



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service



Reprinted from
MORBIDITY AND MORTALITY WEEKLY REPORT
Recommendations and Reports
June 5, 1992 / Vol. 41 / No. RR-10

Prevention and Control of Tuberculosis in Migrant Farm Workers

Recommendations of the Advisory Council for the Elimination of Tuberculosis

U.S. Department of Health and Human Services
Public Health Service
Centers for Disease Control
Atlanta, Georgia 30333

HHS PHS CDC - 14 Sep 98 - 1,000

Contents

Introduction.....	1
Migrant Farm Workers and Migrant Patterns	2
East Coast Migrant Stream.....	2
Midwest Migrant Stream	2
West Coast Migrant Stream	3
Tuberculosis in Migrant Farm Workers	3
Infection and Transmission.....	3
Recommendations	3
Prevention and Control	3
Diagnosis.....	4
Hospitalization and Isolation	4
Treatment	4
Monitoring Response	5
Monitoring Compliance	6
Contact Investigation.....	6
Screening.....	6
Preventive Therapy.....	7
Follow-Up	8
Role of Public Health Departments.....	8
Role of Public Health Service	8

Prevention and Control of Tuberculosis in Migrant Farm Workers

Recommendations of the Advisory Council for the Elimination of Tuberculosis*

Summary

Farm workers are approximately six times more likely to develop tuberculosis (TB) than the general population of employed adults. These recommendations are presented to assist health-care providers serving migrant and seasonal farm workers. The following services, listed by priority, that should be available for migrant and seasonal farm workers and their family members are: a) detection and diagnosis of those with current symptoms of active TB; b) appropriate treatment and monitoring for those who have current disease; c) contact investigation and appropriate preventive therapy for those exposed to infectious persons; d) screening and appropriate preventive therapy for asymptomatically infected workers who may be immunosuppressed, such as those with human immunodeficiency virus (HIV) infection; e) screening and appropriate preventive therapy for children of migrant and seasonal farm workers; and f) widespread tuberculin test screening for workers and families with preventive therapy prescribed, as appropriate. Health-care providers should immediately perform appropriate diagnostic studies for persons with a productive, prolonged cough, or other symptoms suggestive of tuberculosis. Health departments should be immediately notified when TB is suspected or diagnosed to enable examination of contacts and initiation of other health department diagnostic, preventive, or patient management services.

Workers and family members with uncomplicated pulmonary TB should be treated with a regimen that includes isoniazid, rifampin, pyrazinamide, and ethambutol (or streptomycin). Drug-resistant TB is an important consideration since it requires altered treatment regimes and because higher rates of resistance have been found in ethnic and social groups comprising much of the migrant farm worker-force. Patients should be monitored carefully for compliance, treatment response, and toxicity. Ideally, patients should be placed on directly observed therapy given by a well-trained, outreach worker from the same cultural/language background as the patients.

INTRODUCTION

The Department of Health and Human Services (DHHS) Advisory Council for the Elimination of Tuberculosis (ACET) has published a plan for the elimination of tuberculosis (TB) from the United States by the Year 2010 (1). The plan gives top priority to implementation of strategies to prevent TB in identifiable high-incidence population groups, including migrant and seasonal farm workers. In this document, a "migrant farm worker" is defined as a laborer whose principal employment is in agriculture on a seasonal basis and who establishes for the purposes of such employment a temporary abode. The term "seasonal farm worker" means a person whose principal employment is in agriculture on a seasonal basis, but who does not move from area to area for work.

These recommendations are intended for health-care providers serving migrant and seasonal farm workers—providers who can contribute to the elimination of TB in this population through improved screening, prevention, and control activities. The recommendations are also directed to health departments because of their important role in assisting migrant health-care providers in the prevention and control of TB among migrant and seasonal farm workers. Finally, these recommen-

*The Advisory Council for the Elimination of Tuberculosis recognizes that a variety of terms are used and preferred by different groups to describe race and ethnicity. Racial and ethnic terms used throughout this document reflect the way data are collected and reported by official health agencies.

dations are directed to public policy and decision makers because many health departments and migrant health-care providers do not now have the resources and staff to fully implement these recommendations.

