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Recommendations for Prevention and Control of Tuberculosis Among Foreign-Born Persons

Report of the Working Group on Tuberculosis Among Foreign-Born Persons

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Recommendations for Prevention and Control of Tuberculosis Among Foreign-Born Persons

Report of the Working Group on Tuberculosis Among Foreign-Born Persons

Summary

During 1986–1997, the number of tuberculosis (TB) cases among foreign-born persons in the United States increased by 56%, from 4,925 cases (22% of the national total) to 7,702 cases (39% of the national total). As the percentage of reported TB cases among foreign-born persons continues to increase, the elimination of TB in the United States will depend increasingly on the elimination of TB among foreign-born persons.

On May 16–17, 1997, CDC convened a working group of state and city TB-control program staff, as well as representatives from CDC's Division of TB Elimination and Division of Quarantine, to outline problems and propose solutions for addressing TB among foreign-born persons. The Working Group on Tuberculosis Among Foreign-Born Persons considered a) epidemiologic profiles of TB cases among foreign-born persons, b) case finding, screening, and preventive therapy for the foreign born, c) TB diagnosis and management for the foreign born, d) opportunities for collaborations with community-based organizations (CBOs) to address TB among the foreign born, and e) TB-related training needs.

The Working Group's deliberations and the resulting recommendations for action by federal agencies, state and local TB-control programs, CBOs, and private health-care providers form the basis of this report. For each of the five topics of discussion, the group identified key issues, problems, and constraints and suggested solutions in the form of recommendations, which are detailed in this report. The Working Group made the following recommendations:

- *The epidemiology of TB among foreign-born populations differs considerably from area to area. To tailor TB-control efforts to local needs, TB-control programs should develop epidemiologic profiles to identify groups of foreign-born persons in their jurisdictions who are at high risk for TB.*
- *The priorities of TB control among the foreign born should be the same as those for control of TB among other U.S. populations — completion of treatment by persons infected with active TB, contact tracing, and screening and provision of preventive therapy for groups at high risk. Screening and preventive therapy should be limited to areas where completion of therapy rates and contact-tracing activities are currently adequate.*
- *Based on local epidemiologic profiles, selective screening should be conducted among populations identified as being at high risk for TB. Screening should target groups of persons who are at the highest risk for TB infection and disease, accessible for screening, and likely to complete preventive ther-*

apy. The decision to screen for infection, disease, or both should be based on the person's age and time in the United States, prior screening, and locally available resources for the provision of preventive therapy.

- *TB-control programs should direct efforts towards identifying impediments to TB diagnosis and care among local foreign-born populations, devising strategies to address these barriers, and maximizing activities to ensure completion of treatment.*
- *Providing TB preventive therapy and other TB-related services for foreign-born persons is often impeded by linguistic, cultural, and health-services barriers. TB-control programs can help overcome these barriers by establishing partnerships with CBOs and by strengthening training and education efforts. Collaborations with health-service CBOs should center on developing more complementary roles, more effective coordination of services, and better use of existing resources for serving the foreign born. TB-related training should be linked to overall TB-control strategies for the foreign born. Training and education should be targeted to providers, patients, and community workers.*

INTRODUCTION

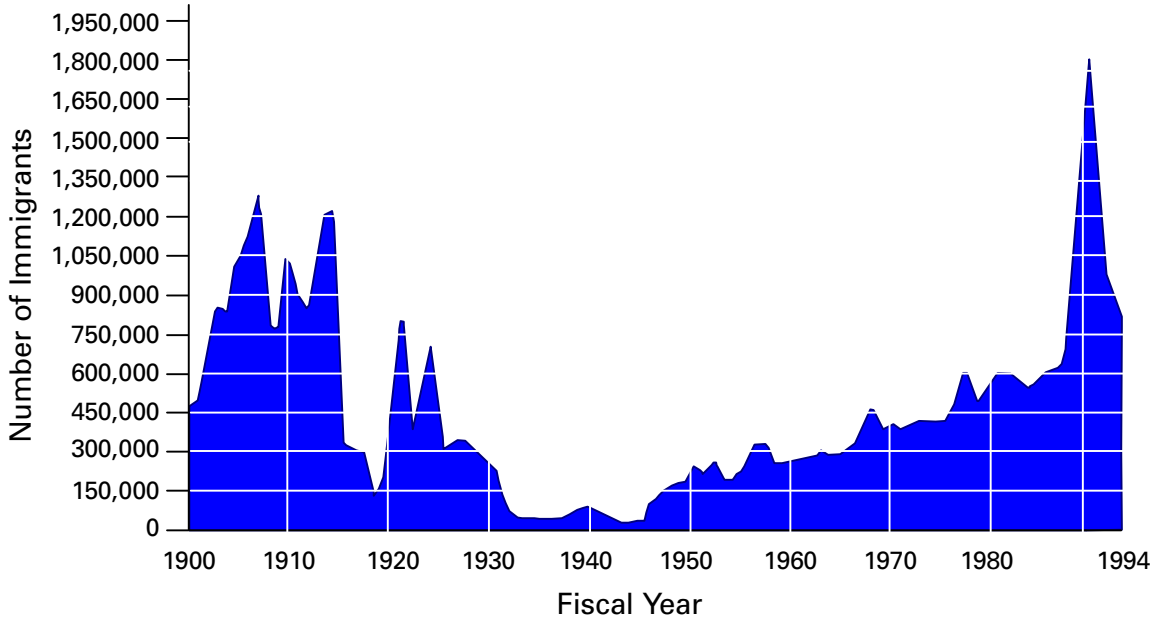
In 1986, CDC began collecting information on place of birth for those persons residing in the United States who have been reported to be infected with tuberculosis (TB). National surveillance data for the decade that followed indicate that the number of TB cases among persons born in other countries increased from 4,925 in 1986 to 7,702 in 1997, and that the percentage of foreign-born cases increased from 22% to 39% of the national total. In Canada and several European countries, foreign-born persons now account for more than half of TB cases. If current U.S. trends continue through the next decade, more than half of TB cases are likely to occur among the foreign born.

BACKGROUND

Immigration Trends

The increase in TB cases among foreign-born persons over the past decade is partly attributable to increased immigration (Figure 1). The largest wave of immigration in U.S. history occurred in the early 1900s; by 1910, 14% of all U.S. residents were foreign born. Immigration declined during the next two decades, reached a low during the Great Depression (1929–1939), and then gradually increased until the mid-1980s. A peak occurred in 1986, when the Immigration Reform and Control Act was passed and persons who had entered the country illegally were allowed to legalize their status. In 1996, the most recent year for which immigration figures are available, 915,900 persons were granted permanent residence (*1*). In addition, an estimated 275,000 undocumented aliens arrive annually. In 1996, an estimated 24.6 million foreign-born persons resided in the United States, representing 9% of the total population (*2*).

FIGURE 1. Immigrants admitted to the United States during fiscal years 1900–1994



Source: U.S. Department of Justice, Immigration and Naturalization Service. Statistical yearbook of the Immigration and Naturalization Service, 1996. Washington D.C.: U.S. Government Printing Office, 1997.

Another factor in the increase in TB cases among foreign-born persons is changing trends in countries of origin. Immigration has been increasing from Asia and the Latin Americas, where TB rates are 5–20 times higher than those in the United States. In 1994, 25% of the 24 million foreign-born persons in the United States were from Asia and 42% from Latin America, including 6 million persons from Mexico (*2*). In recent years, Asian-born persons have accounted for an increasing percentage of new immigrants; in 1995, 37% of new arrivals were from Asia (*3*). After Mexico, the top two countries of birth among immigrants in that year were the Philippines and Vietnam.

