

This Health Hazard Evaluation (HHE) report and any recommendations made herein are for the specific facility evaluated and may not be universally applicable. Any recommendations made are not to be considered as final statements of NIOSH policy or of any agency or individual involved. Additional HHE reports are available at <http://www.cdc.gov/niosh/hhe/reports>

HEALTH HAZARD EVALUATION REPORT

HETA 92-0345-2457

**ORANGE COUNTY EMPLOYEES
GOSHEN, NEW YORK**

HETA 92-0345-2457
SEPTEMBER 1994
ORANGE COUNTY EMPLOYEES
GOSHEN, NEW YORK

NIOSH INVESTIGATOR:
DOUGLAS B. TROUT, M.D., M.H.S.

SUMMARY

In 1993 and 1994 NIOSH conducted a study to evaluate the occupational transmission of tuberculosis (TB) among employees of Orange County, New York, who work in the District Attorney's Office and the Departments of Mental Health, Social Services, and Probation. Five hundred forty County employees, divided into suspected "exposed" and "unexposed" groups according to their likelihood of working with populations at high risk for TB, were asked to participate in a tuberculin skin testing (TST) program. By entering this program, employees would receive an initial purified protein derivative (PPD) skin test and a repeat PPD test after one year.

One hundred forty eight (27%) employees participated in the initial TST, with seven found to be skin test positive, indicating prior infection. Of the remaining 141, 132 were available for repeat skin testing after a one year period; 78 (59%) participated in the follow-up TST program. In the follow-up TST program, one person was found to convert from skin test negative to skin test positive. That person, who worked in the Social Services Department in a suspected "exposed" job, was placed on preventive therapy after active TB was ruled out.

A tuberculin skin testing program was conducted among employees in Orange County, New York, some of whom were potentially occupationally exposed to populations at high risk of tuberculosis. One person (out of a total of 78 who completed the study) was found to convert from skin test negative to skin test positive over a one year period. A low participation rate prevented any conclusions concerning the occupational risk of tuberculosis among these County employees. The Orange County Health Department should continue the skin testing program for those workers who are potentially occupationally exposed to tuberculosis.

KEYWORDS: SIC 8322 (Social Services); Tuberculosis, tuberculin skin testing.

INTRODUCTION

In July 1992, the National Institute for Occupational Safety and Health (NIOSH) received a request for a health hazard evaluation (HHE) from the Commissioner of Health for Orange County, New York. In that request, NIOSH was asked for assistance in evaluating county employees who may be occupationally exposed to tuberculosis (TB). In late 1992 and early 1993 a NIOSH investigator met with Orange County officials to identify employees potentially at risk. Based on these meetings, four departments were selected for study: (1) the Office of the District Attorney, and the (2) Mental Health Department, (3) Social Services Department, and (4) Probation Department. Beginning in June 1993, and completed in July 1994, a tuberculin skin testing (TST) program was conducted to assess the risk of TB infection among these employees.

BACKGROUND

Tuberculosis Epidemic

The number of cases of TB reported to the Centers for Disease Control and Prevention (CDC) has increased in recent years,¹ with New York State (NYS) reporting over 4500 (45 in Orange County) cases of TB in 1992.² The CDC has recommended that the following groups be considered at high risk for TB: (1) persons infected with the human immunodeficiency virus (HIV); (2) close contacts of persons known or suspected to have TB; (3) persons with medical risk factors known to increase the risk of disease if infection has occurred; (4) foreign-born persons from countries with high TB prevalence; (5) medically underserved low-income populations; (6) alcoholics and intravenous drug users; (7) residents of long-term care facilities, correctional facilities, mental institutions, nursing homes/facilities, and other long-term residential facilities.³

Workers who have contact with these populations are potentially at increased risk of infection with the organisms that cause TB.^{4,5} Documented cases of occupational transmission of TB have occurred among employees in hospitals and prisons.^{6,7} Many other occupational groups are involved with similar high-risk groups as part of their daily work but have not been evaluated as closely in terms of exposure to TB. Some of these groups include social workers, mental health workers, and law enforcement personnel such as attorneys, investigators, and probation officers.