MIGRANT FARM WORKERS AND MIGRANT PATTERNS

Information provided by the Office of Migrant Health, DHHS, indicates that there are an estimated 4.2 million migrant and seasonal farm workers in the United States. Approximately 500,000 (12%) are served by federally supported migrant health centers (2). Compared with the general population, these workers often have numerous and complex health problems (e.g., TB, parasitic diseases, other communicable diseases, diabetes, hypertension, high-risk pregnancy, and neonatal problems), and they often live in substandard housing and in very crowded conditions. Continuity of medical care is difficult for migrant farm workers because they move often. Migrant and seasonal farm workers and their families often face linguistic, cultural, financial, immigration, educational, and other barriers that also make it difficult for them to obtain needed health-care services.

These barriers must be addressed by migrant health and public health officials when designing and carrying out strategies for implementing the recommendations in this report.

Migrant farm workers in the United States traditionally follow one of three geographic migratory streams (travel patterns: East Coast, Midwest, and West Coast). The race, ethnicity, and cultural background of migrant farm workers vary somewhat from stream to stream. Living and working conditions, as well as access to transportation, also vary. These differing characteristics may affect access to health-care and the formulation of strategies for TB prevention and control. In all three streams, families often migrate together to maximize family income. Some settle in a town to pursue better educational or work opportunities, but often remain tied to local agricultural activities.

The primary residence or homebase areas (e.g., California, Texas, Puerto Rico, and Florida) for all three streams are economically disadvantaged areas.

East Coast Migrant Stream

In the East Coast stream, most workers have their primary homebase, or winter home, in southern Florida. The largest cultural groups in this stream are Hispanic, primarily Mexican Americans and Mexicans, Central American refugees, and Puerto Ricans; other groups in this stream are American blacks, Haitians and Appalachian whites.

Migrants in the East Coast stream most often reside in ethnically homogeneous labor camps, characterized by family unit housing or single-sex barracks. A primary contractor or crew leader usually contracts directly with a grower to supply farm workers. The crew leader also provides meals and transportation, the cost of which is usually deducted from workers' pay. Farm workers, during the harvest season, may change camps or move to a new location with a crew or group. Thus, outreach is a very important factor in delivering health care to this migrant population.

Midwest Migrant Stream

In the Midwest stream, most farm workers use south Texas as their homebase and work winter crops there before moving up into the midwestern states. South Texas is the largest migrant homebase area in the nation. Migrant farm workers from there also may move into the East and West Coast migrant streams. Mexican Americans constitute the majority of migrant farm workers in this stream, but recently the number of Southeast Asian migrant farm workers has been increasing in this stream.

The basic Midwest migrant family unit travels "upstream" from the homebase community in groups with children and other relatives, sometimes also accompanied by friends, including single males. The migrant groups generally travel in cars with the crew leader or "truckero" transporting personal possessions in a truck for the crew. The crew leader's truck also may be used to haul produce during harvesting.

Migrants in southern Texas live as part of the community in "colonias" or unincorporated areas. These areas are not required to have water, sewage, or electric services, and some colonias have none. Three to six families may live under one roof on a 20' by 40' plot of land. Family members cross the border to visit or stay with relatives in Mexico during the winter months. When not in the homebase area, migrants in the Midwest stream live primarily in labor camps.

West Coast Migrant Stream

Most migrant farm workers in the West Coast stream use southern California as homebase. This stream runs north through Idaho, Oregon, and Washington. The West Coast stream consists mostly of Mexican Americans from the southwest, primarily California and Texas. American blacks, non-Hispanic whites, and increasing numbers of Southeast Asians and Central Americans comprise a smaller percentage of the migrant farm workers in this stream. Southeast Asians, however, quickly settle in the area, leaving the migrant stream.

The primary migrant units in the West Coast Stream are individual families. Some single males come from Mexico to work the crops and then return home. Many of these workers own their own cars and have more mobility and better access to medical care.

Generally, there are better housing conditions in the West Coast stream than in the other streams. However, migrants are living under bridges and along river banks in Southern California. As in other migrant streams, these migrant families live in labor camps when they leave their homebase.

TUBERCULOSIS IN MIGRANT FARM WORKERS

Although the magnitude of the problem of TB among migrant and seasonal farm workers is not clearly established, a survey conducted by CDC during the period 1985–1989 assessed the occupational and residential characteristics of TB cases reported in 29 states; overall farm workers accounted for more than 5% of all employed cases. Based on data from that survey, the risk of TB among farm workers was estimated to be six times greater than the general population of employed adults (CDC, unpublished data).

