

Health Care for the Homeless

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Bibliography #12

Tuberculosis and HIV/AIDS

June 2004

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2003

Baker LM, Case P, Policicchio DL. **General health problems of inner-city sex workers: A pilot study.** *J Med Libr Assoc* 91(1): 67-71, 2003.

OBJECTIVE: A pilot study was designed to determine the general health problems of inner city sex workers. **SAMPLE:** The researchers worked with an agency that provides outreach services to these sex workers. Through this agency, they had access to a purposive sample of sex workers in a large Midwest city. **METHODS:** Nonparticipant observation was used to gather information about their health problems, the nature of information they may need, and the barriers to obtaining health care and health information. **RESULTS:** Sex workers ranged in age from nineteen to sixty-one years old. They identified a number of physical or psychological problems, such as rape, depression, and tuberculosis. HIV/AIDS was never mentioned. A major barrier to health care is a lack of information about where to go for treatment or how to obtain health insurance. **CONCLUSIONS:** More research needs to be done by library and information science professionals to determine the information needs of sex workers and the agencies that provide them with health and social services.

Kaufmann SH, Schaible UE. **A dangerous liaison between two major killers: Mycobacterium tuberculosis and HIV target dendritic cells through DC-SIGN.** *J Exp Med* 197(1): 67-71, 2003.

McElroy P, Southwick K, Fortenberry E, Levine E, Diem L, Woodley C, Williams P, McCarthy K, Ridzon R, Leone P. **Outbreak of tuberculosis among homeless persons coinfectd with Human Immunodeficiency Virus.** *Clinical Infectious Diseases* 36(10): 1305-1312, 2003.

In this article, the authors investigated a cluster of patients with tuberculosis (TB) in North Carolina and determined the extent of transmission of one strain of Mycobacterium tuberculosis. According to the article, a retrospective cohort study was conducted, and homeless shelter attendance and medical records for 1999 and 2000 were reviewed. The period of exposure to M. tuberculosis was determined, and shelter residents were offered TB screening. The authors state that all but one patient was male, twenty-two were African American, and fourteen were human immunodeficiency virus-infected. The authors also assert that an epidemiological link to a single shelter was identified for all but one patient. The authors suggest that earlier recognition of this shelter as a site of M. tuberculosis transmission could have been facilitated through innovative approaches to contact investigation and through genetic typing of isolates (authors).

Munsiff S, Nivin B, Sacajiu G, Mathema B, Bifani P, Kreiswirth B. **Persistence of a highly resistant strain of tuberculosis in New York city during 1990-1999.** *Journal of Infectious Disease* 188(3): 356-363, 2003.

This article discusses one multidrug-resistant Mycobacterium tuberculosis (MDRTB) strain, strain W, which caused several nosocomial outbreaks in New York City (NYC) during January 1990 through July 1993. The authors reviewed all MDRTB cases verified during August 1993 through December 1999 that had isolates with either this DNA pattern or a variant of this strain, and compared them to the outbreak cases. The authors assert that of 427 DNA-confirmed cases from 1990 to 1999, one hundred-sixty-one were from August 1993 through December 1999 and constituted twenty-eight percent of all MDRTB cases in NYC during this period. The article states that compared with those from January 1990 through July 1993, patients from August 1993 through December 1999 were less likely to be infected with human immunodeficiency virus, to have been

born in the United States, to be homeless, to have been incarcerated, and to have epidemiological links. The article concludes that this strain was disseminated widely in the community during the outbreaks and that postoutbreak cases likely represent reactivated disease among individuals infected during the outbreak periods in the community (authors).

Paterson R. **Initiative to unify control of HIV/AIDS and tuberculosis.** *Lancet Infect Dis* 3(3): 119, 2003.

2002

Cheung RC, Hanson AK, Maganti K, Keffe EB, Matsui SM. **Viral hepatitis and other infectious diseases in a homeless population.** *J Clin Gastroenterol* 34(4): 476-480, 2002.

To determine the prevalence of four common infectious diseases-hepatitis B, hepatitis C, human immunodeficiency virus (HIV), and tuberculosis-as well as co-infection rates and risk factors in a homeless population. The prevalence of infectious diseases, especially viral hepatitis, among the homeless population is largely unknown. This study consists of a retrospective analysis of the history and laboratory data collected from all homeless veterans admitted to a Veterans Administration (VA) domiciliary from May 1995 to March 2000. Of the homeless veterans admitted to a VA domiciliary program, 597 of 829 were screened for markers of all four infectious diseases. The overall prevalence of anti-hepatitis C virus (HCV) antibody, and positive result for purified protein derivative (PPD), anti-HIV antibody, and hepatitis B surface antigen (HbsAg) were 41.7%, 20.6%, 1.84% and 1.17%, respectively. At least one of the four markers was positive in 52.6% and more than one in 12%. Co-infection with HCV occurred commonly in veterans who were positive for anti-HIV and HBsAg. Four self-reported major risk factors were evaluated. Multivariate analysis indicates that intravenous drug use and anti-HBs reactivity are independent risk factors for HCV infection, HCV infection for anti-hepatitis B surface antibody reactivity, and older age for PPD positivity. Chronic hepatitis C and co-infections are common among the homeless population. Patients infected with HIV and hepatitis B virus frequently are co-infected with HCV. Infections frequently are associated with certain identifiable risk factors.

Chinai R. **Raju has TB and AIDS and lives on the street.** *Bull World Health Organ* 80(6): 519-520, 2002.

Ellis B, Crawford J, Braden C, McNabb S, Moore M, Kammerer S, Tuberculosis genotyping and surveillance network work group. **Molecular epidemiology of tuberculosis in a sentinel surveillance population.** *Emerging Infectious Diseases* 8(11): 1197-1209, 2002.

In this article, the authors conducted a population-based study to assess demographic and risk-factor correlates for the most frequently occurring *Mycobacterium tuberculosis* genotypes from tuberculosis (TB) patients. The study included all incident, culture-positive TB patients from seven sentinel surveillance sites in the United States from 1996 to 2000. The article states that overall, forty-eight percent of cases had isolates that matched those from another patient, including sixty-four percent of U.S. born and thirty-five percent of foreign-born patients. The authors identified risk factors for clustering of genotypes as: being male, U.S. born, black, homeless, and infected with HIV; having pulmonary disease with cavitations on chest radiograph and a sputum smear with acid-fast bacilli; and excessive drug or alcohol use. The article asserts that molecular characterization of TB isolates permitted risk correlates for clusters and specific genotypes to be described and provided information regarding cluster dynamics over time (authors).

