U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

Issues and Practices

Tuberculosis in Correctional Facilities

National Institute of Justice

Centers for Disease Control and Prevention

HEALTH AND JUSTICE

About the National Institute of Justice

The National Institute of Justice (NIJ), a component of the Office of Justice Programs, is the research and development agency of the U.S. Department of Justice. NIJ was established to prevent and reduce crime and to improve the criminal justice system. Specific mandates established by Congress in the Omnibus Crime Control and Safe Streets Act of 1968, as amended, and the Anti-Drug Abuse Act of 1988 direct the National Institute of Justice to:

- *Sponsor special projects, and research and development programs* that will improve and strengthen the criminal justice system and reduce or prevent crime.
- *Conduct national demonstration projects* that employ innovative or promising approaches for improving criminal justice.
- *Develop new technologies* to fight crime and improve criminal justice.
- *Evaluate the effectiveness of criminal justice programs* and identify programs that promise to be successful if continued or repeated.
- *Recommend actions* that can be taken by Federal, State, and local governments as well as by private organizations to improve criminal justice.
- *Carry out research on criminal behavior.*
- *Develop new methods of crime prevention* and reduction of crime and delinquency.

The National Institute of Justice has a long history of accomplishments, including the following:

- Basic research on career criminals that led to development of special police and prosecutor units to deal with repeat offenders.
- Research that confirmed the link between drugs and crime.
- The research and development program that resulted in the creation of police body armor that has meant the difference between life and death to hundreds of police officers.
- Pioneering scientific advances such as the research and development of DNA analysis to positively identify suspects and eliminate the innocent from suspicion.
- The evaluation of innovative justice programs to determine what works, including drug enforcement, community policing, community anti-drug initiatives, prosecution of complex drug cases, drug testing throughout the criminal justice system, and user accountability programs.
- Creation of a corrections information-sharing system that enables State and local officials to exchange more efficient and cost-effective concepts and techniques for planning, financing, and constructing new prisons and jails.
- Operation of the world's largest criminal justice information clearinghouse, a resource used by State and local officials across the Nation and by criminal justice agencies in foreign countries.

The Institute Director, who is appointed by the President and confirmed by the Senate, establishes the Institute's objectives, guided by the priorities of the Office of Justice Programs, the Department of Justice, and the needs of the criminal justice field. The Institute actively solicits the views of criminal justice professionals to identify their most critical problems. Dedicated to the priorities of Federal, State, and local criminal justice agencies, research and development at the National Institute of Justice continue to search for answers to what works and why in the Nation's war on drugs and crime.

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

Tuberculosis in Correctional Facilities

by
Theodore M. Hammett, Ph.D.
and
Lynne Harrold

with the assistance of
Joel Epstein, J.D.

January 1994

Issues and Practices in Criminal Justice is a publication series of the National Institute of Justice. Each report presents the program options and management issues in a topic area, based on a review of research and evaluation findings, operational experience, and expert opinion on the subject. The intent is to provide information to make informed choices in planning, implementing, and improving programs and practice in criminal justice.

National Institute of Justice

Michael J. Russell
Acting Director

Cheryl Crawford
NIJ Program Monitor

National Center for Prevention Services
Centers for Disease Control and Prevention

Alan R. Hinman, M.D.
Director

Prepared for the National Institute of Justice, U.S. Department of Justice, by Abt Associates Inc., under contract #OJP-89-C-009 and Cooperative Agreement #92-IJ-CX-K016. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice and the Centers for Disease Control and Prevention.

Foreword

Since 1985, the National Institute of Justice (NIJ) has been sponsoring national surveys of HIV/AIDS in correctional facilities. In the mid-1980s, as the AIDS epidemic accelerated among communities of poor, minority, and drug using Americans, tuberculosis was also making a comeback after several decades of steady decline. The resurgent tuberculosis of the late 1980s and the early 1990s is closely associated with the epidemic of HIV/AIDS and particularly afflicts the poor, inner-city minorities, and injection drug users. Since these populations are overrepresented among correctional inmates, tuberculosis has become a serious problem in correctional facilities. Not only do inmate populations contain concentrations of persons at high risk for both TB and HIV, but the facilities themselves may be high-risk settings for TB transmission because of their crowding and poor ventilation.

One of the most ominous developments in the new tuberculosis resurgence has been the appearance of multidrug-resistant TB (MDR-TB). In a widely publicized 1992 outbreak of MDR-TB, 36 New York State prison inmates and one correctional officer died. Ninety-eight percent of the inmates who died were also HIV-infected.

For several years prior to 1992, NIJ-sponsored surveys of HIV/AIDS in correctional facilities included questions about TB. However, as concern with the dual epidemics and particularly with MDR-TB increased, it seemed important to increase the survey's coverage of TB issues and policies. Thus, for the first time, an extensive set of TB questions was included in the survey, and a separate report on TB in correctional facilities was prepared. Also, for the first time, the Centers for Disease Control and Prevention (CDC) joined NIJ in sponsoring the survey. CDC has issued guidelines for correctional policies to address TB, and one objective of the joint survey was to assess the extent to which systems were following these guidelines. We hope this report will provide vital information to correctional and public health officials who are responding to the growing problem of TB in correctional facilities.

Michael J. Russell
Acting Director
National Institute of Justice

Alan R. Hinman, M.D.
Director
National Center for Prevention Services
Centers for Disease Control and Prevention

Acknowledgements

It is a pleasure to thank all of the individuals who contributed to this report. At Abt Associates, Lynne Harrold carried out the entire survey effort and Joel Epstein wrote the chapter on legal issues. Michael Gross reviewed and provided helpful comments on the full report. Peter Jacobson assisted with data analysis. Wendy Sanderson provided overall administrative support and Mary-Ellen Perry and Winn Sinclair did their usual exemplary job of word processing.

At the National Institute of Justice, Cheri Crawford was our project monitor and provided constant support and assistance. Virginia Baldau reviewed and commented on the report.

At the Centers for Disease Control, a number of individuals provided assistance in design of the survey instrument, reviewed the draft report, and provided ongoing support. These include Sandra Kerr, Christopher Hayden, Dr. Ken Castro, Dr. Steve Jones, Dr. Dixie Snider, Dr. Alan Bloch, and Dr. Sarah Valway.

Orville Pung, former commissioner of the Minnesota Department of Corrections and president of the Association of State Correctional Administrators was extremely helpful in securing the cooperation of respondents for the survey.

Dr. Robert Greifinger, deputy commissioner and chief medical officer, New York State Department of Correctional Services and Dr. Kenneth Moritsugu, medical director of the Federal Bureau of Prisons, both reviewed drafts of this report and provided useful comments.

I wish to thank as well all of the correctional administrators and correctional health care professionals who responded to the survey. Staff of the correctional systems and medical facilities to which we made site visits also deserve special thanks. These include Dr. Robert Greifinger of New York State, Dr. Victoria Sharp of St. Clare's Hospital in New York City, Dr. Steven Safyer of Montefiore Medical Center in New York City (and former director of Montefiore/Rikers Island Health Services), and Madeline LeMarre, Dr. James Hipkens, Bennie Satterwhite, and Joseph Geoffrey of the Georgia Department of Corrections.

Theodore M. Hammett, Ph.D.
November 1993

Table of Contents

List of Tables

Introduction and Summary

Infectious diseases are of increasing concern to correctional health care professionals and correctional administrators. Inmate populations contain disproportionate numbers of persons of low socio-economic status, individuals with problems of substance abuse, and people with generally high-risk and unhealthy lifestyles and poor access to medical care. As in the community beyond the walls of prisons and jails, such groups are much more susceptible to a range of infectious diseases, including HIV/AIDS, tuberculosis (TB), hepatitis B and C, syphilis, gonorrhea, and other sexually transmitted diseases.

The problem of infectious diseases in correctional facilities is, of course, not only a correctional problem. While there is great and legitimate concern about the spread of such diseases within correctional facilities, it is of at least equal concern that the vast majority of inmates return to the community where they may contribute to sharply rising epidemic curves. According to a recent estimate by the U.S. Centers for Disease Control and Prevention (CDC), as many as 133,000 persons with TB infection may be released to the community each year from Federal and State correctional facilities.[1]

As Dr. Robert Greifinger, Deputy Commissioner and Chief Medical Officer in the New York State Department of Correctional Services, has pointed out, the increased incidence of infectious disease among inmates represents not only a grave problem demanding response, but also a significant "public health opportunity." According to a recent article on correctional health care by Greifinger and Jordan Glaser, "[a] public policy agenda for criminal justice should include an epidemiologic orientation, as well as resources for education, counseling, early detection, and treatment. Taking advantage of the period of confinement would serve both the individual and society by controlling communicable diseases in large urban communities. . . . [This] provides a unique chance to reach an otherwise elusive group, whose risk factors and infection prevalence rates far exceed those of other populations."[2]

Tuberculosis presents particularly serious problems, as well as intervention opportunities, for correctional institutions. Prisons and jails, like other congregate facilities, are high-risk settings for the spread of tuberculous infection. Living conditions are invariably crowded, and many buildings have antiquated systems with poor ventilation and air circulation. Inmates are already more susceptible to TB infection and TB disease because of factors associated with their high-risk lifestyles and inadequate access to health care services, as well as increased prevalence of HIV/AIDS among them. Finally, the appearance of multidrug resistant tuberculosis (MDR-TB) raises the threat of an often untreatable disease spreading in a closely confined population.

On the other hand, it is more feasible to screen inmate populations, as well as to ensure that they complete a course of preventive therapy or treatment for TB disease, than it is to carry out such interventions with high-risk populations in the community. Data from health departments funded by CDC to provide nationwide TB skin testing and preventive therapy in correctional facilities show how effective such programs can be in retaining patients. Of almost 10,000 inmates eligible for screening in six correctional facilities, 99.9 percent received the skin test, 99.7 percent had their tests read, 91 percent of those with positive results were referred for followup medical evaluation, 85 percent of those referred actually received followup evaluation, and 94 percent of those recommended for preventive therapy and able to complete the course of therapy within their sentences actually completed it. Almost 30 percent more inmates than drug treatment center clients (66 percent) completed the preventive therapy.[3]

In view of growing concern about tuberculosis in prisons and jails, as well as the spreading realization that more intensive TB control interventions in inmate populations make sense both for the health of this population and for the public health, the Centers for Disease Control and Prevention and the National Institute of Justice (NIJ) cosponsored a national survey of tuberculosis and tuberculosis control in correctional facilities. The survey was conducted by Abt Associates Inc. in conjunction with the seventh survey of HIV/AIDS in Correctional Facilities.

In November 1992, the questionnaire was mailed to 88 correctional systems: the Federal Bureau of Prisons; all 50 State correctional systems; and 37 large city and county jail systems. Responses were received from late November 1992

through mid-March 1993. Substantial telephone followup was required to obtain responses, as well as to obtain missing or clarified information following the receipt of initial responses.

The final response rate achieved was 100 percent for State and Federal prison systems (questionnaires were received from all 51 systems) and 84 percent (31 of 37) for city/county jail systems. To supplement the survey effort, site visits were made to three correctional systems—New York City (Rikers Island), New York State (St. Clare's Hospital, New York City), and Georgia (Women's Diversion Center, Atlanta, and Correctional Medical Institution, Augusta).

In addition to presenting survey data on the dimensions of the problem of TB in correctional facilities (chapter 2), this report provides: basic clinical background on tuberculosis, its resurgence in the United States beginning in the mid- and late-1980's and the increase in MDR-TB (chapter 1); and describes correctional systems' policies and procedures in the following key areas:

- CDC guidelines for control of TB in correctional facilities and overall TB control policies (chapter 3).
- Screening for TB infection (chapter 4).
- Diagnosis of TB disease (chapter 5).
- Management and treatment of inmates with TB disease (chapter 6).
- Containment of TB: contact investigation, preventive therapy, and other infection control measures (chapter 7).
- Discharge issues (chapter 8).
- Training and education (chapter 9).

A summary of legal issues and relevant case law is also provided (chapter 10). A separate 1992 Update on HIV/AIDS in Correctional Facilities has also been prepared.

Survey respondents reported 1,177 inmates under treatment for TB disease (805 in State/Federal prison systems and 372 in city/county jail systems). Eighty-five percent of cases were among men and 15 percent among women. Some have suggested that these numbers are suspiciously low, but the resulting point prevalence rate of 121 cases per 100,000 inmates is in the expected range, based on independently reported incidence rates from other prison studies.[4] Correctional systems reported 45 current and 140 cumulative cases of drug-resistant TB; 76 of the cumulative drug-resistant cases (54 percent) were resistant to both isoniazid (INH) and rifampin (RIF), the two leading TB drugs. Inmate cases of drug-susceptible TB were reported from all regions and drug-resistant cases were reported from most regions, although distributions were uneven with a bicoastal emphasis.

Survey results reveal 53,000 TB-infected inmates in the responding correctional systems (48,000 in 33 State/Federal prison systems and 5,000 in 16 city/county jail systems). The infection rate (based on total inmates) was 10 percent among men and 11 percent among women. However, many correctional systems participating in the survey were unable to supply this information. There were about 2,400 reported TB skin test conversions in the two years before the survey, although many systems were unable to provide these data. In particular, many jail systems do not screen for TB infection or conduct repeat screening because of the generally short inmate stays.

Based on responses from about 65 percent of the participating systems, 43 current cases of TB disease were reported among correctional staff. Two of the cases were drug-resistant. In addition, 605 staff were estimated to be TB-infected, including 79 skin test convertors over the past two years.

In general, the TB control policies of most correctional systems appear to follow most of the CDC's recommendations. Areas of high compliance with recommended policies include the following: coordination of TB control programs and tracking of TB cases; screening of inmates for TB infection, particularly among State/Federal systems; providing chest x rays for skin-test positive inmates and sputum smear/culture examination for inmates with TB symptoms; conducting drug susceptibility studies on all cultures positive for TB; duration of treatment for TB disease for HIV-negative inmates; provision of directly observed therapy for inmates with TB disease; identification, tracking, and screening of close contacts of potentially contagious TB cases in State/Federal systems, particularly for close contacts in the same facility as the index case; offering preventive therapy to most recommended categories of inmates; duration of preventive therapy for HIV-negative inmates; and provision of training on TB to correctional and medical staff.

Areas in which compliance with CDC recommendations is less widespread include the following: screening of city/county inmates for TB infection (although such programs may be impractical in jails due to short stays and rapid turnover); screening of staff for TB infection; testing of HIV-infected inmates for anergy (i.e., they may be nonreactive on skin tests requiring an immune system response), which

may produce false negative skin test results; isolation of all potentially contagious TB cases in negative pressure isolation rooms; duration of treatment for TB disease for HIV-infected inmates; identification, tracking, and screening of close contacts—particularly in jail systems—and contacts in facilities other than the current facility of the index case; offering preventive therapy to close contacts; duration of preventive therapy for HIV-infected persons; and providing TB education to inmates.

Endnotes

1. Centers for Disease Control, "Tuberculosis Prevention in Drug-Treatment Centers and Correctional Facilities — Selected U.S. Sites, 1990–1991," *Morbidity and Mortality Weekly Report*, March 26, 1993; 42: 210–213.

2. J.B. Glaser and R.B. Greifinger, "Correctional Health Care: A Public Health Opportunity," *Annals of Internal Medicine*, January 15, 1993; 118: 139. For another broad view of the recommended response to infectious diseases in the correctional setting, see S. Burris, "Prisons, Law, and Public Health: The Case for a Coordinated Response to Epidemic Diseases Behind Bars," *University of Miami Law Review*, November 1992; 47: 291–335.

3. CDC, "Tuberculosis Prevention in Drug-Treatment Centers and Correctional Facilities," pp. 210–213.

4. See, e.g., M.M. Braun et al., "Increasing Incidence of Tuberculosis in a Prison Inmate Population: Association with HIV Infection," *Journal of the American Medical Association*, January 20, 1989; 261: 393–397.

Chapter 1

Clinical Background of Tuberculosis

This chapter presents basic clinical information on tuberculous infection and active TB disease and discusses the resurgence of TB since the mid-1980's and the appearance of drug-resistant TB, both in the U.S population as a whole and among correctional inmates.

Tuberculous Infection and Tuberculosis Disease

It is important to understand the difference between *tuberculous infection* and *tuberculosis disease*. Tuberculous infection is spread through the air in tiny droplets containing the bacterium (*Mycobacterium tuberculosis*) exhaled by persons with active TB disease, primarily when they cough or sneeze. TB infection may also be spread in dust particles containing the bacterium. While the infection is "casually" transmitted, fairly intensive or prolonged exposure is generally required for transmission to occur.

Only persons with active TB disease of the lungs can transmit infection to others. Tuberculosis disease commonly affects the lungs (pulmonary TB), but extrapulmonary TB may attack other parts of the body.

Persons may be TB-infected but totally free of symptoms, and therefore not infectious, for a long time. Many infected persons never develop active TB disease. Following initial infection, the bacteria multiply in the lungs for a short time before a normal immune system controls their growth. The bacteria usually remain dormant but can cause active disease later. This most common of the two patterns of progression to disease is called *reactivation* TB. Much less commonly, an individual moves to active disease during the first two to three months following initial infection. This pattern is termed *primary* TB.

Before the appearance of HIV/AIDS, it was estimated that a TB-infected person had only a 5–10 percent lifetime risk of developing active TB disease, absent preventive therapy. Moreover, with the advent of effective antituberculosis drugs in the early 1950's, TB became an eminently treatable disease for those who did develop it.

HIV disease and MDR-TB have, however, dramatically changed the calculus. Persons infected with TB but not infected with HIV are still believed to have about a 5–10 percent *lifetime* risk of TB disease. Dually infected individuals, by contrast, are estimated to have an 8 percent risk *each year* of developing active TB disease, absent preventive therapy.[1]

HIV-infected individuals are more at risk for both primary and reactivation TB disease.[2] Once infected with HIV, a person latently infected with TB may move much more rapidly to active TB disease. Similarly, an HIV-infected person who is newly infected with TB is at much greater risk of progressing to primary TB disease. This set of circumstances helped to produce the most serious outbreaks to date of MDR-TB, including the one in the New York State prison system in 1991–92.

In general, HIV-infected persons are "extraordinarily susceptible" to TB disease. Indeed, in many cases, extrapulmonary TB disease is the first indication of an individual's HIV disease.[3] In recognition of this fact, *extrapulmonary* TB was made an AIDS-defining disease in CDC's 1987 revision of the AIDS case definition. *Pulmonary* TB in the presence of HIV infection was also added in the most recent revision of the AIDS case definition that became effective January 1, 1993.[4]

TB infection and disease are also likely to be more difficult to diagnose in persons with HIV infection. It is tragically ironic that, as leading TB researcher Peter Selwyn puts it, the population in which one is least likely to detect TB is also the population in which it is most likely to occur.[5] Difficulty of diagnosing TB infection is associated with increased likelihood that HIV-infected persons will have anergy, thus producing false negative results on purified protein deriva-

tive (PPD) skin tests normally used to detect infection. Diagnosis of TB disease is complicated by its frequent atypical pulmonary presentation in HIV-infected patients' x rays and the likelihood of extrapulmonary involvement which does not, of course, appear in chest x rays.