The first population-based study of TB in a random sample of migrant farm workers, conducted in 1988 in North Carolina, indicated a prevalence of active TB in 0.47% of Hispanics and 3.5% of American blacks (3).

Migrant farm workers also have high rates of asymptomatic TB infection (positive skin tests). A 1987 study showed a skin-test positivity rate of 29% among U.S.-born blacks and 55% among Haitian migrant farm workers in the Delmarva Peninsula (4). Tuberculin testing of migrant farm workers employed in Virginia's Eastern Shore showed overall skin-test positivity rates of 39% and 48% in 1984 and 1985, respectively (5). In a separate study conducted in 1988, Hispanic migrant farm workers in North Carolina had a tuberculin skin-test positivity rate of 31% (6). A 1988 study demonstrated a 47% prevalence rate of TB infection among migrant farm workers 15-34 years of age and a 68% prevalence rate among those >34 years of age (7). In the population-based study (3), tuberculin positivity rates ranged from 33% (Hispanics) to 62% (blacks) to 76% (Haitians). These high rates of asymptomatic TB infection suggest that screening and prevention activities should be directed to migrant farm workers.

INFECTION AND TRANSMISSION

The TB organism *M. tuberculosis*, also known as the tubercle bacillus, is transmitted primarily through the air from persons with TB of the lung who are coughing. Persons who share the same air with an infectious person for long periods of time are at risk of becoming infected. This includes persons living in the same household with the infectious person and those who travel in the same vehicle. Most persons who become infected usually develop a positive TB skin test, but remain asymptomatic and are not infectious. The lifetime risk of acquiring clinically active TB disease is about 10%; it is greatest in the first 2 years after infection, but disease can also occur many years later. Impairment of the immune system, such as by HIV infection, increases the risk of clinically active TB.

RECOMMENDATIONS

ACET developed these recommendations for the Public Health Service, public health departments, and for health-care providers serving migrant and seasonal farm workers.

Prevention and Control

The following prevention and control activities should be undertaken for all migrant and seasonal farm workers and their families.

- The services of highest priority that should be available to all workers and their families, are:
 - Detection and diagnosis of those persons with current symptoms of active TB.
 - Appropriate treatment for those persons with disease.
 - Contact investigation and appropriate preventive therapy for those persons exposed to infectious (sputum positive) TB.
 - Screening and appropriate preventive therapy for workers who may be immunosuppressed, including those with HIV infection.
- The second priority is screening and appropriate preventive therapy for children of migrant and seasonal farm workers.
- The third priority is widespread tuberculin skin-test screening of workers and families, followed by appropriate preventive therapy.

Providing the above services will require a commitment of resources from the national, state, and local levels.

Diagnosis

- Pulmonary TB should be suspected in persons with a productive, prolonged cough (>2 weeks in duration). Other common symptoms of TB include fever, chills, night sweats, fatigue, loss of appetite, weight loss, and, occasionally, hemoptysis (coughing up blood).
- Persons with suspected pulmonary TB should receive an immediate evaluation that includes: a medical history and physical examination, chest x-ray, Mantoux tuberculin test, at least three sputum specimens (collected on separate days) for acid fast bacilli (AFB) smear, culture and drug susceptibility testing, and HIV-antibody counseling and testing.
- If the clinician confirms or suspects TB as a result of this examination, the local health department should be notified so that appropriate examination of contacts can be initiated. Migrant health-care providers should seek, and health departments should provide, no-cost TB medical consultation, medication and laboratory services for migrant farm workers.

Hospitalization and Isolation

- Health departments should ensure that inpatient care (e.g., hospitalization) is available at no cost to migrant farm workers or family members. Persons hospitalized with infectious TB should be placed in AFB isolation until they become noninfectious (8).
- Health department TB control staff should be consulted on issues regarding hospitalization, housing, and return to work. The restriction of normal activities and the duration of such restrictions depends upon: the degree of infectiousness, the response to treatment, the nature of activities, and the likelihood that others might be exposed. Some patients are never infectious and have no need for restrictions. Care must be taken in housing TB patients to ensure that those who may be infectious do not expose uninfected farm workers or family members. Patients who feel well may be able to continue normal work activities, particularly in an open-air work setting where there is little risk of exposure for new or highly susceptible contacts.

