family Planning and the Sexually Transmitted Disease (STD) Control Program in order to ensure all screen positive female clients and their locatable sex partners are brought to treatment in a timely manner.

#### Methods

The five major state-subsidized family planning clinics on the island of Oahu were involved. A total of 272 asymptomatic women were screened by obtaining a weighted sample from each of the participating clinics between December 1986 and April 1987. Eligibility criteria included any female having one or more of the following high-risk factors:<sup>1–9</sup> less than 25 years old; single; more than one sexual partner in the preceding 60 days; past history of a sexually transmitted disease (STD); patient being seen for an STD or STD screen, but who otherwise would not be treated for chlamydia.

Address reprint requests to Alan R. Katz, MD, MPH, Director, AIDS/STD Project, State of Hawaii Department of Health, 3627 Kilauea Avenue, Room 305, P.O. Box 8435, Honolulu, HI 96815. Dr. Katz is also Assistant Clinical Professor at the University of Hawaii School of Public Health.

Less than 3 per cent of those eligible refused to participate (7/279). Patients completed an anonymous questionnaire (coded by number only) to identify possible risk factors. Exclusionary criteria included: no past history of sexual intercourse; use of antibiotics in the preceding two weeks. As patients with a diagnosis of cervicitis or pelvic inflammatory disease (PID) were treated with an anti-chlamydial regimen, it was not considered cost-effective to screen them.

Specimens were obtained with a swab from the endocervix. Each was tested using the "chlamydiazyme"® technique. This is an enzyme-linked immunoabsorbent assay with a sensitivity of approximately 80–90 per cent and a specificity of approximately 97 per cent.<sup>10–13</sup>

Staff at each of the five targeted clinics were trained in patient interview methods and the proper use of STD epidemiologic report forms. Orientations included mock patient interviews and role playing.

The initial follow-up of screen positive patients was the responsibility of that patient's family planning clinic staff. Disease intervention specialists from the state STD Control Program were responsible for field investigations of any screen positive females lost to follow-up, as well as all partners of screen positive patients.

A logistic regression modeling technique was used to identify independent variables suggestive of increased risk for chlamydial infections. Software for this purpose was the "Logress" program from the Centers for Disease Control (CDC).

### Results

Of 272 asymptomatic women screened for chlamydia, 20 were found to be positive, a prevalence rate of 7.4 per cent. During the same period, three females were excluded from the study with diagnoses of mucopurulent cervicitis (MPC) and one with PID. As chlamydia is responsible for up to 50 per cent of all MPC<sup>1,3,4</sup> and approximately 40 per cent of PID,<sup>3,14,15</sup> the overall prevalence rate may be slightly higher than 7.4 per cent.

Two independent demographic variables were suggestive of increased risk for chlamydia: Hawaiian ethnicity, and attendance at the rural clinic. Japanese and Caucasian ethnicity were suggestive of lower risk of chlamydia.

### Networking

Ninety-five per cent of the screen positive women (19/20) were brought to treatment within five days of laboratory confirmation. All screen positive women had follow-up, including interview and treatment, by their respective family planning clinic staff. Seventy-five per cent (15/20) gave information such that their sexual partner(s) could be located. Ninety per cent (14/16) of the locatable partners were brought to examination within seven days. Twenty-five per cent of the partners (4/16) had evidence of nongonococcal urethritis on examination; 75 per cent (12/16) were asymptomatic. All received treatment. A disease intervention specialist was required to field investigate 75 per cent (12/16) of the locatable partners.

### Discussion

The success of this project was partially due to funding of a "project director" to oversee the project, to follow-up on all positive cases and locatable contacts, and to serve as a liaison between the family planning clinics and the disease intervention specialists at the STD Control Program. However, the excellent follow-up of screen positive patients was

due almost entirely to the diligence and persistence of the individual clinic staffs. The additional training in disease intervention skills and interviewing techniques gave these clinics the tools needed to serve an STD control function as well as their underlying family planning functions.

The 7.4 per cent chlamydia prevalence rate in women without clinically apparent infection is comparable to the 6.4–11.3 per cent values reported from mainland US family planning clinics.<sup>2,7,16</sup> The Hawaii State STD Clinic is reporting a 13–15 per cent overall chlamydia prevalence rate. The finding that the family planning clinics in a given area have approximately half the chlamydia prevalence rates as the STD clinics in the same area is in keeping with trends reported from several mainland cities.<sup>3</sup>

The finding of increased STD prevalence in clients of part Hawaiian ancestry, and decreased prevalence in those of Caucasian or Japanese ethnicity, conforms with reported state trends in gonorrhea and other STDs and may actually reflect socioeconomic factors.

