MINNESOTA DEPARTMENT OF HEALTH

DISEASE CONTROL NEWSLETTER

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Epidemiology of Tuberculosis in Minnesota

Minnesota Rules Governing Communicable Diseases require health care providers to report confirmed or suspected cases of tuberculosis (TB) disease to the Minnesota Department of Health (MDH). The MDH TB Prevention and Control Program collects, analyzes, and disseminates epidemiologic surveillance data to determine the incidence of TB in Minnesota, to assess trends in the occurrence of TB, to identify affected populations, and to evaluate and prioritize TB prevention and control strategies. The following data describe the epidemiology of TB disease in Minnesota.

A resurgence of TB occurred in the United States in the mid-1980s and early 1990s. During that period, the incidence of TB in Minnesota increased from the historical low of 91 cases (2.1 per 100,000 population) in 1988 to a peak of 165 cases (3.7 per 100,000) in 1992. While the number of TB cases reported nationally has declined steadily since 1993, the incidence of TB is increasing markedly in Minnesota. In 1999, 201 new cases were reported statewide (4.3 per 100,000). This is the largest number of TB cases reported annually since 1980 (237 cases), more than twice the number of cases in 1988, and a 25% increase from 1998 (161 cases).

TB occurs throughout Minnesota, with 23 of the state's 87 counties reporting at least one case of TB disease during 1999 (Figure 1). The majority (79%) of TB cases occurred in the seven-county Twin Cities metropolitan area, particularly in Hennepin (57%) and Ramsey (12%) Counties. From 1998 to 1999, the number of cases reported in Hennepin County increased 28%; the incidence of TB in Hennepin County (8.1 per 100,000) is nearly twice the statewide rate. Approximately 20% of TB cases in Minnesota occur in greater Minnesota; increases have occurred in specific areas. For example, the number of TB cases reported in Olmsted County increased from five (3% of reported cases statewide) in 1995 to 19 (9%) in 1999.

The most notable trend in the epidemiology of TB in Minnesota is the large and increasing number of cases among foreign-born persons. From 1995 to 1999, the number of foreign-born TB cases in Minnesota doubled while the number of cases among U.S.-born persons decreased 42% (Figure 2). During 1995-1999, 67% of TB cases in Minnesota occurred in persons born outside the U.S. This figure increased from 50% of cases in 1995 to 78% of cases in 1999. Among states, Minnesota ranks second after Hawaii in the percentage of TB cases among foreign-born persons. In 1999, 12% of white TB cases, 87% of black cases, 89% of Hispanic cases, and 96% of Asian cases occurred among persons born outside the U.S.

Until recently, the highest TB incidence rates in Minnesota have occurred among Asians; however, the incidence among blacks (65.1 per 100,000) now significantly exceeds that among Asians (45.9 per 100,000). The increased incidence of TB among blacks in Minnesota is due largely to TB among recent immigrants from Sub-Saharan Africa (Figure 3).

In addition to being born outside the U.S., other risk factors among TB cases in Minnesota in 1999 included residing in a nursing home (1%), incarceration in a correctional facility (2%), homelessness (3%), and HIV infection (3%). The percentage of TB cases with each of these risk factors declined from 1998 to 1999. Since 1984, 56 cases of TB in HIV-infected persons have been reported.

Surveillance data also describe clinical characteristics of TB in Minnesota. Nearly 30% of TB cases have exclusively extra-pulmonary disease, more than 60% have pulmonary disease only, and the remaining cases have both pulmonary and extra-pulmonary involvement. The percentage of *Mycobacterium tuberculosis* isolates resistant to isoniazid (INH) in Minnesota exceeds the national rate, although other local drug susceptibility data are comparable to national rates. During the past 5 years, 107 (16%) of 666 TB cases in Minnesota with known susceptibility results were resistant to at least one anti-TB drug, including 75