The foreign-born population is concentrated in some areas in the United States. Forty-three percent of such persons live in California (34%) or New York (9%). Florida, Texas, New Jersey, and Illinois each have 5%–8% of the total foreign-born population (*2*). In 1995, two thirds of immigrants indicated California, New York, Florida, Texas, New Jersey, and Illinois as their intended residence at the time of immigration, and approximately one fourth of all new immigrants indicated an intent to live in Los Angeles or New York City (*3*).

Characteristics of TB Cases Among Foreign-Born Persons

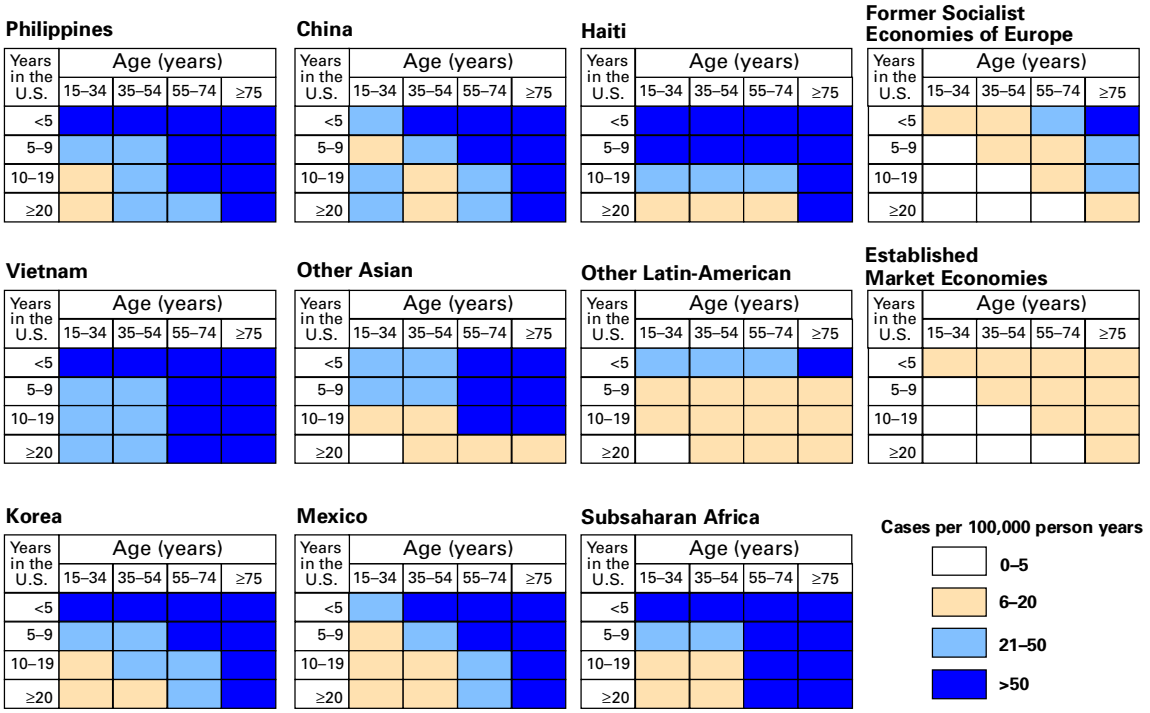
The composition of TB cases among foreign-born persons reflects immigration patterns and trends. In 1997, Mexico was the country of origin for 22% of immigrants with TB, with the Philippines (14%) and Vietnam (11%) the next most common countries of birth. India, China, Haiti, and Korea each accounted for 3%–6% of the total.

Together, these seven countries accounted for two thirds of TB cases among foreign-born persons in the United States.

As expected, most TB cases among foreign-born persons are reported from the states with the most immigrants. In 1997, 66% of all TB cases among foreign-born persons were reported from California (36% of the national total), New York (15%), Texas (8%), Florida (5%), New Jersey (4%), Illinois (3%), Washington (2%), Massachusetts (2%), Virginia (2%), and Hawaii (2%) (Table 1). In 1997, TB cases among foreign-born persons were examined as a proportion of total TB cases in each state. A total of 66% of TB cases occurred among foreign-born persons in California and 51% in New York. Even in states with relatively few cases among the foreign born (e.g., Minnesota and Rhode Island), approximately 60% of TB cases in 1997 were among persons born outside the United States.

Most TB cases among foreign-born persons are likely the result of reactivation of remotely acquired infection, although some transmission is probably occurring in the United States. Studies using the restriction-fragment-length polymorphism (RFLP) technique document transmission to the foreign born by others who are foreign born or U.S. born (*4*); other studies document high percentages of cases among the children of the foreign born (*5*). For all immigrant groups, the disease risk appears highest in the first years after U.S. arrival (Figure 2). Among some groups, the risk decreases rapidly over time, whereas for others, it remains high for up to 20 years (*6*). The risk for disease among the foreign born also appears related to chronological age and age at immigration; younger persons and those who immigrated at younger ages are at lower risk for subsequent infection with TB.

FIGURE 2. Rates of reported tuberculosis by place of birth, age, and length of residence in the United States, 1986–1994



Source: Zuber PLF, McKenna MT, Binkin NJ, Onorato IM, and Castro KG. Long-term risk of tuberculosis among foreign-born persons in the United States. JAMA 1997; 278:304–7; CDC, Unpublished data.

TABLE 1. Tuberculosis cases among U.S.- and foreign-born persons — United States, 1997

State	Total cases	U.S.-born persons		Foreign-born persons*		Unknown	
		No.	%	No.	%	No.	%
United States	19,851	11,898	59.9	7,702	38.8	251	1.3
Alabama	405	384	94.8	21	5.2	0	0
Alaska	78	60	76.9	18	23.1	0	0
Arizona	296	185	62.5	109	36.8	2	0.7
Arkansas	200	182	91.0	16	8.0	2	1.0
California	4,056	1,243	30.6	2,795	68.9	18	0.4
Colorado	94	43	45.7	48	51.1	3	3.2
Connecticut	128	74	57.8	54	42.2	0	0
Delaware	39	26	66.7	13	33.3	0	0
District of Columbia	110	86	78.2	17	15.5	7	6.4
Florida	1,400	988	70.6	408	29.1	4	0.3
Georgia	696	570	81.9	115	16.5	11	1.6
Hawaii	167	41	24.6	126	75.4	0	0
Idaho	15	6	40.0	9	60.0	0	0
Illinois	974	727	74.6	223	22.9	24	2.5
Indiana	168	143	85.1	24	14.3	1	0.6
Iowa	74	37	50.0	34	45.9	3	4.1
Kansas	78	42	53.8	23	29.5	13	16.7
Kentucky	198	184	92.9	14	7.1	0	0
Louisiana	406	380	93.6	23	5.7	3	0.7
Maine	21	16	76.2	5	23.8	0	0
Maryland	340	208	61.2	132	38.8	0	0
Massachusetts	268	83	31.0	185	69.0	0	0
Michigan	374	320	85.6	54	14.4	0	0
Minnesota	161	46	28.6	114	70.8	1	0.6
Mississippi	245	235	95.9	10	4.1	0	0
Missouri	248	197	79.4	51	20.6	0	0
Montana	18	15	83.3	3	16.7	0	0
Nebraska	22	11	50.0	11	50.0	0	0
Nevada	112	56	50.0	56	50.0	0	0
New Hampshire	17	8	47.1	9	52.9	0	0
New Jersey	718	379	52.8	339	47.2	0	0
New Mexico	71	51	71.8	20	28.2	0	0
New York	2,265	1,119	49.4	1,146	50.6	0	0
North Carolina	463	393	84.9	70	15.1	0	0
North Dakota	12	7	58.3	5	41.7	0	0
Ohio	286	226	79.0	59	20.6	1	0.3
Oklahoma	212	169	79.7	28	13.2	15	7.1
Oregon	161	94	58.4	67	41.6	0	0
Pennsylvania	528	399	75.6	123	23.3	6	1.1
Rhode Island	38	13	34.2	23	60.5	2	5.3
South Carolina	328	308	93.9	20	6.1	0	0
South Dakota	19	18	94.7	1	5.3	0	0
Tennessee	467	423	90.6	43	9.2	1	0.2
Texas	1,992	1,234	61.9	626	31.4	132	6.6
Utah	36	16	44.4	20	55.6	0	0
Vermont	6	4	66.7	2	33.3	0	0
Virginia	350	205	58.6	143	40.9	2	0.6
Washington	305	114	37.4	191	62.6	0	0
West Virginia	54	51	94.4	3	5.6	0	0
Wisconsin	130	78	60.0	52	40.0	0	0
Wyoming	2	1	50.0	1	50.0	0	0

