U.S. Department of Justice
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Research in Brief

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Issues and Findings

Discussed in this Brief: Results of a 1994 survey cosponsored by NIJ and CDC to determine the existing dimensions of the TB problem in correctional facilities housing adults and the prevention and control strategies being used to address it. The survey followed up on a similar survey in 1992-93 and sought information on infection and disease occurrence (including skin test conversions, coinfection with HIV, and drug-resistant and multidrug-resistant (MDR) TB); tuberculosis screening; isolation, treatment, and preventive therapy; and discharge policies. The study also examined legal issues.

Key issues: Prison and jail officials confront the need to curb the spread of tuberculosis infection and disease in correctional facilities that house high-risk inmates frequently under crowded, poorly ventilated conditions. In addition, they face the problem of preventing recently released inmates with infectious TB disease from infecting members of the communities to which they return. Detecting all cases of TB infection or disease within a facility is difficult because of such problems as:

- Coinfection with HIV resulting in false negative TB skin tests.
- High turnover and short lengths of stay in jails, making it impossible to administer and read TB skin tests for all inmates.

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Tuberculosis in Correctional Facilities 1994–95

by Karen Wilcock, Theodore M. Hammett, Rebecca Widom, and Joel Epstein

Many prisons and jails present optimal conditions for the spread of tuberculosis (TB), a disease that was resurgent in the United States in the 1980's and early 1990's.[1] Correctional facilities house men and women who often come from those segments of the community with high rates and risk of TB because of such factors as poverty, poor living conditions, substance abuse, and HIV/AIDS. Overcrowding in a correctional facility increases the potential for close and repeated contact with an active case of TB. The significant health problem posed by TB is further exacerbated by two factors. First, because of immunosuppression, persons coinfected with TB and HIV may not be reactive on a tuberculin skin test and thus elude detection; persons with unidentified or incompletely treated TB can remain infectious for a long time, further spreading infection and the disease. Second, recent prison outbreaks of multidrug-resistant tuberculosis (MDR-TB) raise the threat of an often untreatable disease spreading in a closely confined population.

CDC Recommendations

Controlling TB in Correctional Facilities (1995), a new CDC publication, is based on the latest recommendations of the Advisory Council for the Elimination of Tuberculosis (ACET) for the prevention and control of TB in correctional facilities. Designed for use by correctional medical staff, correctional facility administrators, health department staffs, and anyone responsible for providing training and guidance in implementing TB control policies, the ACET recommendations cover needs of both short- and long-term correctional facilities. This resource is intended to encourage collaboration between health departments and their jurisdictions' correctional facilities. Specific assistance is provided through case studies, screening algorithms, treatment tables, and sample forms for information management.

Copies may be ordered by calling 404–639–1819, faxing 404–639–8628, or writing:

Information & Technology Services
National Center for HIV, STD, and TB Prevention
Mailstop E–06
Centers for Disease Control and Prevention
1600 Clifton Road, N.E.
Atlanta, GA 30333

Please provide name, organization, address with a ZIP code, and a daytime phone.

Issues and Findings

continued . . .

Key findings: The survey revealed the following with regard to TB infection:

- In 31 State prison systems, 14 percent of inmates had positive tuberculin skin test results at intake.
- In 51 Federal/State systems surveyed, 25 reported a total of 5,609 TB skin test conversions in the 2 years prior to the survey.
- Coinfection with TB and HIV increased among male inmates in some systems since the 1992–93 NIJ/CDC survey, but data on female inmates generally were not provided.

Findings on TB disease included the following:

- The number of inmates with TB disease under treatment declined since 1992-93.
- The use of CDC-recommended negative-pressure rooms to isolate infectious inmates from the rest of the prison population increased.
- Directly observed therapy (DOT) for TB disease became more widespread in correctional systems; directly observed preventive therapy (DOPT) also increased.
- As part of discharge planning, most correctional systems referred to local health department TB programs those inmates who had not completed treatment prior to release or parole.
- However, validation survey results revealed that some facilities were not following their systems' TB treatment and control policies.

Target audience: Corrections officials, public health officials, State and local policymakers.

To determine the scope of the TB problem in prisons and jails, the National Institute of Justice (NIJ) and the Centers for Disease Control and Prevention (CDC) have cosponsored national surveys of tuberculosis and tuberculosis control in correctional facilities in conjunction with surveys of HIV/AIDS.[2] This Research in Brief presents results from the eighth survey of State/Federal prison systems and city/county jail systems, conducted in 1994.

A more complete discussion of basic clinical information and the history of TB in correctional facilities can be found in the previous report,[3] as well as in CDC's published guidelines (see "CDC Recommendations"). Some comparisons between the results of the 1994 survey with those of the 1992–93 survey are possible, although the 1994 survey was not an exact replication of the previous effort.