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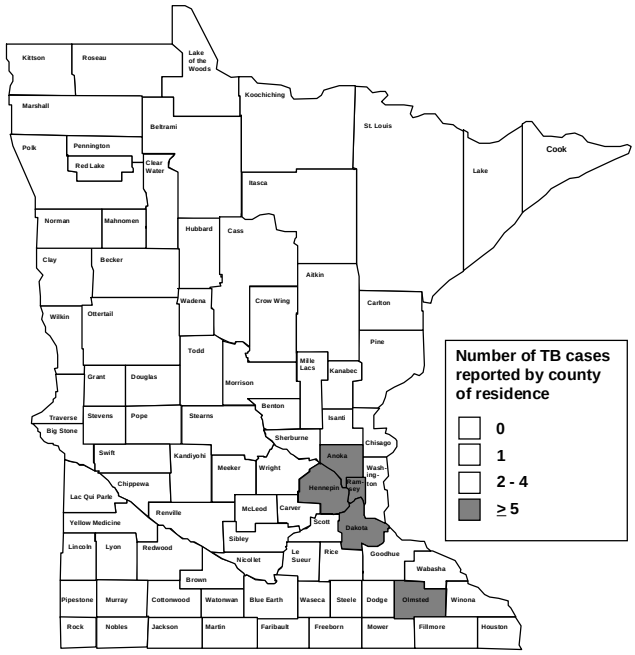
(11%) INH-resistant cases and 11 (2%) multi-drug resistant (MDR) cases resistant to both INH and rifampin (Table 1). The emergence of MDR-TB is a critical public health concern; however, rates of MDR-TB have remained relatively low in Minnesota. Of 11 MDR-TB cases reported statewide since 1995, six were resistant to INH, rifampin, and at least two other drugs.

Demographic and clinical features of foreign-born TB cases differ substantially from those of U.S.-born cases. Of 542 foreign-born TB cases reported in Minnesota from 1995 to 1999, 96% were of non-white race, 51% were less than 30 years of age, 31% had exclusively extra-pulmonary disease, and 20% of culture-confirmed cases were resistant to at least one anti-TB drug. In comparison, of 268 U.S.-born cases reported during the same period, 50% were white, 47% were 50 years of age or older, 22% had exclusively extra-pulmonary disease, and 8% of culture-confirmed cases were drug-resistant. Of 26 drug-resistant TB cases reported in 1999, 25 (96%) occurred in persons born outside the U.S. While the percentage of foreign-born cases with drug resistance has increased steadily during the past 5 years, the prevalence of drug resistance among U.S.-born cases has decreased. Foreign-born drug-resistant TB cases likely represent primary drug resistance acquired outside the U.S. rather than secondary resistance resulting from nonadherence to prescribed therapy.

Changing Epidemiology of TB Among Foreign-Born Persons

The World Health Organization estimates that in 1997, approximately 8 million new TB cases were reported worldwide and 2 million people died of TB. The estimated global prevalence of TB infection is 32%. Eighty percent of incident cases of TB disease in 1997 occurred in 22 countries, with more than half of the cases in five Southeast Asian countries. Nine of the 10 countries with the highest incidence rates of TB were in Africa. Regions with the highest incidence rates were Africa (259 per 100,000 population) and Southeast Asia (202 per 100,000) (Figure 4). In comparison, the incidence rate in the U.S. in 1997 was 7.4 per 100,000 population.

Figure 1. Tuberculosis Disease, Minnesota, 1999



During the past 5 years, the percentage of TB cases occurring among foreign-born persons and the demographics of those cases have changed markedly. This reflects both the prevalence of TB globally and immigration trends in this state. In 1995, 78 (50%) of 156 TB cases in Minnesota were born outside the U.S.; of those foreign-born cases, the largest numbers originated from South/Southeast Asia (47%) and Sub-Saharan Africa (24%). In contrast, of the 156 (78%) foreign-born TB cases reported in 1999, 52% originated from Sub-Saharan Africa, 24% were from South/Southeast Asia, 12% were from Latin American/Caribbean countries, and 10% were from East Asian/Pacific countries (Figure 3).