*Persons born outside the United States, American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Midway Island, Northern Mariana Islands, Puerto Rico, Republic of Palau, U.S. Minor Outlying Islands, U.S. Miscellaneous Pacific Islands, and U.S. Virgin Islands.

Source: CDC. Reported tuberculosis in the United States, 1997. Atlanta, GA: US Department of Health and Human Services, CDC National Center for HIV, STD, and TB Prevention, July 1998.

The number of foreign-born persons in the United States with TB infection is unknown. However, based on the World Health Organization (WHO) estimate that one third of the world's population is infected, more than 7 million foreign-born persons in the United States might be at risk for reactivation of remotely acquired infection.

PRIORITIES FOR ELIMINATING TB IN THE UNITED STATES

As the percentage of reported TB cases among foreign-born persons continues to grow, the elimination of TB in the United States will depend increasingly on the elimination of TB among the foreign born. Although this factor presents challenges and requires a flexible approach, the priorities of TB control remain the same — a) finding persons with active disease and ensuring completion of treatment; b) tracing the contacts of those with active disease and evaluating each contact's status regarding TB infection and disease; and c) screening persons at high risk for infection, providing preventive therapy to eligible candidates, and ensuring completion of that preventive therapy (*7*).

TB Case Finding, Screening, and Preventive Therapy

In the United States, TB screening is required for a) immigrants and refugees applying for permanent legal status and b) persons of foreign birth (e.g., business persons, students, and dependents) who entered the country on nonimmigrant visas and want to adjust their immigration status to legal permanent resident. Each year, active case finding is conducted on approximately 800,000 persons applying for long-term residence. In recent years, approximately half have been screened overseas and half in the United States.

Immigrants and refugees who want to enter the United States are screened overseas by local physicians designated by U.S. consuls. Persons with suspected TB disease are assigned a specific classification — Class A, B1, B2, or B3. The screening procedure consists of initial radiologic screening for persons aged >15 years followed by sputum smear microscopy for acid-fast bacilli (AFB) in those whose radiographs are compatible with active TB. Persons who are AFB-smear–positive (designated Class A) must be treated before departure. Those who are smear-negative, but whose radiographs are compatible with active TB (Class B1) or with inactive disease (Class B2), are referred to a health department in the state of their intended residence for further evaluation. (Those persons with abnormal radiographs indicating calcified granulomas not indicative of active TB are Class B3 and are not referred for additional evaluation.) U.S. screening practices differ from those of other industrialized countries, which require negative cultures.

The yield of the overseas screening process has been well documented; 3%–14% of the approximately 6,000 Class B1 immigrants and 0.4%–4% of the 12,000 Class B2 immigrants who enter the country each year are infected with active TB after arrival in the United States (*8*). Of those without evidence of active TB, many have positive tuberculin skin tests and radiologic abnormalities compatible with old TB; these persons are at high risk for reactivation and are candidates for preventive therapy regardless of age. A study in Seattle determined that approximately half of Class B1 immigrants and one fourth of Class B2 immigrants were considered candidates for

preventive therapy (*9*). Limited information exists concerning the practices of health departments in pursuit of preventive therapy for these groups because, to date, no systematic studies have been conducted on the subject.

Applicants already in the United States must be screened and found free of infectious TB before they can adjust their immigration status. Screening must be performed by physicians designated as "civil surgeons" by the U.S. Department of Justice/Immigration and Naturalization Service (INS). The procedure consists of an initial tuberculin skin test. If the reaction size is ≥5 mm, a chest radiograph is required. Persons whose results are compatible with TB must be referred to a health department for treatment. Referral for possible preventive therapy also is recommended for persons with skin-test reactions of ≥10 mm.

In contrast to the overseas program, less data are available regarding the yield of the U.S. screening program. One program in Denver — where the health department physician was the INS-appointed civil surgeon performing TB examinations — detected an active TB rate of 40/100,000, which was similar to the rate in the country of origin for most of those tested. The study also identified several candidates for preventive therapy for whom the completion rate was higher than for candidates identified by other means (*10*).

The number of foreign-born persons who are screened and treated for TB infection through mechanisms other than formal immigration processes is not known. Contact tracing, an important component of the U.S. strategy for TB control, is a possible case-finding mechanism. However, limited information is available on the usefulness of this approach in identifying either persons suspected of having TB or persons who are at high risk for preventive therapy among the foreign born. A study in Seattle documented that the yield for both the number of contacts and the number of tuberculin-skin-test–positive contacts was higher among the foreign born than among the U.S. born in the area, but the study population was too small to assess the usefulness of contact tracing as a case-finding tool among the foreign born (*9*).

TB-control programs have tried to identify foreign-born preventive-therapy candidates through several other means, including screening migrant farm laborers, school entrants, and participants in English-as-a-second–language (ESL) programs. However, few of these efforts have been evaluated to assess the potential yield.

Efforts to provide screening and preventive therapy for the foreign born are limited. Averting future cases of TB requires linking screening programs to prevention services. However, few resources are available to health departments for large-scale prevention efforts for foreign-born persons. Also, persons who do not consider themselves ill and who are from countries where TB is regarded as a stigma might be reluctant to begin or complete preventive therapy (*11*).

TB-control programs in the United States also must strive to overcome perceptions about tuberculin-skin–test results among persons who have been vaccinated previously against TB. Many countries vaccinate infants with BCG (live attenuated vaccine) as part of their TB-control programs. For those persons, tuberculin sensitivity is highly variable and depends on the strain of BCG used, the population vaccinated, and the recency of vaccination because reactivity wanes over time (*12*). Moreover, no reliable method exists to distinguish tuberculin reactions caused by BCG from those caused by natural infections. Thus, some U.S. health-care providers are reluctant to

perform tuberculin skin tests on foreign-born patients with previous BCG vaccinations because they think that substantial reactions are likely to be falsely positive.

Screening programs also are hindered by the unknown role of environmental mycobacteria in other parts of the world in producing false-positive reactions and by the cultural barriers to providing services to persons who do not consider themselves ill and who are from countries where TB is regarded as a stigma. Finally, the high levels of isoniazid (INH) resistance in many countries of origin raise questions about the usefulness of INH preventive therapy among foreign-born populations.

TB Diagnosis

Data regarding the timeliness of TB diagnosis after the onset of symptoms are not routinely collected for either U.S.- or foreign-born populations. Compared with U.S.-born patients, a higher percentage of foreign-born patients have extrapulmonary TB only. Among foreign-born patients with pulmonary TB, the percentage diagnosed on clinical criteria alone is higher than among U.S.-born patients (14% versus 10%) (*13*).