Treatment (Tables 1 and 2)

- Migrant and seasonal farm workers and family members with uncomplicated pulmonary TB can be treated with the following 6-month regimen: isoniazid, rifampin, pyrazinamide, and ethambutol (or streptomycin) given for 2 months (initial phase), followed by isoniazid and rifampin for 4 months (second phase). Ethambutol (or streptomycin) should be included in the initial regimen until drug susceptibility studies are available. Among migrant workers, higher rates of resistance to isoniazid and streptomycin are known to occur. Drug resistance is also more common in patients with a history of previous treatment and in contacts to drug-resistant patients.
- Medication does not have to be given on a daily basis throughout the entire course of treatment. Several options exist for administering directly observed therapy. Intermittent (e.g., twice weekly) therapy may be administered during the second phase after daily therapy during the initial phase. For those for whom prolonged supervision of daily therapy during the initial phase is impractical, a regimen of daily isoniazid, rifampin, pyrazinamide, and ethambutol (or streptomycin) for 2 weeks, followed by twice weekly administration of the same drugs for 6 weeks, and subsequently twice weekly isoniazid and rifampin for 16 weeks has been shown to be highly effective (9).

Alternatively, three times weekly administration of isoniazid, rifampin, pyrazinamide, and ethambutol (or streptomycin) for 6 months yields equivalent results (10). (When isoniazid, ethambutol, and pyrazinamide are administered 2 or 3 times weekly instead of every day, the dosage must be increased; the rifampin dose is the same for daily or intermittent therapy.)

In cases of smear and culture negative pulmonary TB, when drug resistance is unlikely, reducing the 6-month regimen to 4 months is acceptable. The same regimen should be used to treat sputum-culture-negative, tuberculin-positive persons with radiographic evidence of healed TB or silicosis.

- All persons with confirmed or suspected TB should be offered HIV testing and counseling. For HIV seropositive patients, treatment should be continued for a minimum of 9 months and for at least 6 months beyond documented culture conversion as evidenced by three negative cultures.
- Patients treated with rifampin who are on methadone should have the methadone dosage increased to avoid withdrawal symptoms resulting from the interaction between the two drugs (11).
- The treatment regimen should be appropriately revised if resistance to any of the drugs in the regimen is found.
- Treatment of extrapulmonary TB and TB related to drug resistance or HIV infection may be complicated. For this reason, a health department or another qualified TB and infectious disease medical expert should be consulted.

Monitoring Response (Table 3)

- Patients should be medically assessed at least twice monthly for symptoms and by smear until they become asymptomatic and smear negative. Cultures should be obtained at least monthly until negative. Frequent smears and cultures are the most reliable means for detecting treatment failure. Treatment failure is often due to patient noncompliance with therapy, but also may be due to an ineffective regimen (e.g., when the organisms are resistant to the drugs).
- Patients should demonstrate sputum conversion within 3 months. Appropriate medical consultation should be sought for patients whose sputum does not convert within this time. Such patients must be evaluated for noncompliance and drug-resistant organisms.
- Toxicity monitoring must be individualized and based on the drugs used in a given regimen and patient factors related to toxicity (e.g., age and alcohol use). Patients should be evaluated at least monthly during therapy and questioned about reactions to determine toxicity, even if no problems are apparent. Patients should be specifically instructed to look for symptoms associated with the most common reactions to the medications they are receiving. If symptoms suggesting drug toxicity occur, appropriate laboratory testing and medical evaluation should be performed immediately.
- All patients receiving isoniazid, rifampin, and/or pyrazinamide should be instructed to report immediately any symptoms suggesting hepatitis (loss of appetite, nausea, vomiting, jaundice, malaise, unexplained elevated temperature of >3 days duration, or abdominal tenderness).
- Peripheral neuropathy associated with isoniazid administration is uncommon at doses of 5 mg/kg. Among persons with conditions in which neuropathy is common (diabetes, uremia, alcoholism, malnutrition), pyridoxine (50 mg day) may be given with isoniazid. It is also advisable to give pyridoxine with isoniazid to pregnant women or persons who have a seizure disorder.
- Hyperuricemia may occur in patients receiving pyrazinamide, but acute gout is uncommon.
- The interaction of isoniazid and phenytoin increases the serum concentration of both drugs. When these drugs are given concomitantly, the serum level of phenytoin should be monitored.
- Rifampin may accelerate clearance of drugs metabolized by the liver. These include methadone, coumadin derivatives, glucocorticoids, estrogens, oral hypoglycemic agents, digitalis, anticonvulsants, ketoconazole, and cyclosporin. By accelerating estrogen metabolism, rifampin may interfere with the effectiveness of oral contraceptives.
- Outreach workers responsible for directly observed therapy should be trained to identify symptoms related to reactions and toxicity. They should also be trained to obtain sputum specimens.