Survey method

As in earlier NIJ/CDC surveys, questionnaires were sent to 88 correctional systems, including the Federal Bureau of Prisons, all 50 State correctional systems, and 37 large city and county jail systems. The State/Federal response rate was 100 percent; 78 percent of the large city and county jail systems provided information, although the data provided were sometimes incomplete. Questionnaires were answered primarily by correctional health services personnel, but in some cases, certain sections were answered by other correctional administrators. Respondents relied on sources such as internal management information system data and written policies and procedures to complete the survey forms. To ensure a high response rate, telephone followup was carried out over a 6-month period; respondents were also telephoned if key responses on a returned questionnaire were left blank or required clarification.

In addition to the basic survey, a validation survey (an abbreviated version of the main questionnaire covering only key policy issues) was sent to 50 larger

Table 1: ***TB Infection in Inmates 1994***

Percentage of Inmates with positive PPD	Number of Systems (%)	Number of PPD Positive	Percent of PPD Positive[a]
	State/Federal Systems		
Less than 5.0%	12 (24%)	2,006	2.2
5.0–10.9%	10 (20%)	8,532	6.7
11.0–20.0%	5 (10%)	16,232	14.0
More than 20%	4 (8%)	42,148	25.7
Did not report	20 (39%)	N/A	–
Total	51 (101%)[b]	68,918	13.8
	City/County Systems		
Less than 5.0%	6 (21%)	232	2.2
5.0–10.9%	0	–	–
11.0–20.0%	3 (10%)	14,238	15.8
More than 20%	0	–	–
Did not report	20 (69%)	N/A	–
Total	29 (100%)[b]	14,470	6.9

[a] The percent positive was calculated by dividing the reported number of positive skin tests in each category by the reported number of inmates who were given a skin test at intake in each category, and then multiplying the result by 100.
[b] Due to rounding, numbers do not add up to 100 percent.

facilities in 14 State systems and the Federal Bureau of Prisons. An effort was made to achieve representativeness on some broad dimensions (e.g., men's and women's facilities, maximum- and medium-security facilities).

TB infection among inmates

Survey results indicate that TB infection continues to be a frequently observed phenomenon among inmates in correctional facilities, but only a small percentage of infected persons ever develop active disease. The prevalence of infection serves as an indicator of how much disease activity is in a population and also identifies potential candidates for preventive therapy. Correctional systems were asked to report the number of inmates who tested positive at intake during the 2 years preceding the survey (see table 1).

Standard purified protein derivative (PPD) skin tests administered at intake produced positive reactions in more than 68,000 State/Federal and over 14,000 city/county inmates, according to survey responses. Twelve State/Federal prison systems reported that from 0 to 5 percent of prisoners were TB-positive at intake, and four State/Federal systems reported that more than 20 percent of incoming prisoners had positive tests. Rates of positive skin tests at intake ranged from 0 to 27 percent (with a mean of 8.9 percent) among males tested in State/Federal systems; for females, positive rates at intake ranged from 0 to 25 percent (with a mean of 6.7 percent). The few city/county jail systems reporting on PPD results indicated that the percentage of inmates positive at intake ranged from 0 to 16 percent (with a mean of 6.1 percent) among men and from 0 to 17 percent (with a mean of 4.3 percent) among women.

The fact that 39 percent of State/Federal systems and 69 percent of city/county systems reported no data on PPD positivity is important from a policy standpoint because an effective TB control strategy depends fundamentally on the presence of a sound data base.

Skin test conversions. A single positive PPD test result indicates past TB exposure and an infection of unknown duration. Sometimes a change in skin test reaction, or conversion from negative to positive, occurs between screening intervals. Conversions, either among inmates or staff, indicate the likely transmission of infection from one or more active cases within the same facility. Long-term inmates and all staff with negative skin test reactions should be retested annually. For short-term inmates, such as those in city/county jails, it is less likely that two TB skin-tests can be performed during incarceration.

Conversions among inmates. Correctional systems were asked how many inmates had skin test conversions in the 2 years prior to the survey (see table 2); however, since data were not sought on the number of inmates with initial negative test results who were tested for TB infection twice in the past 2 years, conversion rates could not be calculated.

Six State/Federal prison systems reported no skin test conversions among inmates during the 2 years preceding the 1994 survey, while 19 systems reported having documented evidence of skin test conversions in which both negative and positive test results were obtained during the inmate's confinement in that system. Seven State/Federal systems reported having over 100 such conversions. Two city/county jail systems had documented conversions among inmates. However, 51 percent of State/Federal systems and 79 percent of city/county systems provided no information on inmate skin-test conversions.

Twenty-five State/Federal prison systems reported a total of 5,609 PPD conversions for the 2 years prior to the 1994 survey. Only six city/county jail systems provided conversion information in 1994; of the 18 documented conversions they reported, 17 occurred within a single system. This large number of conversions in a single jail system may have been discovered through a contact investigation, although systems were not asked to elaborate on the circumstances of PPD testing.