Drug Resistance

Drug-resistance rates are higher among foreign-born populations than among the U.S. born. In a recent study of drug resistance based on national TB surveillance data for 1993–1996, levels of INH resistance were higher among TB patients born in Vietnam (18.3%), the Philippines (14.7%), and Mexico (9.8%) than among U.S.-born TB patients (6.4%) (*14*). Levels of resistance to INH and rifampin for the three groups were 2.1%, 2.1%, and 1.9%, respectively, which is similar to the rate of 2.0% for those born in the United States. Among foreign-born TB patients from the three countries, resistance levels were higher in new arrivals than in long-term residents.

TB Treatment Outcomes

The outcome of TB treatment is slightly better for foreign-born patients than for U.S.-born patients (*15*). Among the foreign-born community, levels of completion vary by country of origin, but among all the major immigrant groups, completion rates equal or exceed those of TB cases among U.S.-born patients.

TB-HIV Coinfection

In the United States, HIV has not played a major role in TB cases among foreign-born persons in most areas. The only exception is persons from Haiti. Recent studies conducted in southern Florida indicated that half of the Haitians infected with TB among those aged 25–44 years were also HIV positive (*16*). The low incidence of HIV among foreign-born persons with TB might be partly attributable to the U.S. law prohibiting persons with HIV infection from applying for overseas immigration (*17*). Also, injecting-drug use has not emerged as a major problem among the foreign-born population. However, areas (e.g., San Diego) that are experiencing increasing drug use among the foreign born have noted a corresponding increase in HIV prevalence among foreign-born TB patients in recent years (personal communication, Kathleen Moser, M.D., M.P.H., San Diego Department of Health, May 1997).

OVERVIEW OF THE WORKING GROUPS REPORT

Given the issues outlined previously, the Working Group on Tuberculosis Among the Foreign Born was responsible for a) delineating the most important policy and programmatic needs related to TB among foreign-born persons and b) providing recommendations for action by CDC and other federal agencies, health departments, community-based organizations (CBOs), and private health-care providers to enhance control efforts. The group's deliberations centered on five topics —

- epidemiologic profiles of TB cases among foreign-born persons;
- case finding, screening, and preventive therapy;
- diagnosis and management;
- collaborations with CBOs; and
- training needs.

The remainder of this report is organized around these topics, with discussion of key issues related to each, followed by the recommendations of the Working Group.

DEVELOPING EPIDEMIOLOGIC PROFILES OF TB CASES AMONG FOREIGN-BORN PERSONS

Issues

Because the characteristics of foreign-born populations and TB cases among the foreign born differ among public health jurisdictions in the United States, TB-control efforts must be tailored to meet local needs. These efforts require developing detailed epidemiologic profiles of TB cases among the foreign born. TB-control program staff need to know the characteristics and outcomes of foreign-born patients with TB in their jurisdictions. They also need information on sources of medical care in communities of the foreign born, care-seeking behaviors, delays in seeking care, community organizations or structures with access to specific foreign-born populations, sources of interpreter services, and sources of culturally appropriate health information.

Recommendations for Developing Epidemiologic Profiles of TB Cases Among Foreign-Born Persons

CDC

- CDC should continue to expand data presented regarding TB cases among foreign-born persons in annual surveillance reports (e.g., time person has been in the United States when TB is diagnosed).
- CDC should develop guidelines to monitor disease prevalence in each reporting jurisdiction to document the burden of disease represented by persons entering the United States. Current TB case counts exclude foreign-born persons who received TB treatment before entering the United States, even if these persons

have documented disease and require months to years of treatment after entry. Prevalence is an important measurement for assessing TB program needs given the prolonged treatment courses required for each active case. These data should be added to CDC's annual surveillance reports.

- CDC should collaborate with international and national agencies and organizations, (e.g., the North American Chapter of the International Union Against TB and Other Lung Diseases) as well as state and local health departments to develop profiles of immigration trends and patterns at the global, national, state, and local levels.
- CDC should help health departments use TB surveillance data to develop profiles of TB cases among foreign-born persons in their jurisdictions (Appendix A). CDC should develop prototype documents and the computer programs needed to generate routine reports at state and local levels. CDC also can help identify and direct health departments to other data sources, such as a) CDC's Division of Quarantine database on immigrants with Class B tuberculosis and b) INS and U.S. Bureau of Census documents and data sets that might be useful for certain rate calculations. (Note: Detailed calculations at the state and local levels will not always be feasible.)
- CDC should conduct and support studies to evaluate TB transmission, contact tracing, and source investigations among foreign-born populations. Possible research topics include a) the effects and yield of contact tracing with regard to case prevention and completion of preventive therapy; b) TB transmission by foreign-born patients to children; c) identification of groups at high risk for whom to target screening; and d) strategies to address border issues.

Health Departments and TB-Control Programs

- Heath departments should develop baseline profiles of TB cases among foreign-born persons in their jurisdictions (Appendix A). The frequency of subsequent profiles and their use at the city or county level will be governed by the number and percentage of cases among the foreign born. Annual profiles will be useful management tools for states with a high incidence of TB among persons born in other countries.
- Although much of the information needed to generate the epidemiologic profiles already is collected as part of the "Reports of Verified Cases of Tuberculosis" (RVCT), health departments in areas with large foreign-born populations should consider including additional variables (e.g., whether persons were identified as Class B1 or B2 cases on overseas screening). Information on case designations (Class A, B1, B2, or B3) can also be used to measure the impact of overseas TB screening on U.S. morbidity.
- As necessary, health departments should conduct special studies to complete their epidemiologic profiles. Research could focus on a) determining who is providing health-care services to the foreign born; b) identifying factors that are responsible for delays in TB diagnosis; c) identifying obstacles to care seeking; d) assessing the role of managed-care organizations in the care of foreign-born

TB patients; and e) determining the capability of local practitioners to provide services for foreign-born populations.

- Health departments should work with CDC and other agencies to develop profiles of immigration trends and patterns at the global, national, and state and local levels.

CASE FINDING, SCREENING, AND PREVENTIVE THERAPY

Case Finding and Contact Tracing

Issues

Active case finding can help identify cases of TB among foreign-born persons whose access to health-care services might be more limited than that of persons born in the United States. However, the yield of such case-finding efforts is influenced by the following factors:

- Screening procedures before entry into the United States.
- Country or region of origin — Immigrants from the Philippines, Vietnam, Haiti, Korea, and sub-Saharan Africa have higher rates of reported TB than immigrants from other countries (*6*).
- Length of time in the United States — Regardless of country of origin, immigrants who have been in the United States for <5 years have higher rates of TB than immigrants who have been in the United States >5 years (*6*).
- Current age and age at the time of U.S. entry — Older immigrants have higher rates of TB disease than immigrants who are younger. Those who enter the United States at an older age have higher rates than their counterparts who enter at younger ages (*6*).

Other factors, (e.g., return travel to the country of origin, HIV status, living conditions, and family constellation) also can affect contact tracing. All of these factors need to be considered in deciding which groups, if any, should be the target of active case-finding efforts.

Contact tracing is one form of active case finding and is an important component of TB-control efforts in the United States, regardless of a patient's country of origin. Although the intent and methods of contact tracing for foreign-born persons do not differ substantially from those for persons born in the United States, contact investigations among foreign-born persons might have different dynamics. For example, determining if transmission has occurred among "close" household contacts can be difficult because of the high background prevalence of positive tuberculin reactions. Expanding the contact investigation to those other than close household contacts requires additional time, effort, and resources.