Monitoring Compliance

- Treatment must be continuous to be effective. Identify noncompliance early, before drug resistance, treatment failure, or relapse occurs, or before the patient is lost to follow-up.
- A number of techniques have been developed to assist in identifying the noncompliant patient. The majority of noncompliant patients is determined by their failure to return for follow-up clinic visits. Thus, having an accurate appointment and delinquent referral system is paramount. An effective communication system is also needed to assure that the discovery of missed appointments immediately comes to the attention of the responsible public health officials. Monthly pill counts are also helpful in early identification of noncompliance.
- The best way to ensure compliance is to place patients on directly observed therapy given by a well-trained outreach worker from the same cultural/language background as the patient population. Health departments should provide staff for this purpose. As an alternative, a concerned and interested person may be identified to directly observe the patient's therapy (e.g., family member).
- Incentives and enablers should be considered to encourage patient compliance. These might include such items as food or food vouchers and transportation vouchers or tokens.
- Long-term institutionalization is sometimes necessary for the management of seriously uncooperative patients. If, despite the best efforts of migrant health-care and health department staff, an infectious patient refuses treatment, temporary involuntary isolation may be necessary in accordance with state and local public health laws and regulations. This option should be used only in rare instances and only after due process.

Contact Investigation

- Contact investigation should begin as soon as a migrant or seasonal farm worker or family member is suspected to have infectious TB. The health department assumes this responsibility. The investigation normally involves a visit to the patient's work and housing site to observe transmission possibilities, identify contacts, and to note factors that might affect compliance with treatment or preventive therapy.
- The investigation should begin with close contacts who are most likely to be infected, usually the persons living with and sharing the same air space as the patient. Close contacts include family members of workers traveling and working alone, if they have lived in the household during the preceding year. (The health department can make arrangements to ensure that out-of-area family members and other remote contacts receive appropriate examinations.)
- High priority should be given to rapid examination of close contacts who are children. Newly infected children can develop life threatening meningitis within weeks of infection unless preventive therapy is administered.
- Contacts should be interviewed for symptoms and given a tuberculin skin-test using the Mantoux technique. Those with symptoms of respiratory disease or skin-test reactions of $\geq 5\text{mm}$ should be given chest radiograph examinations. All contacts with reactions of $\geq 5\text{mm}$ should be considered for preventive therapy. Close contacts of highly infectious persons, especially young children, should be considered for preventive therapy even if the initial tuberculin test after exposure is negative. The preventive therapy can be halted if contact with the infectious person(s) is discontinued and a repeat tuberculin test, 3 months after exposure, remains negative.

Screening

- Screening should be carried out by migrant health-care providers in cooperation with employers and local health departments. In the absence of definitive data, screening of migrant farm workers should be considered *annually*.
- Emphasis should be placed on screening and preventive therapy conducted in the homebase sites. However, since access to health care is sometimes better in non-homebase areas, TB screening and preventive therapy programs should be encouraged wherever resources and access to migrant farm workers permit. This is particularly important for "settled out" workers who choose not to return to homebase areas.

- The Mantoux tuberculin skin test should be used to identify persons who have been infected with *M. tuberculosis*. Multiple puncture tests should not be used. Migrant and seasonal farm workers, as well as members of their families, should be considered tuberculin positive according to the following criteria.