The increasing incidence of TB in Minnesota is due largely to immigration from high-incidence areas. From 1995 to 1999, Minnesota received 11,924 primary refugees. Many secondary migrants who initially arrive in other states also settle in Minnesota. According to one estimate, immigrants comprise 5% of Minnesota's population or approximately 225,000 people; this figure continues to increase. The

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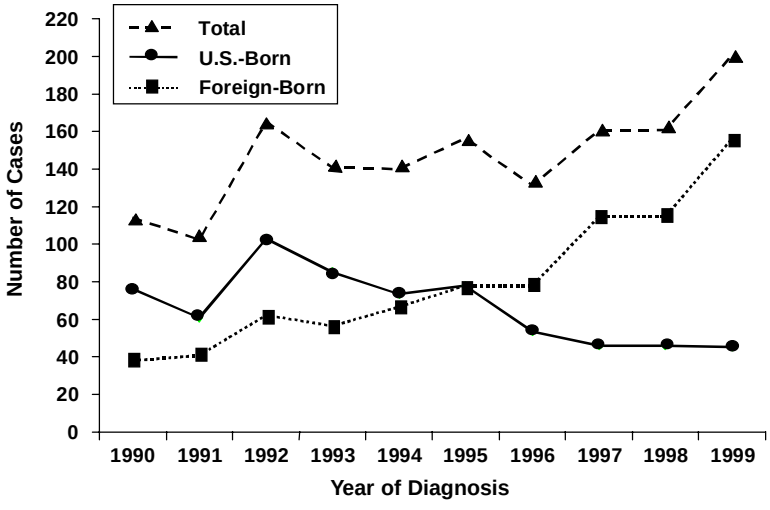
Figure 2. Number of Tuberculosis Cases by Country of Origin, Minnesota, 1990-1999



number of immigrants arriving in Minnesota from countries where TB is prevalent has increased notably. Of 1,608 primary refugees who arrived in Minnesota during the first 9 months of 1999 and were evaluated for TB, 735 (46%) had a reactive Mantoux tuberculin skin test. The prevalence of TB infection varied by country of origin, with the highest rates among persons from Ethiopia (55%), Vietnam (48%), Somalia (47%), Bosnia/Herzegovina (46%), Liberia (41%), and Ukraine (40%).

Figure 3. Foreign-Born Tuberculosis Cases by Region of Origin and Year of Diagnosis, Minnesota, 1995-1999

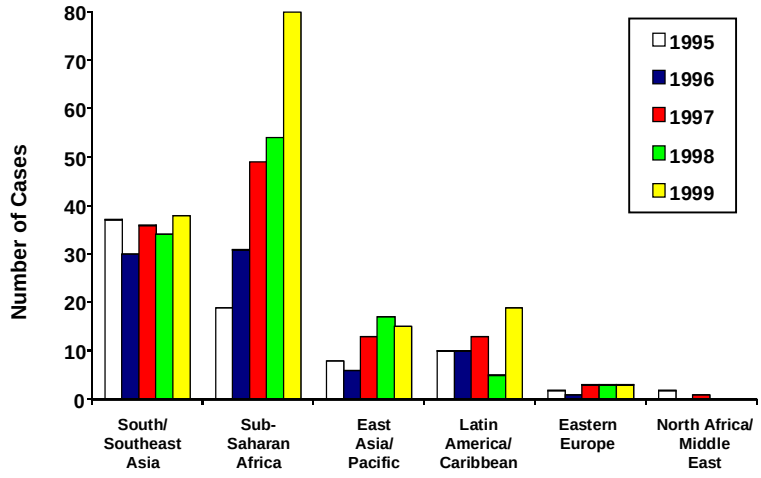
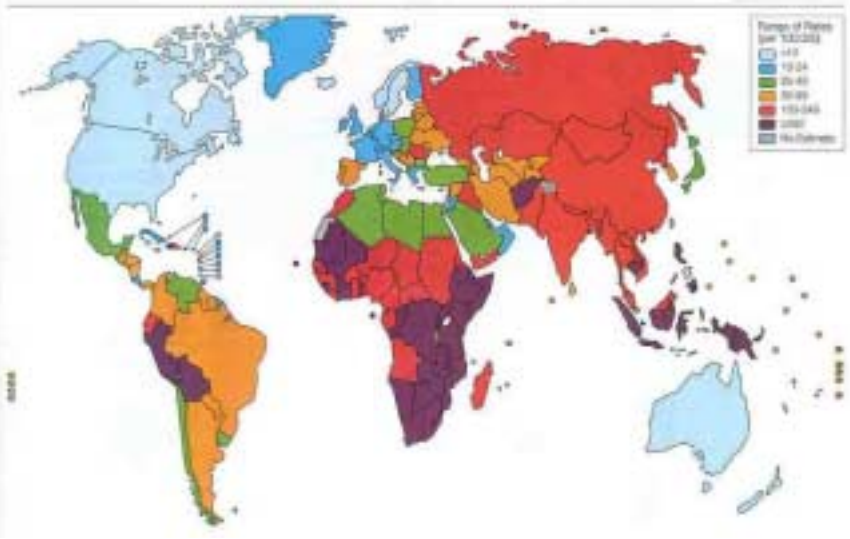