Estrada AL. **Epidemiology of HIV/AIDS, hepatitis B, hepatitis C, and tuberculosis among minority injection drug users.** Public Health Rep 117(1): 126-134, 2002.

OBJECTIVE: This article reviews the literature on the impact of HIV/AIDS, hepatitis B and C viruses (HBV, HCV), and tuberculosis on minority drug injectors in the United States. **OBSERVATIONS:** Injection drug use is a key factor in the transmission of blood-borne pathogens, and HIV disease is exacerbated by tuberculosis infection. Minority drug injectors are disproportionately represented in the national statistics on these infections. Behavioral epidemiologic studies show that both injection-related risk factors (years of injecting drugs, type of drug injected, direct and indirect sharing of injection paraphernalia) and sex-related risk factors (lack of condom use, multiple sexual partners, survival sex) are conducive to the spread of HIV, HBV, and HCV. **CONCLUSIONS:** Two issues must be addressed to halt the spread of HIV infection and hepatitis B and C. The capacity of syringe-exchange programs to refer participants to drug treatment programs and facilitate access to health and social services must be increased. Culturally appropriate behavioral interventions targeting risk behaviors among ethnic and racial minorities, especially women, must be developed and put in place.

Garcia de Olalla P, Martinez-Gonzalez MA, Cayla JA, Jansa JM, Iglesias B, Guerrero R, Marco A, Gatell JM, Ocana I; Barcelona AIDS-TB Study Group. **Influence of highly active anti-retroviral therapy (HAART) on the natural history of extra-pulmonary tuberculosis in HIV patients.** Int J Tuberc Lung Dis 6(12): 1051-1057, 2002.

OBJECTIVE: To determine factors related to survival in acquired immune-deficiency syndrome (AIDS) patients with extra-pulmonary tuberculosis (EPTB), when this condition is the first AIDS-defining disease. **DESIGN:** A retrospective cohort-study of 549 AIDS patients with EPTB as the first AIDS-defining disease. Potential candidates to predict survival were sex, human immunodeficiency virus (HIV) exposure, the coexistence of pulmonary and EPTB at diagnosis, tuberculin skin test, directly observed therapy for tuberculosis (DOT), and highly active anti-retroviral therapy (HAART). The Kaplan-Meier method and Cox regression models were used to assess factors associated with survival. **RESULTS:** Estimated 3-year survival was 47.0% for those diagnosed before 1993, 72.6% for patients with first AIDS diagnosis during 1995-1996 and 84.6% for those diagnosed after 1996. A negative tuberculin test, not being on DOT and having pulmonary tuberculosis involvement also were independently associated with poorer survival. The survival of patients significantly improved after the introduction of HAART. **CONCLUSION:** The survival of HIV patients with EPTB as their first AIDS-defining disease has substantially improved during the last decade. A negative tuberculin skin test and not receiving DOT are associated with poorer survival among HIV-infected patients whose first AIDS-defining disease is EPTB.

Libbus MK, Phillips L, J Knudson K. **TB-HIV registry matching in Missouri, 1987-1999.** Pub Health Nurs 19(6): 470-474, 2002.

Mycobacterium tuberculosis (MTB) is an important problem for human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) patients. This study investigated whether all cases of MTB reported to the HIV/AIDS Registry (HARS) in Missouri were also reported to the Tuberculosis Information Management System (TIMS) to determine the sensitivity of TIMS and the predictive value of HARS. We found 262 total MTB cases registered in HARS. Of these, 145 were included in the TIMS. Thirty-eight of the remaining 117 were caused by mycobacteria other than TB leaving 79 for investigation. Chart review of the 79 revealed 16 cases of MTB. Sensitivities and predictive values were calculated first including unknown/unreported group as being MTB-positive and the second including this group as being MTB-negative. Sensitivities for TIMS were 83 and 90%, respectively, and predictive values for HARS were 68 and

63%, respectively. The fact that there were at least 16 unreported cases of MTB has significant public health implications for TB control in Missouri. Public health nursing could work with HARS surveillance staff to help improve the accuracy of case finding and reporting. By whatever means necessary, communications between the TB and HIV programs within the Missouri Department of Health should be enhanced.

2001

Badri M, Ehrlich R, Wood R, Pulerwitz T, Maartens G. **Association between tuberculosis and HIV disease progression in a high tuberculosis prevalence area.** *Int J Tuberc Lung Dis* 5(3):225-32, 2001.

SETTING: Adult human immunodeficiency virus (HIV) clinics affiliated to the university of Cape Town, South Africa. OBJECTIVE: To assess the impact of tuberculosis on HIV-1 disease progression in an area with high tuberculosis prevalence and minimal antiretroviral therapy use. DESIGN: Prospective patient cohort study. METHODS: Age, race, risk status, CD4+ T-lymphocyte count, history of AIDS, prophylactic co-dependents Cox proportional hazards regression model. RESULTS: Tuberculosis fulfilling the case definition developed in 158/609 patients in the 5-year observation period. Tuberculosis was associated with an increased risk of AIDS. In a stratified analysis, the increased mortality associated with tuberculosis was observed only in patients with CD4+ T-lymphocyte count > 200 cells/microliter and in those without AIDS at baseline. CONCLUSION: The onset of tuberculosis in HIV-infected patients is associated with an increased risk of AIDS and death. Although a casual link cannot be established in an observational study, our findings support the view that prolonged immune activation induced by tuberculosis leads to prolonged increased HIV replication and consequent accelerated disease progression.

Brewer TF, Heymann SJ, Krumplitsch SM, Wilson ME, Coldits GA, Fineberg HV. **Strategies to decrease tuberculosis in US homeless populations: A computer simulation model.** *JAMA* 286(7):834-42, Aug 2001.