Migrant/Seasonal Farm Workers and Families Positive Tuberculin Reactions	
<p><u>5 mm Induration or more</u></p> <ul style="list-style-type: none"> ● Person with HIV infection ● Close contacts of infectious cases ● Chest radiographs with fibrotic lesions 	<p><u>10 mm Induration or more</u></p> <ul style="list-style-type: none"> ● All other migrant farm workers ● Family members of workers

Outside the United States, many countries use Bacille Calmette-Guerin (BCG) vaccination as part of their TB control activities, especially for infants. The degree of sensitivity to tuberculin that is acquired after BCG vaccination is highly variable. No reliable method exists for distinguishing tuberculin reactions caused by previous BCG vaccination from those caused by natural mycobacterial infections. Positive tuberculin reactions in BCG- vaccinated persons from high prevalence areas usually indicate infection with *M. tuberculosis*. Such persons should be evaluated for preventive therapy.

Persons who have tuberculous infection should receive a chest radiograph. If the radiograph does not show TB, preventive therapy should be considered. Persons with abnormal radiographs and/or other symptoms suggesting TB should be referred for further evaluation.

Preventive Therapy

- The use of preventive therapy can substantially reduce the risk of TB (by more than 90%) in infected persons who comply with therapy (12). A minimum of 6 months of preventive therapy is recommended. However, a 12-month course is recommended for tuberculin-positive persons with HIV infection.
- Whenever necessary, preventive therapy should be directly observed and should be administered twice weekly to facilitate the supervision of treatment (INH 15mg/kg up to 900mg).
- Before migrant farm workers and their family members are placed on preventive therapy, ensure that they are likely to complete at least 6 months of the regimen. The rationale for this policy is to ensure that persons receive the benefits from 6 months of preventive therapy and not just the early risk of toxicity. Persons with a positive tuberculin reaction who are not placed on preventive therapy should be counseled about the meaning of the skin-test reaction and instructed to seek medical attention if they develop symptoms suggesting TB.
- The following list defines those migrant and seasonal farm workers and their family members with positive tuberculin reactions (who have not been previously treated) who should be considered candidates for preventive therapy *regardless of age*:
 - Persons with known or suspected HIV infection, including injecting drug users.
 - Close contacts of infectious persons.
 - Recent tuberculin skin test converters (defined as a ≥ 10 mm increase for those < 35 years old; or a ≥ 15 mm increase for those ≥ 35 years old).
 - Persons with medical conditions that increase the risk of TB (e.g., diabetes, being 10% or more below ideal body weight, or prolonged adrenocorticosteroid therapy).
- Persons with a positive tuberculin test should be considered for preventive therapy even if they have no other medical risk factor when they are < 35 years of age.
- Before therapy is initiated, baseline liver function studies should be done for all persons ≥ 35 years of age.
- Persons on preventive therapy should be monitored at least monthly, by questioning, for: compliance with prescribed regimen, symptoms of neurotoxicity (such as paresthesia of hands or feet), and signs consistent with hepatotoxicity (e.g., loss of appetite, nausea, vomiting, persistent dark urine, jaundice, malaise, or unexplained elevated temperature of > 3 days duration, or

abdominal tenderness especially in the upper right quadrant). Patients should be advised to report immediately to their health-care provider if any of these signs or symptoms occur.

- Pill counts should be done each month for all persons on preventive therapy.

Follow-Up

- When a migrant farm worker is departing and requires treatment for active TB, preventive treatment, or diagnostic services, health providers should contact their state health department TB control officers to apprise them of the need for follow-up and of the next possible destination of the farm worker.
- Out-of-state communications regarding TB care should be routed through state health departments to ensure that the information is transmitted appropriately and that necessary follow-up is initiated. Often the health-care provider or health department will receive a TB laboratory report after the person departs for another area. The report should be immediately telephoned or expeditiously mailed to the health department or health-care provider in the next area.
- Although sharing necessary information between health-care providers and health departments is encouraged to protect the health of the worker and the public, information should be shared only on a need-to-know basis. Measures must be taken to ensure confidentiality.
- Migrants who are placed on antituberculosis treatment or preventive therapy should be given records they can take with them to indicate their current treatment and diagnostic status. Special care should be taken to instruct such persons on how to take their medications and how and where to get additional medication and medical care at the destination sites.
- Different areas have different protocols for the treatment of active TB and for the preventive treatment of infected persons. However, once a patient starts treatment or a preventive treatment regimen, the same regimen should be continued in the migrant's next location (unless medically contraindicated).