Table 1. Cases of Drug-Resistant Tuberculosis by Type of Resistance and Place of Birth, Minnesota, 1995-1999

Place of Birth	Cases With Susceptibility Results*	Any Drug Resistance No. (%)	INH-Resistant** No. (%)	MDR-TB† No. (%)
Foreign-Born Cases	438	89 (20)	64 (15)	11 (3)
U.S.-Born Cases	228	18 (8)	11 (5)	0 (0)
Total	666	107 (16)	75 (11)	11‡ (2)

* Culture-confirmed cases with drug susceptibility results available
** Isoniazid-resistant cases (also may be resistant to other drugs)
† Multi-drug resistant TB, resistant to both INH and rifampin
‡ Six of these cases were resistant to INH, rifampin, and at least two other drugs

Figure 4. Estimated Incidence Rates of Tuberculosis by Country, 1997



Source: *Global Tuberculosis Control: WHO Report 1999*

A subsequent article in this issue describes the process by which immigrants and refugees are screened for TB disease prior to immigration and by which states are notified of primary arrivals with potentially infectious TB conditions. However, due to significant secondary migration to Minnesota, this process identifies only a small percentage of TB cases diagnosed among foreign-born persons in Minnesota. Few foreign-born TB cases in the state are identified through overseas examinations of primary refugees and immigrants. In 1999, MDH received 211 Class B1/B2 ("noninfectious TB") notifications for persons with TB conditions. Of those persons, 125 (59%) have been evaluated to date and five (4%) were diagnosed with TB disease; rates of disease ranged from 2% to 12% among B2 and B1 notifications, respectively. Of 542 foreign-born TB cases reported during 1995-1999, four (1%) arrived with Class A ("clinically active, infectious TB") notifications and 20 (4%) and 13 (2%) arrived with B1 or B2 notifications, respectively. During this period, 40% of foreign-born TB cases in Minnesota were diagnosed within 12 months of arriving in the U.S.; an additional 20% of cases were diagnosed within 5 years after arrival in this country.

The large proportion of diverse foreign-born TB cases in Minnesota increases the challenge of providing clinical and public health TB prevention and control services. Foreign-born TB cases reported in Minnesota from 1995 to 1999 originated from 52 countries. Of the state's 57 counties with at least one incident TB case during 1995-1999, 33 (58%) counties reported a case born outside the U.S. Foreign-born patients often have complicating factors such as drug resistance, extra-pulmonary disease, nonadherence to prescribed therapy, socioeconomic hardships, and cultural and linguistic barriers. TB services for these patients must be individualized to accommodate diverse foreign-born populations statewide.