The high chlamydial prevalence rate (11.6 per cent) found at the rural clinic may reflect an accessibility factor since the one STD clinic on the island is located in urban Honolulu. This rural population is also at increased risk for STDs because of lower socioeconomic status and high number of active duty military personnel residing there.<sup>17</sup>

The Hawaii State Department of Health plans to recommend annual screening of high-risk females for chlamydia in both state-subsidized and private family planning clinics, with continued cooperation between the Office of Family Planning and the STD Control Program. We plan to train staff members at our other family planning clinics in the CDC disease intervention skills and the use of STD epidemiologic report forms.

### ACKNOWLEDGMENTS

This study was supported by a grant from the Division of Preventive Health Services and Family Planning Unit, US Public Health Service, Region IX. Grateful acknowledgment is given to the following individuals and agencies: Dr. Franz von Sonnenburg for programming and statistical consultation; Donald Cowne, Public Health Adviser, Centers for Disease Control; Queen's Medical Center, Research and Institutional Review Committee; staff members at the Rural Oahu Family Planning Project, Kapiolani Medical Center Family Planning Clinic, University of Hawaii Family Planning Clinic, Queen Emma Clinic, and the Waikiki Health Center. A brief summary of this paper was presented at a Region IX, USPHS Preventive Health Services Conference in San Diego, CA on April 16, 1987.

### REFERENCES

- Judson F: Assessing the number of genital chlamydia infections in the United States. *J Reprod Med* 1985; 30:(suppl):269–272.
- Handsfield H, et al: Criteria for selective screening for *Chlamydia trachomatis* infection in women attending family planning clinics. *JAMA* 1986; 255 (13):1730–1734.
- Centers for Disease Control: *Chlamydia trachomatis* infections. *MMWR* 1985; 34(suppl):53S–74S.
- Brunham R, et al: Mucopurulent cervicitis—The ignored counterpart in women of urethritis in men. *N Engl J Med* 1984; 311:1–6.
- Faro S: *Chlamydia trachomatis* infections in women. *J Reprod Med* 1985; 30(suppl):273–277.
- Edwards D, et al: *Chlamydia trachomatis* at a family planning clinic. *NZ Med J* 1985; 98:333–335.
- Schachter J, et al: Screening for chlamydial infections in women attending family planning clinics. *West J Med* 1983; 138:375–379.
- Ismail M, et al: Chlamydia colonization of the cervix in pregnant adolescence. *J Reprod Med* 1985; 30:549–553.
- Khurana C, et al: Prevalence of *Chlamydia trachomatis* in the pregnant cervix. *Obstet Gynecol* 1985; 66:241–243.
- Chernesky MA, et al: Detection of *Chlamydia trachomatis* antigens by enzyme immunoassay and immunofluorescence in genital specimens from symptomatic and asymptomatic men and women. *J Infect Dis* 1986; 154: 141–147.

11. Stamm WE: Diagnosis of *Neisseria gonorrhoeae* and *Chlamydia trachomatis* infection using antigen detection methods. *Diagn Microbiol Infect Dis* 1986; 4:93S-99S.
12. Pugh SF, et al: Enzyme amplified immunoassay: A novel technique applied to direct detection of *Chlamydia trachomatis* in clinical specimens. *J Clin Pathol* 1985; 38:1139-1141.
13. Caul EO, and Paul ID: Monoclonal antibody based ELISA for detecting *Chlamydia trachomatis*. *Lancet* 1985; 1:279.
14. Miettinen A, et al: Epidemiologic and clinical characteristics of pelvic inflammatory disease associated with *Mycoplasma hominis*, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae*. *Sex Transm Dis* 1986; 13:24-28.
15. Sweet RL: Pelvic inflammatory disease. *Sex Transm Dis* 1986; 13(suppl): 192-198.
16. McCormack W, et al: Infection with *Chlamydia trachomatis* in female college students. *Am J Epidemiol* 1985; 121:107-115.
17. Holmes K, et al (eds): *Sexually Transmitted Diseases*. New York: McGraw Hill, 1984; 90-99.