The Resurgence of Tuberculosis in the United States

TB has been a continuously serious problem in many parts of the world. Indeed, among infectious diseases, TB is the leading cause of death worldwide, accounting for almost 8 million new cases and 3 million fatalities each year.[6]

Tuberculosis seemed to be on the road to eradication in the United States until the early 1980's. The incidence of tuberculosis disease had declined steadily for more than 30 years. New cases reported in 1953 numbered 84,000; by 1984 the number had fallen to 22,000.[7] Then, however, the trend was reversed. By 1992 the number of new cases reported had risen to 26,673, a 20 percent increase over the number reported in 1984. Analysis by the CDC comparing projected trend lines calculated prior to 1984 with actual incidence of tuberculosis between 1985 and 1992 reveals approximately 52,000 "excess" cases during this period.[8]

The timing of the TB resurgence in the United States indicates that HIV infection was a driving force behind it. There is universal agreement on this point, but other, often interrelated, factors have also been at work. These include drug abuse, poverty, homelessness, poor access to health care, and prison crowding. Dr. James Curran, Deputy Director of CDC for HIV, has noted that there are really three interrelated epidemics of TB, HIV, and drug abuse and that it is extremely important to develop a coordinated and cooperative approach to addressing them.[9]

Several other unrelated factors have also played a role in the TB resurgence. One of these is increased immigration from parts of the world with higher levels of TB infection and disease, particularly Southeast Asia. In the United States 27 percent of the TB cases reported in 1991 were among foreign-born individuals; this percentage has been increasing gradually since 1985.

The deemphasis, defunding, and dismantling of TB control programs and the reduced attention to TB research that accompanied the declining incidence of the disease in the United States in the 1960's and 1970's also contributed to its resurgence in the late 1980's and has weakened the response to the resurgence.[10]

All of these factors have produced sharp increases in TB infection and TB disease among groups disproportionately represented in prisons and jails—poor people, many of whom have substance abuse problems and inadequate access to health care services.

Drug-Resistant Tuberculosis

To add to the seriousness of the situation, strains of TB disease have emerged that are resistant to at least one, and often several, of the known treatment agents. Some strains have no known treatment at this time. Due in part to coinfection with HIV and sometimes inappropriate treatment regimens, case fatality rates in MDR–TB outbreaks have reached 80 percent. Strains resistant to seven drugs have been identified. The most commonly found serious form of MDR–TB is resistant to both isoniazid (INH) and rifampin (RIF), the two leading therapeutic drugs. The availability of rifampin, beginning in 1971, made possible the short-course (six-month) chemotherapy (SCC) treatment of TB disease.

Until recently there was no nationwide surveillance of drug-resistant TB cases. Data collection began on January 1, 1993. A previous CDC survey of TB isolates from the general U.S. population in the first quarter of 1991 revealed that about 60 percent had been tested for drug susceptibility. Among these, almost 200 (about 8 percent) were resistant to at least one drug, and almost 100 (3 percent) were resistant to both INH and RIF. Applying these percentages to the total 26,000 TB cases reported in 1991 suggests that 2,000 may have been resistant to at least one drug and almost 800 may have been INH–RIF resistant. The MDR–TB cases identified in the first quarter of 1991 were in 13 States. However, almost half were reported in New York City (90 cases); another 10 percent were in New Jersey; six cases occurred in California; and five in Texas. In New York 52 percent of isolates tested were resistant to both INH and RIF. Moreover, 79 percent of the reported MDR–TB cases were primary disease, and only 21 percent were reactivation disease, suggesting the virulence of the strains and the vulnerability of hosts due to HIV infection, histories of injection drug use, and other conditions.[11]

Recent research suggests that a genetic mutation in *M. tuberculosis* may be involved in the development of INH resistance.[12] However, the evolution of drug-resistant strains is hastened when patients fail to complete a course of treatment. The strains can be transmitted to others who may

become infected and who may develop drug-resistant disease irrespective of any noncompliance with treatment. Treatment of TB disease, even in its drug-susceptible forms, is lengthy, extending long after symptoms subside. Completion of therapy is difficult to achieve, particularly in substance abusers and those leading otherwise dysfunctional lives. In New York City, where the TB resurgence has been most pronounced, only 54 percent of patients with TB disease during the period 1986–1990 were able to complete six continuous months of chemotherapy.[13] National data suggest that more than 20 percent of TB patients fail to complete a full course of therapy.[14]

A recent New York City study found that one-third of all patients with positive cultures for TB disease in April 1991 had strains resistant to at least one TB agent and that 19 percent had strains resistant to both isoniazid and rifampin. Although a history of anti-TB treatment was the strongest predictor of drug resistance in these patients, the investigators found that most cases were associated with initial infection with a drug-resistant strain, rather than the patient's own noncompliance with a previous TB regimen. This conclusion suggests the potential magnitude of spread of MDR–TB among populations at risk, particularly injection drug users with HIV infection. The overall case fatality rate for the New York City patients with drug-resistant strains was 27 percent, but this figure rose dramatically to 91 percent in patients with AIDS diagnoses and TB strains resistant to both isoniazid and rifampin. Patients in this study with HIV infection also progressed more rapidly to active TB disease and died more quickly.[15]

A recent study of patients with TB disease resistant to both INH and RIF concluded that treatment of such strains is "complicated, risky, and of limited efficacy." Regimens may require 5–7 medication visits per week and may involve alternative agents with greater likelihood of having serious side effects. Ultimately, the chances of success are highly uncertain. Only 56 percent of the patients in this study remained free of disease throughout a mean followup period of 51 months; 44 percent experienced treatment failures (i.e., inability of chemotherapy to sterilize cultures) or relapses of active disease after temporarily achieving negative cultures. Almost half of those with unfavorable treatment outcomes died. Since this was a study of patients first diagnosed between 1973 and 1983, very few of the subjects were thought to be HIV-infected.[16] Although results are not empirically known, treatment of HIV-infected patients with MDR–TB is likely to be even more complicated and less successful.

The History of Tuberculosis in Correctional Facilities

Prisons and jails are high-risk settings for the spread of tuberculous infection. Living conditions are invariably crowded, and many facilities have extremely poor ventilation and air circulation. Moreover, many inmates already have elevated risk for TB because of their lifestyles, inadequate prior health care, and increased prevalence of HIV/AIDS. A recent study of the New York City jail system demonstrates that tuberculous infection and progression to active TB disease occur at higher rates in individuals with more frequent incarcerations and longer total time spent in jail.[17]

Tuberculosis is not a new problem in prisons and jails, however. A number of studies undertaken in correctional facilities in New York City, New Orleans and Arkansas between the mid-1940's and the late 1970's revealed higher rates of TB infection and disease among inmates than in the outside population. Several of these studies also documented the transmission of TB infection among inmates and from recently released inmates to persons in the free community.[18]

A CDC survey of 29 States in 1984 and 1985 found that the incidence of TB disease among inmates was 31 cases per 100,000, more than three times the rate in the nonincarcerated populations of these States.[19] In New Jersey, an extremely high incidence rate for TB among inmates (110 cases per 100,000) relative to the total population (10 cases per 100,000) was found in 1987.[20]

The recent general resurgence of TB in the United States has been particularly noticeable in inmate populations. Between 1985 and 1989 the CDC reported at least 11 TB outbreaks in prisons in eight States.[21] In the period 1976–78 the incidence of TB disease among New York State prison inmates was 15.4 cases per 100,000; in 1986 the annual incidence was 105.5 cases per 100,000. More than half of the New York inmates diagnosed with TB disease in 1985 and 1986 had HIV disease.[22] By 1992 the annual incidence of TB disease among New York State inmates had reached 189 cases per 100,000, an increase of more than 1,300 percent since 1977–80. In 1991, 95 percent of the New York inmates with TB disease were also HIV infected.[23] In the New York City study cited earlier, the annual incidence of TB disease among inmates who were PPD-negative upon entry to the jail system in 1985 ranged from 152 to 500 cases per 100,000 between 1986 and 1991. These rates were more than twice

those found in Central Harlem, an area with extremely high TB incidence in the outside community.[24]

High annual incidence rates of TB among prison inmates have not been limited to the Northeast. In 1991 the annual incidence rate of TB disease in one California State prison was 184 cases per 100,000, more than 10 times the statewide annual incidence rate. Transmission of TB was also documented in this California prison.[25]

Rates of TB infection among correctional inmates have also been high. PPD-positive rates of 12 percent and 14 percent have been documented in Maryland[26] and New Mexico;[27] the rate reached 27 percent in New York State in 1990[28] and 30 percent in a California State prison in 1991.[29] In six jurisdictions where the CDC funded health departments to implement on-site PPD screening in correctional facilities, the positive rate among inmates in 1990–91 was 25 percent (almost 10,000 screened).[30]

Outbreaks of MDR-TB in Prisons and Other Congregate Facilities

Outbreaks of MDR-TB have been documented in hospitals, residential drug treatment facilities, and shelters for the homeless,[31] as well as in prisons. HIV infection has played a key role in virtually all of these outbreaks. At least three outbreaks of MDR–TB have occurred in correctional systems in the United States. The most serious and widely known of these occurred in New York State in 1990–92. Detailed epidemiologic investigation and linkage of MDR–TB isolates using Restriction Fragment Length Polymorphism (RFLP) testing, a form of DNA "fingerprinting," ultimately revealed the involvement of at least 19 correctional facilities and two hospitals where inmates were treated. A total of 41 inmates were diagnosed with MDR–TB. A number of these inmates had TB strains resistant to as many as six drugs used to treat TB disease. Spread was rapid and the strains were highly virulent. The median time from specimen collection to death was 29 days and more than two-thirds of the inmates exhibited both pulmonary and extrapulmonary TB. Thirty-six of the inmates have died, and 85 percent of the deaths occurred within four weeks of diagnosis. Ninety-eight percent of the inmates involved in this outbreak were also HIV-infected. One correctional officer—who was immunocompromised due to radiation therapy for cancer—died, and a number of health care workers were also infected with an MDR–TB strain.[32]

The New York outbreak was widely reported in the press, including a series of articles in the *New York Times*.[33] The publicity occasioned great alarm, particularly among community hospitals regularly used to treat inmates. One hospital threatened to refuse inmate patients. The alarm caused by the outbreak led to increased resources for the implementation of more intensive and systematic TB control measures throughout the New York correctional system. These included mandatory annual skin testing of all inmates and staff, routine drug susceptibility testing on all cultures positive for TB disease, directly observed therapy, and other steps to address policy and procedural deficiencies generally blamed for the seriousness of the outbreak: principally, delayed diagnosis and treatment; interfacility transfers of inmates with MDR–TB; failure to isolate inmates with MDR–TB quickly enough; insufficient systems of surveillance and tracking of cases; and inadequate training and education.[34]

Since the New York outbreak, there has been another report of MDR–TB transmission in correctional facilities. In a California State prison, epidemiologic investigation concluded that an inmate with MDR–TB *may* have transmitted TB infection to cellmates, other inmates, medical staff, and correctional officers. Transmission could not be conclusively documented due to the timing of a number of these individuals' PPD skin tests. In any case, possible transmission by this California inmate was facilitated by several of the same problems that contributed to the New York outbreak: delayed diagnosis and delayed and inadequate respiratory isolation.[35]

Endnotes

1. P.A. Selwyn et al., "A Prospective Study of Tuberculosis Among Intravenous Drug Users with HIV Infection," *New England Journal of Medicine*, March 2, 1989; 320: 545–550.

2. P.F. Barnes, A.B. Bloch, P.T. Davidson, and D.E. Snider, Jr., "Tuberculosis in Patients with HIV Infection," *New England Journal of Medicine*, June 6, 1991; 324: 1644–1650.

3. Barnes et al., "TB in Patients with HIV Infection," p. 1648.

4. Centers for Disease Control, "1993 Revised Classification System for HIV Infection and Expanded Surveillance Definition for AIDS Among Adolescents and Adults," *Morbidity and Mortality Weekly Report*, 1993; 41(RR–17): 1–19.

5. Peter Selwyn, "TB and AIDS: Clinical Dimensions," presented at a Conference on The Dual Epidemics of Tuberculosis and AIDS: Health Care Policy, Professional Practice, Law and Ethics, New York City, December 4, 1992.

6. Cited in B.R. Bloom and C.J.L. Murray, "Tuberculosis: Commentary on a Reemergent Killer," *Science*, August 21, 1992; 257: 1055–1064.

7. H.L. Reider, G.M. Cauthen, G.D. Kelly, A.B. Bloch, and D.E. Snider, Jr., "Tuberculosis in the United States," *Journal of the American Medical Association*, 1989; 262: 385–389.

8. C. Hayden, Division of Tuberculosis Elimination, CDC, personal communication, June 1993.

9. Dr. James Curran, "Public Policy for Persons Dually Infected with TB/HIV," presented at a conference on The Dual Epidemics of Tuberculosis and AIDS: Health Care Policy, Professional Practice, Law and Ethics, New York City, December 5, 1992.

10. Bloom and Murray, "Commentary on a Reemergent Killer," p. 1061.

11. A.R. Hinman, J.M. Hughes, D.E. Snider, and M.L. Cohen, "Meeting the Challenge of Multidrug-Resistant Tuberculosis: Summary of a Conference," *MMWR*, June 19, 1992; 41(RR–11): 49–57; L.K. Altman, "Deadly Strain of Tuberculosis Is Spreading Fast, U.S. Finds," *New York Times*, January 24, 1992, pp. A1, B6.

12. A. Gibbon and P. Aldhous, "Exploring New Strategies to Fight Drug-Resistant Microbes." *Science*, August 21, 1992; 257: 1036–1038.

13. Bloom and Murray, "Commentary on a Reemergent Killer," Exhibit 2, p. 1059.

14. Cited in D.E. Snider and W.L. Roper, "The New Tuberculosis," *New England Journal of Medicine*, March 5, 1992; 326: 703–705.

15. T.R. Frieden et al., "The Emergence of Drug-Resistant Tuberculosis in New York City," *New England Journal of Medicine*, February 25, 1993; 328: 521–526.

16. M. Goble et al., "Treatment of 171 Patients with Pulmonary Tuberculosis Resistant to Isoniazid and Rifampin," *New England Journal of Medicine*, February 25, 1993; 328: 527–532.

17. E.Y. Bellin, D.D. Fletcher, and S.M. Safyer, "Association of Tuberculosis Infection with Increased Time in or Admission to the New York City Jail System," *Journal of the American Medical Association*, May 5, 1993; 269: 2228–2231.

18. J. Katz and R.E. Plunkett, "Prevalence of Clinically Significant Pulmonary Tuberculosis Among Inmates of New York State Penal Institutions," *American Review of Tuberculosis*, 1950; 61: 51–56; H. Abeles et al., "The Large City Prison: A Reservoir of Tuberculosis," *American Review of Respiratory Diseases*, 1970; 101: 706–709; D.H. Thompson et al., "Orleans Parish Prison Still Needs Program for Tuberculosis Control," *Journal of the American Medical Association*, 1977; 237: 2286; L. King and G. Geis, "Tuberculosis Transmission in a Large Urban Jail," *Journal of the American Medical Association*, 1977; 237: 791–792; W.W. Stead, "Undetected Tuberculosis in Prison (Source of Infection for Community at Large)," *Journal of the American Medical Association*, 1978; 240: 2544–2547; D.E. Snider, Jr. and M.D. Hutton, "Tuberculosis in Correctional Institutions," *Journal of the American Medical Association*, January 20, 1989; 261: 436–437.

19. B.J. Anno, *Prison Health Care: Guidelines for the Management of an Adequate Delivery System*, Washington: National Institute of Corrections, March 1991.

20. M.D. Hutton, "Why Control TB Now?" Presentation at 12th National Conference on Correctional Health Care, Lake Buena Vista, Florida, October 3, 1988.

21. "Prevention and Control of Tuberculosis in Correctional Institutions: Recommendations of the Advisory Committee for the Elimination of Tuberculosis," *MMWR*, May 12, 1989; 38: 313–320, 325.

22. M.M. Braun et al., "Increasing Incidence of Tuberculosis in a Prison Inmate Population: Association with HIV Infection," *Journal of the American Medical Association*, January 20, 1989; 261: 393–397.

23. Glaser and Greifinger, "Correctional Health Care," p. 141; Dr. Robert Greifinger, Deputy Commissioner/ Chief Medical Officer, New York State Department of Correctional Services, personal communication, June 1993.

24. Bellin et al., "Association of Tuberculosis Infection."

25. "Tuberculosis Transmission in a State Correctional Institution—California, 1990–1991," *MMWR*, December 11, 1992; 41: 927–929.

26. M.E. Salive, D. Vlahov, and T.F. Brewer, "Coinfection with Tuberculosis and HIV-1 in Male Prison Inmates," *Public Health Reports*, 1990; 105: 307–310.

27. S.S. Spencer and A.R. Morton, "Tuberculosis Surveillance in a State Prison System," *American Journal of Public Health*, April 1989; 79: 507–509.

28. J.B. Glaser, J.K. Aboujaoude, R. Greifinger, "Tuberculin Skin Test Conversion Among HIV-Infected Prison Inmates, *Journal of the Acquired Immune Deficiency Syndrome*, 1992; 5: 430–431.

29. "Tuberculosis Transmission in a State Correctional Institution—California, 1990–1991," p. 928.

30. CDC, "Tuberculosis Prevention in Drug Treatment Centers and Correctional Facilities," p. 211.

31. See, for example, B.R. Edlin et al., "An Outbreak of Multidrug-Resistant Tuberculosis Among Hospitalized Patients with AIDS," *New England Journal of Medicine*, June 4, 1992; 326: 1514–1521; "Nosocomial Transmission of Multidrug-Resistant Tuberculosis Among HIV-Infected Persons—Florida and New York, 1988–1991," *MMWR*, August 30, 1991; 40: 585–591; "Transmission of Multidrug-Resistant Tuberculosis from an HIV-Positive Client in a Residential Substance-Abuse Treatment Facility—Michigan," *MMWR*, March 1, 1991; 40: 129–131; "Nosocomial Transmission of Multidrug-Resistant Tuberculosis to Health-Care Workers and HIV-Infected Patients in an Urban Hospital—Florida," *MMWR*, October 12, 1990; 39: 718–722; "Drug-Resistant Tuberculosis Among the Homeless—Boston," *MMWR*, July 19, 1985; 34: 429–431.

32. R. B. Greifinger, "Tuberculosis Behind Bars," in *The Tuberculosis Revival: Individual Rights and Societal Obligations in a Time of AIDS*, A Special Report of The United Hospital Fund of New York, New York: United Hospital Fund, 1992; "Transmission of Multidrug-Resistant Tuberculosis Among Immunocompromised Persons in a Correctional System—New York, 1991," *MMWR*, July 17, 1992; 41: 507–509; Dr. Robert Greifinger, Deputy Commissioner/Chief Medical Officer, New York State Department of Correctional Services, personal communication, 1993.

33. Robert D. McFadden, "Weakened by AIDS, prisoners are dying of TB strains (New York State prisoners with AIDS are dying from drug resistant tuberculosis)," *New York Times*, November 16, 1991, pp. 1, 22; McFadden, "TB Strains Kill 13th Inmate in New York Prison System," *New York Times*, November 17, 1991, p. 39; Robert C. McFadden, "Mandatory Testing for TB in Prisons Begins with Guards," *New York Times*, November 19, 1991, p. B3.