Table 2: ***Skin Test Conversions Among Inmates***

Skin Test Conversions in Past 2 Years	State/Federal Systems		City/County Systems	
	Number of Systems (%)	Total Number of Conversions	Number of Systems (%)	Total Number of Conversions
0	6 (12%)	0	4 (14%)	0
1–10	6 (12%)	21	1 (3%)	1
11–100	6 (12%)	221	1 (3%)	17
More than 100	7 (14%)	5,367	0	–
Did not report	26 (51%)	N/A	23 (79%)	N/A
Total	51 (101%)[a]	5,609	29 (99%)[a]	18

[a] Due to rounding, numbers do not add up to 100 percent.

Conversions among staff. Twenty State/Federal prison systems reported a total of 598 conversions, and 13 city/county jail systems reported 62 conversions. Fourteen systems reported having no staff with PPD conversions (see table 3). Many systems failed to report the number of documented skin test conversions among staff during the 2 years preceding the survey. This is because the usual practice is for staff to be tested outside of the prison or jail system, and the prison or jail system does not always receive records of their tests and results. It is important for the designated TB control person in each correctional system to collect this information, in order to monitor and evaluate TB screening and containment.

Coinfection with HIV

Systems were asked to report the number of PPD-positive inmates for the 2 years preceding the survey who were also HIV-positive. This question was posed as the last in a hierarchical series in 1994:

- How many inmates had been skin-tested at intake during the previous 2 years?
- How many of those tested were PPD-positive?
- How many of the PPD-positive inmates were also HIV-positive?

Among prisoners in State/Federal systems with both TB and HIV test results, approximately 11 percent were TB-positive. Of these PPD-positive prisoners, 9 percent were coinfected. In city/county jail systems, 0.3 percent of PPD-positive prisoners were also HIV-positive.

Many systems were unable to provide data on TB and HIV coinfection, particularly for women inmates. Reports were available for male inmates from 19 State/Federal prison systems and from 14 such systems for women. Three city/county jail systems provided this information for men, and two provided it for women. Seven State/Federal systems reported no instances of coinfection among male PPD-positive inmates. In five State/Federal systems, fewer than 1 percent of PPD-positive men were also HIV-positive; in five other systems, from 1 to 10 percent of male inmates were coinfected, and over 10 percent of PPD-positive men were also positive for HIV in two systems. Eight State/Federal systems reported no cases of coinfection among females with positive PPD tests; two systems reported that between 1 and 10 percent of PPD-positive women were also positive for HIV, and four systems reported that more than 10 percent of women were both PPD- and HIV-positive.

The 1992–93 survey had also asked systems to report on coinfection, but not in a hierarchical framework—as used in 1994; in addition, systems were not asked in 1992–1993 to provide information on intake. As a result, the 1992–1993 and 1994 surveys are not directly comparable in this respect. Sixteen State/Federal systems responded to this question in both surveys; three reported a decrease in coinfections, seven reported the same number for both surveys, and six reported an increase. A total of 87 coinfections in State/Federal systems were reported in 1992–93; in 1994, the number of coinfected at intake was 1,581. New York reported the largest number of coinfected inmates in both surveys, with 34 in 1992–93 and 1,512 in 1994.

One city/county jail system reported 0.2 percent coinfection for men; the other two responding jail systems reported that 8 and 42 percent, respectively, of male TB-positives were also HIV-positive. For females, both reporting city/county jail systems indicated that no cases of coinfection had been found.

Table 3: ***Skin Test Conversions Among Staff***

Skin Test Conversions in Past 2 Years	State/Federal Systems		City/County Systems	
	Number of Systems (%)	Total Number of Conversions	Number of Systems (%)	Total Number of Conversions
0	10 (20%)	0	4 (14%)	0
1–10	6 (12%)	21	8 (28%)	36
11–100	3 (6%)	85	1 (3%)	26
No response	32 (63%)	N/A	16 (55%)	N/A
Total	51 (101%)[a]	598	29 (100%)	62

[a] Due to rounding, numbers do not add up to 100 percent.

TB disease among inmates

The survey asked correctional systems whether any prisoners currently in the system were under treatment for TB disease (excluding *Mycobacterium avium*, a tuberculous infection causing neurologic complications that is often associated with AIDS). The majority of systems reported having between 0 and 10 cases of TB under treatment, as shown in table 4. Total populations for

the correctional systems in each category are presented to establish a context for these figures. The total numbers for the various systems were reported as of May 1, 1994 (they can, therefore, be used as a midyear total population estimate), while information on the number of prisoners under treatment was often drawn from records having various dates. For the 51 State/Federal systems, reporting dates ranged from December 1993 (one system) to mid-December 1994. Dates for city/county systems ranged from the end of January 1994 to late September 1994. Some data are missing, particularly for women. For example, a system may have reported cases of TB disease for men and not for women, meaning either that there were no cases for women or that the count was simply unavailable. Many systems indicated they had no cases for men or women. As a result, the data do not provide a solid basis for calculating formal TB case rates.