CONTEXT: The rate of TB among US homeless persons may be 20 times that of the general adult population. Studies suggest that the majority of urban homeless TB cases are attributable to ongoing transmission of TB. Optimal TB-control strategies in both chronically and transiently homeless populations are not known. OBJECTIVE: To examine the effects of TB-control strategies on projected TB cases and deaths in US homeless populations using a computer-based simulation model. DESIGN, SETTING, and POPULATION: The US general population and a theoretical population of 2 million homeless individuals in 1995 were divided into 18 clinical states based on the risk for or presence of TB and HIV infection. MAIN OUTCOME MEASURES: Prevalence of transiently and chronically homeless individuals with active TB and deaths from TB as a function of public health measures taken to control and eliminate TB, including improvement of treatment effectiveness, improvement in access to treatment, and vaccination with BCG. RESULTS: A 10% increase in access to treatment among homeless persons with active TB produced larger declines in predicted TB cases and deaths after 10 years than improvements in the effectiveness of treatment programs (cases and deaths among chronically homeless persons declined 7.2% and 3.1% and among transiently homeless persons dropped 10.9% and 4.1%, respectively). A 10% increase in access to treatment homeless persons with latent TB infection led to a 6.7% decline in TB among chronically homeless persons and 5.7% decline among transiently homeless persons, while a 10% improvement in effectiveness of treatment for latent TB infection was associated with declines of 3.0% and 3.3%, respectively. When treatment for latent TB infection was modeled to be the same in vaccinated and nonvaccinated population, BCG vaccination led to TB case declines of 15.4% and 21.5% in chronically and transiently homeless

populations, respectively. **CONCLUSIONS:** Overcoming barriers faced by homeless individuals in accessing TB treatment programs will be crucial to reducing the burden of TB in this high risk group. Increased treatment access, improvement in the effectiveness of treatment programs, and BCG vaccination of HIV-negative homeless individuals have the best chance to markedly decrease TB morbidity and mortality.

Burman WJ, Jones BE. **Treatment of HIV-related tuberculosis in the era of effective antiretroviral therapy.** Am J Respir Crit Care Med, 164(1):7-12, July 2001.

Culhane DP, Gollub EL. **Connections between AIDS and homelessness.** LDI Issue Brief 6(9): 1-4, 2001.

Although the links between health and environment are well known, interventions that target these associations in order to improve health are rare. Health and social service agencies often function independently of one another, maintaining separate, unlinked databases. For example, relationships among homelessness, AIDS, and tuberculosis have been noted, but services have not focused on the intersecting populations these conditions affect. This Issue Brief summarizes efforts to merge databases and provide policymakers with information to guide housing, social service, and health care resources. The investigators identify risk factors associated with AIDS among the homeless, and homelessness among people with AIDS.

Goedert JJ, Fung MW, Felton S, Battjes RJ, Engels EA. **Cause-specific mortality associated with HIV and HTLV-II infections among injecting drug users in the USA.** AIDS 15(10):1295-302, 2001.

Human T-lymphotropic virus type II (HTLV-II) is widespread among injecting drug users (IDU) and may contribute to the risk of leukemia/lymphoma, neurodegenerative disease, and perhaps pneumonia, especially with HIV co-infection. In 1987-1991, 6570 IDUs were tested for HIV and HTLV-II antibodies. In 1998, they were matched to the National Death Index. Numbers of observed deaths of each cause were compared by standardized mortality ratios with the numbers expected, using sex-, race-, age-, and year-specific rates in the general population. Relative risk associated with each virus, compared to uninfected drug users, was estimated. There were 1351 deaths, including 683 of 4604 participants who enrolled seronegative for both viruses; 328 of 701 who had HIV but not HTLV-II infection; 220 of 1033 who had HTLV-II but not HIV infection; and 120 of 232 who were infected by both viruses. Compared to the general population, mortality for participants with neither virus was increased 4.3-fold and was significantly elevated for every cause of death. With HIV, mortality from medical causes, but not external causes, was increased 3.7-fold, particularly with AIDS and related conditions. With HTLV-II, all cause mortality was reduced, but there was no excess mortality from leukemia/lymphoma, other malignancies, or neurodegenerative disease. Without HIV or HTLV-II, IDU had profoundly increased mortality from medical and external causes. HIV was associated with death due to AIDS and related conditions. HTLV-II infection was not significantly associated with mortality from any cause, suggesting that it is not a significant human pathogen, even when present with HIV.

Raoult D, Foucault C, Brouqui P. **Infections in the homeless.** Lancet Infect Dis 1(2): 77-84, 2001.

Homeless people in developed countries have specific problems predisposing them to infectious diseases. Respiratory infections and outbreaks of tuberculosis and other aerosol transmitted infections have been reported. Homeless intravenous drug users are at an increased risk of contracting HIV, and hepatitis B and C infections. Skin problems are the main reason the homeless seek medical attention, and these commonly include scabies, pediculosis, tinea infections, and impetigo. Many foot disorders are more prevalent in the homeless including ulcers, cellulitis, erysipelas, and gas gangrene. The louse transmitted bacteria Bartonella

quintana has recently been found to cause clinical conditions in the homeless such as urban trench fever, bacillary angiomatosis, endocarditis, and chronic afebrile bacteraemia. Treatment of homeless people is complicated by financial constraints, self-neglect, and lack of adherence. Patients with serious and contagious illnesses should be hospitalised. Physicians should be aware of these specific issues to enhance care.

Riley ED, Chaisson RE, Robnett TJ, Vertefeuille J, Strathdee SA, Vlahov D. **Use of audio computer-assisted self-interviews to assess tuberculosis-related risk behaviors.** *Am J Respir Crit Care Med* 164(1):82-5, 2001.

The objective of this study was to compare self-reported TB and HIV risk factors obtained from computer assisted and interviewer-assisted questionnaires among participants of a needle exchange program. Between June 1998 and May 1999, needle exchange program participants requesting TB screening underwent interviews regarding demographics and risk factors for TB and HIV infection. The first 190 participants underwent traditional interviewer-assisted questionnaires, whereas the remaining 92 underwent computer-assisted questionnaires. Among 282 participants, demographic characteristics, health status, HIV serostatus, visits to homeless shelters, alcohol intake, and cigarette smoking were all similar by interview technique. However, respondents receiving computer-assisted questionnaires were more likely than those receiving interviewer-assisted questionnaires to report smoking marijuana, crack, and heroin; as well as sharing cocaine smoking equipment, sharing heroin smoking equipment, “shotgunning,” and visiting crack houses. In the final model, respondents receiving computer-assisted questionnaires were more likely to report “shotgunning” and visiting a crack house relative to respondents receiving interviewer-assisted questionnaires.