34. "Transmission of MDR–TB in a Correctional System—New York, 1991"; R.B. Greifinger, J.B. Glaser, and N.J. Heywood, "Tuberculosis in Prison: Balancing Justice and Public Health," *Law Medicine and Health Care* (in press).

35. "Probable Transmission of Multidrug-Resistant Tuberculosis in a Correctional Facility—California," *MMWR*, January 29, 1993; 42: 48–51.

Chapter 2

TB Infection and Disease in Correctional Systems: Dimensions of the Problem

This chapter presents results of the NIJ/CDC study of TB infection and TB disease among correctional inmates and staff. These discussions cover regional patterns and the extent of TB/HIV coinfection.

Before presenting the survey results, it is important to understand their limitations. With the budget available for this effort, on-site or other types of validation of responses was not feasible beyond the limited site visits noted in the introduction. Therefore, the data presented here represent the responses received from the correctional systems taken at face value. We can neither guarantee the accuracy of this information nor state for certain that all policies are actually being implemented as promulgated. Following oral presentations of preliminary survey results, there have been several comments that the reported numbers of TB cases are unrealistically low. It has been suggested that reported *policies* for TB screening, tracking of TB cases within correctional systems, and use of directly observed therapy may not accurately reflect *practice*.

Inmates

TB Infection Among Inmates

Survey data on numbers of inmates with TB infection and TB disease suggest a problem of uneven distribution. Table 1 shows that 33 State/Federal prison systems reported having more than 48,000 inmates with positive PPD tests or histories of TB disease. Notably, more than one-third of State/Federal systems did not know the rates of PPD positivity among their inmates. The PPD positive rate across those systems that reported data was 10 percent (based on total inmates), compared with the 25 percent rate across the CDC-funded TB screening programs in correctional facilities. However, the CDC sites were selected on the basis of high reported levels of AIDS and TB cases.[1]

Eighteen systems reported having PPD positivity rates of less than 5 percent, while only three systems reported rates higher than 20 percent. These three systems accounted for 38 percent of the total number of TB-infected prisoners reported on the survey.

Ninety-three percent of the PPD-positive inmates in State/Federal systems were men, and 7 percent were women. However, PPD-positive rates were similar among men and women inmates: (10 percent and 12 percent respectively).

A regional analysis shows that, among State systems, the largest shares of PPD-positive inmates were in the Pacific region (34 percent) and the Middle Atlantic region (28 percent).[2] Collectively, these two parts of the country accounted for almost two-thirds of the PPD-positive inmates in State systems.

Reported data on rates of PPD positivity/history of TB disease among city/county jail systems (table 1) are more sketchy. Sixteen systems reported a total of 5,180 PPD-positive inmates, but almost half (48 percent) of the jail systems did not know their inmates' PPD positivity rates. As noted earlier, generally short lengths of stay in jails may render PPD screening impractical.

PPD-positivity data from the reporting city/county systems reveal essentially the same distribution and gender patterns found among the State/Federal systems. Four of these jail systems accounted for 87 percent of total inmates with TB infection; 89 percent of the PPD-positive inmates were men. Ninety-three percent of the PPD-positive jail inmates were from the Middle Atlantic region, a higher share than among the State/Federal systems. This difference may be an artifact of differential survey participation, however.

Table 1

TB Infection in Inmates November 1992–March 1993

% of Inmates With Positive PPD/History of TB Disease	State/Federal Prison Systems (N=51)				City/County Jail Systems (N=31)			
	Number of Systems	% of Systems	Number of Cases	% of Cases	Number of Systems	% of Systems	Number of Cases	% of Cases
<5%	18	35%	2,764	6%	10	32%	239	5%
5–10%	6	12	7,623	16	1	3	140	3
11–20%	6	12	19,422	40	4	13	4,491	87
>20%	3	6	18,208	38	1	3	310	6
Did Not Know	18	35	N/A	—	15	48	N/A	—
TOTAL	51	100	48,017	100	31	99[a]	5,180	101[a]

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

Twenty-one State/Federal prison systems reported a total of 2,403 of PPD conversions over the two years prior to the survey—2,224 males and 179 females. Thirty systems could not provide this figure. Six systems reported no conversions, eight systems reported 1–20 conversions, three reported 21–100, and four reported more than 100. As might be expected due to inmates' short lengths of stay, few city/county jail systems were able to provide any information about PPD conversions.

At one New York State facility, 38 of 625 male prisoners (6 percent) available for retesting converted from negative to positive skin tests (from less than 10 mm to 10 mm or greater) over a median followup period of 41 months (range 6–113 months). These cases may have resulted from some combination of new TB infections from exposures within the facility, noncompliance with INH prophylaxis offered to initially negative inmates considered at high risk for TB, and cases in which the initial negative results resulted from anergy.[3]

Coinfection With TB and HIV Among Inmates

We also asked systems to estimate the percentage of PPD-positive inmates who were HIV-infected. Just under one-half of the State/Federal systems were able to provide estimates for males and females. For females, 16 systems said there were no cases of coinfection, five systems estimated coinfection levels of 1–10 percent, two systems estimated levels of 11–20 percent, and one system reported a level of more than 20 percent. Among males, 10 systems reported no coinfection, 12 reported levels of 1–10 percent, two reported levels of 11–20 percent, and one system reported a level of more than 20 percent.

Not surprisingly, the systems with high rates of TB infection also tend to have high HIV seroprevalence rates—notably New York State with about 27 percent PPD-positive and 12 percent HIV seroprevalence among men and 20 percent among women.[4]

Only 11 of the 31 responding jail systems were able to offer estimates of the TB/HIV coinfection level among inmates. Among males, five systems estimated no cases of coinfection, and two each reported coinfection levels of 1–10 percent, 11–20 percent, and more than 20 percent. For women, seven jail systems estimated no cases of coinfection, while one system reported a coinfection level of 1–10 percent, two reported levels of 11–20 percent, and one reported a level of more than 20 percent.

TB Disease Among Inmates

Table 2 presents survey results on the number of inmates under treatment for active tuberculosis at the time the questionnaire was completed. This shows that of 1,177 cases, 805 were reported by State/Federal prison systems and 372 by city/county jail systems. This represents a 154 percent increase over the 317 cases reported by State/Federal systems to the 1990 NIJ survey, but only a 24 percent increase over the 301 cases reported by city/county jail systems in 1990.

As noted earlier, the accuracy of the data on TB cases reported to the survey has been questioned. However, the point prevalence rate of 121 per 100,000 inmates (1,177 cases in a total population of 970,752 inmates in the correctional systems responding to the survey) may be roughly accurate in light of the range of reported annual TB incidence rates among inmates discussed earlier: 31 cases per 100,000 in 29 systems in the mid-1980's, before the TB resurgence, and higher rates (up to 500 cases per 100,000) in New York City, New York State, New Jersey, California, and several other jurisdictions in the late 1980's and early 1990's.

Table 2

Inmates Under Treatment for Active TB Disease November 1992–1993

Inmates *Currently* Under Treatment for TB Disease	State/Federal Prison Systems (N=51)				City/County Jail Systems (N=31)			
	Number of Systems	% of Systems	Number of Cases	% of Cases	Number of Systems	% of Systems	Number of Cases	% of Cases
0 cases	17	33%	0	0%	9	29%	0	0%
1–10 cases	16	31	65	8	12	39	55	15
11–25 cases	6	12	95	12	1	3	14	4
26–50 cases	3	6	105	13	1	3	28	8
51–100 cases	2	4	121	15	2	6	155	42
>100 cases	2	4	419	52	1	3	120	32
Did Not Know	5	10	N/A	—	5	16	N/A	—
TOTAL	51	100	805	100	31	99 [a]	372	101 [a]

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

Effective January 1, 1993, CDC added to the standard TB case reporting form an item for designating whether the patient was a correctional inmate at the time of diagnosis. This should increase the accuracy of annual incidence figures for correctional inmates. This will also provide data against which to check future survey responses for accuracy and completeness.

One-third of State/Federal systems reported having no current cases of TB disease; another one-third reported having 10 or fewer cases. At the other extreme, more than half of the cases in State/Federal systems were reported by two systems. Five State/Federal systems could not provide the information. Ninety-six percent of the cases of TB disease in State/Federal systems were in men and only 4 percent in women.

The current TB cases in State prison systems were distributed across all geographic regions, but the East South Central region had the largest share (38 percent), followed by the Pacific (20 percent), West South Central (11 percent), South Atlantic (10 percent), and Middle Atlantic (8 percent) regions. This distribution may not be accurate given differential response to the survey, but it clearly demonstrates that there are significant numbers of inmate TB cases outside the Middle Atlantic region.

The distribution of current cases of TB disease across city/county jail systems was similar to that in the State/Federal systems. Almost one-third (29 percent) of the jail systems reported no cases. Another 39 percent of the systems reported 1–10 cases. At the other extreme, 74 percent were reported by three systems (9 percent of those responding). Many more cases of TB disease among women were reported in city/county systems than in State/Federal systems, despite the fact that the gender distributions in jail and prison populations are very similar. Thirty-eight percent of all cases in the responding jail systems were in females, 62 percent in males. Here again, differential reporting may have played a role in producing apparent differences. Almost two-thirds (63 percent) of TB cases in city/county systems were in the Middle Atlantic region and one-third (33 percent) in the Pacific region.

Drug-Resistant TB Among Inmates

Table 3 provides survey results regarding numbers of inmates with drug-resistant TB disease at the time the survey

Table 3

Current Inmate Cases of Drug-Resistant TB Disease[a]
November 1992–March 1993

	State/Federal Prison Systems (N=51)			City/County Jail Systems (N=31)		
Range of Cases	Number of Systems	Number of Cases	% of Cases	Number of Systems	Number of Cases	% of Cases
0	39	0	0%	25	0	0%
1-10	11	33	100	3	12	100
>10	0	0	0	0	0	0
Did Not Know	1	N/A	—	3	N/A	—
TOTAL	51	33	100	31	12	100

Source: NIJ/CDC Questionnaire Responses.

[a]Resistant to at least one TB drug.

was completed. Only 33 drug-resistant cases were reported by State/Federal systems. All but one of these cases was among men. Thirty-nine State/Federal systems (76 percent) reported no current cases of drug-resistant TB disease, 11 systems reported 1–10 cases, and no systems reported more than 10 cases.

These drug-resistant cases were scattered across a number of regions: 30 percent in the South Atlantic, 24 percent in West South Central, 21 percent in West North Central, and 9 percent each in Pacific and Middle Atlantic. These data suggest that, although the numbers of cases are not large, drug-resistant TB among correctional inmates has been reported in most regions of the country.

Three city/county jail systems reported a total of 12 current cases of drug-resistant TB disease (3 percent of all cases of active TB), nine among men and three among women. Ten of these cases were reported from the Pacific region. Eighty-one percent of the city/county jail systems in the survey reported no cases.

We also asked systems to report cumulative total inmate cases of drug-resistant TB and cases resistant to both INH and RIF, the most serious pattern of multidrug resistance. These data are shown in tables 4 and 5. Across all reporting correctional systems, 77 of 141 (55 percent) drug-resistant cases were resistant to isoniazid and rifampin. (CDC considers this percentage suspiciously high; it may result from an artificially low denominator representing all drug-resistant cases due to underidentification or under-reporting of drug-resistant cases.)

State/Federal systems reported a cumulative total of 116 drug-resistant cases, almost two-thirds of which were in three systems. Ninety-one percent of these cases were among men and 9 percent among women. Forty-one percent of these cases were in the Middle Atlantic region, 17 percent in West North Central, 16 percent in West South Central, and 12 percent in South Atlantic.

Twenty-five cumulative drug-resistant cases were reported by 11 city/county jail systems, a much more scattered distribution than in the prison systems. Twenty-one cases were among men and four among women. Forty percent of the reported cases were from the Pacific region, 32 percent from the South Atlantic region, and 12 percent from East North Central. It should be noted, however, that at least one

Table 4

Cumulative Inmate Cases of Drug-Resistant TB Disease[a] November 1992–March 1993

	State/Federal Prison Systems (N=51)			City/County Jail Systems (N=31)		
Range of Cases	Number of Systems	Number of Cases	% of Cases	Number of Systems	Number of Cases	% of Cases
0	29	0	0%	14	0	0%
1–10	18	41	35	11	25	100
>10	3	75	65	0	0	0
Did Not Know	1	N/A	—	6	N/A	—
TOTAL	51	116	100	31	25	100

Source: NIJ/CDC Questionnaire Responses.

[a]Resistant to at least one TB drug.

Table 5

Cumulative Inmate Cases of TB Disease Resistant to Both Isoniazid and Rifampin November 1992–March 1993

	State/Federal Prison Systems (N=51)			City/County Jail Systems (N=31)		
Range of Cases	Number of Systems	Number of Cases	% of Cases	Number of Systems	Number of Cases	% of Cases
0	37	0	0%	15	0	0%
1–10	9	27	40	6	9	100
>10	1	41	60	0	0	0
Did Not Know	4	N/A	—	10	N/A	—
TOTAL	51	68	100	31	9	100

Source: NIJ/CDC Questionnaire Responses.

of the jail systems expected to have the largest number of cases (New York City) was unable to report because staff are currently preparing extensive tuberculosis data for publication.

Cumulative total TB cases resistant to both isoniazid and rifampin (table 5) revealed similar patterns. Forty-one of the 68 total cases reported by State/Federal systems were from the New York State outbreak discussed earlier. Eighty-eight percent of the 68 cases were among men and 12 percent were among women. The nine cumulative cases (eight among men and one among women) reported by city/county jail systems were scattered across five systems.

Correctional Staff

TB Infection Among Staff

Although many correctional systems recommend PPD screening for staff, few require it. Most staff screening is conducted by private practitioners rather than by the correctional system, so results are not so readily known to the system. In view of this, it is not surprising that two-thirds of the correctional systems in the survey did not know how many of their staff had positive PPD tests or histories of active TB disease. The 28 systems able to provide this information reported a total of 605 TB-infected staff. Four systems reported no staff members with positive PPDs, 12 systems reported 1–10 cases, 10 systems reported 11–50 cases, and two systems reported more than 50 cases.

In State/Federal systems, 86 percent of staff with positive PPDs were males and 14 percent were females. However, in city/county jail systems 58 percent of the TB-infected staff were males and 42 percent were females.

The regional distribution is quite different from that found among inmate cases of TB infection, probably due more to patterns of missing data than to actual differences in patterns of infection. Among State systems, 56 percent of staff with TB infection were in New England, 24 percent in Mountain States, and 14 percent in the Pacific region. No State systems in the Middle Atlantic region reported statistics on TB infection. In city/county systems, 69 percent of staff with TB infection were in the Pacific region and another 17 percent in the East North Central region.

Five State/Federal systems reported a total of 21 staff PPD conversions over the two years prior to the survey—five

among women and 16 among men. Eight prison systems reported no conversions among staff, and 38 prison systems were unable to provide these data. Seven city/county jail systems reported a total of 58 PPD conversions among staff. Of these, six systems reported less than 10 conversions, and one system reported 40. Seven jail systems reported no staff PPD conversions, and 17 did not provide data.

TB Disease Among Staff

Few cases of staff under treatment for active TB were reported. Across all responding correctional systems, 36 male and seven female staff cases were reported. Half of the 36 male cases were reported by two systems, while the seven female cases came from four different systems. Twenty-nine (35 percent) of the 82 responding systems were not able to provide figures on staff cases of active TB disease. Among State prison systems, 58 percent of staff cases of TB disease were in the Pacific region and 33 percent in the Middle Atlantic region. In city/county jail systems, the Middle Atlantic and Pacific regions each accounted for 35 percent of staff cases of TB disease, while 29 percent of cases were in the East North Central region.

Drug-Resistant TB Among Staff

Survey responses on drug-resistant TB among correctional staff are sparse. Two current drug-resistant cases among male staff were reported by one correctional system. No current female staff cases were reported. As noted, one correctional officer died in the New York State MDR-TB outbreak, and several health care workers were infected with MDR-TB strains while providing care to inmates.

Endnotes

1. CDC, "Tuberculosis Prevention in Drug-Treatment Centers and Correctional Facilities," pp. 210–213.

2. For this and subsequently referenced regional analyses, the nation was divided as follows: New England—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; Middle Atlantic—New York, New Jersey, Pennsylvania; E.N. Central—Ohio, Indiana, Illinois, Michigan, Wisconsin; W.N. Central—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; S. Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; E.S. Central—Kentucky, Tennessee, Alabama, Mississippi; W.S. Central—Arkansas, Louisiana, Oklahoma, Texas; Mountain—Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada; Pacific—Washington, Oregon, California, Alaska, Hawaii.

3. Glaser and Greifinger, "Tuberculin Skin Test Conversion Among HIV-Infected Prison Inmates," 430–431. The title is somewhat misleading, since none of the 38 PPD convertors were documented to be HIV-infected. Dr. Robert Greifinger, Deputy Commissioner/Chief Medical Officer, New York State Department of Correctional Services, personal communication, April 2, 1993.

4. J. Mikl, P.F. Smith, and R.B. Greifinger, "HIV Seroprevalence Among New York State Prison Inmates Entering the Bedford Hills, Downstate, and Ulster Correctional Facilities, August 1992–February 1993," presented at IX International Conference on AIDS, Berlin, June 1993.

Chapter 3

TB Control Policies

TB Control Policy: Balancing Individual Rights and Public Health

Those designing and implementing disease control measures must be sensitive to both individual rights and the demands of public health. These objectives are sometimes seen as being in conflict or tension. In the case of HIV/AIDS, many have argued that the protection of public health demands such measures as mandatory testing, disclosure of HIV test results, and mandatory contact tracing, even if individual rights to consent to medical procedures and to have medical information kept confidential would be violated. Since HIV is not transmitted casually but only in certain well-defined ways that are largely consensual or subject to other nonintrusive intervention measures, the arguments for mandatory testing and widespread disclosure have largely failed.

Tuberculosis is a very different disease, however. TB infection is spread through the air. As a result, the TB resurgence of the 1980's and 1990's poses more complicated issues. HIV-infected and other immunocompromised persons are particularly vulnerable to both primary and reactivation TB disease. Failure to comply with and complete treatment increases the possibility of TB transmission and increases the threat that particularly dangerous MDR-TB strains will develop and spread.

For these and other reasons, renewed calls for aggressive TB control measures have been widely supported and adopted in some settings. Measures include mandatory screening for infection, aggressive contact investigations, mandatory directly observed therapy, and quarantine of persons who are noncompliant with treatment regimens.

Perhaps the most controversial of these applications occurred in New York City. In December 1992, a multidisciplinary work group called for strengthened TB control measures in the community. Among other things, the panel recommended adoption of legislation or regulations requiring that TB patients complete their course of treatment or be subject to court-ordered isolation. The group also called for mandatory directly observed therapy for TB patients after their release from a hospital.[1]

These recommendations occasioned sharp criticism from advocacy groups and others who argued that the real problem was an inadequate program of treatment and supportive services for often poor, substance-abusing, and homeless TB patients, rather than willful noncompliance or irresponsibility. In such circumstances, they argued, the first step ought to be to improve the system of TB treatment services rather than to impose coercive measures.[2] Nevertheless, the New York City Health Department promulgated regulations in March 1993 for detention of persons failing to complete TB treatment. A 25-bed unit will be opened where recalcitrant patients can be held until they complete their treatment under supervision. The regulations provide for detention by court order that must be renewed every three months. Nine States currently permit emergency detention in cases of immediate threats to public health.[3] Depending on the jurisdiction, persons may be placed in detention on the sole authority of a health officer, by court order, or as a result of a civil commitment. States with such provisions typically permit 48–72 hours' detention with extensions up to 30 days based on a probable cause hearing. A few States allow up to six months' detention.