State/Federal systems reported 663 cases under treatment in the 1994 survey, compared to 805 in 1992–93. Four State/Federal systems did not provide this information in 1994; two of these had reported no cases in 1992–93, and the others had reported 4 and 12 cases, respectively. In 1992–93, 372 cases were under treatment in city/county systems, while the 1994 survey indicated 256 such cases. The fact that seven systems provided no case numbers in 1994, compared to four in the earlier survey, may account for part of the discrepancy in figures for city/county jails. At least one of this round's nonresponding systems indicated in the earlier survey that it had a large number of cases under treatment.

Drug-resistant TB among inmates. Tuberculosis disease that is resistant to the leading medications poses very serious problems for correctional facilities. Resistant strains of TB can be transmitted to others. If a TB strain is resistant to only one drug, others from the list of the most effective treatments can be selected; however, if a strain is resistant to both isoniazid (INH) and rifampin (RMP), the two most widely used and effective anti-TB drugs, then treatment options are seriously reduced. In both surveys, a similar number of systems reported about the same numbers of drug-resistant TB cases; however, systems were not asked to provide information on cumulative inmate cases of drug-resistant TB disease in 1994, as they had been in 1992–93.

Of the 35 cases with any drug resistance reported to the 1994 survey (as shown in table 5), 24 (69 percent) were cited as being resistant to both INH and RMP. Although based on relatively small numbers, this proportion is much higher than that found in a nationwide survey conducted by the CDC, where 24 percent (114/472) of cases with any drug resistance were resistant to both INH and RMP.[4]

TB control policies

TB is an airborne disease, transmitted via droplet nuclei (e.g., the dried residue of droplets from sneezes or coughs) from patients who have pulmonary or laryngeal TB and who cough, laugh, spit, or otherwise emit sputum containing the TB bacteria (called *Mycobacterium tuberculosis*). TB can be transmitted through repeated exposure in crowded, poorly ventilated environments; it does not require intimate contact. Priority TB control activities, as identified by CDC[5] are:

• Rapidly identifying, reporting, isolating, and initiating appropriate therapy for active and potentially infectious cases of TB.

Table 4: ***Inmates Under Treatment for Active TB Disease***

Inmates Currently Under Treatment for TB Disease	State/Federal Systems			City/County Systems		
	Systems	Cases	Total Inmatesa	Systems	Cases	Total Inmatesa
0 cases	14	0	105,314	11	0	18,548
1–10 cases	23	85	297,231	12	45	55,998
11–50 cases	6	177	180,804	3	77	22,246
51–100 cases	3	268	152,051	2	134	41,103
More than 100 cases	1	133	23,817	0	0	0
Did not report	4	N/A	76,589	1	N/A	18,478
Total	51	663	835,806	29	256	156,373

[a] Total Inmates reflect reported prison populations as of May 1, 1994. Current cases were reported as of the last recorded information available. These dates varied widely.

• Ensuring the continuity and completion of therapy through direct observation and other adherence-enhancing strategies.

• Rapidly identifying and evaluating contacts of infectious TB cases and initiating preventive therapy for infected persons.

• Identifying persons with TB infection at high risk for developing active TB and ensuring that they complete a full course of preventive therapy.

CDC's specific guidelines for TB control in correctional facilities are designed to help these facilities avoid the spread of TB and diminish the numbers of cases that are exported to the community as prisoners are released. The CDC guidelines have recently been updated and include recommendations for both long- and short-term facilities, thus providing more specific guidance for jails as well as for prisons.[6]

Screening policies and practices

CDC guidelines for TB screening. Several types of screening for TB are used in correctional facilities. Symptom screening involves checking for signs and symptoms of TB through a systematic interview that inquires about persistent, productive cough; chest pain; coughing up blood; fever, chills, and night sweats; loss of appetite and weight loss; and tiring easily, especially during the preceding 6 weeks. Symptom screening should be performed as soon as possible. During the regular medical evaluation, inmates should be asked whether they have had TB disease, been treated, or received preventive therapy for TB.

A second screening procedure involves the PPD (purified protein derivative) or Mantoux tuberculin skin test. The PPD is injected under the skin and, after 48 to 72 hours, interpreted by an experienced reader, who measures the diameter of the swollen area that can be felt around the injection site and records the result in millimeters. Chest radiographs are also used in screening for TB disease when the incidence or prevalence of TB is high and the time required for skin testing makes that method impractical or may delay the isolation of infectious persons. Generally, a posterior-anterior view of the chest is taken.

For all facility types, CDC recommends TB symptom screening of incoming inmates. Inmates who are found to have symptoms of TB should be isolated and further evaluated. For short-term facilities serving populations at low risk for TB, this is the only recommended screening. To fall in this category, facilities would have no existing cases and draw inmates from communities that have had no TB cases within the previous year. Some small facilities in rural areas may meet this definition.

CDC recommends more than symptom screening in short-term facilities with high-risk populations. Prisoners who stay long enough should be tuberculin skin-tested within 14 days of arrival if their medical records do not include a documented positive skin test result. Those with TB symptoms or with positive tuberculin skin tests should be given radiographs and medical evaluations. Any inmates known to be HIV-positive or to be at high risk for HIV should be given a radiograph as part of the initial screening process. CDC suggests that large jails may want to consider using onsite radiography for all prisoners.