Recommendations for Case Finding and Contact Tracing

CDC

- CDC should provide health departments with timely information on Class B entrants who need evaluation. CDC should help health departments set up monitoring systems to ensure that evaluations of these entrants are completed.
- CDC should provide guidance and data to help health departments determine priorities for active case finding beyond Class B1 and B2 immigrants.
- CDC should conduct and support studies and assessments of innovative methods of case finding.
- CDC should develop and disseminate measurement instruments and other tools to help programs measure effectiveness and prevention effectiveness.
- CDC should develop interstate communication and notification methods for tracking TB patients who might be highly mobile and easily lost to follow-up (e.g., asking immigrants at the time of entry about plans for relocating).

Health Departments and TB-Control Programs

- Where appropriate, health departments should develop local plans for controlling TB among the foreign born through case finding, screening, and preventive therapy. Emphasis should be on the community planning role of the health department and the implementation role of other providers in the community. The plan should be specific to the characteristics of TB among the jurisdiction's foreign-born population and should include
  - — risk assessments of TB among the foreign born, based on local demographic and epidemiologic profiles;
  - — data regarding expected patterns of immigration, based on information provided by INS;
  - — information provided by the local public health and TB-control programs about their structure and resources;
  - — a list of community health centers and CBOs providing health-care and other services to immigrant populations provided by local community outreach organizations; and
  - — recommendations on case finding, contact tracing, screening, and preventive therapy based on recommendations of CDC and others.
- Health departments should conduct active case finding according to the following three priorities:

  Priority 1 — Immigrants with Class A TB. Health departments should ensure that these patients are located, evaluated, and treated appropriately.

  Priority 2 — Immigrants with Class B1 or B2 TB. Currently, no federal regulations exist that prescribe follow-up procedures for those who have suspicious chest

radiographs but negative sputum smears, although those persons are reported to state health departments by federal authorities. The number who are actually evaluated nationally is unknown, but in health departments where assessments have been made, the percentage has been reported to range from 63% to approximately 95% (*8*). Each state and local TB-control program should therefore have an active process to ensure that all Class B1 and B2 immigrants are located, evaluated, and treated appropriately. Programs should develop a notification process (e.g., timely transfer of Class B1 and B2 forms to the health department with a prescribed "window" for action).

Priority 3 — Other Groups at High Risk. The next priority should be older immigrants (especially those aged >55 years), immigrants from countries with high rates of TB, immigrants from high-risk areas who have been in the United States <5 years, and/or other groups that are "producing" cases, as documented in the epidemiologic profile.

- Health departments should determine other processes for case finding among lower-risk foreign-born persons. These will likely center on sources of care for the foreign born and will require fostering partnerships with those who provide such care, including CBOs, community clinics, community health-care providers, and foreign-trained physicians. The health department should involve these partners in developing and implementing the proposed plan to combat TB in their community. The health department's role should be to provide education, training, and consultation.
- Health departments should ensure that the evaluation of Class B1 and B2 immigrants includes a thorough history, medical examination, and in many cases, a repeat chest radiograph. Evaluation of lower-risk groups might include a) a symptom check followed by a chest radiograph for persons with symptoms indicative of TB; b) a purified protein derivative (PPD) tuberculin test followed by a chest radiograph for PPD-positive persons; or c) screening with a chest radiograph without symptom history or PPD testing, based on whether screening is to be used for both case finding and preventive therapy or for case finding only (e.g., elderly foreign-born persons). The most effective strategy will depend on the risk for disease among the population screened. Health departments should include these strategies in their TB-control plans.
- Health departments should evaluate their case-finding strategies and determine the operational outcomes and cost-effectiveness of different approaches. For example, depending on the prevalence of TB disease among the population being screened, symptom check and chest radiograph screening might be more cost-effective than performing PPD screening with chest radiographs for persons with positive PPD results.
- Contact tracing should continue according to CDC guidelines. Health departments should systematically collect data regarding the outcomes of contact tracing among foreign-born populations and evaluate the yield and effectiveness.

- Health departments should use CDC-developed *interstate* communication and notification methods for tracking TB patients. Health departments should develop *intrastate* tracking methods.
- Health departments should share information on lessons learned. TB incidence among foreign-born persons is a fluctuating situation in many parts of the country. Communities that currently have few TB cases among the foreign born might have more in the future. To transfer lessons learned, programs with large numbers of recent immigrants should systematically record their experiences with case finding, contact tracing, screening, preventive therapy, and directly observed preventive therapy (DOPT) and should document successful strategies. Regional associations could make this topic a formal forum at periodic meetings.

Providers

- Community practitioners and physicians providing health services to foreign-born persons from high-risk areas should have a high degree of suspicion for anyone who is symptomatic and refer them, when possible, to a state TB-control clinic.

Screening and Preventive Therapy

Issues

A substantial number of foreign-born persons are from countries where the prevalence of TB is many times higher than that reported for the United States. CDC estimates that at least 7 million foreign-born persons in the United States are infected with TB and that 140,000–210,000 (2%–3%) will develop disease after immigration unless they complete a regimen of preventive treatment.

Screening and providing preventive therapy to foreign-born persons are hindered by the large number of persons to be screened, difficulties in diagnosis, difficulties in gaining access to persons who should be screened, cultural and linguistic barriers, and the perceived difficulty in interpreting tuberculin skin tests among persons who have received BCG vaccine. In health departments already serving large numbers of TB patients, efforts to initiate large-scale screening programs to identify additional foreign-born persons with TB infection might be impeded by insufficient resources to ensure completion of preventive therapy.

As of the publication of this report, data are scarce regarding the rate of completion of preventive therapy among foreign-born persons with TB infection. Lack of data thwarts efforts to evaluate the cost-effectiveness of screening and prevention programs or to measure or predict the impact of DOPT on completion rates, the impact of directly observed therapy (DOT) for index cases on the preventive therapy completion rates of their contacts, or the impact of more extensive screening programs.

Data are also lacking on the contribution of civil surgeons in identifying candidates for preventive therapy, providing preventive therapy to foreign-born patients, and referring patients to local health departments for evaluation. Some physicians do not place tuberculin-reactive foreign-born patients on preventive therapy because the physicians attribute positive skin-test results to prior BCG vaccination. Some foreign-

born candidates might not be started on preventive therapy because physicians find difficulty in convincing patients of the value of this health intervention (*18*). Physicians and patients have concerns about potential adverse effects or toxicity associated with preventive therapy.

Recommendations for Screening and Preventive Therapy

CDC

Screening —

- CDC should develop guidelines to help state and local health departments develop area-specific, cost-effective strategies for TB screening targeted to foreign-born populations at high risk and ensure that resources are targeted to areas of greatest need.
- CDC should develop guidelines for evaluating screening programs to assess cost-effectiveness.
- CDC should provide information on any national policies related to TB screening, diagnosis, treatment, and preventive therapy in high-prevalence countries that are the source of large numbers of reported U.S. cases (e.g., Mexico, the Philippines, Vietnam, India, China, Haiti, and South Korea). CDC should make this information available to appropriate health departments, universities, hospitals, clinics, and private physicians to facilitate and maximize treatment efforts.
- CDC should collect and disseminate data regarding drug-resistance prevalence and incidence by country. Data could be based on WHO surveys and on information generated by U.S. states on immigrants with TB.
- CDC should conduct and support studies of screening practices in schools, universities, ESL programs, CBOs, and managed-care organizations. The studies should document screening and preventive therapy practices, the impact of the screening practices on case finding and disease prevention, and cost-effectiveness.
- Certain approaches might be better than others at screening undocumented persons. CDC should ensure that screening strategies identify the most effective approaches without excluding or discouraging undocumented populations from seeking TB evaluation and follow-up.
- Community screening plans should address the differing opinions of providers regarding interpretations of positive tuberculin tests. CDC or the American Thoracic Society (ATS) should consider developing a decision algorithm to help providers assess the importance of BCG vaccination history among different immigration groups and age cohorts.