These laws and procedures apply to nonincarcerated TB patients. Prisoners are already in a coercive environment. Therefore, many of the arguments against intrusive or mandatory measures carry less weight. As in the case of HIV/AIDS, it is important that prisoners' rights be respected and that individuals not be punished or unnecessarily deprived of normal privileges or activities solely because of their medical status. However, the living arrangements and environmental conditions in most correctional facilities make them likely high-risk environments for TB transmis-

sion. Therefore, more intensive screening, diagnostic, and containment procedures than those generally indicated in community settings may be justifiable. Indeed, our survey results show that such measures have been widely adopted by correctional systems.

CDC Guidelines for Prevention and Control of TB in Correctional Facilities

In 1989 CDC issued guidelines for the prevention and control of tuberculosis in correctional facilities.[4] These guidelines are designed to help correctional systems develop and implement more effective TB control programs. They cover principles of surveillance (screening of inmates and staff, diagnosis, case reporting, and investigation of contacts of persons with potentially contagious TB), containment (isolation and treatment of persons with active TB disease, and preventive therapy), and assessment (record keeping, case tracking, and ongoing evaluation of compliance with policies and procedures). In addition, the guidelines recommend centralized coordination and oversight of TB control, both at individual institutions and systemwide. Finally, CDC recommends close collaboration between correctional systems and public health departments. Correctional systems must ensure that cases are reported to public health departments as required; moreover, public health departments can be valuable sources of consultation, program development, and training.

In view of outbreaks of MDR-TB involving almost 200 cases, CDC recently issued guidelines for managing persons exposed through close contact to MDR-TB.[5] These include guidance on assessing the likelihood that infection with MDR-TB has occurred and that it will progress to active MDR-TB disease and preventive therapy considerations for patients likely to be infected with an MDR-TB strain. Information on selecting drugs for a preventive therapy regimen, including possible alternatives for various drugs of choice, is provided.

Tuberculosis and other infectious diseases pose problems for all types of correctional facilities. However, all correctional facilities should not be considered the same for the purposes of devising TB control strategies. Most important are the differences between prisons and jails. Inmates typically spend at least one year in a State prison system. By contrast, some jail inmates stay only a few hours, and most are released within a few days or weeks.

The short average length of stay and high turnover of inmates in jails render impractical some TB control procedures recommended for correctional facilities. For example, many jail inmates do not remain in custody long enough to be screened for TB infection by PPD skin test. The test cannot be read accurately until 48–72 hours after it has been administered. Moreover, tuberculosis case tracking and contact investigation procedures generally recommended for correctional settings may be virtually impossible to implement in jails.

In recognition of the special TB control issues affecting jails, CDC sought the advice of several jail medical directors in revising its correctional TB control guidelines to be more relevant to facilities with short inmate lengths of stay. Revisions will be presented to CDC's Advisory Committee for the Elimination of Tuberculosis and will be reviewed by a larger group of correctional medical practitioners. The issue date for the revised guidelines is uncertain as of this writing.

The remainder of this chapter and chapters 4–9 present results of the NIJ/CDC survey on correctional systems' policies and procedures regarding TB control and treatment. Throughout this discussion, the relevant CDC guidelines are summarized and the extent of correctional systems' reported adherence to these guidelines is detailed.

Coordination of TB Control Efforts

The basic principles of TB control are that the overall program of screening, diagnosis, treatment, and prophylaxis must be coordinated, meet all applicable clinical standards, and be consistently applied. Cases must be properly reported and followed, and any transmission tracked. Accordingly, the CDC guidelines recommend that each correctional institution, and the correctional system as a whole, have a knowledgeable person responsible for coordinating all TB control programs. CDC also recommends that correctional systems coordinate their efforts with, and seek expert consultation from, public health departments. Indeed, CDC is funding 15 health departments in their efforts to support TB screening and preventive therapy in correctional facilities and to assist correctional staff in designing and implementing other TB control measures.[6]

Table 6 shows that more than 60 percent of State/Federal and responding city/county correctional systems have designated TB control coordinators at the institutional and system levels. Almost two-thirds of State/Federal systems,

Table 6

Coordination of TB Control November 1992–March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Cases	Number of Systems	% of Cases
TB Control Person, Each Institution	35	69%	21	68%
TB Control Person, Entire System	32	61	19	61
Central Registry of TB Cases	33	65	13	42
Cases Tracked Throughout System	45	88	20	65
Public Health Departments Assist with Expert Consultation	41	80	27	87

Source: NIJ/CDC Questionnaire Responses.

but only 42 percent of reporting city/county jail systems maintain central registries of all TB cases. Eighty-eight percent of State/Federal systems and 65 percent of responding city/county jail systems reported having programs for tracking TB cases as they move through these institutions.

Jail systems face particular problems with regard to record keeping and case tracking because of the typically short length of stay and rapid turnover of inmates. A notable exception is the Rikers Island jail complex in New York City where staff of Montefiore/Rikers Island Health Services have developed an extensive automated database for tracking TB cases and following their treatment.[7]

Inmates are frequently transferred within State prison systems. This makes tracking of cases more complicated but also more important. The MDR-TB outbreak in the New York State prison system was more serious than it might have been because many inmates with undiagnosed or ineffectively treated disease were transferred to other institutions, ultimately spreading the outbreak to 19 different prisons. In response to the outbreak, New York instituted universal PPD screening and developed a database to maintain all test results. This database generates analytic reports and supports epidemiologic investigations.[8] However, this system cannot be used to track inmates with TB disease as they are transferred within the prison system or to maintain information on individual treatment regimens.

Finally, table 6 also shows that, in 80 percent of State/Federal systems and 87 percent of responding city/county jail systems, public health departments help correctional staff to obtain expert consultation on TB cases. The New York State Department of Correctional Services, for example, works closely with county and State health departments in the design and implementation of its TB control programs.

Endnotes

1. N. N. Dubler, R. Bayer, S. Landesman, and A. White, "Tuberculosis in the 1990s: Ethical, Legal, and Public Policy Issues in Screening, Treatment, and the Protection of Those in Congregate Facilities. A Report from the Working Group on Tuberculosis and HIV," in *The Tuberculosis Revival: Individual Rights and Societal Obligations in a Time of AIDS*, A Special Report of The

United Hospital Fund of New York, New York: United Hospital Fund, 1992, pp. 21–22, 24–25. See also R. Bayer, N.N. Dubler, and S. Landesman, "The Dual Epidemics of Tuberculosis and AIDS: Ethical and Policy Issues in Screening and Treatment," *American Journal of Public Health*, May 1993; 83: 649–654.

2. Panel of advocacy groups at a conference on The Dual Epidemics of Tuberculosis and AIDS: Health Care Policy, Professional Practice, Law and Ethics, New York City, December 4, 1992.

3. M. Navarro, "New York City to Detain Recalcitrant TB Patients," *New York Times*, March 10, 1993, p. A13; L. Gostin, "Controlling the Resurgent Tuberculosis Epidemic: A 50-State Survey of TB Statutes and Proposals for Reform," *Journal of the American Medical Association*, January 13, 1993; 269: 255–261.

4. "Prevention and Control of Tuberculosis in Correctional Institutions: Recommendations of the Advisory Committee for the Elimination of Tuberculosis," *MMWR*, May 12, 1989; 38: 313–320, 325.

5. "Management of Persons Exposed to Multidrug-Resistant Tuberculosis," *MMWR*, June 19, 1992; 41(RR-11): 59–71.

6. CDC, "Tuberculosis Prevention in Drug-Treatment Centers and Correctional Facilities," pp. 210–213; "Prisons and Drug Clinics Urged to Help Halt the Spread of TB," *New York Times*, March 27, 1993, p. 9.

7. Interview with Dr. Steven Safyer, Medical Director, Montefiore/Rikers Island Health Services, Rikers Island, New York City, February 3, 1993.

8. Greifinger, "Tuberculosis Behind Bars," p. 61.

Chapter 4

Screening for TB Infection

Screening of Inmates

CDC recommends screening all inmates for TB infection at intake, using the intracutaneous Mantoux PPD test. Regular annual retesting for those with negative initial tests is also recommended. CDC guidelines state that all correctional staff should be tested at employment and those working with inmates should receive annual retesting if initially negative. All tests should be administered and read (48–72 hours thereafter) by trained personnel. Experts point out that the PPD test is somewhat difficult to administer and read correctly, so it is essential that well-trained staff perform these functions.

CDC guidelines specify that 10 millimeters of induration (the diameter of the thickening of the skin in reaction to the test) should be considered a positive PPD result for persons with normal immune systems, but 5 mm should be the cut point for recent close contacts of infectious TB cases, persons with HIV infection or other immunosuppression, and those with abnormal x ray findings consistent with TB. PPD results should be entered in medical records by millimeter induration, rather than simply by "positive" or "negative" determination.

Ninety-eight percent of all responding correctional systems use the Mantoux test to screen for TB infection. However, the NIJ/CDC survey results reveal that two responding jail systems still employ the multiple puncture test. The multiple puncture test reportedly remains in use in some smaller county jails not included in the survey. According to CDC, this obsolete test should not be used.[1]

Of the correctional systems responding to the survey, 98 percent record PPD test results by millimeters of induration. Eighteen percent exceed the CDC recommendation by considering 5 mm to be positive for all inmates. Ninety-two percent of the systems meet or exceed the CDC guideline by considering 5 mm positive for persons with HIV infection. In addition, 70 percent meet or exceed the CDC recommendation of a 5 mm standard for close contacts of TB cases, 46 percent meet or exceed the 5 mm recommended standard for persons with histories of injection drug use (regardless of HIV status), and 67 percent meet or exceed the CDC guideline of 5 mm for inmates with chest x ray evidence of old TB disease. Finally, 9 percent of systems fall short of the CDC guideline by applying a 10 mm induration standard to all inmates: 10 mm meets the standard for immunocompetent individuals but not for those who are HIV-infected or otherwise immunosuppressed, or for those who are recent close contacts of persons with contagious TB disease.

Table 7 shows screening policies for inmates. All but two State/Federal prison systems have policies for screening all inmates. The remaining prison systems screen selected inmates—various combinations of HIV-infected inmates and close contacts of active TB cases.

All State/Federal systems conduct inmate screening at intake; 78 percent screen both at intake and at least annually thereafter. Only 4 percent screen inmates at release. The CDC recommendations to correctional systems are unclear as to whether PPD screening of inmates and staff should be mandatory. Nevertheless, many correctional systems have instituted mandatory screening programs. In California and a number of other States, screening of all inmates for TB infection is required by law.[2] The New York State prison system has mandated universal inmate screening by policy directive. Dr. Robert Greifinger, the system's Chief Medical Officer, believes that mandatory screening can be justified on legal grounds as well as on consideration of the minimal risks of the policy in relation to its benefit for TB prevention and control in a high-risk congregate setting. Greifinger cites case law approving a correctional system's mandatory vaccination of inmates against diphtheria-tetanus. In this case, the court recognized the inmate plaintiff's privacy interest but held that it was overshadowed by the correctional system's compelling interest in preventing the spread of deadly disease in the close quarters of correctional facilities.[3]

Table 7

Screening Inmates for TB Infection November 1992–March 1993

Procedures	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Screening				
All Individuals	49	96%	21	68%
Only HIV+ and Close Contacts of Active TB Cases	0	—	1	3
Other Selected Inmates[a]	2	4	8	26
Missing	0	0	1	3
TOTAL	51	100	31	100
Screening Frequency				
At Intake	51	100%	19	61%
At Intake and Annually	40	78	10	32
At Release	2	4	0	0

Source: NIJ/CDC Questionnaire Responses.

[a]Various combinations including HIV-positive inmates, close contacts, persons with histories of BCG vaccination, and unspecified.

Yet, Greifinger concludes that the same argument cannot be used to justify mandatory HIV antibody testing of inmates. In this case, he asserts, "[t]he personal and social costs. . . outweigh the potential public health benefit."[4] Ronald Bayer, a leading medical ethicist who has written widely on the HIV epidemic, has suggested that endorsement of mandatory TB screening might occasion renewed calls for mandatory HIV screening of inmates and that the public must be educated to distinguish between the means of transmission of the two conditions and the differing arguments for the two types of screening.[5] The New York Working Group on TB and HIV, of which Bayer was a part,

> unanimously concluded that effective screening for TB could be accomplished without a fundamental shift from individual consent for an HIV test to routine testing without consent. The group reasoned that the real danger in the resurgent epidemic of TB comes from persons with active disease, especially those in congregate settings. . . .

> PPD screening, augmented with a chest X ray and a careful clinical history and examination, will identify most persons with active disease. *Adding HIV testing to this medical evaluation will not increase the sensitivity or specificity of this clinical algorithm* (emphasis in the original).[6]

Although many correctional systems require PPD screening of all inmates, only 16 (31 percent) State/Federal systems have mandatory HIV antibody testing of all inmates, according to the 1992 NIJ/CDC survey. However, more than half (57 percent) of State/Federal prison systems reported that they test PPD-positive inmates for HIV antibody.

As shown in table 7, fewer jail systems than prison systems have policies calling for PPD screening of all inmates. Sixty-eight percent of responding city/county systems have policies calling for screening of all inmates (although 62 percent of jail systems do not skin test inmates with histories of BCG vaccination). Nine responding jail systems do *not* do PPD screening on all inmates. Eight of these systems screen selected inmates—various combinations of HIV-infected inmates and close contacts of active TB cases. One jail system did not report a screening policy.

Sixty-one percent of responding city/county jail systems screen inmates at intake, but only 32 percent screen both at intake and at least annually thereafter, and none screen inmates at release. Notably, no responding city/county jail systems have mandatory HIV antibody testing for all inmates.

Universal skin testing may be impractical in jails due to the short length of inmates' stays. Many may be released before a skin test can be read. For this reason, some jail systems, notably Los Angeles County, focus on identifying infectious cases of TB disease rather than screening for TB infection. In Los Angeles, accordingly, all inmates are screened by "minifilm" chest x ray. All individuals with abnormal findings on the minifilm x rays receive full x rays and diagnostic workups.[7]

Screening of Staff

Table 8 shows that policies for universal screening of correctional staff are far less common than for inmates. For example, 53 percent of State/Federal prison systems and 42 percent of responding city/county jail systems screen all employees. Thirty-five percent of State/Federal systems and 43 percent of responding city/county jail systems screen selected staff based on various criteria. Twelve percent of State/Federal systems and 13 percent of responding city/county systems do not offer staff PPD screening. Eighty percent of State/Federal systems and 74 percent of responding city/county systems screen at hiring; the percentages screening both at hiring and annually thereafter are 73 and 55 respectively in the prison and jail systems. The New York State Department of Correctional Services mandates testing of all staff at hiring with annual retesting. California law also requires PPD screening of correctional staff.[8]

Anergy Testing

As already noted, TB-infected persons who have HIV disease or are otherwise immunocompromised, are likely to be anergic and thus commonly have false negative PPD test results. It is important to consider delayed-type hypersensitivity anergy testing for such persons.[9] However, only 45 percent of State/Federal prison systems and 45 percent of responding city/county jail systems currently conduct anergy testing on PPD-negative inmates known to be HIV-infected. Forty-three percent of State/Federal systems and 36 percent of responding city/county jail systems reported plans to institute anergy testing in the future.

BCG Vaccination and PPD Screening

Efficacy trials of bacille Calmette-Guérin (BCG) vaccine against TB have been inconsistent and use of the vaccine is not recommended in the United States, except for certain specific categories of infants and children.[10] Persons who have received BCG vaccine may have spurious PPD test results.[11] CDC does not, however, recommend against PPD testing of persons with histories of BCG vaccination. Rather, the agency recommends obtaining and using the following information to interpret skin test results: the date of the BCG vaccination, the TB exposure status of the individual (in other words, if there was recent close contact with a potentially contagious case of TB), and size of the PPD skin test reaction.[12] Survey results reveal, however, that 80 percent of State/Federal systems do not skin test inmates with histories of BCG vaccination.

Endnotes

1. CDC, National Center for Prevention Services, Division of Tuberculosis Elimination, *Control of Tuberculosis in Correctional Facilities: A Guide for Health-Care Workers*, Washington, D.C.: U.S. Government Printing Office, 1992, p. 5.

Table 8

Screening Staff for TB Infection November 1992–March 1993

Procedures	State/Federal Prison Systems (N=51) Number of Systems	State/Federal Prison Systems (N=51) % of Systems	City/County Jail Systems (N=31) Number of Systems	City/County Jail Systems (N=31) % of Systems
Screening				
All Individuals	27	53%	13	42%
Staff With No History of BCG Vaccination	2	4	2	7
Other Categories	16	31	11	36
No Screening of Staff	6	12	4	13
Missing	0	0	1	3
TOTAL	51	100	31	100 [a]
Screening Frequency				
At Hiring	41	80%	23	74%
At Hiring and Annually	37	73	17	55
After Possible Exposure to Active TB	43	84	22	71
At End of Employment	0	0	1	3

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

2. Dubler, Bayer, Landesman, and White, "Tuberculosis in the 1990s," p. 14; "Tuberculosis Transmission in a State Correctional Institution–California, 1990–1991," p. 929.

3. Greifinger, Glaser, and Heywood, "Tuberculosis in Prison," pp. 12–13, citing *Zaire* v. *Dalsheim*, 698 F.Supp. 57 (S.D.N.Y., 1988).

4. Ibid., pp. 14–15.

5. R. Bayer, S. Landesman, and N. Dubler, "Screening for Tuberculosis in the Context of HIV: The Ethical and Policy Issues," Poster abstract no. PoC 4805, VIII International Conference on AIDS, Amsterdam, July 19–24, 1992.

6. Dubler, Bayer, Landesman, and White, "Tuberculosis in the 1990s," pp. 14–17.

7. Dr. John Clark, Medical Director, Los Angeles County Sheriff's Department, presentation at National Institute of Corrections Large Jail Network Meeting, Denver, January 25, 1993.

8. "Tuberculosis Transmission in a State Correctional Institution–California, 1990–1991," p. 929.

9. P.A. Selwyn et al., "High Risk of Active Tuberculosis in HIV-Infected Drug Users with Cutaneous Anergy," *Journal of the American Medical Association*, July 22/29, 1992; 268: 504–509.

10. "Use of BCG Vaccines in the Control of Tuberculosis: A Joint Statement by the ACIP and the Advisory Committee for Elimination of Tuberculosis," *MMWR*, November 4, 1988; 37: 663–4, 669–73.

11. Bloom and Murray, "Commentary on a Reemergent Killer," pp. 1056, 1058.

12. D. Snider, "Bacille Calmette-Guérin Vaccinations and Tuberculosis Skin Tests," *Journal of the American Medical Association*, June 21, 1985; 253: 3438–3439.

Chapter 5

Diagnosis of the Disease

Timely diagnosis, isolation, and treatment of persons with active and potentially contagious TB disease are essential to TB control programs. Isolation and treatment are discussed in chapters 6 and 7.