Sackoff JE, Torian LV, Frieden TR. **TB prevention in HIV clinics in NY City.** *Int J Tub Lun Dis* 5(2):123-8, 2001.

Ten hospital-based human immunodeficiency virus (HIV) clinics in New York City. To evaluate tuberculosis (TB) prevention in HIV clinics based on the prevalence and incidence of TB and the efficacy of preventative therapy with isoniazid (INH). The medical records of 2393 HIV-infected patients with a first clinic visit in 1995 were reviewed retrospectively. Deaths and TB cases through December 1997 were ascertained through a match the TB and AIDS registries.: At first visit, 92 patients had a history of TB, 98 were being treated for TB, and six were diagnosed with TB. During follow-up, 23 cases were diagnosed, and incidence of 0.53 per 100 person-years (py). Among 439 tuberculin skin test (TST) positive patients, the incidence of TB/100 py was 1.63 in patients with no INH, 1.28 in patients with <12 months of INH, and 1.06 in patients with 12 months of INH. The incidence/100 py was 0.0 in TST-negative patients and 0.37 in anergic patients. The relative risk of TB was 0.65 in TST-positive patients with 12 months of INH. The benefits of TB prevention efforts in these HIV clinics from 1995 to 1997 were limited because most TB occurred before the first clinic visit. Methods for reaching HIV-infected patients earlier should be identified.

2000

Murphy D A; Rotheram-Borus M J; Joshi V. **HIV-infected adolescent and adult perceptions of tuberculosis testing, knowledge and medication adherence in the USA.** *Aids Care Journal*, 12(1): 59-63, 2000.

Abstract: HIV-infected adolescent and adult perceptions of tuberculosis (TB) infection rates and physician TB behavior, and patient knowledge of TB transmission and treatment adherence were assessed. HIV-infected youth from adolescent clinical care sites in three cities and HIV-infected adults in New York were interviewed. Adolescent self-report was compared to medical chart review. Adolescents reported they were significantly less likely to be tested, although testing rates were high for both samples. Approximately 9% of both samples reported infection with TB; the majority of whom reported receiving medication, and consistent medication adherence. The overall mean knowledge score was 66%, with significant age differences: adolescents were less knowledgeable than adults, and young males tended to be less knowledgeable than young females. Age, gender and experience with TB significantly predicted accuracy of knowledge about TB. Results suggest that if HIV-infected individuals -- a population at very high risk and often among the least able to afford health care resources -- receive the education and support they need from their community health care sources they may substantially reduce their chances of contracting and spreading TB.

1999

DeRiemer K, Daley CL, Reingold AL. **Preventing tuberculosis among HIV-infected persons: A survey of physicians' knowledge and practices.** *Prev Med* 28(4):437-44, 1999.

Guidelines exist for screening, diagnosing, and preventing tuberculosis (TB) among HIV-infected persons, but their application and utility are unknown. We conducted a survey of knowledge and practices among 1,300 physicians in the San Francisco Bay area to assess their practices towards TB among HIV-infected persons. Of 630 respondents, 350 provided care for HIV-infected persons. Thirty-four percent of the respondents had seen the most recent guidelines for preventing tuberculosis among HIV-infected persons; 65% routinely provide information to HIV-infected patients about the risks of exposure to *Mycobacterium tuberculosis*; 39% provide annual tuberculin skin testing (TST) to HIV-infected patients without a history of a positive test; 86% knew that ≥ 5 -mm induration is considered a positive TST result in HIV-infected persons; and 47% provide a 12-month regimen of chemoprophylaxis for HIV-infected persons who have a positive TST but not active tuberculosis. Physician specialty and experience with HIV-infected persons were not strongly correlated; experience was a better predictor of correct knowledge and practices. Many physicians were not aware of the standards of care for preventing tuberculosis among HIV-infected patients, even in a geographic area with a high prevalence of *M. tuberculosis* and HIV.

Dievler A, Pappas G. **Implications of social class and race for urban public health policy making: A case study of HIV/AIDS and TB policy in Washington, DC.** Soc Sci Med, 48(8):1095-102, 1999.

This paper explores how social class and race affect the public health policy-making process in an urban area. Ethnographic methods were used to collect and analyze information about HIV/AIDS and tuberculosis policy-making by the Washington, DC Commission of Public Health, Kingdon's conceptual model of policy making was used to analyze and understand the process. The problems of HIV/AIDS and tuberculosis in the district have important social class dimensions that were not always made explicit, but were instead defined in terms of 'race' and 'place'. Social class considerations and racial politics shaped what policies were developed or not developed and implemented successfully or failed. This study, which has national and international implications, concludes that there is a need to improve our understanding of the complex social dimensions of public health problems; there needs to be more consideration of the politics of strategy formulation and how issues of social class and race affect this process; and public health needs to strengthen its constituency in order to build support for the successful development and implementation of policy.

Mehta JB, Roy TM, Hughes SK, Byrd RP Jr, Harvill LM. **Demographic changes in tuberculosis: High risk groups.** South Med J, 92(3):280-4, 1999.

We conducted a statistical analysis of all verifiable tuberculosis cases in Tennessee from 1990 through 1996 to determine the demographic changes in TB. We studied variables, including age, sex, race, site of the disease, and possible impact of known risk factors such as human immunodeficiency virus infection, homelessness, foreign birth, and residency in extended care facility. The percentage increase in all such categories, except in the nursing home population, had a statistically significant increase. Unlike national epidemiologic findings, foreign-born TB comprised less than 1% of the total cases. Association of HIV as a co-infection increased from 16 in 1990 to 41 in 1996. These findings will have significant impact on TB control measures and the clinical practice of TB cases in Tennessee and other areas of the southeastern US.