Tuberculosis Screening

Screening of high-risk populations for tuberculous infection and tuberculosis and providing appropriate treatment are crucial to achieving the nation's goal of eliminating tuberculosis by the year 2010.⁸ Screening is done to identify infected persons at high risk of disease who would benefit from preventive therapy and to find persons with clinical disease in need of

treatment. In addition, screening programs in the occupational setting provide epidemiologic data for assessing the extent of the tuberculosis problem and its trends. Identification of trends can lead to action preventing infection in other workers.

Tuberculin skin testing (TST) is the standard method of identifying persons infected with *Mycobacterium tuberculosis*. The intracutaneous administration of five units of purified protein derivative (PPD) tuberculin (the Mantoux method) is the best means of detecting infection with *M. tuberculosis*.³

METHODS

Study Objectives

The main objective of this investigation was to provide information to employees of Orange County concerning the risk of occupational TB transmission. Individual employees would be able to learn their current PPD status and make informed decisions concerning appropriate medical care. If the results of this study indicated that specific groups of workers were at an increased risk of occupational transmission of TB, an additional objective would be to identify important sources of TB transmission. This information, in combination with an understanding of the employees work practices and duties, would be used to develop recommendations for reducing potential exposures.

Study Population

The study population included in this HHE consisted of all 540 Orange County employees in the four departments listed in Appendix A. The departments include the District Attorney's (DA) Office, and the Departments of Social Services (SS), Mental Health (MH), and Probation (P). Employees from these departments were divided by NIOSH investigators, Orange County Department of Health staff, and representatives of the various department into suspected "exposed" and "unexposed" populations. * The total number of employees from these departments who were judged to have probable occupational TB exposure (potentially exposed, on a daily basis, to populations at increased risk of TB), the "exposed" population, was 336. There were 204 employees in the "unexposed" category.

Participants were recruited into the study through a letter distributed to each employee of the above-mentioned departments. Educational meetings were held in each department to explain the testing program and answer questions. All employees who were 18 years of age or greater in the study population were offered tuberculin skin tests except those who either:

*The terms "exposed" and "unexposed" are used in this document to indicate the relative potential for occupational exposure to TB. There are currently no data indicating that workers in the "exposed" category are actually at an increased risk of exposure to TB.

(1) had a previously positive reaction, or; (2) completed adequate treatment for disease or preventive treatment for infection. The study protocol was approved by the NIOSH Human Subjects Review Board, and employee participation was by informed consent. All participants in this study were administered a questionnaire at the time of PPD testing in which demographic, exposure, and medical information was obtained.

Participants were informed of their test result immediately after their TST was read, as well as through a letter sent by the NIOSH investigator. Evaluation of employees with positive TSTs, both initial positives and new conversions, was coordinated by staff of the Orange County Department of Health (participants could have their personal physicians perform the evaluation if they wish). All follow-up evaluations followed CDC guidelines,⁹ which were already in place at the Orange County Department of Health.

TST Protocol

The TST protocol used in this investigation follows CDC guidelines^{9,10,11} and was administered by Orange County Department of Health registered nurses who are experienced in TST administration. The TST program was administered at individual worksites in several cities throughout Orange County.

FINDINGS AND DISCUSSION

Initial TST -- 1993

The TST program was initiated in June 1993. One hundred forty-eight (27%) of the 540 total employees participated (Table 1). Between 21 and 38% of the workers in each department participated. Employees with a TST of <10 millimeters who had not had a TST within the prior two years were given a second TST (booster) in the following one to three weeks. The results of the initial skin tests are presented in Table 2. Active TB was subsequently ruled out in all seven persons with positive tests. One of the seven persons with a positive TST was a confirmed PPD converter (based on records available to the Health Department), and another was a possible converter; they were both placed on preventive therapy and contact trace-backs were conducted. The other five persons were evaluated and determined by the Health Department not to meet criteria for preventive therapy.⁹

Of the seven persons with positive PPDs in the initial TST, four were in the suspected "exposed" group and three were in the "unexposed" group. Two reported having a history of receiving Bacillus Calmette-Guerin (BCG) vaccine in the past, and none had reported contact with persons with active TB. The worksites included Newburgh and Goshen; six were from the SS department and one was from the DA's Office.