Chest X Ray and Sputum Smear/Culture

CDC's recommendations regarding diagnosis state that all persons with positive PPD tests or symptoms of active TB (e.g., cough, anorexia, weight loss, fever) receive chest x rays within 72 hours of skin-test reading or identification of symptoms. CDC also recommends that all HIV-infected inmates be given chest x rays as part of initial screening, regardless of PPD test results.

According to CDC, all persons with abnormal chest x ray findings or symptoms consistent with TB disease should also receive sputum smear and culture examinations. Three sputum samples should be collected on successive mornings, with staff taking care that patients produce sputum from the lungs rather than saliva from the nose or mouth. If necessary, aerosol sputum induction should be used, but only in well-ventilated locations and with staff wearing masks during the procedure.

Tuberculosis is generally more difficult to diagnose in persons with HIV disease because of its often atypical and extrapulmonary presentations. Extrapulmonary TB is more common in persons with HIV disease. Its clinical presentation varies widely by site and symptoms. If extrapulmonary TB is suspected, CDC recommends that other clinical specimens (e.g., urine, pleural fluid, biopsy specimens) be obtained for analysis.

Table 9 shows that 96 percent of State/Federal systems and 97 percent of responding city/county systems follow CDC recommendations regarding chest x rays for persons with positive PPD results *regardless of whether they exhibit TB symptoms*. One State system reported a policy of providing chest x rays only to those PPD-positive inmates *with symptoms*. Eighty percent of State/Federal systems and 71 percent of responding city/county systems follow the CDC recommendation that sputum smear/culture examination be conducted for all inmates with symptoms of TB. Some correctional systems (18 percent of State/Federal systems and 29 percent of responding city/county systems) go beyond CDC guidelines by conducting sputum smear/culture examination on all PPD-positive inmates including those who are asymptomatic. Some also collect more than three sputum samples for initial analysis. At the Georgia Correctional Medical Institution (Augusta), for example, five successive daily sputum samples are collected for smear and culture.

Table 9 shows lower levels of compliance with the recommendation that HIV-positive inmates routinely receive chest x rays. Two-thirds of State/Federal systems and 52 percent of responding city/county jail systems have policies calling for anergic HIV-positive inmates to receive chest x rays; additionally, 35 percent of State/Federal systems and 36 percent of responding city/county jail systems do sputum cultures on anergic HIV-positive inmates.

Delayed diagnosis has been a major factor in the expansion of TB outbreaks, especially those involving MDR-TB. Sputum smears for acid-fast bacilli (AFB, refers to the means of detecting the TB bacterium in the sputum smear) can be done fairly quickly but are considered to be relatively insensitive—that is, not highly reliable in detecting disease—particularly in severely immunocompromised persons with x ray findings suggesting primary or reactivation TB disease.[1]

With generally available procedures and technology, definitive diagnosis must be based on sputum cultures that usually require three to four weeks for TB bacilli. This is much

Table 9

TB Diagnostic Procedures November 1992-March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Chest X Ray				
PPD+ whether or not symptoms are present	49	96%	30	97%
PPD+ if symptoms present	1	2	0	0
Missing	1	2	1	3
TOTAL	51	100	31	100
Sputum Smear/Culture				
PPD+ whether or not symptoms are present	9	18%	9	29%
PPD+ if symptoms present	41	80	22	71
Missing	1	2	0	0
TOTAL	51	100	31	100
Procedures for HIV+ with Anergy				
Chest X Ray	34	67%	16	52%
Sputum Smear/Culture	18	35	11	36

Source: NIJ/CDC Questionnaire Responses.

longer than for most other bacteria. CDC suggests that this could be improved to two weeks.[2] Innovative methods such as Restriction Fragment Length Polymorphism (RFLP) testing, which was used by CDC to investigate the New York State MDR-TB outbreak, provide much faster results on presence of TB disease, determination as to whether it is primary or reactivation, detailed characteristics of the strain (both critical for tracking transmission), and drug resistance/susceptibility. Such methods are extremely expensive and unlikely to be generally available to correctional systems in the near future.

A recent report for CDC describes other less expensive methods to hasten detection of the growth of TB bacilli (the BACTEC radiometric system that permits detection in 7–14 days), to shorten the time required to identify *M. tuberculo-*

sis once growth has been detected (DNA probes or high-performance liquid chromatography [HPLC]), and to obtain faster drug susceptibility results (BACTEC system).[3]

According to CDC, all persons with suspected or confirmed TB with pulmonary involvement in chest x ray, cough, and/or positive sputum smear should be treated as "suspect" cases, isolated and given appropriate treatment, pending culture results. Moreover, asymptomatic persons at risk for TB disease, such as those with HIV infection and anergy and close contacts of active cases, should be considered for preventive therapy, even in the absence of any skin test, x ray, or laboratory findings suggesting TB infection or disease. Treatment for TB disease and preventive therapy are discussed in later chapters.

Drug Susceptibility Studies

The CDC correctional guidelines recommend drug susceptibility studies on all culture-positive patients who do not respond to initial treatment. However, in light of recent MDR-TB outbreaks, the American Thoracic Society now recommends that drug susceptibility studies be done on all positive cultures.[4] Many correctional systems report taking this approach. Indeed, table 10 shows that 76 percent of State/Federal prison systems conduct drug susceptibility studies on all specimens that are culture positive for TB; 14 percent conduct such studies on some specimens; 4 percent only when the patient does not respond to initial treatment; and 2 percent do not conduct drug susceptibility studies. Almost three-quarters (74 percent) of responding city/county jail systems have policies for conducting drug susceptibility studies on all culture-positive specimens, 6 percent on some, 6 percent in face of nonresponse to treatment, and 3 percent do not conduct drug susceptibility studies.

Drug susceptibility studies can only be done on cultured isolates. At the Georgia Correctional Medical Institution, drug susceptibility studies are routinely performed on the first culture that grows out. Cultures generally take approximately three to four weeks; the drug susceptibility studies

Table 10

Drug Susceptibility Studies
November 1992-March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
When Are Drug Susceptibility Studies Done?				
All Specimens Culture Positive for TB	39	76%	23	74%
Some Specimens Culture Positive for TB	7	14	2	6
Only When Patient Is Unresponsive to Treatment	2	4	2	6
Never	1	2	1	3
Missing	2	4	3	10
TOTAL	51	100	31	99[a]

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

require an additional 3–12 weeks. The total time from obtaining sputum sample to receiving drug susceptibility results may be 6–16 weeks. CDC asserts that with improvements—such as use of the most specific, sensitive, and rapid test methods and employment of a five-drug primary panel for susceptibility testing—this could be reduced to four weeks.[5] It seems unlikely, however, that most correctional systems will be able to implement such improvements very soon.

In view of the length of time required to obtain results, even when samples are collected and sent for analysis on a timely basis, initial treatment of suspect TB cases with a multiple drug-regimen, designed with reference to known or possible drug-resistance patterns at the facility, should be considered.

Endnotes

1. Barnes et al., "Tuberculosis in Patients with HIV Infection," p. 1646.

2. Hinman, Hughes, Snider, and Cohen, "Meeting the Challenge of Multidrug-Resistant Tuberculosis," p. 55.

3. F.C. Tenover et al., "The Resurgence of Tuberculosis: Is Your Laboratory Ready?" *Journal of Clinical Microbiology*, April 1993; 31: 767–770.

4. American Thoracic Society, "Control of Tuberculosis in the United States," *American Review of Respiratory Diseases*, December 1992; 146: 1623–1633.

5. Hinman, Hughes, Snider, and Cohen, "Meeting the Challenge of Multidrug-Resistant Tuberculosis," p. 55.

Chapter 6

Management and Treatment of Inmates With TB Disease

Isolation of Inmates With Potentially Contagious TB Disease

The CDC guidelines call for immediate respiratory isolation of persons with suspected or confirmed cases of contagious TB disease. Anyone with symptoms of active TB disease should be considered contagious and isolated to prevent transmission of TB infection to others. According to CDC, correctional officers and health staff should suspect TB in anyone with a cough lasting longer than two weeks, especially if other signs of TB are present. This is true even if the inmate or employee is a smoker.[1]

Sputum specimens should be obtained immediately for smear and culture examination, and appropriate medication should be initiated immediately. Patients should remain in isolation until they are on appropriate therapy, their cough and other TB symptoms have abated, and they have negative sputum smears on at least three consecutive days. Duration of isolation should be based on bacteriologic and clinical evidence rather than on a standard number of days on therapy.

Respiratory isolation is defined by CDC as housing in a room with separate ventilation to the outside, negative pressure in relation to adjacent areas, and at least four to six air exchanges per hour.[2] Ideally, anterooms are provided between each isolation room and the common space to prevent cross-contamination when the door is opened. Patients must wear masks whenever they leave the isolation room.

Negative-pressure isolation rooms are generally expensive to construct or to retrofit from existing space. The Illinois Department of Corrections, however, was able to retrofit with negative pressure about 28 existing outside infirmary rooms in 20 correctional facilities at a cost of $2,000–$6,000 per room. The Illinois project did not include construction of anterooms between each negative-pressure room and the common area, because according to officials of the correctional department, that would probably have made the cost prohibitive. CDC does recommend anterooms, but their importance has not been empirically demonstrated. In any case, the retrofitted rooms were provided with door closers, and policy prohibits leaving doors open when rooms are occupied.

The Illinois retrofit program depended on several circumstances: the availability of outside rooms with exhaust fans venting directly to the outside; the feasibility of modifying the existing building ventilation system to eliminate air recirculation in the negative pressure rooms (all air returns and windows must be permanently sealed); and the feasibility of having separate temperature control zones to maintain adequate heat in the negative pressure rooms, since negative pressure reduces the temperature relative to surrounding areas. Other features of the Illinois program include air pressure switches in exhaust air ducts that signal disruption in exhaust by illuminating a red light at the nurses station and differential gauges to monitor the air pressure in each room against that in the corridor outside.[3]

In New York City, a court order forced the city Department of Corrections to construct 42 negative-pressure isolation rooms at Rikers Island.[4] The Department opened a 42-cell isolation unit in May 1992, and another 98 rooms opened in spring 1993. The prefabricated steel negative-pressure rooms were installed in existing structures. Each 120-square-foot negative-pressure cell has an anteroom with positive pressure to prevent cross-contamination. The rooms are handicapped accessible and contain a hospital bed, toilet, lavatory, and shower, with maximum security hardware and fixtures. The cells are grouped with nurses' and officers' stations, examination and treatment rooms, and sputum

induction booths. Also included in the complex are an x ray suite, visiting room, and staff areas.

The isolation unit at Rikers Island was extremely expensive—about $500,000 per room, about half of which were "corrections-related costs" such as steel walls. The high cost is also attributable in part to the need to construct the unit under a court-ordered deadline. Correctional systems may save money if they move to address the need for respiratory isolation rooms before being ordered to do so as a result of court action.

Table 11 shows that 31 percent of State/Federal prison systems house all inmates with potentially contagious TB disease in negative-pressure isolation rooms, while another 8 percent send such patients to community hospitals. Assuming that the community hospitals to which patients are sent are properly isolating these patients, less than 40 percent of prison systems appear to be following the CDC recommendations that *all* potentially contagious TB patients be isolated. Another 27 percent of State/Federal systems place *some* potentially contagious TB cases in negative-pressure rooms but house others elsewhere in the correctional facility, including the facility infirmary. Eighteen percent place all such patients in single infirmary rooms, 16 percent place at least some of them in administrative segregation units. Two State/Federal systems house at least some potentially infectious patients in infirmary wards, while one maintains at least some such inmates in single cells in the general population. Only 33 percent of State/Federal systems reported having what they considered a "sufficient" number of negative-pressure rooms.

Table 11 shows that only 32 percent of responding city/county jail systems house all inmates with potentially contagious TB disease in negative-pressure isolation rooms, while another 29 percent send such patients to community hospitals. Assuming that patients sent to community hospitals are appropriately isolated, 61 percent of jail systems appear to be following CDC guidelines regarding isolation for all potentially contagious TB patients. Another 16 percent of city/county systems place some potentially contagious TB cases in negative-pressure rooms but house others elsewhere in correctional facilities, including infirmaries. Six percent of jail systems place all such patients in single infirmary rooms, and 10 percent place at least some of them in administrative segregation units. Two jail systems house at least some potentially contagious patients in infirmary wards, and one system maintains some such inmates in single cells in the general population. Thirty-nine percent of responding city/county jail systems reported sufficient negative-pressure rooms.

Table 11 shows that, among State/Federal systems employing negative-pressure isolation rooms in correctional facilities or community hospitals, 82 percent keep patients in such isolation until they have negative sputum smears on three successive days (the CDC recommendation), 8 percent isolate patients for 14 days, and 8 percent have other criteria. In State/Federal systems with their own negative-pressure rooms, 7 percent report that air flow is monitored weekly; 62 percent monitor air flow less frequently; and 31 percent did not provide an answer.

Among city/county jail systems placing potentially contagious TB cases in negative-pressure isolation rooms or in community hospitals, 64 percent isolate until the patient has three successive negative smears, 20 percent for 14 days, and 16 percent gave other answers (table 11). Air flow monitoring in negative-pressure rooms is conducted weekly in 13 percent of the city/county jail systems with their own isolation rooms, less frequently in 50 percent of these systems. Thirty-eight percent of these jail systems did not provide information on air-flow monitoring.

Treatment of Inmates With TB Disease

CDC recommends that inmates with suspected or confirmed TB disease be started on treatment immediately. In light of the increase in drug-resistant TB, CDC has revised its recommendations regarding initial therapeutic regimens. It now recommends that *all* patients be started and continued on *four* drugs until susceptibility results are known. The initial phase should include isoniazid, rifampin, pyrazinamide (PZA), and either ethambutol or streptomycin.[5] In the New York State prison system, where the most serious MDR-TB outbreak in a correctional setting occurred, all TB treatment now employs at least four drugs.[6]

Duration of therapy should depend on HIV status. Non-HIV-infected patients should receive a total of six months of treatment but at least three months following the first negative culture. HIV-infected inmates with TB disease should receive nine months of treatment, including at least six months after the culture has become negative. Regardless of HIV status, most therapy can be administered twice a week. CDC provides a range of possible regimen options.[7]

Failure to complete treatment is a major cause of prolonged infectiousness and development of drug-resistant TB strains. Directly observed therapy (DOT) increases the probability that a patient will complete the prescribed course of therapy. DOT means that a health care worker watches the patient

Table 11

Housing of Inmates With Potentially Contagious TB November 1992–March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Housing Placement				
All Reportedly In Negative-Pressure Isolation Rooms	16	31%	10	32%
All In Community Hospitals	4	8	9	29
Some In Negative-Pressure Isolation Rooms, Others Elsewhere In Correctional Facility	14	27	5	16
All In Single Rooms In Correctional Facility Infirmary	9	18	2	6
At Least Some In Administrative Segregation Unit, Others In Nonisolation Housing	8	16	3	10
All In Single Cell In General Population	0	—	1	3
Other	0	—	1	3
TOTAL	51	100	31	99[b]
	(N=39)[a]		(N=25)[a]	
Duration of Isolation				
Until 3 Successive Daily Negative Sputum Smears	32	82%	16	64%
About 2 Weeks	3	8	5	20
Other	3	8	4	16
Missing	1	3	0	—
TOTAL	39	101[b]	25	100

Source: NIJ/CDC Questionnaire Responses.

[a]Systems that have their own negative-pressure isolation rooms and/or that place potentially contagious TB cases in community hospitals.

[b]Due to rounding.

swallow each pill. Such supervision cannot guarantee that the pills are swallowed unless the patient's mouth is carefully checked. A person determined to resist therapy can "cheek" the pills and spit them out when they are no longer under observation.[8]

DOT is somewhat labor intensive but is considered highly cost effective. A recent analysis concluded that for the cost of treating one case of MDR-TB (up to $200,000) DOT could be provided for 700 patients with TB. This does not even take into account the added benefits of reducing the spread of TB.[9]

The need for DOT is probably more pronounced in correctional settings. Many prisoners have mental disabilities that make it hard for them to understand the importance of taking medication. Moreover, some see refusing to take medication as one of the few areas in which it is possible to resist correctional authorities. For all of these reasons, CDC recommends DOT for treatment of all inmates with TB disease.

CDC emphasizes that TB patients should be carefully monitored for adverse drug reactions, treatment failure, and relapse. Finally, to plan treatment and other interventions, all inmates with TB disease should be offered, and encouraged to undergo, HIV counseling and testing.

Table 12 summarizes treatment policies. It shows that 77 percent of State/Federal systems provide at least six months of treatment to non-HIV-infected patients, while 63 percent provide at least nine months treatment to HIV-infected persons (the CDC standards). In 77 percent of State/Federal systems, treatment is directly observed for all inmates on TB treatment; DOT is used for selected inmates in 18 percent of systems; and no DOT is available in 6 percent of systems. Repeat sputum specimens are obtained from inmates on TB treatment on a weekly basis in 27 percent of State/Federal systems, and on a monthly basis in 25 percent of systems.

In the Georgia State prison system, all treatment for TB disease is centralized at the Augusta Correctional Medical Institution (ACMI). Any inmate with a suspected or confirmed case of TB disease is transferred immediately to ACMI for evaluation and treatment. Inmates are masked for the trip and transported to ACMI individually with a correctional officer, rather than on a bus with other inmates.

Inmates with confirmed TB remain at ACMI until released from custody or until they complete the prescribed course of treatment. Suspect cases that are not confirmed by sputum smears are sent back to their original institutions. Directly observed therapy is required for all inmates on TB treatment at ACMI. Inmates must appear for "pill call" on a prescribed schedule. If they fail to appear, they are sent for by a correctional officer. In the Georgia system, parole can be delayed for inmates exhibiting resistance to therapy and revoked for parolees who fail to comply with drug regimens following release.[10] In California, compliance with TB treatment can also be made a condition of parole.[11] New York State also requires DOT for all inmates in treatment for TB disease. Inmates who fail to comply are placed in respiratory isolation in their assigned facility.[12]

Table 12 shows that, among responding city/county jail systems, 77 percent provide at least six months of therapy for HIV-negative inmates with TB disease, and 61 percent provide at least nine months of treatment to TB patients with HIV infection. Eighty-four percent of responding jail systems report DOT for all inmates on TB treatment, 10 percent for selected inmates, and 7 percent provide no DOT. Repeat specimens are obtained weekly in 16 percent of city/county systems, on a monthly basis in 10 percent of these jail systems, and every other month in 10 percent. Almost half of the jail systems reported other criteria for frequency and duration of obtaining specimens.

At Rikers Island, New York City, medical staff have developed a sophisticated database that shows each inmate's treatment regimen and is used to monitor compliance with therapy. All treatment is directly observed, based on the inmate's appearance at a designated medical unit to receive medication. If the data tracking system shows that an inmate has missed two scheduled doses, the inmate is called in. Inmates who remain noncompliant are placed in medical isolation.[13]

Endnotes

1. CDC, *Control of TB in Correctional Facilities: A Guide for Healthcare Workers*, p. 8.

2. CDC, "Prevention and Control of Tuberculosis in Correctional Institutions: Recommendations of the Advisory Committee for the Elimination of Tuberculosis," *MMWR*, May 12, 1989; 38: 316.