Clinical Concepts: Diagnosis, Treatment, and Case Management of Tuberculosis

The increasing incidence and complexity of TB in Minnesota heightens the necessity for vigilance in diagnosing, treating and preventing TB. Early identification and isolation, prompt and adequate treatment of TB disease, and thorough evaluation and prophylaxis of exposed persons are critical to TB control. The following are recommendations for evaluating persons at risk for TB and treating patients with TB disease or infection:

"Think TB"

- Maintain an appropriate index of suspicion for TB, based on the local epidemiology of TB and the demographics of your community. Those at high risk for TB include foreign-born persons (especially newly-arrived immigrants) from areas where TB is common, homeless persons, residents of long-term care or correctional facilities, and persons with HIV infection.
- Take a detailed medical history, including risk factors (e.g., country of origin, travel history, occupation, history of homelessness or incarceration, medical conditions), known exposure to TB, prior tuberculin skin test (TST) results, history of TB disease, prior treatment or prophylaxis for TB, and current symptoms.
- Symptoms of TB disease include a persistent and productive cough (≥ 3 weeks), hemoptysis, weight loss, anorexia, night sweats, fever, and fatigue. Children and elderly or immunocompromised persons may have atypical presentations. Symptoms of extra-pulmonary TB vary by site of disease.
- Patients with suspected pulmonary or laryngeal TB should be triaged and evaluated immediately; promptly initiate respiratory isolation precautions when indicated.

Perform a thorough diagnostic evaluation for persons with suspected TB disease

- Administer a Mantoux TST, unless prior TB infection is documented. A negative TST result does not rule out TB. Approximately 10-20% of persons with TB disease have a non-reactive TST result.
- Perform a posterior-anterior and lateral chest x-ray, regardless of the TST result. Additional radiographic testing may be needed.
- Obtain specimens for acid-fast bacillus (AFB) smears, mycobacterial cultures, and drug susceptibility testing prior to prescribing anti-TB therapy. For suspected pulmonary TB, collect at least three early-morning sputum specimens on consecutive days. The patient should be instructed on how to produce an adequate specimen. If the patient is unable to cough up sputum, specimens should be induced or, if necessary, obtained via bronchoscopy. In young children particularly, early-morning gastric aspirates may be useful. When indicated, efforts should be made to obtain specimens (e.g., lymph node, urine, cerebrospinal fluid, other tissue) for suspected extra-pulmonary disease.
- The MDH Clinical Mycobacteriology Laboratory is a statewide reference facility that performs AFB smears, isolation, species identification, and drug susceptibility testing of mycobacteria. Identification of mycobacterial isolates and susceptibility testing of *Mycobacterium tuberculosis* is performed free of charge. A $15 handling fee is charged for patient specimens submitted for mycobacterial culture.

Promptly report confirmed or suspected cases of TB disease to MDH

- Minnesota Rules Governing Communicable Diseases require health care providers to report confirmed or suspected TB disease to MDH within 1 working day. Prompt reporting facilitates timely evaluation and treatment of contacts. Report cases by calling the MDH TB Program at (612) 676-5414 or 1-877-676-5414. Both pulmonary and extra-pulmonary disease should be reported. Laboratories are required to submit *M. tuberculosis* isolates to the MDH Clinical Mycobacteriology Laboratory.

Initiate four-drug therapy for all newly diagnosed, previously untreated TB disease

- Seek expert consultation when initiating TB therapy, particularly when treating drug-resistant disease which may require alternative medications and a prolonged course of treatment. MDH TB Program staff are available for consultation.
- National guidelines recommend that in areas where the prevalence of isoniazid (INH) resistance is ≥4%, all TB cases initially should receive INH, rifampin, pyrazinamide (PZA), and either ethambutol or streptomycin. The prevalence of INH-resistant *M. tuberculosis* in Minnesota is 11%. MDH produces a yearly antibiogram with statewide susceptibility patterns for specific organisms, including *M. tuberculosis*.

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BCG Vaccine and Tuberculin Skin Testing

Bacille Calmette-Guerin (BCG) vaccine is administered to newborns and children in many countries to protect against TB. Studies have documented the highly variable efficacy of the vaccine, ranging from 0% to 80%. The vaccine is most effective at lowering the risk of disseminated disease (e.g., miliary or meningeal TB) in young children; it does not prevent TB infection. BCG vaccination generally is not recommended in the U.S. due to the small overall risk of TB infection and the vaccine's low and variable efficacy. However, most foreign-born persons have received BCG vaccine. Although BCG vaccine may induce TST reactivity, this reactivity wanes with time. There is no reliable way to distinguish TST reactions caused by BCG vaccine from those caused by TB infection.