Follow-up TST -- 1994

The follow-up TST program was conducted in June and July of 1994. Of the 141 persons who had a negative (including incomplete) skin test in 1993, nine were not available for repeat testing due to death, change in employment status, or medical illness, leaving 132 persons available to have repeat testing. Of these 132, 78 (59%) participated in the follow-up testing (Table 3). Of the 78 participants, 61 (78%) were from the "exposed" population (this compares to 62% [336] of the entire study population of 540 who had been categorized as "exposed").

One person converted from a negative to a positive PPD (Table 4) and was placed on preventive therapy after active TB was ruled out. This person worked in the SS department, was in the "exposed" group, and reported having two clients recently diagnosed with active TB. An ongoing contact trace-back is being performed by the Orange County Health Department.

There are several possible reasons why the participation rate was so low for this HHE despite efforts of the NIOSH investigator and Orange County Health Department staff to actively educate employees and encourage them to participate in the study. The most likely reason is that most employees did not feel they were at increased risk of becoming infected with TB. Another possible reason for non-participation was fear of medical testing. Thirdly, it is possible that lack of understanding concerning TB and the TST program played a role, although the Health Department staff conducted educational sessions (as well as the TST programs) at the individual worksites throughout the County in order to minimize this problem. Other possible reasons for the low participation rate include testing by private physicians or medical plans, distrust of the County Health Department and/or NIOSH, and a lack of encouragement (or perhaps discouragement) within the individual departments.

CONCLUSIONS

Due to potential exposure to populations at high risk of TB, some Orange County employees who perform social service, law enforcement, and mental health functions may be at increased risk of becoming infected with TB while performing their job. Although this study found only one PPD conversion among 78 employees who completed the TST program, the low participation rates preclude drawing any definitive conclusions regarding the risk of occupational transmission of TB among Orange County employees.

RECOMMENDATIONS

1. A continuing TST program should be available to all Orange County employees who have contact with populations at high risk of tuberculosis. This TST program should follow CDC guidelines.^{3,9}
2. The Health Department should continue to identify those County employees who have jobs that involve routine exposure to high-risk populations and continue to perform training and educational activities related to TB for these employees.

REFERENCES

1. Frieden TR, Sterling T, Pablos-Mendez A, Kilburn JO, Cauthen GM, Dooley SW [1993]. The emergence of drug-resistant tuberculosis in New York City. *NEJM* 328(8):521-526.
2. CDC (Centers for Disease Control and Prevention) [1992]. Summary of notifiable diseases, United States, 1992. *MMWR* 41(55):67.
3. CDC [1990]. Screening for tuberculosis and tuberculous infection in high-risk populations. *MMWR* 39(RR-8).
4. CDC [1990]. Guidelines for preventing the transmission of tuberculosis in health-care settings, with special focus on HIV-related issues. *MMWR* 39(RR-17).
5. CDC [1989]. Prevention and control of tuberculosis in correctional institutions: recommendations of the Advisory Committee for the Elimination of Tuberculosis. *MMWR* 38:313-20,325.
6. Pearson ML, Jereb JA, Frieden TR, Crawford JT, Davis BJ, Dooley SW, et al. [1992]. Nosocomial transmission of multidrug-resistant *Mycobacterium tuberculosis*. *Ann Int Med* 117(3):191-196.
7. NIOSH [1992]. Recommended guidelines for personal respiratory protection of workers in health-care facilities potentially exposed to tuberculosis. Cincinnati, OH: US Department of Health and Human Services. Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.
8. CDC [1989]. A strategic plan for the elimination of tuberculosis in the United States. *MMWR* 38(S-3):1-25.
9. CDC and ATS [1991]. Core curriculum on tuberculosis, 2nd edition. Atlanta, GA: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention and New York, NY: American Thoracic Society, HHS Publication No. 00-5763, April, 1991.
10. American Thoracic Society/Centers for Disease Control and Prevention [1990]. Diagnostic standards and classification of tuberculosis. *Am Rev Resp Dis* 142:725-735.
11. American Thoracic Society, American Academy of Pediatrics, Centers for Disease Control and Prevention, Infectious Disease Society of America [1992]. Control of Tuberculosis in the United States. *Am Rev Resp Dis* 146:1623-1633.