3. Memorandum from Glen Hodgson (Architect and Manager, Capital Programs Unit, Illinois Department of Corrections) to Wardens, Superintendents, and Chief Engineers, "TB Isolation Rooms and Associated Shower Rooms," April 24, 1992; Glen Hodgson, Illinois Depart-

Table 12

Treatment of Inmates With TB Disease November 1992–March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Duration of Therapy				
9 months or more for HIV+ inmates	32	63%	19	61%
6 months or more for HIV- inmates	39	77	24	77
Directly Observed Therapy				
All inmates	39	77%	26	84%
Selected inmates	9	18	3	10
None	3	6	2	7
TOTAL	51	101 [a]	31	101 [a]
Repeat Specimens Obtained				
Weekly	14	27%	5	16%
Monthly	13	25	3	10
Every 2 months	0	0	3	10
As long as symptoms persist	10	20	2	7
Other	11	22	14	45
Missing	3	6	4	13
TOTAL	51	100	31	101 [a]

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

ment of Corrections, personal communication, March 30, 1993. Correctional officials interested in learning more about Illinois' retrofitting program should contact Mr. Hodgson at (217) 522-2666.

4. *Vega* v. *Sielaff*, 92-Civ.-6475 (U.S.D.C., S.D. New York).

5. CDC, "Initial Therapy for Tuberculosis in the Era of Multidrug Resistance: Recommendations of the Advisory Council for the Elimination of Tuberculosis," *MMWR* (in press, 1993).

6. R.B. Greifinger, "Tuberculosis Behind Bars," p. 64.

7. CDC, "Initial Therapy for Tuberculosis in the Era of Multidrug Resistance."

8. Interview with Millie Reeves, P.A., Augusta (Georgia) Correctional Medical Institution, March 15, 1993.

9. M.D. Iseman, D.L. Cohn, and J.A. Sbarbaro, "Directly Observed Treatment of Tuberculosis—We Can't Afford Not to Try It," *New England Journal of Medicine*, February 25, 1993; 328: 576–578.

10. Interviews with staff at Augusta Correctional Medical Institution, March 15, 1993; Georgia Department of Corrections, Standard Operating Procedures VB03–007, "Management of Inmates with Suspected or Active Tuberculosis," June 25, 1992.

11. "Tuberculosis Transmission in a State Correctional Institution—California, 1990–1991," p. 929.

12. Dr. Robert Greifinger, Deputy Commissioner and Chief Medical Officer, New York State Department of Correctional Services, personal communication, March 1993.

13. Interview with Dr. Steven Safyer and staff, Rikers Island, February 3, 1993.

Chapter 7

Containment of TB: Contact Investigation, Preventive Therapy, and Other Infection Control Measures

Identification and Screening of Close Contacts of Persons With Tuberculosis Disease

Whenever an inmate or staff member is believed to have contagious TB disease, all "close contacts" of that person must be identified and screened for TB infection and disease. The precise amount of exposure to airborne droplet nuclei or dust particles needed to cause TB infection is unknown and, in any case, depends upon the infectiousness of the source, the susceptibility of the host, and the quality of ventilation in the environment. In congested, poorly ventilated environments with high turnover, like many prisons and jails, cumulative exposure to a number of people with infectious TB disease, as well as intensive exposure to one person with disease, may occur. In either situation, infection may result.

Close contacts—i.e., people who sleep, live, work, or otherwise share air with an infectious person through a common ventilation system—are those at highest risk. Therefore, CDC recommends careful contact investigation in all cases of suspected or confirmed TB disease believed to be infectious (i.e., with x ray findings showing pulmonary involvement and/or positive sputum smear). A contact investigation involves identifying and screening close contacts of possible source cases. All persons considered to be close contacts should be skin-tested (unless they have had a recent test), and those with positive results and all those with TB symptoms (regardless of PPD result) should receive chest x rays and evaluation for TB disease. Treatment for disease or preventive therapy should be initiated, as appropriate. Close contacts who are initially PPD-negative should be retested 10–12 weeks after contact has ended.

Depending on the infectiousness of the potential source case and the characteristics of the environment in which contact may have occurred, the following may be considered close contacts: cellmates, inmates or staff living or working in the same tier, and all inmates or staff living or working in the same building. Other inmates and staff with whom a potential source case had contact during work, education, health care, or other programs, as well as recent visitors, might be considered close contacts. Table 13 shows that 85 percent of correctional systems responding to the NIJ/CDC survey consider cellmates to be close contacts. Most systems (80 percent of State/Federal and 61 percent of responding city/county systems) consider inmates living on the same tier to be close contacts. In addition, 82 percent of State/Federal and 54 percent of responding city/county systems count staff working on the same tier as close contacts. Recent visitors and inmates and staff living or working in the same building are less likely to be considered close contacts, particularly in city/county jail systems. In the Georgia State system, inmates in the same education and work programs as potential source cases are also considered close contacts.

If a potential source case was recently transferred from another facility, CDC recommends that inmates and staff who may have been close contacts in the previous facility be identified for possible screening. Conversely, any persons who may have been close contacts of an infectious TB case but were subsequently transferred to other facilities should be tracked to their new facilities and followed up there. Table 13 also shows that most State/Federal systems, but far fewer city/county systems have policies for tracking contacts in these ways.

In general, CDC recommends a "concentric circles" approach to contact investigation. This should begin with the

Table 13

Tracking/Screening of Close Contacts November 1992–March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Who Is Considered a Close Contact?				
Cellmates	44	86%	26	84%
Inmates—Same Tier	41	80	19	61
Staff—Same Tier	42	82	17	54
Inmates/Staff—Same Building	26	51	5	16
Recent Visitors	24	47	3	10
Tracking Close Contacts				
Inmates Transferred to Other Facilities	43	84	12	39
Inmates at Former Facility(ies) of Index Case	39	76	10	32
Screening All Close Contacts				
Same Facility	46	90	22	71
Other Facilities	43	84	12	39
Visitors/Others Outside Correctional Facilities	17	33	3	10

Source: NIJ/CDC Questionnaire Responses.

persons believed to have the closest and most prolonged contact and those most susceptible due to HIV infection or other immunosuppression, then move out in successive steps to those with less intensive or prolonged contact. The individuals in each group should be screened until a group is identified with no evidence of recent infection (i.e., a level of infection similar to that in the total inmate population), which signals that the contact investigation can be safely terminated. During the course of the contact investigation, the confidentiality of the potential source case must be protected.

Finally, table 13 shows that 90 percent of State/Federal systems and 71 percent of city/county systems screen all close contacts in the same facility. The vast majority of State/Federal systems (84 percent) also report screening close contacts in other facilities; a far smaller percentage (39 percent) of city/county systems have such policies. Only 33

percent of State/Federal and 10 percent of city/county systems screen contacts outside the correctional system, such as visitors. An additional feature of the screening program for close contacts in the New York State system, where HIV seroprevalence approaches 20 percent among male inmates and may be even higher among women, is the testing of all close contacts for anergy.

The smaller percentages of city/county systems with screening policies for all categories of close contacts reflects the rapid turnover and shorter stays characteristic of jail populations, which may render initiation of any screening program impractical.

Prompt screening of close contacts is an important feature of an effective program. However, only 35 percent of State/Federal systems and 42 percent of responding city/county systems reported screening close contacts within three days of possible exposure. Much larger percentages (49 percent of State/Federal systems and 29 percent of city/county systems) reported screening contacts within three months of exposure.

Finally, 91 percent of State/Federal systems and 70 percent of city/county systems have policies to retest close contacts whose negative PPD was within three months of last exposure (the CDC recommendation).

Preventive Therapy for TB

Preventive therapy with INH substantially reduces the likelihood that TB-infected persons will develop active disease. CDC recommends that, once active disease has been ruled out, all PPD-positive persons who are non-HIV-infected be considered for at least six months of INH (300 mg daily or 900 mg twice weekly) and dually-infected persons be considered for 12 months of prophylaxis.

CDC recommends that all preventive therapy be directly observed. This is particularly important since people on preventive therapy are asymptomatic and may never have experienced TB symptoms, a circumstance that offers little incentive for them to adhere to a lengthy course of medication.

INH has some potentially serious side effects, particularly exacerbation of underlying liver diseases including hepatitis, but CDC recommends that a history of liver disease not be considered a contraindication for INH preventive therapy as long as such patients' liver function is carefully monitored while they are on the medication. Disagreement on this point has led some correctional medical staff and other clinicians to recommend that INH preventive therapy be voluntary. This is the policy in New York State, for example, although it is "under constant review" by the Chief Medical Officer. Inmates in New York State for whom preventive therapy is considered appropriate are counseled to accept such therapy, but not required to do so.[1]

Indeed, CDC does not recommend that all persons in certain categories be given INH preventive therapy on a mandatory basis. Rather, the guidelines list groups, in descending order of priority, whose members ought to be considered for INH prophylaxis. These include PPD-positive persons in the following categories: persons with known or suspected HIV infection; close contacts of contagious TB cases; recent skin-test convertors; persons at risk for reactivation TB who were previously untreated or inadequately treated; injection drug users; persons with other medical conditions placing them at increased risk for TB disease; and all other persons under 35 years of age.

CDC's original recommendations for TB control in correctional facilities were limited to PPD-positive persons in the above groups. However, HIV-infected and other immunocompromised persons who are infected with TB may be false negatives on the PPD test. Subsequently, CDC has recommended anergy testing of persons with known or suspected HIV infection and provision of INH prophylaxis to those who are anergic.[2] There have also been recommendations from TB clinicians and researchers that INH prophylaxis be provided, as a matter or course, to all HIV-infected injection drug users without PPD testing or anergy testing. This recommendation excluded black females who have been found to test more accurately on the PPD.[3]

Table 14 summarizes correctional systems' policies regarding INH preventive therapy. Sixty-seven percent of State/Federal systems and 55 percent of responding city/county jail systems exceed CDC recommendations by offering preventive therapy to all PPD-positive persons. This is the policy of the Georgia Department of Corrections.

Only 12 percent of State/Federal systems and 19 percent of city/county systems place all HIV-infected inmates on INH preventive therapy, regardless of PPD result. However, the vast majority (80 percent of State/Federal systems and 65 percent of city/county systems) provide INH prophylaxis to all persons coinfected with HIV and TB. Finally, 43 percent of State/Federal systems and 52 percent of city/county systems provide TB preventive therapy to all anergic HIV-infected persons. The Georgia system is about to institute this policy.

Table 14

INH Preventive Therapy for Inmates November 1992–March 1993

	State/Federal Prison Systems (N=51)		City/County Jail Systems (N=31)	
	Number of Systems	% of Systems	Number of Systems	% of Systems
Inmates Offered Preventive Therapy				
All PPD-Positive Inmates	34	67%	17	55%
HIV-Infected Inmates				
Regardless of PPD Result	6	12	6	19
If PPD-Positive	41	80	20	65
With Anergy	22	43	16	52
Close Contacts				
Regardless of PPD Result	16	31	8	26
If PPD-Positive	27	53	16	52
Duration of Therapy				
≥ 12 Months for HIV-Positive	35	69	17	55
≥ 6 Months for HIV-Negative	46	90	28	90
Directly Observed Therapy				
All Inmates	34	67	25	81
Some Inmates	12	24	5	16
None	5	10	1	3
TOTAL	51	101[a]	31	100

Source: NIJ/CDC Questionnaire Responses.

[a]Due to rounding.

Only 53 percent of State/Federal and 52 percent of city/county systems in the survey provide INH preventive therapy to PPD-positive close contacts of infectious TB cases, despite the fact that this category is third highest on CDC's priority list. Fewer still (31 percent of State/Federal systems and 26 percent of city/county systems) provide preventive therapy to all close contacts regardless of PPD result.

As to duration of preventive therapy, 90 percent of both State/Federal and city/county systems provide at least six months' therapy to HIV-negative inmates, but only 69 percent of State/Federal and 55 percent of city/county systems provide at least 12 months' therapy to HIV-infected inmates (the CDC recommendation).

Two-thirds of State/Federal systems and 81 percent of responding city/county systems have DOT policies for all inmates on preventive therapy. In the New York State system, which provides INH preventive therapy on a voluntary basis, about 5,000 inmates are on therapy, and all administration is directly observed. The Georgia system, by contrast, does not use DOT for preventive therapy but distributes supplies of medication in "blisterpacks," which facilitate compliance monitoring. In addition, the Georgia system distributes vitamins with each INH dose, a procedure that staff believe encourages compliance with INH therapy, since inmates welcome the vitamin supplements.

Finally, 96 percent of State/Federal systems and 97 percent of city/county systems monitor all inmates on INH preventive therapy for adverse drug reactions.

Other Infection Control Measures

It is frequently said that in tuberculosis "treatment equals prevention"—that is, the best infection-control strategy is the prompt identification and proper isolation and treatment of persons with contagious TB.[4] However, other infection-control strategies may be employed to complement good diagnosis, isolation, and treatment. The additional infection-control measures fall into three categories: restriction of transfers; personal respiratory protection; and environmental measures.

In Georgia State prisons, all transfers and other movement of inmates within the system can be, and have been, halted temporarily when a case of TB transmission occurs. Movement in the system was temporarily stopped for this reason five times during 1992.[5] In New York State, transfers of inmates with contagious TB are not permitted without the approval of the Deputy Commissioner/Chief Medical Officer.[6]

Personal respiratory protection measures that may be considered for both inmates and staff include masks and particulate respirators. Numerous types of such devices are available, and opinions differ as to which are preferable. At St. Clare's Hospital, New York City, which maintains a secure unit for State prisoners with HIV and TB, dust/mist respirators are used in preference to dust/mist/fume respirators. The medical director of the unit notes that some respirators require deep breathing, which may be difficult for persons with asthma or other respiratory problems. She recommends doing pulmonary function tests or, at least, screening interviews to inform individual recommendations for respiratory protection.[7]

Some types of respiratory protection may present security problems because their use inhibits hearing and/or peripheral vision. These issues should also be considered in the selection process.[8]

Survey results reveal that 78 percent of State/Federal prison systems and 87 percent of responding city/county jail systems provide respiratory protection measures for both inmates and staff. The most popular mask is the type with a single elastic band (used in 61 percent of State/Federal systems and 74 percent of responding city/county jail systems). Dust/mist/fume respirators are used in 37 percent of State/Federal systems and 26 percent of responding city/county systems.

Environmental measures include special locations for cough-inducing procedures, as well as ultra-violet lights, HEPA filters, and ventilation improvements. Cough-inducing procedures, such as sputum induction, bronchoscopy, and administration of aerosolized pentamidine (for prophylaxis and treatment of *Pneumocystis carinii* pneumonia), increase the risk of TB transmission if they are not performed in well-ventilated areas. For this reason, the New York State system has reduced the use of aerosolized pentamidine and increasingly substituted treatment with bactrim.

Some correctional systems, such as New York City's, have provided special sputum induction booths for cough-inducing procedures. Sixty-seven percent of State/Federal systems perform cough-inducing procedures in negative-pressure isolation rooms at the correctional facility or in a community hospital, 24 percent in the correctional facility's infirmary, and 10 percent conduct some of these procedures in the inmate's cell (the least preferred place) or other

location. Among responding city/county jail systems, 81 percent do cough-inducing procedures in negative-pressure rooms or in community hospitals, 13 percent in the facility infirmary, and 6 percent in other places including inmates' cells.

Ultraviolet (UV) lights are used in some hospitals and homeless shelters to kill tubercle bacilli in the air. They may be especially useful in high-volume, high-turnover areas. However, UV lights may pose other health risks unless they are properly maintained and appropriate precautions are taken in their use. In any event, CDC recommends that UV lights only be used as a supplement to other infection control measures such as proper ventilation.[9] Fourteen percent of State/Federal systems and 19 percent of responding city/county jail systems employ UV lighting, and 49 percent and 29 percent, respectively, have taken steps to improve ventilation. High Efficiency Particulate Air (HEPA) filters are used to improve ventilation and air disinfection in some health care settings. However, only 10 percent of the correctional systems responding to the NIJ/CDC survey reported use of HEPA filters. At the Georgia Correctional Medical Institution, HEPA filters are deployed in offices used for interviews and medical appointments of inmates with suspected or confirmed cases of TB disease.

Endnotes

1. See, for example, Greifinger, Glaser, and Heywood, "Tuberculosis in Prison," pp. 13–14.

2. CDC, "Purified Protein Derivative (PPD)-Tuberculin Anergy and HIV Infection: Guidelines for Anergy Testing and Management of Anergic Persons at Risk of Tuberculosis," *MMWR*, 1991; 40(RR–5): 27–33.

3. T.J. Jordan et al., "Isoniazid as Preventive Therapy in HIV-Infected Intravenous Drug Abusers: A Decision Analysis," *Journal of the American Medical Association*, June 12, 1991; 265: 2987–2991.

4. Barnes et al., "Tuberculosis in Patients with HIV Infection," p. 1648.

5. Interview with staff at Augusta Correctional Medical Institution, March 15, 1993.

6. Dr. Robert Greifinger, Deputy Commissioner and Chief Medical Officer, New York State Department of Correctional Services, personal communication, March 1993.

7. Interview with Dr. Victoria Sharp, St. Clare's Hospital, New York City, February 4, 1993.

8. Greifinger, Glaser, and Heywood, "Tuberculosis in Prison," p. 18.

9. R.L. Riley and E.A. Nardell, "Clearing the Air: The Theory and Practice of Ultraviolet Air Disinfection," *American Review of Respiratory Diseases*, 1989; 139: 1286–1294.

Chapter 8

Discharge Issues

Few correctional systems offer medical furlough or temporary release specifically for inmates with TB disease. Seven percent offer home release programs, and 18 percent offer release to community hospitals. Since TB is an AIDS-defining condition, however, some inmates with HIV-related TB may be eligible for early release programs for those with AIDS or other terminal illnesses.

In any case, many inmates on treatment for TB disease or INH preventive therapy will be paroled or reach the end of their sentences before they complete their courses of medication. Some persons with contagious TB disease may be released as well. Although there is no legal authority to detain inmates beyond the expiration of their sentences for any reason, compliance with medication regimens may, in some jurisdictions, be made a condition of parole.

Careful discharge planning and coordination with public health officials are necessary to assist releasees in completing their treatment in the community and to protect the public health. Persons about to be released should also be given a supply of their medication with clear instructions on their prescribed course of treatment.

The correctional department should report to public health agencies and parole officials, as required by law or regulations, and link releasees with appropriate medical and social services. In some communities, health departments or other agencies offer DOT supervision and other supportive services for persons on TB treatment or prophylaxis. Persons about to be released should be put in touch with those services if they are available.

Virtually all (95 percent) correctional systems responding to the NIJ/CDC survey have policies for referring releasees on TB treatment or prophylaxis to the local health department's TB program, and 88 percent report the medical status and locating information for releasees to the local health department. However, only 41 percent of State/Federal systems and 19 percent of responding city/county jail systems reported that they actually made appointments with health departments or other service providers for inmates prior to their release.

The Georgia correctional department notifies local or county health departments of persons on TB treatment or prophylaxis who are about to be released to their communities. In this way, public health agencies can follow up with releasees and provide services to help them comply with their medication regimens.

In New York City, releasees from Rikers Island who are on TB treatment or prophylaxis receive a supply of their medication and a card detailing their course of treatment and providing a contact person and telephone number for Montefiore/Rikers Island Health Services. If the releasee seeks treatment in the community and presents this card, the provider can call and obtain information on the patient's history and other details of the case to assist in rendering the most appropriate continuing care.