Role of Public Health Departments

- Health departments should ensure the provision of TB services for migrant and seasonal farm workers regardless of ability to pay. These services should include diagnostic services, antituberculosis medication, laboratory services, contact follow-up and inpatient and outpatient clinical services. Making medical care accessible to the migrant farm workers and their families often means providing services in migrant health-care centers or near the work site. Health departments should make outreach services available for directly observed therapy.
- Health departments should ensure that expert TB medical consultation is available to the clinicians and nurses providing health-care services to migrant farm workers.
- Health departments should teach migrant health personnel how to perform and read intracutaneous Mantoux tuberculin tests. To aid in this training, CDC has made training materials available through state health departments.
- Whenever possible, physicians and nurses from the migrant health centers should be invited to attend state and local health department TB control staff training programs.

Role of the Public Health Service

- The Public Health Service (PHS) should promote collaboration between health departments and migrant health centers in the homebase states and elsewhere to plan and carry out TB screening and preventive therapy programs. The PHS should require documentation of such collaboration as part of applications for federally funded migrant health and TB grants and cooperative agreements. In addition, as part of routine site visits, PHS staff should review related activities and make proposals for more effective implementation of the recommendations in this document.
- The CDC and the Health Resources and Services Administration, with the assistance of the Migrant Clinicians Network, should jointly develop a prototype TB medical history card to be given to migrant workers. The card should indicate results of the worker's latest tuberculin test, history of preventive therapy, and appropriate current and past treatment and diagnostic status. This card can serve as a supplement to, but cannot substitute for, complete medical records

Full implementation will require the commitment of additional resources at the national, state and local levels. Implementation of these recommendations is an important step in the TB elimination

effort. Most importantly, implementation of these recommendations will be of great benefit to individual migrant farm workers and their families whose economic and social progress is being impeded by the occurrence of TB.

For further information on TB diagnosis, treatment, monitoring, and control the following references are recommended:

- Treatment of Tuberculosis and Tuberculosis Infection in Adults and Children, American Review of Respiratory Disease, 1986;134(2):355-63.
- Diagnostic Standards and Classification of Tuberculosis 1990, American Review of Respiratory Diseases, 1990;142(3):725-35.
- Control of Tuberculosis in the United States, American Review of Respiratory Diseases, 1992 (in press).
- Core Curriculum on Tuberculosis, developed by the American Thoracic Society and CDC and supported by a grant from the Pittsfield AntiTuberculosis Association.
- Improving Patient Compliance, CDC, revised February, 1990.

Reprints are available from either state or local health departments or from American Lung Association offices.

References

1. CDC. A strategic plan for the elimination of tuberculosis in the United States. MMWR 1989;38(No.S-3):1-25.
2. Health Resources and Services Administration. An atlas of state profiles which estimates number of migrant and seasonal farm workers and members of their families. 1990:9-10,13.
3. Ciesielski SD, Seed JR, Esposito PH, Hunter N. The epidemiology of TB among North Carolina migrant farm workers. JAMA 1991;265:1715-9.
4. Jacobson ML, Mercer MA, Miller LK, Simpson TW. Tuberculosis risk among migrant farm workers on the delmarva peninsula. Am J Public Health 1987;77:29-32.
5. CDC. Tuberculosis among migrant farm workers-Virginia. MMWR 1986;35:467-9.
6. Simmons JD, Hull P, Rogers E, Hart B. Tuberculosis control migrant study of 1988. North Carolina Medical Journal 1989;50:309-10.
7. Hibbs J., Xeager S, Cochran J. Tuberculosis among migrant farm workers. JAMA 1989;262:1775.
8. American Thoracic Society/CDC. Treatment of tuberculosis and tuberculosis infection in adults and children. Am Rev Respir Dis 1986;134:355-63.
9. Cohn DL, Catlin BJ, Peterson KL, Judson FN, Sbarbaro JA. A 62-dose, 6-month therapy for pulmonary and extrapulmonary tuberculosis. A twice-weekly, directly observed, and cost-effective regimen. Ann Int Med 1990;112:407.
10. Hong Kong Chest Service/British Medical Research Council. Five-year follow-up of a controlled trial of five 6-month regimens of chemotherapy for pulmonary tuberculosis. Am Rev Respir Dis 1987;136:1339.
11. CDC. Tuberculosis and human immunodeficiency virus infection: Recommendations of the advisory council for the elimination of tuberculosis. MMWR 1989;38:17:236-8,243-50.
12. IUAT. Efficacy of various duration of isoniazid preventive therapy for tuberculosis: five years of follow-up in IUAT trials. Bull WHO 1982;60:(4):555-64.