Schluger NW. **Issues in the treatment of active tuberculosis in human immunodeficiency virus-infected patients.** Clin Infect Dis 1999 Jan;28(1):130-5

Most HIV-infected patients with TB can be treated satisfactorily with standard regimens with expectations of good results. Treatment of TB in these patients has been complicated by the introduction of HAART, which relies on drugs that interfere with the most potent class of antituberculous medications. Rifampin-free regimens or regimens that employ rifabutin may be acceptable strategies for patients who are receiving protease inhibitors, although these regimens have not been rigorously evaluated in patients with AIDS. At present, there is good reason to believe that a 6-month course of a rifabutin-containing regimen or a 9-12-month course of a regimen of streptomycin, isoniazid, and pyrazinamide should be adequate therapy for most patients with drug-susceptible disease. As the treatment of HIV infection with antiretroviral agents evolves, the treatment of TB in patients with AIDS is likely to evolve as well. This will require careful coordination of antituberculosis and antiretroviral therapies.

Telzak EE, Chirgwin KD, Nelson ET, Matts JP, Sepkowitz KA, Benson CA, Perlman DC, El-Sadr WM. **Predictors for multidrug-resistant tuberculosis among HIV-infected patients and response to specific drug regimens. Terry Beirn Community Programs for Clinical Research on AIDS (CPCRA) and the AIDS Clinical Trials Group (ACTG), National Institutes for Health.** *Int J Tuberc Lung Dis* 1999 Apr;3(4):337-43

SETTING: Mortality associated with human immunodeficiency virus (HIV) related multidrug-resistant tuberculosis (MDR-TB) is reduced with effective early therapy. Identifying predictors of, and effective regimens for, MDR-TB is critical. **OBJECTIVE:** A multicenter prospective study was initiated to 1) determine the demographic, behavioral, clinical and geographic risk factors associated with the occurrence of MDR-TB among HIV-infected patients, and 2) to evaluate the overall survival and clinical response of MDR-TB patients treated with specific drug regimens. **METHODS:** Patients were prospectively evaluated for MDR-TB. Information included history of prior treatment for tuberculosis, close contact with a known case of MDR-TB, and residence in a facility with known or suspected MDR-TB transmission. Patients with known MDR-TB, or those suspected to be at high risk, were offered enrollment in a treatment pilot study. Study drugs included levofloxacin and at least two additional drugs to which the patient's isolate was known, or most likely, to be susceptible. Survival was the primary endpoint. **RESULTS:** Complete data are available for 156 HIV-infected patients with confirmed tuberculosis. Sixteen had MDR-TB. Only a history of prior tuberculosis treatment was associated with MDR-TB in multivariate analysis. Twelve patients with MDR-TB enrolled in the treatment pilot had a median CD4 cell count of 51/mm³. The cumulative probability of survival at one year was 75% and at 18 months, 65.6%. Toxicity requiring discontinuation of medications occurred in two patients. **CONCLUSIONS:** A history of treatment for tuberculosis was the only predictor for MDR-TB in a cohort of HIV-infected patients with tuberculosis. In addition, this prospective study supports the results of prior retrospective studies that effective treatment impacts on mortality. Current second-line treatment, including high dose levofloxacin, appears to be reasonably well tolerated.

Weis, SE, Foresman, B, Cook, P, Matty, K. **Universal HIV Screening at a Major Metropolitan TB Clinic: HIV Prevalence and High-Risk Behaviors Among TB Patients.** *American Journal of Public Health*, 89(1): 73-75, January 1999.

OBJECTIVES: This study assessed the outcome of implementing a policy of universal screening of patients with TB for HIV infection at a major metropolitan public health TB clinic. **METHODS:** HIV serologic testing was completed on 768 of 825 eligible patients. Ninety-eight HIV-positive cases were compared with 670 HIV-negative cases. The presence of adult HIV risk factors was determined by structured interview and review of medical records. **RESULTS:** One or more HIV risk factors were present in 93% of HIV-positive and 42% of HIV-negative cases. **CONCLUSIONS:** the metropolitan TB clinic is well suited for HIV screening, and HIV-antibody testing and counseling should be provided to all TB patients.

Wroten JE, Crockett LK, Kertesz C. **Trial marriage: Florida's experience in consolidating HIV/AIDS, STD, and TB programs.** *Public Health Rep*, 114(1):74-80, Jan-Feb, 1999.

After a three-year experiment in consolidating services, the Florida Dept. of Health has again separated programs for the prevention and control of HIV/AIDS, sexually transmitted diseases (STDs), and TB. The authors report that while there were some clear advantages to consolidating services, especially programs dealing with HIV and other STDs, the individual programs suffered in some important ways. The authors describe Florida's effort to preserve the positive programmatic and administrative aspects of the consolidated approach and to apply the lessons learned.

1998

Centers for Disease Control and Prevention. **Prevention and Treatment of Tuberculosis Among Patients Infected with Human Immunodeficiency Virus: Principles of Therapy and Revised Recommendations.** MMWR 47(RR_20), October 30, 1998.

These guidelines update previous CDC recommendations for the diagnosis, treatment, and prevention of TB among adults and children co-infected with HIV in the U.S. The most notable changes in these guidelines reflect both the findings of clinical trials that evaluated new drug regimens for treating and preventing TB among HIV-infected persons and recent advances in the use of antiretroviral therapy. AVAILABLE FROM: CDC National Prevention Information Network, PO Box 6003, Rockville, MD 20850. (800) 458-5231.

Glynn JR. **Resurgence of tuberculosis and the impact of HIV infection.** Br Med Bull, 54(3):579-93, 1998.

Tuberculosis is increasing in many countries. In some areas the major influences on tuberculosis trends are the traditional ones: poverty, failures in the treatment system, and immigration. In others, and increasingly, the HIV epidemic is having a huge impact. HIV infection increases the risk of TB approximately 7-fold, though this may vary with the stage of the HIV epidemic, the prevalence of TB, and the age groups considered. Dually-infected individuals develop TB disease at a rate of 5-10% per year. HIV also increases the risk of disease following recent infection, which makes a major contribution to the TB burden in some settings. HIV-infected individuals, may transmit Mycobacterium TB less than do HIV-negative individuals, but the extra cases will add to the transmission overall, and evidence of HIV-attributable increases in the annual risk of infection is beginning to be seen.

Messmer PR, Jones S, Moore J, Taggart B, Parchment Y, Holloman F, Quintero LM. **Knowledge, perceptions, and practice of nurses toward HIV/AIDS patients diagnosed with tuberculosis.** J Cont Ed Nurs, 29(3):117-125, 1998.