Chapter 9

Training and Education

Both inmates and staff need to understand the truth about TB transmission and how to prevent it, so that misinformation and undue concern may be forestalled. TB is transmitted through the air, but inmates and staff should know that fairly intensive exposure generally is required for transmission to occur. Inmates and health care workers should also receive education on TB prophylaxis and treatment and the importance of completing courses of medication to prevent increased transmission and development of drug-resistant strains.

Only 44 percent of correctional systems responding to the NIJ/CDC survey reported that their staff received training on TB control and treatment from local health departments, but 75 percent reported that their staff received TB education from other sources. Fifty-nine percent of State/Federal systems and 45 percent of responding city/county jail systems reported that their inmates received training on tuberculosis prevention and treatment. In New York State, one of those hardest hit by the TB resurgence, TB education is mandatory for inmates and staff. This includes instructor-led sessions with opportunities for discussion.

CDC and other organizations have prepared TB training and education materials for inmates and staff. CDC's materials include a brochure for inmates called "Doing Time with TB," a series of five factsheets covering exposure to TB, the PPD skin test, TB prevention, treatment for TB, and TB and HIV. These factsheets come in pads. CDC has also issued *Control of Tuberculosis in Correctional Facilities: A Guide for Health Care Workers*, which provides additional detail on implementation of the guidelines (a flowchart to guide screening decisions, exhibits summarizing recommended regimens for TB treatment and prophylaxis, and a sample TB summary record form) as well as clinical background information on TB and a case study of a TB outbreak in a prison.[1] CDC has prepared a narrative text on *Tuberculosis in Correctional Facilities* with 67 accompanying slides providing detailed epidemiologic data and recommendations for treatment and control, and a videotape and wall chart on administering, reading, and interpreting the PPD skin test. Finally, CDC's *Core Curriculum on Tuberculosis* contains much information applicable to the correctional setting. (An order form for CDC's TB materials is included in Appendix A to this report.)

NIJ's National Criminal Justice Reference Service (NCJRS) also provides a variety of materials and services to help correctional systems develop their response to TB. Information on NCJRS is included in Appendix B.

The American Correctional Health Services Association (ACHSA) offers a video on TB control in correctional facilities. This 17-minute video for correctional professionals covers TB screening for inmates and staff, treatment of TB disease, suggested architectural modifications, and changes to security procedures.[2] In addition, the National Prison Project of the ACLU has issued a brochure for inmates and correctional officers called "TB & Prisons: The Facts." This provides basic information on signs, symptoms, prevention, and treatment of TB.[3]

The National Jewish Hospital in Denver offers a one-week course for clinicians on the treatment of tuberculosis. Several videos on various aspects of TB control have also been produced by CDC, the American Correctional Health Services Association, and the New York Lung Association.

Endnotes

1. Centers for Disease Control, National Center for Prevention Services, Division of Tuberculosis Elimination, *Control of Tuberculosis in Correctional Facilities: A Guide for Health Care Workers*, Washington: U.S. Government Printing Office, 1992.

2. Information may be obtained from ACHSA at (513) 223–9630.

3. This publication may be obtained from the National Prison Project, 1875 Connecticut Ave. NW, Suite 410, Washington, DC 20009. Telephone (202) 234–4830.

Chapter 10

Legal Issues

Inmates' complaints about correctional systems' TB policies began reaching the nation's courts as early as the 1940's. In *State ex rel. Baldwin* v. *Superintendent*, 63 A.2d 323 (Md.App. 1949), a case involving a prisoner's complaint that he had been denied proper treatment for TB in the prison hospital, a Maryland Appellate Court ruled that the allegations did not afford a basis for *habeas corpus* relief and "should be addressed to the Board of Correction which is responsible for proper prison management."[1] *Bush* v. *Babb*, 23 Ill.App.2d 285, 162 N.E.2d 594 (Ill.App. 1959), held that the failure of the Cook County Jail authorities to provide adequate TB care was not actionable because decisions concerning jail medical are "quasi-judicial" and protected by immunity.

More recently, courts have recognized that exposure to or failure to treat TB is actionable on the same basis as other claims of "deliberate indifference to serious medical need," the constitutional standard enunciated by the Supreme Court with regard to issues of inmate medical care.[2] During the 1970's and 1980's, failure to isolate or treat TB periodically surfaced in conditions-of-confinement litigation, especially in Southern prisons and jails.[3] *Grubb* v. *Bradley*, 552 F.Supp. 1052 (M.D.Tenn. 1982), found that prison officials had failed to comply with internal procedures and State laws for TB monitoring, reporting, and screening. A Federal District Court in *Nicholson* v. *Choctaw County, Ala.*, 498 F.Supp. 295, 299–300, 309 (S.D.Ala. 1980), cited the failure of corrections authorities to respond to TB among jail populations, and in *Feliciano* v. *Barcelo*, 497 F.Supp. 14, 28, 38 (D.P.R. 1979), a District Court in Puerto Rico, noting the occurrence of a TB epidemic, required medical screening for TB and other diseases.[4]

In *McFadden* v. *State*, 542 So. 2d 871 (Miss. 1989), the Supreme Court of Mississippi held that some correctional officials are liable to lawsuit for failure to establish and implement appropriate TB control procedures. In this case, the court considered the appeal of a Circuit Court decision dismissing the suit of an inmate who allegedly contracted tuberculosis from fellow prisoners. The Circuit Court had dismissed the suit for failure to state a claim[5] and the issues before the Mississippi Supreme Court were whether and when such a plaintiff may proceed past the pleadings stage in the face of the qualified immunity to such suits enjoyed by public officials.[6]

In its ruling on the appeal of the dismissal of the inmate's civil action, the Mississippi Supreme Court ruled that three of the defendants, the State of Mississippi, the Department of Corrections, and the Board of Corrections as a separate legal entity, enjoy absolute immunity to such a suit.[7] Noting that the individuals named as defendants enjoy no such absolute immunity, the Supreme Court affirmed dismissal of the complaint against the State's Governor on the ground that it "cannot imagine any set of facts within the scope of the complaint and within the statutory duties of the governor... [that the appellant] had identified which would have entitled him to relief."[8] With respect to the Commissioner of Corrections and the Superintendent, however, the Supreme Court ruled that the Circuit Court erred when it dismissed so much of the complaint as charged these defendants with intentional and/or constructively intentional and/or grossly negligent actions that proximately caused his injury.[9]

Finally, the court in *McFadden* v. *State* took up the plaintiff's claims against three prison physicians. While regarding as "quite slight" the likelihood that the plaintiff could prove intentionally tortious conduct on the part of these defendants, the court reversed as well the Circuit Court's dismissal with respect to these defendants.[10] In a less than resounding decision for the plaintiff inmate, the court concluded by stating:

> Nothing said here should be taken as deciding whether plaintiff may be entitled to proceed to trial against any or all of the defendants remaining in

> the case; only that plaintiff is entitled to proceed beyond the Rule 12(b)(6) [failure to state a claim] stage consistent with this opinion.[11]

To date, the most thorough judicial examination of prison tuberculosis issues appears in a case arising from an outbreak at the Minnesota Correctional Facility.[12] The outbreak at the center of *DeGidio* v. *Pung*, 704 F.Supp. 922 (D. Minn. 1989), came about after an inmate admitted with active TB in early 1982 infected several hundred other inmates. At least eight of these inmates developed TB disease.

Citing the failure to diagnose promptly and treat the initial cases, to advise inmates of their exposure, to test all inmates even after all staff had been tested, to develop a policy and protocol and the facility's policy of leaving patient education to an unqualified laboratory technician, a Federal District Court in Minnesota found that the response by prison officials and the State department of health amounted to deliberate indifference.[13] The court cited a "failure of coordination" in which "[n]o one claims ultimate responsibility for the many supervisory functions within the health services unit." It described a "passing of blame and responsibility between the Department of Health, the administrative director of health services, and the staff physicians" in which "[e]ach person describes his or her role narrowly, and disclaims ultimate responsibility for directing the effort at controlling tuberculosis."[14]

In rejecting the arguments of the defendants that, viewed individually, the specific claims of inadequate or improper medical care did not violate the Eighth Amendment, the District Court wrote that, "When all of defendants' omissions and instances of neglect are viewed in the whole . . . the breaches of established norms are more than trivial.[15] Nonetheless, the District Court denied the plaintiffs injunctive relief on the ground that after 1986 the defendants had made "great progress" with respect to reducing the risk of an outbreak of TB and that the constitutional violation was not likely to recur as of the time of trial.[16]

Although not directly appealed, the District Court's conclusions in *DeGidio* v. *Pung* came under appellate review in the context of an attorneys' fees application.[17] In *DeGidio* v. *Pung*, 723 F.Supp. 135 (D.Minn. 1989), the District Court found that the plaintiffs were "prevailing parties" entitled to attorneys' fees because the suit was a "catalyst" that in large part prompted the defendants' reform efforts; on appeal of the case to the Eighth Circuit, the Appeals Court had to determine whether these reforms were "required by law" and therefore had to review the District Court's findings that the Eighth Amendment had been violated. The decision in *DeGidio* v. *Pung*, 920 F.2d 525 (8th Cir. 1990), affirmed the District Court's conclusion that "a consistent pattern of reckless or negligent conduct is sufficient to establish deliberate indifference" and that the record showed such a pattern on the defendants' part.[18] In particular, the Appeals Court cited with approval the District Court's finding concerning the lack of adequate organization, control, and overall supervision in the health services program.[19]

Ogle v. *State of New York*, Claim No. 75561, NYLJ, 12/26/91, p. 1, involved a former prison inmate's medical malpractice lawsuit against prison officials alleging that doctors at three state prisons failed to diagnose and treat his tuberculosis.[20] In ruling for the former inmate and awarding him a $256,000 judgment, the Binghampton, New York, Court of Claims found that none of the testimony of prison physicians (e.g., that tuberculosis was rare in 1986 and that the form contracted by the inmate—TB of the spine or Pott's Disease—was particularly difficult to diagnose) excused their negligence in assuming that the inmate's symptoms were psychosomatic. The court found that State physicians committed malpractice by ignoring the plaintiff's positive TB skin test results in their diagnoses, assuming his complaints were psychosomatic without conducting further tests to rule out a physical cause, and violating written correctional department policy and guidelines on TB treatment. In his decision, the Court of Claims judge found the former inmate 20 percent responsible for his injuries because of his failure adequately to inform prison doctors of his prior medical treatment at Rikers Island and his refusal early in his incarceration to be admitted to an infirmary. Nonetheless, the judge awarded damages for pain and suffering; the state had paid the plaintiff's medical expenses, and he had no work history on which to measure damages for lost earnings.[21]

In *Office of Inmate Advocacy* v. *Fauver*, 536 A.2d 1306 (N.J.Super.A.D. 1988), involving an appeal of the New Jersey Department of Corrections' adoption of amendments to regulations governing medical screening of new county jail inmates, a New Jersey Superior Court Appellate Division held that the abandonment of provisions that provided that all inmates be tested for infectious diseases and adoption of amendments provided for testing at the discretion of county jail physicians were not unconstitutional. Additionally, the court's ruling found that the Department of Corrections had a sufficiently rational basis for amending its regulations to avoid being overturned as arbitrary or capricious.

Under the revised New Jersey regulations, medical examination by a physician is required where none was required before, but leaves to the doctor's discretion whether to order

tests for disease. The prior regulation mandated testing for all incoming inmates but did not specifically enumerate the infectious diseases for which testing was required.[22] The appellant, the Office of Inmate Advocacy (OIA), had attacked the amendments on constitutional grounds alleging that inmates' rights to mandatory testing for sexually transmitted diseases and tuberculosis are so "fundamental" as to require that any restriction on those rights be justified by a greater showing of governmental need than would be applicable to a less intrusive health regulation. Additionally, OIA's appeal involves the Eighth Amendment prohibition against cruel and unusual punishment and Article I, Paragraph I of the New Jersey Constitution (the right to enjoy life, liberty, and to pursue and obtain safety and happiness).[23]

In its ruling the New Jersey court declared that no cases have been found that hold that the kind of preadmission testing sought by the appellant is constitutionally required.[24] In *Lareau* v. *Manson*, 651 F.2d 96 (2nd Cir. 1981), inmates brought a Federal class action under 42 *U.S.C.A.* § 1983 alleging that overcrowded prison conditions violated their Eighth and Fourteenth Amendment rights. Among their complaints, the plaintiffs in *Lareau* v. *Manson* alleged that incoming prisoners were not screened for communicable diseases. In its ruling the Court of Appeals for the Second Circuit upheld the findings of the District Court[25] that the resulting threat to the inmate population was so serious as to constitute punishment without due process under the Fourteenth Amendment and cruel and unusual punishment under the Eighth Amendment.[26] As part of its remedy, the Appeals Court in *Lareau* v. *Manson* ordered that inmates be examined within 48 hours of their admission and defined "such tests as are necessary in the opinion of the physician to identify and isolate those who have communicable diseases."[27]

As in *Lareau* v. *Manson*, the regulation under attack in *Office of Inmate Advocacy* v. *Fauver* requires a medical examination by a doctor upon admission and calls for tests if deemed necessary by the physician. The New Jersey court found no proof that the lack of mandatory testing for sexually transmitted diseases and tuberculosis has resulted in, or is likely to result in, "medically significant consequences." The new regulation, stated the court, is intended to heighten counties' responsibilities with regard to medical screening.[28]

At Rikers Island in New York City an isolation unit has been constructed in response to the court order in a TB case.[29] The court's order in *Vega* v. *Sielaff*, 92–Civ.–6475 (S.D. NY), forced the New York City Department of Corrections to construct 42 negative-pressure isolation rooms at Rikers Island by May 1, 1992. The Department complied with the order and the isolation unit opened on schedule.

Jolley v. *Keane*, NY Sup.Ct., Westchester Cnty., No. 15385, 12/22/92, involved the case of a prisoner at Sing Sing who refused to undergo a PPD skin test for TB infection on the ground that his religion forbade injecting a substance into his body. With no way of telling whether the inmate was TB-positive or not, prison officials put him on "medical keeplock," confining him to his cell 24 hours a day without exercise or visitation. In a petition filed in State court, the inmate asked that his privileges be equivalent to the somewhat less restrictive ones accorded persons who were found to be infected with TB but did not have contagious TB disease. In dismissing the petition, the judge said officials can restrict the privileges of any inmate who refuses to take a tuberculosis skin test, even for religious reasons. In finding the regulation valid, the judge cited the high incidence of TB in the State and its correctional facilities and the prison's need to control TB, and wrote that:

> There is a valid, rational connection between mandatory testing and the governmental interest of identifying and controlling the spread of TB. There is also a valid, rational connection between mandatory medical keeplock and the need for an effective medical program that identifies the spread of the disease.[30]

The court found the mandatory testing and mandatory medical keeplock for those who refuse the screening process to be religiously neutral (nondiscriminatory). It noted that while the inmate's proposal for alternative treatment "focuses on the question of contagion . . . [it] ignores the need to identify, track, and offer treatment to all first-stage individuals. To allow petitioner to avoid the PPD screening would have significantly more than a de minimis cost to respondent's valid penological interests."[31]

In another recent TB case in Pennsylvania, a court ordered the State prison system to provide improved TB prevention and control measures. Citing the importance of protecting inmates with HIV-related and other illnesses, a Federal District Court judge in Philadelphia granted a preliminary injunction in September 1992 forcing the Pennsylvania Department of Corrections (DOC) to implement a set of new guidelines for the treatment of inmates with tuberculosis.[32] In granting the motion in *Austin* v. *Pennsylvania Department of Corrections*, Civ. No. A 90–7497, 1992 WL 277511 (E.D. Pa. Sept. 29, 1992), the District Court noted the possible physical danger a delay in enacting the new regu-

lations could pose to inmates with diminished immune systems and the amplified opportunities for TB transmission in the prison setting.

The class-action lawsuit was brought on behalf of inmates at 14 DOC institutions, challenging Pennsylvania's intent to delay implementation of the Department of Corrections' Clinical and Administrative Guidelines for the Prevention and Management of Tuberculosis until an independent contractor could develop a program to ensure its implementation and effectiveness. Arguing for immediate enactment, the inmate class provided medical evidence that any delay in treatment of TB may allow infected inmates to develop drug-resistant strains of the disease. Finding a "probability of irreparable injury to the plaintiff class in the absence of relief," the court went on to note:

> Individuals infected with both HIV and TB are more likely to develop active TB disease in areas of the body other than the lungs. Therefore, an active TB control program is particularly important in correctional institutions. Inmates confined at correctional institutions face a higher risk of being infected with TB than the general public due to the close proximity of inmates, the high level of dust particles on which droplet nuclei can become attached and mechanically recirculated air which has not been exposed to sunlight or ultraviolet light. Inmates are also more likely than members of the general public to be HIV-positive."[33]

Pennsylvania's 1992 TB Policy was designed to replace regulations promulgated during the mid-1980's. Among other things, the new policy requires TB screening for all inmates upon intake and annually thereafter, segregation of inmates pending receipt of the test results, preventive therapy for inmates with TB infection, and semiannual TB screening of inmates known to be infected with HIV.[34]

Two practical problems may have flowed from the result in *DeGidio* v. *Pung* that are avoided by the order in the *Austin* v. *Pennsylvania Department of Corrections*. First, the plaintiffs in *DeGidio* had no court order on which to rely should the defendants return to their former practices. Second, their failure to obtain an injunction led the court to reduce the plaintiffs' attorneys' fees awarded by 65 percent, a strong disincentive to future litigation.[35]

In *Wilder* v. *Leak*, No. 90 C 5044, 1992 WL 97678 (N.D. Ill. May 4, 1992), a Federal District Court in Illinois refused to dismiss a prisoner's civil rights complaint against the Cook County Department of Corrections based on its failure to separate TB-positive from TB-negative inmates, a policy that the plaintiff alleged resulted in his being infected with TB while in custody. The court also agreed to appoint counsel for the prisoners.[36]

In *Hill* v. *Marshall*, 962 F.2d 1209 (6th Cir. 1992), another recent decision involving a prisoner with tuberculosis, the Federal Court of Appeals for the Sixth Circuit upheld a damage award of $95,000 in compensatory damages plus $990,000 in punitive damages to a prisoner who did not receive prescribed preventive treatment for tuberculosis.[37] In May 1981, after developing symptoms of tuberculosis, Lawrence Hill, the inmate plaintiff was given a PPD test. The results of the test were positive, confirming tuberculous infection. Isoniazid (INH) and Vitamin B-6 were prescribed and Hill began treatment. Subsequently, the inmate was twice moved to new facilities. Following the second transfer, he alleges that he was told he would receive his medication by standing in the "pill line," but that he took this action day after day but never received his prescription. Hill further alleges that even after complaining and sending "kites"—informal written complaints—to the infirmary administrator and the Deputy Superintendent of Treatment at the facility, his problem was ignored and he continued to be deprived of his medication.[38]

In his Federal civil rights action, the plaintiff alleged cruel and unusual punishment violative of the Eighth Amendment. The defendant cross-appealed, challenging on several grounds the judgment on the jury verdict for the plaintiff. The decision of the Sixth Circuit held that evidence in the case sustained a finding that prison officials had violated the inmate's rights with respect to prescription medication, that an award of $95,000 in actual damages was supported by the record, and that there was sufficient evidence to permit an award of punitive damages.