TABLE 1. Regimen options for the initial treatment of tuberculosis in children and adults

TB without HIV infection			TB with HIV infection
Option 1	Option 2	Option 3	
Daily isoniazid, rifampin, and pyrazinamide for 8 weeks followed by 16 weeks of isoniazid and rifampin daily or 2–3 times weekly (see text)* Ethambutol or streptomycin should be added to the initial regimen until sensitivity to isoniazid and rifampin is demonstrated. Continue treatment for at least 6 months total and 3 months beyond culture conversion. Consult TB medical expert if patient remains smear or culture positive after 3 months.	Daily isoniazid, rifampin, pyrazinamide, and streptomycin or ethambutol for 2 weeks followed by twice weekly* administration of the same drugs for 6 weeks, and subsequently twice weekly isoniazid and rifampin for 16 weeks. Consult TB medical expert if patient remains smear or culture positive after 3 months.	Treat with directly observed therapy 3 times weekly,* with isoniazid, rifampin, pyrazinamide, and ethambutol or streptomycin for 6 months. Consult TB medical expert if patient remains smear or culture positive after 3 months.	Options 1, 2, or 3 can be utilized, but treatment regimens must continue for a total of 9 months and at least 6 months beyond culture conversion.

*All regimens administered twice weekly or three times a week should be monitored by directly observed therapy.

TABLE 2. Recommended dosage for the initial treatment of tuberculosis in children and adults

Drugs	Dosage					
	Daily dose		Two times a week		Three times a week	
	Children	Adults	Children	Adults	Children	Adults
Isoniazid	10–20mg/kg Max. 300mg	5mg/kg Max. 300mg	20–40mg/kg Max. 900mg	15mg/kg Max. 900mg	20–40mg/kg Max. 900mg	15mg/kg Max. 900mg
Rifampin	10–20mg/kg Max. 600mg	10mg/kg Max. 600mg	10–20mg/kg Max. 600mg	10mg/kg Max. 600mg	10–20mg/kg Max. 600mg	10mg/kg Max. 600mg
Pyrazinamide	15–30mg/kg Max. 2gm	15–30mg/kg Max. 2gm	50–70mg/kg Max. 4gm	50–70mg/kg Max. 4gm	50–70mg/kg Max. 2.5gm	50–70mg/kg Max. 2.5gm
and Ethambutol or	15–25mg/kg Max. 2.5gm	15–25mg/kg Max. 2.5gm	50mg/kg Max. 2.5gm	50mg/kg Max. 2.5gm	25–30mg/kg Max. 2.5gm	25–30mg/kg Max. 2.5gm
Streptomycin	20–40mg/kg Max. 1gm	15mg/kg Max. 1gm	25–30mg/kg Max. 1.5gm	25–30mg/kg Max. 1.5gm	25–30mg/kg Max. 1gm	25–30mg/kg Max. 1gm

TABLE 3. Medical evaluation and monitoring of TB patients

	Month 1	Month 2	Month 3 to completion of therapy
1. Medical evaluation	At least twice	Twice monthly	Once monthly if smear/culture-negative and asymptomatic
2. Monitoring			
a. Bacteriologic (sputum smear culture/resistance drug susceptibility)	Initially 3-6 sputum specimens for diagnosis (pulmonary disease) Initial drug susceptibility testing. Twice monthly until sputum smear negative and patient asymptomatic.	Twice monthly until sputum smear negative and patient asymptomatic.	Twice monthly until sputum smear negative and patient asymptomatic, then monthly.
b. Adverse reaction to drugs.	Baseline lab studies \geq 35 years of age Question and observe for signs and symptoms of toxicity. Additional testing if they occur.	Question and observe for signs and symptoms of toxicity. Additional testing if they occur.	Question and observe for signs and symptoms of toxicity. Additional testing if they occur.