CDC recommends that while long-term facilities also begin with symptom screening, they should give a skin test to each asymptomatic inmate without a documented prior positive result. An inmate with positive PPD results should be given a radiograph and evaluated; an inmate who tests PPD-negative but is HIV-positive or at high risk for HIV also should be given a radiograph and evaluated. Annual PPD tests are recommended for inmates who have negative tests.

Screening recommendations for staff include an evaluation of medical history during the physical exam performed at hiring and mandatory tuberculin skin-testing for those without a documented positive skin-test result. Staff members who have not been tested for 12 months or more should be retested. Any staff member with symptoms suggestive of TB should be sent

Table 5. ***Current Inmate Cases of Drug-Resistant TB Disease***

Current Inmate Cases	State/Federal Systems		City/County Systems	
	Number of Systems	Number of Cases	Number of Systems	Number of Cases
0	40	0	23	0
1–10	8	18	4	4
More than 10	1	13	–	–
Did not report	2	N/A	2	N/A
Total	51	31	29	4

home until infectious TB has been ruled out. A staff member who has positive test results should be given a radiograph and a medical evaluation. Further, staff members should be told that if they are immunosuppressed for any reason, they should consult their personal physicians for additional followup.

Screening practices. Prison and jail systems were asked to report on screening practices for TB infection and disease. Tables 6 and 7 show the responses to questions about who is screened and how frequently. Of the 51 State and Federal prison systems, 44 (86 percent) reported screening all incoming inmates for TB disease. Of the 29 responding city and county jail systems, 24 (83 percent) reported screening all inmates at intake.

Thirty-three facilities in 13 systems responded to the validation study on this issue and revealed that not all facilities followed system policy with respect to screening for TB disease. Ten of the systems that participated in the validation study reported screening all incoming inmates for TB disease, but only 85 percent of the 26 facilities in these 10 systems reported carrying out this policy.

Table 7. ***Screening Inmates for TB Infection***

Current Inmate Cases	State/Federal Systems		City/County Systems	
	Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
Screening				
All individuals	50	98%	19	66%
All HIV+	42	82	19	66
All close contacts of active TB cases	42	82	23	79
Missing/none	1	2	0	–
Screening Frequency				
At intake	51	100	20	69
At intake and annually	46	90	12	41
At release	2	4	1	3

Screening inmates for TB infection is more common than screening for TB disease in State/Federal correctional systems. Of the 51 State/Federal prison systems, 50 reported screening all incoming inmates for TB infection, and 44 stated that this policy was mandatory. Of the 29 city/county jail systems, 19 (66 percent) reported testing all incoming inmates, and 14 indicated that this was mandatory. All systems in the validation study reported testing all incoming inmates for TB infection, and all of the facilities in these systems reported carrying out this policy. For 11 of the systems in the validation study, testing of all incoming inmates was mandatory, and 82 percent of the facilities in these systems complied. In 1992–93, systems were asked if inmates were routinely tested for TB infection at least annually, while in 1994, they were asked if they were tested at intake and at regular intervals thereafter. Forty State/Federal systems reported annual testing in 1992–93, and 46 systems reported testing at intake and regular intervals thereafter in 1994.

Table 6. ***Screening Inmates for TB Disease***

Current Inmate Cases	State/Federal Systems		City/County Systems	
	Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
Screening				
All individuals	44	86%	24	83%
All known HIV+	1	2	2	7
Other	2	4	2	7
Missing/none	4	8	1	3
Total	**51**	**100%**	**29**	**100%**
Method				
Minifilm X-ray	7	14%	6	21%

Housing policies and practices

A primary TB control measure is the isolation of infectious cases to prevent spreading the disease to other inmates. The most common and recommended isolation measure in prisons and jails is use of negative-pressure isolation rooms (i.e., isolation rooms with ventilation that does not flow into the general ventilation system) either in the infirmary or in a community hospital. As shown in table 8, 61 percent of State/Federal systems reported using

negative-pressure isolation rooms in the prison infirmary, and 59 percent of these systems reported using negative-pressure rooms in community hospitals. When the two categories are combined, 65 percent of State/Federal systems reported using negative-pressure rooms in the infirmary, community hospitals, or both. Of city/county jail systems, 48 percent reported using negative-pressure rooms in jail infirmaries, and 52 percent reported using negative-pressure rooms in community hospitals. When the categories are combined, 66 percent of city/county jail systems reported using negative-pressure rooms in one or the other location, or in both.

These 1994 NIJ/CDC survey results show some important changes since 1992–93. Where just under one-third of prison and jail systems reported using negative-pressure rooms for all inmates with potentially infectious TB in the earlier survey, in 1994 the proportion reporting the exclusive use of negative-pressure rooms had more than doubled.