Completion of Preventive Therapy —

- CDC should encourage and assist health departments in developing ongoing systems for compiling and analyzing data regarding the completion of preven-

tive therapy among foreign-born persons. CDC also should assist health departments in analyzing the data regarding cost-effectiveness of efforts to improve completion of preventive therapy among the foreign born.

- CDC should conduct and support cost-effectiveness analyses of preventive therapy program activities to establish criteria for program evaluation.
- CDC should conduct and support studies to evaluate the referral process between civil surgeons and health departments for immigration status adjustment applicants who are TB-infected and need evaluation for preventive therapy.
- CDC should conduct and support clinical and operational research studies to identify and replicate strategies to increase adherence to preventive therapy among target populations.
- CDC should conduct and support studies on the effectiveness of INH preventive therapy among populations with high background levels of INH resistance and the possible role of alternative treatments (e.g., rifampin).
- CDC should conduct and support studies on TB cases prevented as a result of various preventive therapy strategies.
- CDC should work with federal, state, and local agencies that award Medicaid managed-care, primary care, and other direct-service delivery funds to ensure that the assessment of TB prevention indicators are built into funding mechanisms.
- CDC should collect samples of available educational materials and consider dissemination mechanisms (e.g., a TB Internet website). These materials should cover diagnosis of TB infection, the TB skin test, BCG vaccinations, and the importance of preventive therapy. Materials should be posted in a full-text English version, with a list of available translations and sources.

Health Departments and TB-Control Programs

Screening —

- Health departments should establish screening goals and priorities. Because the number of foreign-born persons who are eligible for screening could be large, TB programs should use their epidemiologic profiles to prioritize and target screening to groups who are at the highest risk for TB infection, who are accessible for screening, and who are likely to complete preventive therapy.

  Each community's plan to combat TB among foreign-born persons should provide recommendations for groups identified as screening priorities as well as recommendations for lower-risk groups. The role of CBOs, clinics, and other providers also should be specified, with recommendations for targeted programs for health departments.

  Persons at highest risk for infection can be identified by examining epidemiologic trends in TB disease in the community, results of previous or

existing screening programs, and immigration trends. Data regarding accessibility for screening and likelihood of success with adherence-enhancing efforts (e.g., DOPT) might not be readily available. Data-gathering strategies might include discussions with CBO staff and providers, reviews of the medical literature, reviews of program data, and information exchange with other programs.

Based on this information, possible candidates for screening include a) school entrants, b) ESL students, c) migrant and seasonal farm workers, and d) persons in occupations with large numbers of foreign-born persons (e.g., food handlers, hotel staff, and poultry industry workers). Screening might be conducted at schools, job sites, health departments, private providers' offices, or community clinics. Comprehensive screening strategies (e.g., screening of all new school entrants in areas with substantial foreign-born populations) have the advantage of not stigmatizing the foreign born. Any screening program must include plans and resources for evaluating candidates for preventive therapy and for ensuring completion of therapy, if needed.

- Health department staff should communicate with civil surgeons and private providers to facilitate the evaluation and preventive treatment of TB-infected applicants for immigration adjustment. Health departments can help civil surgeons by becoming familiar with *Technical Instructions for Medical Examination of Aliens in the United States*, the manual used by civil surgeons, and by serving as a technical resource. Health departments need to consider whether they have the resources to provide preventive therapy to TB-infected adjustment applicants before initiating such an activity.
- Health departments should evaluate their screening programs at least annually to assess progress toward goals.

Completion of Preventive Therapy —

- Health departments should ensure that plans for screening include identifying adequate resources and a process to ensure the completion of preventive therapy. If sufficient resources do not exist to ensure completion of preventive therapy, plans for screening should be reconsidered. In some instances, DOPT might be an effective strategy. However, issues of resource allocation and acceptance can limit its application.
- Health departments should evaluate preventive therapy programs to determine their effectiveness and impact. Programs should establish goals for the percentage of persons screened who have their skin tests read, the percentage referred for evaluation who are actually evaluated, the percentage recommended for preventive therapy who actually begin therapy, and the percentage beginning therapy who complete that therapy. Although formal cost-effectiveness analyses are not necessary or feasible for most health departments, the cost of the program, including the cost per participant completing preventive therapy, should be part of any evaluation.

- Health departments should determine the magnitude and scope of nonadherence to preventive therapy among the foreign-born populations in their jurisdictions.
- Health departments should ensure that culturally sensitive and language-appropriate educational materials on TB infection, BCG vaccinations, skin testing, and the importance of preventive therapy are available to foreign-born persons at high risk for disease.
- Health departments should collaborate with practitioners to develop and monitor preventive therapy practices.
- Health departments should undertake pilot approaches for improving completion rates for preventive therapy among less adherent high-risk groups.

DIAGNOSING AND MANAGING TB

Recognizing TB

Issues

In their pursuit of health care in the United States, foreign-born persons encounter many barriers that can impede the recognition of TB (e.g., language and cultural differences, which hinder communication between foreign-born patients and health-care providers). Moreover, many foreign-born patients are unaware of how to gain access to the health-care system. Even when they access health care, they often are ineligible for employee-based health insurance or Medicaid and cannot afford to purchase private insurance.

Attitudes and behaviors can pose other impediments to the recognition of disease among the foreign born. Because of the social stigma of TB or cultural beliefs about disease causation, progression, and treatment, some foreign-born persons might deny the presence of symptoms or known disease. They might delay seeking care even when illness is recognized because of other priorities in their lives (e.g., securing food and shelter, job responsibilities, and family concerns). Undocumented persons (e.g., illegal border crossers and visa "over-stayers") might delay diagnosis and treatment because of fear of detection and possible deportation. Delays can result in diagnosis of disease at more advanced stages, which translates into the possible need for hospitalization and more expensive care, as well as prolonged periods of infectiousness and a greater likelihood of disease transmission. Medical providers and laboratories also can impede or delay disease recognition. Foreign-born patients might seek care from medical providers who are not fully aware of, or up-to–date on, the latest CDC and ATS guidelines for TB diagnosis and treatment.

Persons of foreign origin who enter the country on nonimmigrant visas create specific problems. Unlike immigrants and refugees, nonimmigrant business persons, students, and dependents are not required to be medically evaluated for TB before entering the country. If they later want to adjust their immigration status to that of legal permanent resident while remaining in the United States, they are required to be

screened by a civil surgeon designated by INS. Civil surgeons have valid U.S. medical licenses but have no other TB-related educational or training requirements and receive no postdesignation monitoring or required continuing education. In most areas of the country, a lack of coordination and communication exists between civil surgeons and state and local health departments.

Recommendations for Recognizing TB

CDC

- Via direct links to INS, CDC should initiate efforts to determine the number of adjustment-of-status examinations conducted in various jurisdictions and the names of civil surgeons by jurisdiction. CDC should encourage INS to require training, certification, and mandatory continuing education for civil surgeons.
- CDC should develop training materials for civil surgeons to improve their ability to screen immigrants for TB infection and disease and to make the appropriate referrals for follow-up. The materials could be designed as self-study tools or as course curricula for continuing education classes provided by health departments.
- CDC should conduct and support studies to identify barriers to TB diagnosis and care among foreign-born populations. Helpful information could be provided through operational and behavioral research related to access to care; knowledge and beliefs of patients, community providers, and physicians; and other factors related to recognition of disease among foreign-born populations. CDC also should consider lessons learned from medical anthropology research on other diseases that might be relevant to TB.