Tuberculosis (TB) continues to be a major health problem in the United States. Nurses may be exposed to TB and not realize their risks for becoming infected. The presentation of HIV-associated TB is somewhat different from "standard TB." PURPOSE: The purpose of this study was to determine if an educational program could improve nurses' attitudes, level of knowledge, and compliance with infection control standards for HIV/AIDS patients diagnosed with TB. Participants included 50 staff nurses. The experimental group and control group completed a knowledge test and an attitude survey. Researchers observed participants for compliance with infection control standards pretest and posttest. Following an educational program, the experimental group demonstrated a greater knowledge of TB than the control group who did not participate in the educational program. In addition, the experimental group had a greater improvement in their Nursing precaution protocols scores as compared to the control group. However, there was not a tangible increase in knowledge level of AIDS, attitudes or concerns about caring for these patients. This nursing research study supports the need for an ongoing educational program with continual monitoring of infection control practices to positively affect client and caregiver outcomes.

1997

Alpert PL, Munsiff SS, Gourevitch MN, Greenberg B, Klein RS. **A prospective study of tuberculosis and human immunodeficiency virus infection: Clinical manifestations and factors associated with survival.** Clin Infect Dis, 24(4):661-8, April 1997.

We prospectively studied the effect of human immunodeficiency virus (HIV) infection on the presentation and outcome of tuberculosis. A total of 216 patients with tuberculosis were identified; 162 of these patients were tested for antibodies to HIV; 92 were seropositive. The patients who were seropositive for HIV were more likely to be male and Hispanic and to have been homeless or incarcerated. Eighty-one percent of these patients had CD4 lymphocyte counts of $<$ or $=200/\text{mm}^3$. The seropositive patients had extrapulmonary tuberculosis more often than did the seronegative patients. Smears for acid-fast bacilli were positive more often for non-HIV-infected patients with pulmonary tuberculosis than for HIV-infected patients -even those with focal or cavitory disease. A delay in initiating therapy was associated with in-hospital mortality: The median time from admission to the start of treatment was 4 days for patients who survived and 15 days for those who died. The median survival was 22.7 months for HIV-infected patients who did not die during the initial hospitalization. Factors independently associated with reduced rates of survival included the severity of immunodeficiency, nonuse of directly observed therapy, infection due to drug-resistant Mycobacterium tuberculosis, and a history of injection drug use.

Farmer P. **Social scientists and the new tuberculosis.** Soc Sci Med, 44(3):347-358, February 1997. Comment in: Soc Sci Med, 45(10):1597-9, November 1997.

In much of the world, tuberculosis (TB) remains the leading killer of young adults, in spite of the fact that effective chemotherapy has existed for 50 years. The epidemiology of TB, with its persistence in poor countries and resurgence among the poor of many industrialized nations, causes consternation among those charged with protecting the public's health. Two factors, ostensibly biological in nature, are commonly cited to explain this setback: the advent of HIV and the emergence of TB strains resistant to multiple drugs (MDR TB). But the strikingly patterned occurrence of MDR TB-in the United States afflicting those in homeless shelters and in the inner city, for example-speaks to some of the large-scale social forces at work in the new epidemic, which began before the advent of HIV. These forces (which include poverty, economic inequality, political violence, and racism) are examined through the experience of a young Haitian man with MDR TB, a disease never before described in Haiti. Insights from this case, and from other research on TB and HIV disease, are considered in the light of past anthropological writings on TB. It is argued that, often, social scientists mar contributions to an understanding of TB by making "immodest claims of causality" regarding its distribution and course. Alternative strategies for future sociomedical research on MDR TB are proposed.

Lienhardt C, Rodrigues LC. **Estimation of the impact of the human immunodeficiency virus infection on tuberculosis: Tuberculosis risks re-visited?** Int J Tuberc Lung Dis, 1(3):196-204, June 1997.

The human immunodeficiency virus (HIV) infection has both a direct and an indirect effect on the incidence of tuberculosis. The direct effect is due to the increased number of cases among HIV-infected individuals because of their enhanced susceptibility to the disease. The indirect effect is increased transmission of Mycobacterium tuberculosis infection in a community with high levels of dual infection, as a consequence of infectious cases occurring in HIV-infected persons. The risk of infection by M. tuberculosis in the population will then increase, as will the number of tuberculosis cases in the general population. According to the World

Health Organization, over 4 million people are estimated to be dually infected with HIV and *M. tuberculosis* world-wide. In 1990, it was estimated that 300,000 new TB cases were attributable to HIV infection; around 1.4 million cases are expected per year by 2000, thus increasing the reservoir of tuberculosis patients capable of transmitting the infection to others, and increasing the burden on the already overstretched National Tuberculosis Control Programs, especially in resource-poor countries. This paper is a review of methods suggested to quantify the effect of the interaction between HIV infection and tuberculosis at population level, and more particularly the effect of HIV on the risk of tuberculosis infection.

Morrow R, Fanta J, Kerlen S. **Tuberculosis screening and anergy in a homeless population.** *J Am Board Fam Pract*, 10(1):1-5, January 1997.

BACKGROUND: Tuberculosis has again emerged as a growing public health concern in the United States. Among the homeless population, increased risk factors contribute to immunodeficiency, which can cause false-negative results on purified protein derivative (tuberculin) (PPD) skin testing, the standard screening procedure for tuberculosis in individuals. We evaluated the accuracy of PPD skin test results by determining anergy status of patients when offering the PPD test. **METHODS:** A consecutive convenience sample of 105 underserved men and women were tested at a health clinic located in a homeless shelter in Yonkers, NY. These persons were currently homeless, living in a shelter, or formerly homeless and using the soup kitchen at the shelter. Three antigens, candidin, mumps, and trichophyton, in addition to PPD, were administered intradermally using the Mantoux method, and results were read 48 to 72 hours later on the 100 who returned. An individual was considered to be anergic if the delayed-type hypersensitivity reactions were less than or equal to 2 mm for each of the four antigens. **RESULTS:** Of the 100 persons who returned for follow-up, 5 were found to be anergic. Of these 5, all were previously known to be positive for human immunodeficiency virus (HIV). **CONCLUSIONS:** PPD testing alone was found to be an accurate screening test in this population except in those who were HIV positive.

1996

Frieden TR, Woodley CL, Crawford JT, Lew D, Dooley SM. **The molecular epidemiology of tuberculosis in New York City: The importance of nosocomial transmission and laboratory error.** *Tuber Lung Dis*, 77(5):407-413, October 1996.