In 1994, 76 percent of prison systems and 72 percent of jail systems reported isolating inmates until three negative sputums had been collected on consecutive days. (The current CDC recommendation is that three consecutive sputums be collected on different days and, additionally, that the patient must be on effective therapy and improving clinically.) Fourteen of the 39 prison systems reporting this practice also mentioned using other indicators to determine duration of isolation, as did 6 of 21 jail systems. In 1992–93, 82 percent of prison systems and 64 percent of jail systems had reported isolating inmates until they could produce three successive daily negative sputum smears.

The validation study showed that approximately two-thirds of the facilities in systems that reported policies for isolating TB cases in negative-pressure rooms agreed that this was their practice. Ten of the 13 systems in the validation study indicated that inmates were isolated until three negative sputum smears were collected, and 68 percent of the facilities in these systems followed this practice. These results suggest that significant minorities of facilities are admittedly not following recommended TB control procedures—despite their systems' policies calling for such measures.

Table 8. ***Housing of Inmates With Confirmed or Suspected TB Disease 1994***

	State/Federal Systems		City/County Systems	
	Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
Housing Placement				
General population: Double cells	1	2%	2	7%
Single cells	1	2	2	7
Separate unit	3	6	1	10
Prison/jail infirmary Wards	1	2	0	–
Single rooms	13	25	6	28
Negative-pressure isolation rooms	31	61	14	48
Community hospital Negative-pressure isolation rooms	30	59	15	52
Duration of isolation				
About 3 days	0	–	2	7
About 2 weeks	4	8	4	14
Until symptoms disappear	7	14	5	17
Until 3 negative sputums on consecutive days	39	76	21	72
No isolation	5	10	2	7

Treatment policies and practices

Current CDC guidelines[7] recommend that the initial course of treatment for TB disease for most patients should include four drugs: INH, RMP, pyrazinamide (PZA), and either ethambutol (EMB) or streptomycin (SM). PZA and SM should not be used in pregnant women. If there is little possibility of drug resistance (i.e., the primary INH resistance rate in the community is less than 4 percent, and the patient has had no previous treatment for TB, is not from a country with a high prevalence of drug-resistant TB, and has had no known exposure to a patient with drug-resistant TB), then the

Table 9: ***Treatment of Inmates with TB Disease***

	State/Federal Systems		City/County Systems	
	Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
Duration of Therapy				
HIV+ Inmates				
9 months or more	25	49%	14	48%
Other	17	33	13	45
None specified	7	14	1	3
Missing	2	4	1	3
HIV-inmates				
6 months or more	40	78	19	66
Other	5	10	9	31
None specified	3	6	0	–
Missing	3	6	1	3
Directly Observed Therapy				
All inmates	48	94	26	90
Selected inmates	3	6	3	10
None	0	–	0	–
Total	**51**	**100%**	**29**	**100%**

first three of the drugs listed can be used. In persons with positive smears or cultures at the beginning of therapy, response to treatment should be monitored by smear and culture at least monthly until the results are negative. Directly observed therapy (DOT) is recommended for all inmates.

As shown in table 9, 94 percent of State/Federal prison systems reported employing DOT for all inmates receiving treatment for TB disease, as did 90 percent of city/county jail systems. In 1992–93 only 77 percent of prison systems and 84 percent of jail systems reported using DOT for all inmates under treatment for TB disease. Validation study results showed a 90-percent agreement between facilities and systems with respect to DOT for inmates under treatment.

The majority of HIV-negative inmates were treated for at least 6 months for TB (the CDC-recommended treatment duration) in 1994 (78 percent for State/Federal systems and 66 percent for city/county systems). In 1992–93, 77 percent of both prison and jail systems reported treating HIV-negative inmates for at least 6 months. Forty-nine percent of State/Federal systems and 48 percent of city/county systems reported treating coinfected inmates for 9 or more months in 1994, while more than 60 percent of both prison and jail systems had reported this policy in 1992–93. It should be noted that in 1994, the CDC recommended that treatment duration be changed to 6 months for drug-susceptible, coinfected persons responding adequately to therapy.[8]

INH preventive therapy

Most asymptomatic but infected inmates should be given preventive therapy with INH to reduce their likelihood of developing active disease.[9] CDC recommends that, once active disease has been ruled out, all PPD-positive persons who are non-HIV-infected be considered for at least 6 months of INH (300 mg daily or 900 mg twice weekly) and dually infected persons be considered for 12 months of prophylaxis.[10]

CDC also recommends that all preventive therapy be directly observed.[11] 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. The 1994 survey results on preventive therapy practices are presented in table 10.

As was the case for TB disease treatment, an increased percentage of prison systems reported in the 1994 survey that directly observed prevention therapy (DOPT) was provided for all inmates with TB infection (76 percent vs. 67 percent in 1992–93). Nine of the 51 State/Federal systems that reported not using DOPT in the earlier survey reported its use in 1994. However, four prison systems that did not use DOPT in 1994 had reported employing it in 1992–93. The percentage of jail systems using DOPT for all infected inmates was approximately the same.