History of BCG vaccination is ***not*** a contraindication to tuberculin skin testing. A reactive TST result in a person with a history of BCG vaccination likely is due to TB infection, particularly if the area of induration is large (i.e., ≥10 mm), if the vaccine was administered several years ago, or if the patient has resided in a country where TB is common. A history of BCG vaccination does ***not*** alter guidelines for interpreting a TST result or recommendations for follow-up evaluation and treatment.

- For most uncomplicated drug-susceptible TB disease, ethambutol (or streptomycin) may be discontinued once drug susceptibility results are known; PZA may be discontinued after the first 2 months of therapy. Treatment with INH and rifampin should continue for a total of 6 months.
- Longer therapy regimens may be needed for certain kinds of extra-pulmonary disease and for patients with a delayed response to therapy. If PZA is not used for the full first 2 months of treatment, 9 months of therapy is needed.
- Patients treated previously for TB disease should receive at least two medications not already prescribed and to which their isolate is susceptible. Never add a single drug to a failing regimen; doing so may promote drug resistance.
- Prescribe the safest, most effective, and shortest regimen possible. Lengthy or complicated regimens decrease the patient's likelihood of adherence. Use combination drugs (e.g., Rifamate®, Rifater®) to simplify regimens.

Strive to achieve completion of therapy

- The patient's strict adherence to therapy is critical. Inadequate or sporadic treatment can lead to drug resistance, relapse, and prolonged infectiousness.
- The MDH TB Program provides anti-TB medications at no cost for any patient in Minnesota with confirmed or suspected TB disease. Call (612) 676-5414 to request medications.
- Use Directly Observed Therapy (DOT). DOT involves having a public health worker, clinician, or other designated person observe the patient swallow each dose of TB medication. All patients with TB disease should be assessed at the beginning of therapy as candidates for DOT based on factors such as known or suspected drug resistance, history of non-adherence with medical treatments, reactivated TB disease, history of having taken prophylactic TB therapy, HIV-infection or risk factors for HIV, age less than 18 years, linguistic barriers, homelessness, prior incarceration, mental or emotional handicaps, or chemical dependency. DOT should be used for any patient receiving an intermittent (e.g., twice-weekly) drug regimen.
- Contact the MDH TB Program to arrange a referral to a local public health nurse for DOT. Notify MDH if you suspect your patient is not adhering to the prescribed drug regimen.
- If your patient changes to a new provider or moves to another county or state, notify the MDH TB Program which will make a referral to ensure continuity of care.

Collaborate with MDH and the local public health department

- Successful TB prevention and control require close collaboration between clinicians and public health professionals.
- Clinicians have a primary role in the treatment and ongoing case management of patients with TB. This includes:
  - monitoring the patient monthly for adherence to therapy, clinical improvement, and drug toxicity;
  - obtaining sputum specimens for AFB smears and mycobacterial cultures monthly until cultures convert to negative for *M. tuberculosis* and periodically thereafter;
  - monitoring radiographic response to therapy;
  - adjusting the medication regimen as needed;
  - recommending and offering HIV screening for all TB patients, particularly those 25-44 years of age and those with risk factors for HIV infection;
  - evaluating and managing infected contacts.
- The MDH TB Program's responsibilities for facilitating case management and providing TB prevention and control services include:
  - conducting timely and thorough disease surveillance, including analysis and dissemination of pertinent demographic and clinical data;
  - providing consultation to clinicians, local public health agencies, and others regarding diagnosis, treatment, case management, and contact investigations;
  - providing TB medications free of charge;
  - monitoring the progress of TB cases through completion of therapy;
  - pursuing legal action, as needed, regarding nonadherent infectious patients.
- The local public health agency's responsibilities for TB prevention and control include:
  - performing contact investigations surrounding infectious TB cases;
  - providing DOT or other supervision and monitoring patients for drug toxicity;
  - assuring that persons with infectious TB disease follow appropriate isolation precautions.