SETTING: During the 1980s, New York City (NYC) experienced a rapid increase of TB cases, more than 40% of which were HIV-associated. **OBJECTIVE:** To better define the molecular epidemiology of tuberculosis in NYC. **DESIGN:** We collected an isolate from every patient in NYC with a positive culture for *Mycobacterium tuberculosis*, including both incident and prevalent cases, in April 1991. Restriction fragment length polymorphism (RFLP) analysis using IS6110 was performed and the clinical, demographic, epidemiologic, and drug susceptibility patterns of patients were correlated with RFLP results. **RESULTS:** Of 441 patients, 12 had laboratory, clinical, and RFLP evidence of falsely positive cultures. The remaining 429 patients had 252 distinct RFLP patterns. Patients with clustered 1-3 band isolates did not share demographic or drug susceptibility patterns. Eliminating these patients from the analysis, 344 patients remained, of whom 126 belonged to one of 31 clusters ranging in size from 2-17 patients. Clustering was more common among patients with multidrug-resistant isolates (53%), African Americans, and the homeless, but was not associated with HIV/AIDS. Multidrug-resistance, being African American, and homelessness remained independently associated with clustering. Of 79 patients in clusters of ≥ 4 patients, 25 had identifiable epidemiologic linkages; 17 of these patients, and 6% of all cases, were documented to have been nosocomially associated. **CONCLUSION:** A small but non-negligible proportion of NYC patients had falsely positive cultures for *M.*

tuberculosis as a result of laboratory error. More than one third of all patients and most patients with multidrug-resistance in April 1991 had clustered RFLP patterns, suggesting recent transmission of *M. tuberculosis*. Homelessness, multidrug-resistance, and being African American independently increased the risk of clustering. Most of the identified epidemiologic linkages and 6% of all cases resulted from transmission in hospitals.

Hoffman, N, Kelly, C, and Futterman, D. **Tuberculosis Infection in Human Immunodeficiency Virus-Positive Adolescents and Young Adults: A New York City Cohort.** *Pediatrics*, 97(2): February 1996.

OBJECTIVES: Adolescents with HIV infection are at increase risk for TB, underscoring the importance of early identification of TB infection. The goals of this study were to assess the factors associated with the completion of evaluations for TB in a cohort of HIV-positive adolescents and young adults and to describe the prevalence of *M tuberculosis* infection and adherence to antituberculous treatment regimens. **METHODS:** A retrospective chart review was done for all HIV-positive adolescents and young adults, ages 13 to 21 years, seen in a comprehensive care program from January 1991 through December 1992. Data collected included CD4 cell count, HIV clinical status, living situation, substance use history, and the completion of an annual evaluation for TB infection. **RESULTS:** Thirty-one of 49 patients completed evaluations for TB. Of the 31 completed evaluations, 18 were assessed by clinic staff on site, and 13 were assessed by other medical or trained nonmedical observers through community networking efforts. Neither homelessness nor illicit substance use were factors in the completion of the evaluation. Six of the 31 patients had positive PPD skin test results. Three had medical histories and chest radiographs suggesting active TB, and all were hospitalized for at least two weeks. Two had positive cultures for *M tuberculosis*, although the third also responded clinically to antituberculous therapy. All three were otherwise asymptomatic for HIV infection, with only moderately depressed CD4 cell counts. All three were homeless and used crack cocaine. After the initial treatment as inpatients, none completed treatment within the prescribed time period. **CONCLUSIONS:** The completions of the evaluations for TB were greatly facilitated by community networking, but innovative strategies to enhance both screening and treatment programs, such as training youth service providers in the community to read PPD skin tests, expansion of directly observed therapy services, and youth-centered programs for housing and substance use, need further development. The high prevalence of TB in the cohort underscores the need for providers to increase efforts to identify cases of TB infection among adolescents and young adults and to incorporate HIV risk assessment, counseling, and testing into their practices routinely.

Rubinstien EM, Madden GM, Lyons RW. **Active tuberculosis in HIV-infected injecting drug users from a low-rate tuberculosis area.** *J Acquir Immune Defic Syndr Hum Retrovirol*, 11(5):448-454, April 15, 1996.

This article describes the features of active tuberculosis in HIV-infected injecting drug users (IDUs) from a low-rate tuberculosis area. The cohort was followed in a hospital-based HIV/AIDS registry, and data were extracted from the registry, patient charts, and the Tuberculosis Control Program of the Connecticut Health Department. The setting was an acute care inner-city hospital-based health care system, with a high incidence of AIDS, serving a small-to-medium urban area in Connecticut. The patients were 905 HIV-infected IDUs whose time of HIV diagnosis (TOHD) was between 1984 and 1992. The outcome measures were demographics, clinical characteristics, and morbidity rates of active tuberculosis. Of the 27 IDUs who developed active tuberculosis, none were white, all but one were male, and only one was known to have had a positive purified protein derivative (PPD) reaction prior to TOHD: 59% of cases developed in patients known to be HIV infected, 11% occurred in established AIDS patients, and 67% qualified as extrapulmonary tuberculosis (that is, AIDS defining by pre-1993 definitions). In 22% of cases, both *Mycobacterium tuberculosis* and *M. avium-intracellulare* were isolated. *Mycobacterium tuberculosis* was most commonly isolated from a respiratory specimen (67%). The annual incidence rate has been $\leq 1.0\%$ since 1988. The

cumulative incidence rate was highest for patients with a positive PPD reaction or a history of tuberculosis. The demographics and clinical characteristics of active tuberculosis in our HIV-infected IDUs are similar to those described elsewhere in the United States; the morbidity rates are low and stable. The implications of our findings on tuberculosis control in HIV-infected IDUs may be applicable to health care systems with low tuberculosis rates.

Saez H, Valencia E, Conover S, Susser E. **Tuberculosis and HIV among mentally ill men in a New York City shelter.** American Journal of Public Health, 86(9):1318- 1319, 1996.

The current spread of TB in New York City has been linked to both the HIV epidemic and homelessness. Recent reports indicate that homeless individuals who have mental illness, particularly men, are at high risk for HIV. This article describes the results of a study conducted at a shelter that accommodated between 600 and 1000 men. Results show there was a high prevalence of TB among these men (36.7%). Various statistics are included.