Health Departments and TB-Control Programs

- Health departments should devise, identify, and implement early disease recognition strategies that are focused on specific foreign-born populations at high risk. Successful strategies should be promoted as models for other regions.
- Health departments should develop ongoing educational seminars on TB diagnosis for private physicians, especially civil surgeons and physicians in the community who treat foreign-born persons.
- Health departments should be encouraged to make contact with local civil surgeons to offer training and encourage collaboration and referrals.
- Health-care providers and health departments should not be required to question foreign-born patients to determine if they are legal residents under federal immigration law.

Completing Treatment

Issues

Problems related to completion of treatment center on nonadherence, inadequate tracking systems, information gaps, and drug resistance. Nonadherence to treatment is a major problem in TB-control programs worldwide. Adherence is impeded by the same cultural and economic barriers that hinder timely diagnosis of disease among foreign-born persons.

Tracking and communication networks also are inadequate. Some foreign-born persons (e.g., migrant and seasonal farm workers) are very mobile and move among countries and states and across the U.S.-Mexico border while under treatment. Completion of treatment in these cases is impeded by the lack of efficient tracking and referral systems. Similarly, foreign-born patients sometimes return to their country of origin before completion of treatment, with no follow-up of care. Essentially no communication exists between TB controllers in the United States and their counterparts in foreign countries, with the exception of the U.S.-Mexico border region where lines of communication are being established.

TB treatment is also hindered by gaps in information. U.S. health-care providers have little information on current medical guidelines for TB treatment and diagnosis in the developing world. Even U.S. TB controllers are not knowledgeable about the screening procedures and treatment regimens used in the countries of origin for many of their foreign-born patients. In addition, scant program data are available on the common barriers to adherence affecting foreign-born subpopulations in the United States and even less on the unique problems related to adherence among specific groups within foreign-born subpopulations. Although data regarding completion of treatment are collected via the national RVCT system, the data have not been analyzed by subpopulation or region to help define the scope and magnitude of adherence issues among the foreign born.

Foreign-born patients who were treated in their home countries pose special problems. U.S. physicians who treat foreign-born persons with TB are rarely able to obtain medical records from countries where the patients were treated previously. If the records are available, the medical information is likely to be in an unfamiliar language or format. National TB-control program reports from countries that are sources of large numbers of TB cases among the foreign born often lack reliable data regarding rates of relapse, drug resistance, and completion of therapy.

Finally, because resources and infrastructure for TB-control programs are severely limited in many foreign countries, persons treated for TB in these countries might receive inadequate or incomplete treatment. This puts foreign-born persons at greater risk for disease recurrence with drug-resistant strains, which complicates and lengthens the course of treatment. Some persons with multiple resistant strains are chronically ill and persistently infectious. Although the total number of these patients with treatment-resistant TB is small, the cost associated with their medical care is many times that of patients with drug-susceptible disease. Treating these patients can severely strain local health department resources, especially because foreign-born populations are disproportionately underinsured or uninsured.

Recommendations for Completing Treatment

CDC

- CDC should encourage and help state and local health departments conduct periodic analyses of the data regarding reported TB cases among the foreign born to determine the magnitude and scope of nonadherence to treatment.
- CDC should support regional TB associations in facilitating collaborations with immigrants' countries of origin.
- In conjunction with INS, CDC and the model TB centers* should develop and distribute materials in various languages for applicants for immigration adjustment. The materials developed should explain the TB-screening requirements for legal permanent residency.
- CDC, in conjunction with WHO, should compile drug-resistance/drug-susceptibility data from the appropriate countries as available and disseminate the data to jurisdictions with large numbers of foreign-born TB patients.

Health Departments and TB-Control Programs

- Health departments should identify the characteristics of the foreign-born patients in their jurisdictions who are most likely to be nonadherent. They should develop approaches to address the barriers that cause these patients to drop out before completion of treatment. In areas with diverse populations of foreign-born persons, studies should be undertaken to determine problems related to adherence by ethnic subgroup.
- Whenever possible, health departments should hire outreach workers and case managers from the same cultural, ethnic, and linguistic background as the patient populations they serve. Outreach staff can familiarize patients with the local health-care system, ensure that patients receive the necessary examinations, facilitate DOT, and conduct intermittent home visits for pill counts and client interviews to help identify adherence-related problems.
- Health departments should periodically evaluate their educational materials on TB for foreign-born patients to ensure that the materials are accurate, up-to–date, in agreement with the most current CDC and ATS statements, and appropriate to the needs and characteristics of their more recent immigrants.
- Health departments should maximize their collaboration with refugee health programs to help their patients complete treatment.
- Communication between TB controllers in the United States and Mexico should be continued and expanded to facilitate continuity of medical care for TB patients who frequently move back and forth across the border.

*CDC funds three model TB centers — San Francisco's Francis J. Curry National TB Center; New York City's Charles P. Felton National TB Center at Harlem Hospital; and Newark's New Jersey Medical School National TB Center. These model centers provide comprehensive and coordinated state-of-the–art diagnostic, treatment, prevention, and patient education services for those persons infected with TB, those suspected of being infected, their contacts, and other persons at risk for TB.

- Health departments in jurisdictions with large numbers of foreign-born TB patients should become familiar with the treatment policies and regimens of the major countries of origin. They also should ascertain BCG-vaccination policies and practices in those countries.

COLLABORATING WITH CBOs

Issues

CBOs and health departments can be strong partners in efforts to prevent and control TB among foreign-born persons who are at high risk for the disease. However, in many communities, health departments and relevant CBOs have little or no contact and thus lose opportunities to maximize their effectiveness. Also, many health-service CBOs have limited understanding of TB-related issues and often are unable or unwilling to provide screening and preventive therapy.

Recommendations for Collaborating with CBOs

Health Departments and TB-Control Programs

- Health departments should conduct an inventory of community organizations and resources in their jurisdictions to determine which CBOs, community leaders, associations, and coalitions can be resources in the TB-control effort. The list should differentiate between health-service CBOs and those that cannot or do not provide health services. Useful sources of information might include a) TB outreach workers, b) members of foreign-born communities at risk for TB, and c) directories or listings of health department and CBO services. If no such directories are available, health department staff could work with one or two CBOs to compile such a resource for the community.
- Health departments should identify the most influential organizations for persons who are foreign born among those listed in any directory of resources. At a minimum, these organizations should have substantial interactions with persons at high risk for TB, be effective at working in the community, and be willing to work with the health department. Recognizing which CBOs might contribute as partners in community TB prevention and control efforts targeted to the foreign born is important. Examples include religious organizations, community action agencies, community coalitions, vocational assistance or job programs, recognized community leaders, professional associations, block organizations, health centers, student organizations, and informal community groups.
- Health departments should develop partnerships with influential organizations and leaders and share resources to serve communities at risk for TB. Health department staff can

  — serve as sources of information about health-related issues;

  — help with medical referrals;

- — provide TB-related screening, prevention, and other medical care services;
- — provide TB-related services in CBOs or other facilities; and
- — work with CBOs to help newly arrived immigrants and refugees obtain appropriate TB-related education, screening, and follow-up.