  Hennepin and Ramsey Counties operate public TB clinics that provide clinical TB services for residents in those jurisdictions.

Screen persons at high risk for TB infection

- Due to the relatively low overall prevalence of TB in Minnesota, population-based screening is not recommended. Mantoux tuberculin skin testing should be targeted to populations at increased risk for TB infection, including close contacts of someone with infectious TB disease; foreign-born persons from areas where TB is common and those who have traveled to such areas; persons with medical conditions that increase the risk of developing TB disease once infected (e.g., HIV infection, diabetes mellitus, end stage renal

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Table 2. Interpreting the Mantoux Tuberculin Skin Test Reaction

Induration	Positive For:
≥5 mm	persons with HIV infection or risk factors for HIV, close contacts of infectious TB cases, persons with chest x-ray findings consistent with old healed TB
≥10 mm	foreign-born persons from high-prevalence areas; residents of long-term care facilities; correctional facility inmates; injection drug users; persons with certain medical conditions that increase the risk of TB disease; workers at health care facilities, correctional facilities, or homeless shelters
≥15 mm	persons with no risk factors for TB

disease, immunosuppressive therapy); injection drug users; residents of long-term care facilities; and workers in health care facilities, correctional facilities, and homeless shelters.
- Children at risk for TB according to the criteria described above and those living in families with foreign-born persons should receive a Mantoux TST at stages of childhood that coincide with other health assessments (e.g., 12-15 months of age, 4-6 years, and 14-16 years) or periodically as indicated by individual circumstances. Any child at risk for TB who has not been screened previously should be screened regardless of age.
- The purpose of TB screening is to identify infected persons who would benefit from treatment for latent TB infection (LTBI) to prevent future disease and to identify persons with TB disease who need treatment. Screening programs should include access to appropriate follow-up (e.g., chest x-ray, prophylaxis) for persons identified with TB infection.
- The intradermal Mantoux technique should be used for all tuberculin skin testing. The TST result should be read by trained personnel 48-72 hours later, with results recorded in millimeters of induration. Disregard erythema when interpreting a TST reaction. Results are interpreted based on the patient's individual risk factors (Table 2).
- Initial two-step tuberculin skin testing is indicated for persons who will be screened periodically (e.g., health care and correctional facility workers) and residents of long-term care facilities. By "boosting" the patient's immune system, two-step testing minimizes the effects of any waning immune response and increases the accuracy of a baseline result. Two-step testing involves administering a second TST 1-3 weeks after the first test for persons whose initial test result was negative and who had not received a TST in the prior 12 months.

Prescribe treatment for LTBI when indicated
- Without prophylaxis, approximately 10% of persons with LTBI will develop active TB disease in their lifetime. For persons co-infected with HIV, the risk of developing TB disease is 10% per year. The risk also is higher for children, newly-infected persons, and those with certain immunosuppressive medical conditions.
- Adequate therapy for LTBI reduces the likelihood of developing TB disease by up to 80%. Incomplete therapy confers little benefit; thus, prophylaxis should be initiated only if completion of the regimen is likely.
- All asymptomatic persons less than 35 years of age with TB infection and a normal chest x-ray are candidates for treatment of LTBI.
- High-priority candidates for treatment of LTBI regardless of age include persons with known or suspected HIV infection, close contacts of persons with infectious TB disease, persons with chest x-ray results indicative of old healed TB and who have not received adequate treatment, injection drug users, persons with certain medical conditions (e.g., diabetes mellitus, end stage renal disease, immunosuppressive therapy), and persons whose TST result has converted from negative to reactive within the past 2 years.
- For most persons 35 years of age or older without any of the risk factors described above, the risk of INH-induced hepatotoxicity exceeds the risk of developing TB disease; therefore, prophylaxis is not recommended.
- Rule out active TB disease before initiating prophylactic therapy. Asymptomatic persons with a negative chest x-ray result usually can be considered free of active TB disease. Consider the possibility of extra-pulmonary disease, when indicated. Defer prophylaxis until all diagnostic tests for TB have been completed.
- Recommended treatment for LTBI consists of INH 300 mg daily for 6-9 months. Children should be treated for 9 months at a dosage of 10-20 mg/kg (maximum 300 mg). Alternative regimens are available for persons who cannot tolerate INH and for contacts exposed to INH-resistant TB.
- All persons receiving INH should be monitored monthly for symptoms of hepatotoxicity and for adherence to the regimen. Persons 35 years of age or older and those with risk factors for hepatotoxicity should receive baseline liver enzyme testing (i.e., AST) prior to starting INH, monthly during therapy, or if symptomatic.
- No more than a 1-month supply of INH should be dispensed to the patient at a time.
- Medication for treatment of LTBI can be obtained at no cost for any person in Minnesota who meets the criteria described previously. Request medications by calling the MDH TB Program at (612) 676-5414.