AUTHORSHIP AND ACKNOWLEDGEMENTS

Report prepared by: Douglas B. Trout, M.D., M.H.S.
Medical Officer
Medical Section

Originating Office: Hazard Evaluations and Technical
Assistance Branch
Division of Surveillance, Hazard
Evaluations, and Field Studies

DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report may be freely reproduced and are not copyrighted. Single copies of this report will be available for a period of 90 days from the date of this report from the NIOSH Publications Office, 4676 Columbia Parkway, Cincinnati, Ohio 45226. To expedite your request, include a self-addressed mailing label along with your written request. After this time, copies may be purchased from the National Technical Information Service (NTIS), 5285 Port Royal, Springfield, Virginia 22161. Information regarding the NTIS stock number may be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

1. Health and Safety representative - Local 7900, CSEA
2. Orange County Commissioner of Health
3. Director of Patient Services, Orange County Department of Health

For the purpose of informing affected employees, copies of this report shall be posted by the employer in a prominent place accessible to the employees for a period of 30 calendar days.

Table 1
HETA 92-0345
Participation in Initial TST Program -- 1993

Department	Total # Employees	# Participating (%)
Social Services	311	81 (26)
Probation	83	26 (31)
District Attorney	60	23 (38)
Mental Health	86	18 (21)
Total	540	148 (27%)

Table 2
HETA 92-0345
Results of Initial TST Program -- 1993

Result	Total # Employees
Positive (> 10mm) at initial test	4
Positive (> 10 mm) at booster	3
Negative -- complete*	103
Negative -- 1 step only**	26
Incomplete -- 1st step not read	8
Incomplete -- 2nd step not read	4
Total	148

* Negative -- complete: the person received the booster TST if indicated.

**Negative -- 1 step only: the person did not receive the booster TST which was indicated.

Table 3
HETA 92-0345
Participation in Follow-Up TST Program -- 1994

Department	Total # Employees Available*	# Participating (%)
Social Services	71	37 (52)
Probation	26	20 (77)
District Attorney	20	9 (45)
Mental Health	15	12 (80)
Total	132	78 (59%)

* Total # Employees Available: # participants from 1993 less those no longer available or eligible (deceased, change of employment, illness, previous positive PPD)

Table 4
HETA 92-0345
Results of Follow-Up TST Program -- 1994

Result	Total # Employees
Positive (> 10mm)	1
Negative	74
Incomplete -- not read	3
Total	78

APPENDIX A - STUDY POPULATION

The Department of Social Services. This department is made up of four divisions. The Income Maintenance Division has 60 examiners and receptionists whose daily routine involves seeing clients in the office environment. These employees are distributed among four offices in this approximate manner: Newburgh - 20, Middletown - 20, Goshen - 15, Port Jervis - 5. The Special Investigation Unit has seven investigators based in Goshen who meet clients in private homes or in offices. The Child Support Division, located in Goshen, has approximately seven employees who have frequent exposure to high-risk populations, including senior investigators and some of the investigators. The Human Services Division has 116 employees who have frequent exposure to high risk populations. These employees, who work out of Goshen and Newburgh, include senior caseworkers, caseworkers, casework assistants, and chauffeurs.

The Probation Department. This department has 60 employees identified as having frequent exposure to high risk populations. These employees include probation officers, senior probation officers, and probation supervisors. These employees are based in Goshen, Newburgh, Middletown, and Port Jervis.

The District Attorney's Office. This office, which is based in Goshen with a satellite office in Newburgh, has approximately 60 employees including prosecutors, investigators, and clerical staff. Exposure to high-risk populations may occur during the taking of statements from persons in small rooms, a process which could take as little as a few minutes to as much as several hours.

The Department of Mental Health. This department operates alcohol clinics in the cities of Middletown and Newburgh and an alcohol, drug, and mental health clinic at the County jail in Goshen. Approximately 26 senior caseworkers, social workers, secretaries and support staff perform client interviews in small offices throughout a typical day.

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer and authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to federal, state, and local agencies; labor; industry; and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.