- Health departments should invite representatives of key CBOs to serve on state and local TB advisory committees and coalitions. CBO representation is essential to ensure "buy-in" and to gain community expertise in developing workable TB prevention and control strategies.
- Health departments should work with health-service CBOs to develop more complementary roles, more effective coordination of services, and better use of existing resources. CBO roles should be consistent with each organization's stated and unstated interests, missions, goals, and objectives. Some appropriate roles for CBOs might be to
  - — profile the characteristics, health beliefs, and other attributes of the community's foreign-born population(s);
  - — locate patients who previously have been lost to follow-up (if confidentiality issues can be resolved);
  - — help provide TB-related health education to high-risk populations;
  - — provide outreach and screening services, with or without financial support from the health department;
  - — serve as a site for DOT and/or preventive therapy in close collaboration with health department staff (e.g., a health department might detail a staff person to provide health education, screening, and preventive therapy at a CBO);
  - — identify and provide referral services;
  - — provide and/or distribute incentives and enablers to persons receiving treatment or preventive therapy;
  - — enhance the credibility of health-education messages or outreach activities;
  - — translate health-education or training materials; and
  - — identify contacts abroad with whom to begin developing relationships.
- Health departments should initiate the development of prevention-outcome measures for their communities.

TRAINING NEEDS

Issues

Some problems associated with TB among the foreign born stem from communication barriers, cultural and cognitive dissonance between providers and patients, and gaps in provider training. Foreign-born patients might not know how to gain access to the health-care system. Providing TB prevention and control services to foreign-born persons might be impeded by linguistic, ethnic, cultural, socioeconomic, or other dif-

ferences between patients and health workers. Foreign-born health-care providers might be uninformed about the latest U.S. recommendations and practices related to TB and, thus, be unable to provide optimal diagnostic services, preventive therapy, and management to the foreign born.

TB-related training and educational efforts to support and strengthen TB-control activities need to be linked closely to the overall TB-control strategies for the foreign born. When foreign-born populations are identified and health-care providers for these populations are defined, training efforts can be developed and implemented. Education should be targeted to providers, patients, and community workers.

Recommendations for Training Needs

Health Departments and TB-Control Programs

- Health departments should undertake training needs assessments. These assessments should include a determination of the practitioners' knowledge, skills, and attitudes regarding any planned TB-control interventions. Helpful reference sources might include materials and recommendations from the San Francisco Model Center training summit scheduled for October 1998.
- TB-related training and educational efforts focused on the foreign born should reflect the educational, cultural, and ethnic background of the target audience and should consider the unique characteristics of the trainees (e.g., foreign-born health-care providers, other health-care providers who work with the foreign-born, or foreign-born patients).
- Health departments should adapt educational materials for use by specific foreign-born populations. Adaptations should consider language, concepts, level of comprehension, and message delivery. Health departments also should evaluate the message-delivery tools to assess the effectiveness of outreach efforts.
- In collaboration with CBOs, health departments should provide training to health-care providers of foreign-born groups at risk for TB, with the goal of enhancing screening efforts, improving case management, and increasing completion of preventive therapy. Possible topics include diagnosis of TB infection, the TB skin test, preventive treatment, BCG vaccination, case reporting, case management, availability of TB resources, and partnership building. Programs also should include training in the use of interpreters and education about cultural beliefs and practices that can hinder case finding, treatment, and preventive therapy (e.g., cultural concepts about TB, BCG-vaccination use, or barriers to effective communication with foreign-born populations). Ethnologic research (e.g., EthnoMed* data) might be helpful to trainers in gaining a better understanding of their foreign-born constituents. To encourage interest in and attendance at educational programs, health departments and CBOs should consider sponsoring special luncheon or dinner meetings, offering academic credit, and advertising to foreign-born medical associations.

*Sponsored by the University of Washington's Harborview Medical Center in Seattle, EthnoMed is a database containing medical and cultural information about refugee groups (Internet website, <http://weber.u.washington.edu/-ethnomed>.)

- Health departments should train CBO staff who might not have a health background but who can give PPDs and provide simple epidemiologic data. The importance of this training should not be underestimated when planning collaborative efforts with CBOs.

CONCLUSION

This report presents a plan for federal, state, and local TB-control programs to address TB among the foreign-born population residing in the United States. Not all TB-control programs will have the resources to implement all aspects of this plan, and some TB-control programs will not have the same issues identified in this report. However, these recommendations can provide assistance in identifying programmatic gaps and in establishing priories for a TB-control and prevention plan that will yield the greatest positive results for foreign-born persons.

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APPENDIX
SAMPLE EPIDEMIOLOGIC PROFILE

The following table represents some elements of a tuberculosis (TB) profile for a foreign-born person that should be considered for use in state and local health departments.

Data	Sources	How data will be used
Demographics		
Patient's age at diagnosis Patient's age at entry to United States Country of origin Sex Employed (Y/N)	"Reports of Verified Cases of Tuberculosis"	Targeting of programmatic efforts
Years in United States at time of diagnosis	"Reports of Verified Cases of Tuberculosis"	Identification of at-risk groups; identification of missed opportunities for prevention
Source case identified (especially in pediatric cases)	Add to "Reports of Verified Cases of Tuberculosis"	Transmission in foreign-born community; strategy for case finding
Clinical/diagnostic • Previous treatment for TB (Past preventive treatment?) • Acid-fast bacilli smear • Acid-fast bacilli culture • Drug susceptibility • HIV status	Add to "Reports of Verified Cases of Tuberculosis"	Program management; issues surrounding delays in diagnosis; issues regarding treatment; issues regarding preventive therapy; advocacy; program planning
Case Management		
Type of provider	"Reports of Verified Cases of Tuberculosis"	Targeting provider education
Patient on directly observed therapy?	"Reports of Verified Cases of Tuberculosis"	Patient management
Completion of therapy	Add to "Reports of Verified Cases of Tuberculosis"	Program management; identifying high-risk patients; targeting programs.
Drug regimen Drug resistance	"Reports of Verified Cases of Tuberculosis" and WHO	Program management
Case Finding		
Screening program • Number screened • Number infected • Cases found • Preventive treatment completed	State and local health departments	Evaluation of program performance

Data	Sources	How data will be used
Contact tracing • Done or not? • Number of contacts identified per case • Number of cases with no contacts identified • Number (%) infected with no disease • Number (%) placed on preventive therapy • Number (%) completed preventive therapy • Cases found	CDC and state and local health departments	Evaluation of program performance
Class B1/B2 Cases		
Number of notifications	CDC/National Center for Infectious Diseases/Division of Quarantine	Resource allocation
Number investigated	CDC/National Center for Infectious Diseases/Division of Quarantine and state and local health departments	Resource allocation
Number eligible for prevention Number with disease Number started on treatment Number completed treatment	CDC/National Center for Infectious Diseases/Division of Quarantine and state and local health departments	Prioritization of resources
Civil Surgeon Referral		
Number with status readjusted	U.S. Department of Justice/Immigration and Naturalization Service	Assessment of potential burden to health department
Number eligible for prevention Number with disease Number referred to health department (asylees)	U.S. Department of Justice/Immigration and Naturalization Service and local health department	Resource allocation; advocacy for medical services
Qualitative Data on Screening		
Special studies • Schools/universities • English-as-second–language schools • Community-based organizations	Local health departments	Program planning/resource allocation; strategy for case finding
Immigration Profile		
Current population profiles New immigration • Overseas immigrants • Adjustment of status • Asylum seekers	U.S. Census Bureau and U.S. Department of Justice/Immigration and Naturalization Service	Program planning; resource allocation; advocacy for medical services

Data	Sources	How data will be used
Special Studies		
Barriers to accessing care • Language • Financial • Legal • Cultural • Knowledge • Health beliefs	State and local health departments	Issues regarding access — advocacy for medical services
Patient versus provider delays • Duration of symptoms before diagnosis • Number of visits made before diagnosis • Type of provider	State and local health departments	Issues regarding early diagnosis; patient and provider education

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