Townsend MH, Stock MS, Morse EV, Simon PM. **HIV, TB, and mental illness in a health clinic for the homeless.** J La State Med Soc, 148:267-70, June 1996.

Medical records of both mentally ill and non-mentally ill patients were reviewed in a homeless clinic in New Orleans. The records of all psychiatric patients and a randomly selected comparison group of clinic patients without mental illness were reviewed. Five of the 52 homeless mentally ill who were tested for HIV had a positive test, as did seven of the 129 homeless people without mental illness. Only five of the 29 mentally ill tested for TB were PPD positive, as compared to 34 of the non-mentally ill, a strong trend. Differing trends were found regarding HIV and TB in the two groups under study. Further work with a larger sample is needed to determine the factors, if any, which facilitate the spread of HIV and inhibit that of TB.

1995

Brickner PW, McAdam JM. **Tuberculosis, HIV disease, and directly observed therapy.** J Public Health Manag Pract, 1(4):52-4, Fall 1995.

Directly observed therapy (DOT) to enable completion of antituberculous therapy works. DOT is largely responsible for the recent improvement in tuberculosis case rates in New York City. Despite this favorable trend, the factors of significant HIV disease rates and of multidrug resistant forms of tuberculosis bacteria in the population are of grave concern. Therefore, in addition to DOT other means of preventing tuberculosis spread should be encouraged. These include directly observed preventive therapy (DOPT) programs, use of masks, improved ventilation in crowded settings such as homeless shelters, and ultraviolet light germicidal irradiation of upper room air in such locations.

Layton MC, Cantwell MF, Dorsinville GJ, Valway SE, Onorato IM, Frieden TR. **Tuberculosis screening among homeless persons with AIDS living in single-room-occupancy hotels.** Am J Public Health, 85:1556-9, 1995.

Congregate facilities for homeless persons with AIDS are often endemic for TB. We evaluated TB screening methods at single-room-occupancy hotels housing persons with AIDS. Residents were screened by cross matching the New York City Tuberculosis Registry, interviewing for TB history, skin testing, and chest radiography. Cases were classified as either previously or newly diagnosed. Among the 106 participants, 16 previously diagnosed TB cases were identified. Participants' TB histories were identified by the questionnaire or by registry match. Eight participants were noncompliant with therapy. Findings prompted the establishment of a directly observed therapy program on site.

McGowan JE Jr; Blumberg HM. **Inner-city tuberculosis in the USA.** J Hosp Inf, 30 Suppl:282-295, 1995.

Tuberculosis (TB) has become more common during the past five years in several areas of the USA. Occurrence has been facilitated by the increasing number of patients with concurrent HIV infection, by cases due to multiple-drug-resistant strains, by incomplete TB therapy among homeless and non-compliant patients, and by cases in immigrants from other countries where TB prevalence is high. These features mean that the major burden of TB today is being borne by inner-city health care facilities that care for the poor. This is illustrated by data from Atlanta, Georgia, where a large proportion of the new cases in the metropolitan area are reported by Grady Memorial Hospital, the public hospital serving the indigent and working poor of the inner city. Similar patterns are recognized in the other USA cities where TB has again become a blight. In view of these epidemiological features, minimizing inner-city TB will require careful attention to diagnosis and isolation procedures in the hospital. Engineering changes at hospitals providing acute care of TB have recently been ordered by the federal government. These promise to be very expensive, and primarily affect the public hospitals, which can least afford them. Innovative treatment programs are essential, as follow-up after acute care is difficult in this setting. Directly observed therapy can help, but for some cases the era of the TB hospital may have returned. Current attention focuses on legal and ethical issues associated with detaining non-compliant and recalcitrant patients to complete their therapy. Bacille Calmette Guerin (BCG) vaccine is not a priority for this setting at this time.

Sackoff J, Lawton K, Torian L, Frieden T, Chiasson M, Singh T, Weisfuse I. **Characteristics of women with TB and AIDS in New York City.** HIV Infect Women Conf, :P91, February 22-24, 1995.

Objective: To describe the sociodemographic and clinical characteristics of women who have TB and AIDS in New York City. Methods: From the New York City AIDS Surveillance System we randomly selected 1,020 patients with a first episode of TB after 1990. This report is restricted to 188 cases collected thus far from eight of the hospitals with the largest TB caseloads. Data were abstracted from medical records and the New York City Dept. of Health TB Registry. Results: Women comprised 22% of the sample. At the time of the TB evaluation, their mean age was 36 years. 66% of the women were African American, 27% Hispanic and 7% white, similar to the men. Twice as many women as men were homeless when evaluated for their TB. Women and men did not differ in history of injection drug use, but more women reported noninjection cocaine use. Women and men were similar in terms of site of TB, resistance to 1 TB drugs, and TB as the first AIDS defining illness. Only 7% of the women presented with a concurrent AIDS defining illness. Based on life table estimates, at three months from TB diagnosis, 14% of women and 16% of men had died; at two years, mortality was 28% and 52% respectively. Conclusion: Women with TB and AIDS in this sample differed from men on some social factors. Their two-year survival was significantly better and further investigation is needed to understand why.

State TB and AIDS officials knock down barriers. AIDS Alert, 10:88-91, July 1995.

Officials at the Centers for Disease Control and Prevention (CDC) are using Connecticut as a model for how AIDS and tuberculosis (TB) control programs share information. The two registries have been sharing information since 1986 and find that the match helps both programs monitor recent infection trends and target screening efforts. The law in Connecticut assures that providers will report the HIV status of TB patients and increase the chances that the patients receive proper treatment. By making latent TB a reportable condition in HIV-positive patients, officials also are able to offer preventive therapy and directly observed therapy (DOT) to patients who otherwise may develop active TB. Many civil rights groups have opposed sharing HIV or AIDS reporting with other health agencies because of potential breaches in confidentiality. Although the public health need for identifying co-infection cases is easily justified, confidentiality issues are politically sensitive. In urging TB and AIDS programs to create methods for facilitating detection of co-infection cases, the CDC used a co-infection survey of Chicago. Chicago has a confidentiality law prohibiting the direct reporting of co-infected people to the TB control program. However, the city health department has recently required cases to be reported to both the TB and AIDS registries, facilitating investigation and preventive therapy to contacts.