According to the validation study, reports from systems and facilities as to who received preventive therapy were somewhat inconsistent. Ten of 13 systems in the validation study stated they practiced DOPT, while 88 percent of the reporting facilities in those 10 systems claimed to administer DOPT to all inmates. Most (12 of the 13 in the validation study) systems reported that all inmates under 35 years

Table 10: ***INH Preventive Therapy for Inmates***

	State/Federal Systems		City/County Systems	
	Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
Inmates Offered Preventive Therapy				
All PPD-positive inmates	30	59%	10	35%
All PPD-positive under 35 years	36	71	19	66
HIV-infected inmates regardless of PPD result	11	22	2	7
HIV-infected and PPD-positive	38	75	23	79
With anergy	28	57	17	59
All close contacts with TB disease	19	37	12	41
Only close contacts with PPD-positive	22	43	14	48
Recent skin test converters	37	74	19	66
Duration of Therapy				
At least 12 months for HIV-positive	41	80	18	66
At least 6 months for HIV-negative	49	96	24	83
Directly Observed Therapy				
All inmates	39	76	24	83
Some inmates	9	18	4	14
None	2	4	1	3
Missing	1	2	0	–
Total	**51**	**100%**	**29**	**100%**

of age with positive skin tests received preventive therapy, and 72 percent of facilities in those systems agreed. Nine of the 13 systems in the validation study reported that they gave preventive therapy to recent converters, to all inmates with positive reactions—whatever their age, and to all coinfected inmates. The concurrence rates for facilities in these systems were 83 percent, 55 percent, and 78 percent. Eight systems in the validation study stated that they administered preventive therapy to all HIV-positive inmates who demonstrated anergy (i.e., no response to the skin test); only 45 percent of the facilities in these systems reported doing this. Four systems in the validation study said they administered therapy to all close contacts of a TB case; the agreement rate from facilities in these systems was 58 percent.

Discharge policies

Systems were asked about discharge planning for inmates with TB disease or infection who had not finished their course of therapy prior to discharge or parole. Most systems (94 percent of State/Federal systems and 100 percent of city/county systems) reported that they referred inmates to local health department TB programs on release. Many systems also informed health departments about inmates and provided locating information (86 percent of State/Federal and 97 percent of city/county systems). Relatively few systems went as far as scheduling appointments for inmates (32 percent of State/Federal and 38 percent of city/county systems). Validation study results showed that all 13 systems said they referred inmates to health departments, and 88 percent of facilities in those systems agreed; 12 systems reported that they informed health departments about inmates, and 81 percent of facilities agreed. However, five systems reported that they scheduled appointments for inmates, but only 30 of the facilities in those systems confirmed this practice.

The 1994 survey did not include specific questions on environmental controls, nor were questions posed concerning education and training. Systems were asked to indicate whether they would like to receive assistance from the public health department on a number of different aspects of TB control. Over 30 systems expressed an interest in receiving help with educational programs/materials and with discharge planning. Other types of assistance were of interest as well, but to a smaller number of systems.

Legal issues

Correctional officials may be concerned about liability with respect to the transmission and treatment of TB in their facilities. Additional discussion on this

topic can be found in the report on the 1992-93 survey.[12] Recently adjudicated cases have centered on two issues:

• Failure to protect inmates from acquiring TB or provide adequate treatment or care.

• Failure to respect individuals' constitutional rights by instituting a mandatory TB testing program.

Six instances alleging the first type of failure have been reported. In a case in a Federal District Court in Wyoming, *Blumhagen* v. *Sabes*[13], a prisoner claimed that following the discovery of an active case of TB, prison officials had the entire prison population screened for the disease but failed to quarantine or isolate the sick inmate. Followup tests or proper procedures to control the spread of the disease were not performed, and the prison population was not monitored.

The District Court found that the prisoner's allegations amounted to differences of opinion about proper medical treatment and not "the type of subjective indifference to the medical needs of the prisoners that the controlling cases require." The court's decision in *Blumhagen* acknowledged the decision in *DiGidio* v. *Pung*[14] (holding that "a consistent pattern of reckless or negligent conduct is sufficient to establish deliberate indifference") but distinguished the ruling and held that it need not be followed. The *Blumhagen* decision also noted that the court had found no decisions holding that "speculative harm in future is sufficient to meet" the "serious medical need" requirement. Finally, the court noted that the plaintiffs may have a claim for malpractice and that Wyoming had waived its sovereign immunity.