## Tuberculosis Surveillance in a State Prison System

STEVEN S. SPENCER, MD, AND ARTHUR R. MORTON, DO, MPH

**Abstract:** After four inmates at two New Mexico prisons converted their tuberculosis skin tests, a mass screening program was carried out at all of the State's adult correctional facilities (2,240 inmates). Previously unknown converters were found with a disproportionately high per cent of converters (6.8 per cent and 6.3 per cent) and reactors (14.4 per cent and 12.2 per cent) at the first two prisons. No index cases were found. State policy has been revised to include two-stage skin testing of new inmates, annual testing thereafter, and screening of all new correctional staff. (*Am J Public Health* 1989; 79: 507-509.)

### Introduction

Although tuberculosis has greatly diminished in frequency in the general population of this country in recent decades, it remains a significant problem in certain population groups: some minorities, immigrants from third world countries, patients with human immunodeficiency virus (HIV) infection, residents of nursing homes, and other institutionalized groups.<sup>1-6</sup> Several authors have called attention to the problem of contagious tuberculosis in jails and prisons and the need for surveillance programs.<sup>6-10</sup> Stead in the late 1970s<sup>6,7</sup> showed that tuberculosis morbidity was 6.5 times greater in Arkansas prisons than in the general population of that state.<sup>7</sup>

The State of New Mexico Corrections Department operates seven adult correctional facilities. Prior to August of 1986, tuberculosis screening of new inmates consisted of a single Mantoux test (5 TU, PPD—Tuberculin). Those with a reaction of 10 mm of induration or more and those who gave a history of a positive skin test were x-rayed, after which a decision was made about further investigation and prophylactic treatment.<sup>11,12</sup> Those with negative reactions were scheduled to have repeat skin testing every two years. The tuberculin positivity rate in 1985 was 10.5 per cent.

In September of 1986, four cases of skin test conversion while in prison came to our attention. These four men all had negative skin tests at the same prison (SNM) in 1984, and one of them had been transferred shortly thereafter to another prison in the system.

From the New Mexico Corrections Department and the New Mexico Health and Environment Department. Address reprint requests to Dr. Steven S. Spencer, Medical Director, New Mexico Corrections Department, 1422 Paseo de Peralta, Santa Fe, NM 87503. Dr. Morton is Tuberculosis Control Officer of the NM Health and Environment Department. This paper, submitted to the *Journal* February 29, 1988, was revised and accepted for publication July 22, 1988.

© 1989 American Journal of Public Health 0090-0036/89\$1.50

We decided to conduct a mass screening program at SNM facility. The results obtained led us to extend the program to the other five men's facilities and to the women's prison. The screening was carried out between October 1986 and April 1987.

### Methods

Medical records of all inmates were reviewed; those who had been skin tested with a 0 millimeter result in the previous three months were not retested, but are included in the data for the screening program results. Inmates with a documented reaction of 10 mm or more in the past and with a chronic cough had a chest x-ray done and three sputum specimens obtained for smear and culture. Documented reactors without a cough who had completed a full course of INH (isoniazid) received no further investigation. Reactors who had not completed a course of INH and had not had a chest x-ray in the past six months, were x-rayed at the time of the mass screening. All inmates with a documented negative PPD (purified protein derivative of tuberculin) reading prior to three months earlier were skin tested. Those with any palpable reaction of less than 10 millimeters had a second stage test applied at least one week after the first. Inmates who had not been tested at intake because they gave a history of a positive skin test were tested. All converters and newly confirmed reactors also received a chest x-ray, and sputum investigation if the x-ray was suspicious. A converter was defined as one with a significant reaction whose previous negative test was within the past two years; a reactor as one whose reaction was of more than two years or of unknown duration. The housing location of all reactors and converters was recorded.

An effort was made to screen all employees at all seven correctional facilities. Those employees who could document or give a reliable history of a previous positive skin test were not retested, but did have a chest x-ray. All others received two-stage skin testing. Chest x-rays were also ordered on all reactors and converters.

### Results

#### Inmate Screening

Table 1 shows the distribution of reactors and converters among the inmates of the seven adult correctional facilities in the state. All inmates participated in the screening program.

The skin test positivity rate (reactors plus converters divided by total number tested) was 10.7 per cent or lower in all but two of the facilities; one prison (SNM) was the one in which converters had first been identified, and the other (CNM) was the prison to which one of the converters had been transferred.