In its decision the Circuit Court cited *Estelle* v. *Gamble*, 429 U.S. 97 (1976), the Supreme Court case that established the "deliberate indifference" standard:

> [D]eliberate indifference to serious medical needs of prisoners constitutes the "unnecessary and wanton infliction of pain" proscribed by the Eighth Amendment. This is true whether the indifference is manifested by prison doctors in their response to the prisoner's needs or by prison guards in intentionally denying or delaying access to medical care or intentionally interfering with the treatment once prescribed.[39]

Relying on both *Estelle* v. *Gamble* and two later cases[40] and strong evidence presented by the appellant of a pervasive pattern of indifference to inmates' medical needs generally,

the Circuit Court found that the failure of the Deputy Superintendent of Treatment at the Southern Ohio Correctional Facility to review and respond to inmates' medical needs was so likely to result in the violation of the inmates' constitutional rights as to warrant a finding of deliberate indifference.[41]

Although the events at issue in *Hill* v. *Marshall* date from 1981, the case is of particular interest because of the more recent resurgence of tuberculosis in prisons and jails.[42] Despite the size of the damage award, Hill did not develop active TB in the nine years that passed before the 1990 trial. Although the defendants alleged that he had therefore suffered no compensable loss, the court held:

> Hill has suffered an actual injury, in that he was prevented, by... [the prison official's] indifference to his medical needs, from reducing his risk of developing tuberculosis by approximately ninety percent through INH. Because he received INH for part, but not all, of the prescribed year, Hill may be in an even worse position than if he had not received INH at all, because the tuberculosis bacteria that are in his system may have become resistant to the drug. Hill testified that he suffered a great deal of mental anguish on this account...[43]

With respect to his increased risk of developing the disease, the court held that he "did not have to show more than 50 percent risk of developing active tuberculosis, only that his risk had increased due to the deprivation."[44]

Not surprisingly the courts have taken a range of approaches to assessing the right to damages in tuberculosis cases. *Hill* v. *Marshall* stands for the proposition that any prisoner whose tuberculosis medication program is substantially interrupted by a malfunctioning prison medication delivery system may be entitled to a substantial award of damages, even if there have been no measurable medical consequences by the time of trial.[45] In *Sypert* v. *United States*, 559 F.Supp. 546 (D.D.C. 1983), a Federal District Court, applying Virginia law under the Federal Tort Claims Act, held that exposure to tuberculosis without development of the active disease did not constitute the "physical injury" that is required before a plaintiff may recover tort damages for mental anguish. In *Plummer* v. *United States*, 580 F.2d 72 (3rd Cir. 1978), another Federal Tort Claims Act case, the Court of Appeals for the Third Circuit observed that under Pennsylvania law, such damages may be awarded on a showing of a "physical impact, however slight"—a requirement easily met by the "impact" of the tubercle bacillus. In addition, Pennsylvania has adopted the "zone of danger" rule, which permits damages to be awarded to persons placed in physical danger without regard to actual impact.[46]

DeGidio v. *Pung*, in the view of many correctional health legal observers, is only the latest and clearest judicial declaration that delivering medical care to hundreds or thousands of people, especially those confined to prisons and other correctional settings that limit their ability to seek medical care freely and directly, is a problem requiring systemic solutions.[47] Together with *Hill* v. *Marshall* and several of the other recent court decisions, *DeGidio* emphasizes the importance of coordination, followup, and supervision in correctional medical care systems. This is particularly important in connection with TB because of the possibility of airborne transmission of the infection. Additionally, TB demands that medical service providers conduct long-term followup treatment to ensure that the disease is cured and does not develop drug resistance.[48] These concerns are further heightened by the prevalence of HIV infection in prison populations, since HIV-infected persons are particularly susceptible to many diseases including TB, and since their depressed immune systems render the usual diagnostic methods ineffective in many cases.[49] Due to these factors, many current suits and consent decrees involving prison conditions and medical care may need to be altered or reopened to address TB.[50]

Endnotes

1. *State ex rel. Baldwin* v. *Superintendent*, 63 A.2d 323 (Md.App. 1949). *Habeus corpus*, meaning "to produce the body," refers to the authority of a court of superior jurisdiction to test the legality of a detention.

2. *Estelle* v. *Gamble*, 429 U.S. 97 (1976). See, e.g., *Freeman* v. *Lockhart*, 503 F.2d 1016 (8th Cir. 1974); *Waltenberg* v. *New York City Department of Corrections*, 376 F.Supp. 41 (S.D.NY 1974). Also see *Woolsey* v. *Beto*, 450 F.2d 321 (5th Cir. 1971), involving allegations that the plaintiff's TB was activated by improper work assignments and segregation.

3. J. Boston, "Highlights of Most Important Cases, Tuberculosis Case a Wake-Up Call," *The National Prison Project Journal*, Case Law Report, Washington, D.C.: National Prison Project of the American Civil Liberties Union, Fall 1992, Vol. 7, No. 4, p. 6.

4. Also see *Holt* v. *Hutto*, 363 F.Supp. 194, 200 (E.D. Ark. 1973), in which the court wrote that it "goes without saying that tubercular inmates must be segregated," a

task that is complicated by the closing of the State tuberculosis sanitarium.

5. All of the defendants in the case had moved jointly to dismiss the plaintiff's complaint, asserting immunity to suit and charging that the complaint failed to state a claim upon which relief can be granted; Rule 12(b)(6), Miss.R.Civ.P.

6. *McFadden* v. *State*, 542 So.2d 871, 873 (Miss. 1989).

7. Ibid., p. 876.

8. Ibid, p. 878. The Mississippi Supreme Court relied on similar reasoning in affirming dismissal of the complaint against the members of the Board of Corrections, members of the Leflore County Board of Supervisors, and an official of the Mississippi Department of Health, pp. 878–883.

9. *McFadden* v. *State*, 542 So.2d 871, 881.

10. Ibid., p. 882.

11. Ibid., p. 883.

12. *DeGidio* v. *Pung*, 704 F.Supp. 922 (D. Minn. 1989), cited in J. Boston, "Highlights of Most Important Cases, Tuberculosis Case a Wake-Up Call," *The National Prison Project Journal*, Case Law Report, Washington, D.C.: National Prison Project of the American Civil Liberties Union, Fall 1992, Vol. 7, No. 4, pp. 6, 7.

13. *DeGidio* v. *Pung*, 704 F.Supp. 922, 937-59 (D.Minn. 1989).

14. Ibid., p. 957.

15. Ibid., p. 956.

16. Ibid., pp. 959–960. Also see *DeGidio* v. *Pung*, 125 F.R.D. 503 (D.Minn. 1989), denying the parties' posttrial motions.

17. J. Boston, "Highlights of Most Important Cases, Tuberculosis Case a Wake–Up Call," p. 7.

18. Ibid., p. 533.

19. Ibid., p. 531. Many other Federal and state cases have considered the adequacy of prison medical care and Eighth Amendment challenges by prisoners alleging cruel and unusual punishment based on the poor quality of that care, inadequate staffing, substandard facilities, failure to segregate healthy inmates from contagious prisoners, and the like. In *Laaman* v. *Helgemore*, 437 F.Supp. 269 (D.N.H. 1977), the District Court in New Hampshire noted, *inter alia*, the danger posed by an initial failure of the prison health system to provide for discovery of latent and incubating diseases and medical problems (p. 312); and the need for a ward for inmates with contagious diseases not mandating hospitalization or for other inmates who simply need to be monitored (p. 314).

20. In *Ogle* v. *State*, 535 N.Y.S.2d 190, 142 A.D.2d 37 (A.D. 3 Dept. 1988), a reported 1988 ruling from the case, the court held that the treatment a prison inmate received at correctional facilities and at a medical center to which he was transferred could not be considered part of one "continuous treatment," for purposes of tolling the 90-day period within which the inmate had to give State notice of his malpractice claim.

21. G. Spencer, "Award to Inmate for Failure to Detect TB," *The New York Law Journal*, 12/26/91, pp. 1, 4.

22. *Office of Inmate Advocacy* v. *Fauver*, 536 A.2d 1306, 1307 (N.J.Super.A.D. 1988).

23. Ibid.

24. Ibid., p. 1308.

25. See *Lareau* v. *Manson*, 507 F.Supp. 1177 (D. Conn. 1980).

26. The Appeals Court cited the test for the constitutional level of prison medical care, under the Eighth and Fourteenth Amendments, as developed in *Estelle* v. *Gamble*, 429 U.S. 97 (1976).

27. *Lareau* v. *Manson*, 651 F.2d 96, 109.

28. *Office of Inmate Advocacy* v. *Fauver*, 536 A.2d 1306, 1308.

29. *Vega* v. *Sielaff*, 92-Civ.-6475 (S.D. NY). Additionally, during 1992 and 1993, court orders were issued in the following prison and jail TB cases: (1) *Dickerson* v. *Castle*, Civ. No. 10256 (Ct. Chancery, Castle Cnty., Del.), a consent order was signed in October 1992; (2) *Hamilton* v. *Marial*, 69-2443 (E.D. La. 1992), in this jail case from New Orleans, a TB order was signed during 1992; (3) *Hadix* v. *Jackson*, 492 CV 110 (W.D. Mich.), a TB consent order was issued in March 1993.

30. *Jolley* v. *Keene*, NY Sup.Ct., Westchester Cnty., No. 15385, 12/22/92, cited in "What Can Prison Official Do If an Inmate Refuses to be Tested?" *Tuberculosis: An*

Old Disease Poses New Challenges to Public Health Policy and the Law, Special Report, Washington, D.C.: Buraff Publications, April 1993, p. 7.

31. Ibid.

32. "PA Prison Told to Speed Enactment of Revised Inmate Health Plan," *AIDS Litigation Reporter*, Westtown, PA: Andrews Publications, December 8, 1992, p. 9140 citing decision in *Austin* v. *Pennsylvania Department of Corrections*, Civ. No. A 90-7497, 1992 WL 277511 (E.D. Pa. Sept. 29, 1992).

33. Ibid., p. 9141.

34. Ibid.

35. S. Burris, "Prisons, Law and Public Health: The Case For a Coordinated Response to Epidemic Disease Behind Bars," *47 University of Miami Law Review 291, 320* (November 1992).

36. Ibid.

37. The Ohio Department of Rehabilitation and Corrections has petitioned the Supreme Court of the United States for a writ of certiorari in *Hill* v. *Marshall*. In the view of the Department, the case is one that establishes precedent of great impact for departments of correction and their employees around the country. The Department believes the case has the potential to complicate, and ultimately discourage, efforts to prevent and treat inmates exposed to tuberculosis or other contagious diseases in the correctional setting. See State of Ohio's Petition For Writ of Certiorari to the United States Court of Appeals for the Sixth Circuit, October Term, 1992 in *Terry Morris* v. *Lawrence Hill*.

38. *Hill* v. *Marshall*, 962 F.2d 1209, 1211 (6th Cir. 1992).

39. *Estelle* v. *Gamble*, 429 U.S. 97, 104 (1976) (Citations omitted).

40. *City of Canton* v. *Harris*, 489 U.S. 378, 109 S.Ct. 1197 (1989), applied the deliberate indifference standard to the failure of a city to adequately train its police to deal with the medical needs of those being held in custody. *Berry* v. *City of Muskogee*, 900 F.2d 1489 (10th Cir. 1990), held that an official or municipality acts with deliberate indifference if its conduct (or adopted policy) disregards a known or obvious risk that is very likely to result in a violation of the prisoner's constitutional rights. See *Hill* v. *Marshall*, 962 F.2d 1209, 1214 (6th Cir. 1992).

41. *Hill* v. *Marshall*, 962 F.2d 1209, 1214 (6th Cir. 1992).

42. Boston, p. 6.

43. *Hill* v. *Marshall*, 962 F.2d 1209, 1214 (6th Cir. 1992).

44. Ibid., p. 1214 (citations omitted).

45. Boston, p. 6.

46. 580 F.2d 72, 76. Neither *Sypert* v. *United States* nor *Plummer* v. *United States* addressed the future risk of developing the disease, since the plaintiffs in both cases had received appropriate treatment and any risk of activation of the disease was held to be balanced by their increased immunity to outside infection (Source: J. Boston, "Highlights of Most Important Cases, Tuberculosis Case a Wake-Up Call," *The National Prison Project Journal*, Case Law Report, Washington, D.C.: National Prison Project of the American Civil Liberties Union, Fall 1992, Vol. 7, No. 4, pp. 6, 7.

47. Boston, p. 8. Also see *Newman* v. *Alabama*, 503 F.2d 1320, 1331 (5th Cir. 1984), in which the court held that "disorganized lines of therapeutic responsibility" contributed to an Eighth Amendment violation; and *Tillery* v. *Owens*, 719 F.Supp. 1256, 1305-06 (w.D.Pa. 1989), in which lack of proper administration of medical services and "general disorganization" of nursing services contributed to an Eighth Amendment violation, *aff'd*, 907 F.2d 418 (3rd Cir. 1990); and *Lightfoot* v. *Walker*, 486 F.Supp. 504, 522-24 (S.D.Ill. 1980), in which organization and administration of health care generally was found to be inadequate.

48. Boston, p. 8.

49. Ibid.

50. See H. Goodman, "ACLU Seeks Order on TB in State Jails," *The Philadelphia Inquirer*, 8/7/92, p. A1.

Appendix

Order Form for CDC Materials

TUBERCULOSIS EDUCATIONAL MATERIALS

Please write in the blank space the desired quantity.

Patient Materials

"Tuberculosis--The Connection Between TB and HIV (the AIDS virus)"
_____ English (00-5738) _____ Spanish (00-5745)

"Tuberculosis--Get the Facts!"
_____ English (00-5743) _____ Spanish (00-5772)

Correctional System Inmate Educational Materials:
(these come in pads of 40 tear off sheets, indicate number of pads required)

Tuberculosis Facts--You can Prevent TB
_____ English (00-5981) _____ Spanish (00-6198)

Tuberculosis Facts--TB and HIV (The AIDS Virus)
_____ English (00-5982) _____ Spanish (00-6199)

Tuberculosis Facts--Exposure to TB
_____ English (00-5983) _____ Spanish (00-6200)

Tuberculosis Facts--The TB Skin Test
_____ English (00-5984) _____ Spanish (00-6201)

Tuberculosis Facts--TB Can be Cured
_____ English (00-5985) _____ Spanish (00-6202)

Slide Series

"Core Curriculum on Tuberculosis"
_____ Booklet (00-5763) _____ Slides (00-6077)

TB in Correctional Facilities
_____Slides (00-6251) _____Narrative Text (00-6231) _____Facsimile of Slides (00-6232)

HIV-Related TB
_____Slides (00-6252) _____Narrative Text (00-5787) _____Facsimile of Slides (00-5788)

Provider Materials

_____ "Improving Patient Compliance in Tuberculosis Treatment Programs" (00-5988)

"What Drug Treatment Centers Can Do To Prevent Tuberculosis"
_____ English (00-5748) _____ Spanish (00-6038)

_____ MMWR December 7, 1990 - "Guidelines for Preventing the Transmission of Tuberculosis in Health-Care Settings, with Special Focus on HIV-Related Issues" (00-5856)

_____ MMWR March 18, 1990 - "Screening for Tuberculosis and Tuberculous Infection in High-Risk Populations" and "The Use of Preventive Therapy for Tuberculous Infection in the U.S." (99-3307)

_____ MMWR July 13, 1990 - "Prevention and Control of Tuberculosis in Facilities Providing Long-Term Care to the Elderly" (99-3327)

_____ MMWR December 28, 1990 - "Tuberculosis Among Foreign-Born Persons Entering the United States" (00-5897)

_____ MMWR April 26, 1991 - "Purified Protein Derivative (PPD)-Tuberculin Anergy and HIV Infection: Guidelines for Anergy Testing and Management of Anergic Persons at Risk of Tuberculosis" (00-5973)

_____ "Control of Tuberculosis in Correctional Facilities: A Guide for Health Care Workers" (00-5994)

_____ MMWR April 17, 1992 - "Prevention and Control of Tuberculosis in U.S. Communities with At-Risk Minority Populations" and "Prevention and Control of Tuberculosis Among Homeless Persons" (00-6148)

_____ MMWR June 5, 1992 - "Prevention and Control of Tuberculosis in Migrant Farm Workers" (00-6223)

_____ MMWR June 19, 1992 - "National Action Plan to Combat Multidrug-Resistant Tuberculosis" "Meeting the Challenge of Multidrug-Resistant Tuberculosis: Summary of a Conference" and "Management of Persons Exposed to Multidrug-Resistant Tuberculosis" (00-6224)

_____ MMWR June 19, 1992 - "Management of Persons Exposed to Multidrug-Resistant Tuberculosis" (00-6225)

_____ Mantoux Tuberculin Skin Testing Videotape (00-5457)

Posters/Wallcharts

_____ Mantoux Tuberculin Skin Test Reading Wallchart (00-5564)

_____ TB/HIV Double Trouble (00-6154)

_____ Think TB! (00-6186)

NAME: _____

Address: _____

_____

_____

_____

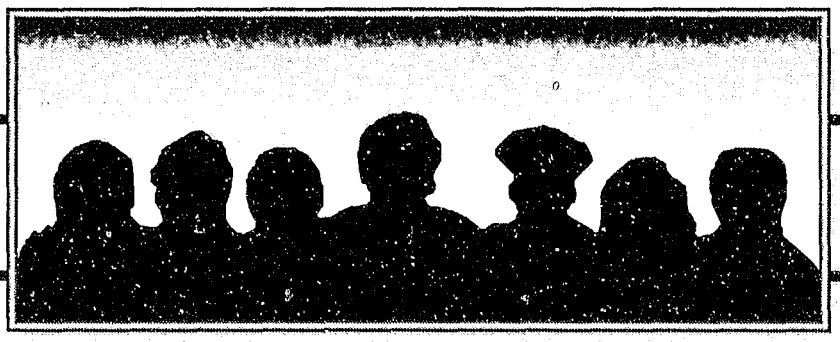
Phone: _____

Send request to: Information Services
National Center for Prevention Services
Centers for Disease Control
1600 Clifton Road NE, Mailstop E-06
Atlanta, Georgia 30333

or Call Voice Information Services Requests (recording) at (404) 639-1819

2-93

*U.S. G.P.O:1994-301-177:80037



The National Institute of Justice responds to issues linking health and justice.

The National Institute of Justice (NIJ) supports a broad range of research and programs to prevent and reduce crime and to improve the criminal justice system. Recognizing the link between health and justice issues, the Institute is intensifying its efforts to combine the insight and experience of several disciplines to solve critical problems affecting health and public safety. Partnerships have been formed and research agendas have been set to address issues of:

- Violence prevention
- Substance abuse treatment
- Family violence and child abuse
- Victimization
- Human development and criminal behavior
- Treatment of mentally-ill offenders
- Health care fraud
- Correctional health care.

For example, with cooperation from the Centers for Disease Control and Prevention, the Institute continued its annual survey on the impact of HIV/AIDS in correctional systems and collected, for the first time, information on tuberculosis in prisons and jails.

For specific information on HIV/AIDS and tuberculosis in correctional systems, or on other NIJ health/justice partnerships and initiatives, **call the National Criminal Justice Reference Service at 800-851-3420.**