Three cases in Texas also revolved around issues of adequate protection of inmates from TB. Two of these are pending against the Harris County Sheriff, while a third case was dismissed. *James H. King* v. *Johnny Klevenhager [sic], Sheriff, et al.*,[15] involves a plaintiff's "civil suit for medical negligence." The plaintiff alleges that, while housed in the Harris County Jail during 1992, he received inadequate medical attention, was subjected to intolerable living conditions due to overcrowding, and was exposed to tuberculosis. *Preston Briggs* v. *Jerry Eversole et al.*,[16] another *pro se* case, involves a plaintiff's "complaint for violation of civil rights pursuant to 42 USC § 1983." In his pleadings the plaintiff claims that, since his incarceration in the Harris County Jail in January 1993, his civil rights have been violated. Among his claims are assertions that he was unreasonably exposed to tuberculosis from other inmates, that he was injured on an ongoing basis because of the inadequate flow of air in the jail, and that he received inadequate medical attention. In a case that was dismissed, *John Friedel and Dorcas Friedel* v. *Sheriff Johnny Klevenhagen et al.*,[17] the plaintiff alleged that he contracted tuberculosis while in prison, that the disease was never properly diagnosed, and that he was never treated for his TB.

Two cases in Massachusetts dealt with the issue of violating inmates' civil rights through mandatory testing programs. The primary issue in *Langton* v. *Commissioner of Correction*,[18] was whether prison officials are authorized to compel inmates to submit to TB testing under State law. The inmates argued that the defendants had no authority to force them to submit to the TB test. In Massachusetts, the State Legislature had mandated specifically that, during each prisoner's physical exam, special attention be given to determining the presence of communicable diseases, particularly pulmonary tuberculosis.

The Appeals Court ruled that the Commissioner of Correction has the responsibility to maintain security, safety, and order at all State correctional facilities. The court further ruled that, although an inmate's incarceration does not divest him of the right of privacy and interest in preserving his bodily integrity, it does limit those constitutional rights when the State's interests in prison security and inmate health are at issue. Furthermore, the court said that disciplinary procedures implemented to deal with inmate refusals to take the TB test were lawful.

On the other hand, a Federal District Court judge in New York recently ruled that the State correctional department must return to the general population a person who had been held in "medical keeplock" (solitary confinement) for 3-1/2 years because he refused a PPD test. Skin testing is mandatory for New York State inmates, but this prisoner refused the test on the grounds that it violated the tenets of his Rastafarian religion. In an affidavit, the inmate stated that "accepting artificial substances into the body constitutes a sin and shows profound disrespect to our creator." The court held that the inmate, "in choosing to undergo the conditions of medical keeplock for a period of over 3-1/2 years, had shown remarkable conviction for what he stated are his religious beliefs."[19]

Implications for policy and practice

These recent legal cases, as well as concerns about the spread of TB within correctional facilities—and, ultimately, beyond, as released inmates return to their communities–indicate the need for continuing attention to prison health policies and practices. The study found that although policies for the prevention, treatment, and control of tuberculosis

have been mandated by legislatures or stipulated as corrections systems policies, some facilities did not comply.

Incarceration may also represent a unique public health opportunity to provide long-term, directly observed therapy to persons with TB disease and directly observed preventive therapy to those who might otherwise go untreated. Following CDC guidelines, strong TB prevention, treatment, and control programs in correctional facilities can help contain the spread of TB within the greater community.

Notes

1. Hammett, T. and L. Harrold, Tuberculosis in Correctional Facilities, Issues and Practices, National Institute of Justice and Centers for Disease Control and Prevention, 1994.

2. Ibid.

3. Ibid.

4. Alan Bloch et al., "Nationwide Survey of Drug-Resistant Tuberculosis in the United States," Journal of the American Medical Association, March 2, 1994, 271:665-671.

5. CDC, Screening for tuberculosis and tuberculous infection in high risk populations: recommendations of the Advisory Council for the Elimination of Tuberculosis," Morbidity and Mortality Weekly Report, 44(No. RR-11):19-34, 1994.

6. CDC, Controlling Tuberculosis in Correctional Facilities, Atlanta 1995.

7. Ibid.

8. ATS/CDC, "Treatment of Tuberculosis and Tuberculosis Infection in Adults and Children," Am J Respir Crit Care Med, 149:1359-74, 1994.

9. ATS/CDC, "Control of Tuberculosis in the United States," Am Rev Respir Dis, 146:1623-1633, 1992.

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11. CDC, "Prevention and Control of Tuberculosis in Correctional Facilities: Recommendations of the Advisory Council for the Elimination of Tuberculosis."

12. Hammett and Harrold, *Tuberculosis in Correctional Faclities*, chapter 10.

13. Blumhagen v. Sabes, 834 F. Supp. 1347, 1353 (D. Wyo. 1993).

14. DiGidio v. Pung, 920 F. 2nd 525 (8th Cir. 1990).

15. James H. King v. Johnny Klevenhager [sic], Sheriff, et al., No. 93-52770.

16. Preston Briggs v. Jerry Eversole et al., No. H–93–1485.

17. John Friedel and Dorcas Friedel v. Sheriff Johnny Klevenhagen et al., No. 93–58890.

18. Langton v. Commissioner of Corrections, 614 N.E. 2d 1002 (Mass. App. Ct. 1993).

19. McKinley, James C. Jr., "Isolation Ends for Prisoner Who Refused Testing for TB," *New York Times*, August 22, 1995, p. B5.

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