Tuberculosis Screening of Refugees, Immigrants, and Other Foreign-Born Persons

The following information describes points at which foreign-born persons are screened for TB and suggests other opportunities for such evaluation.

Overseas Visa Medical Examination

Within 12 months prior to immigrating, all refugees and immigrants receive a medical examination performed overseas by a Panel Physician approved by the Centers for Disease Control and Prevention (CDC). One purpose of this examination is to exclude individuals with certain communicable diseases, including TB. Results of the examination may be inaccurate or incomplete due to inadequate equipment or facilities, lack of standardized procedures, or chaotic conditions overseas.

The TB component of the examination includes a chest x-ray and acid-fast bacillus (AFB) smears of sputum specimens for patients whose chest x-ray indicates possible active TB disease. The screening does not include a tuberculin skin test (TST) to identify persons with TB infection. Individuals diagnosed with possible TB disease are assigned a "TB Class Condition" by the CDC Division of Quarantine.
- **Class A - clinically active, infectious TB:** Individuals are not allowed to travel until they have started treatment and are no longer infectious. These persons must receive a medical evaluation within 7 days of arrival in the U.S. to ensure continuity of care.

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- **Class B1 or B2 - noninfectious TB:** Individuals are instructed to receive a medical examination within 30 days of arrival in the U.S.
- **Class B3 - old, healed TB:** Individuals are instructed to have a medical examination within 90 days of arrival in the U.S.

CDC notifies the MDH TB Program of anticipated primary arrivals with TB Class Conditions. MDH and local public health departments collaborate to ensure appropriate follow-up evaluation for these individuals.

Domestic Refugee Health Assessment

Due to the potentially incomplete and inaccurate results of overseas medical examinations, a domestic health assessment is recommended for all newly arrived foreign-born persons. This is a comprehensive examination intended to identify and eliminate health-related barriers to the patient's resettlement and to protect the health of the community. Any health care provider can perform this examination.

The MDH Refugee Health Assessment Form outlines components of this examination. The TB portion includes:

- Mantoux TST (regardless of BCG history);
- chest x-ray for persons with a reactive TST result and for persons with a TB Class Condition identified overseas (regardless of their TST result);

and, if indicated:

- further evaluation to diagnose or rule out TB disease;
- evaluation as a candidate for treatment of latent TB infection (LTBI).

Federal, state, and local public health agencies track the outcomes of health assessments only for primary refugees who arrive in the U.S. This system does not address other foreign-born persons who also would benefit from such evaluation.

Adjustment of Status Medical Examination

This examination is mandatory for applicants for asylum or permanent residency and must be performed by a Civil Surgeon approved by the Immigration and Naturalization Service. The purpose of the examination is to address specific health conditions that require follow-up prior to the individual's becoming a permanent U.S. resident. The TB component requires a Mantoux TST and a chest x-ray for adults. Individuals may receive immediate clearance with or without a recommendation for treatment of LTBI or delayed clearance dependent on either further evaluation or completion of treatment for TB disease.

Other Opportunities for TB Screening

The previously described examinations do not address all foreign-born persons for whom TB screening is indicated, including:

- immigrants without a TB Class Condition identified overseas;
- secondary migrants who arrive in another state and move to Minnesota;
- illegal immigrants;
- international adoptees;
- students on visas or exchange programs; and,
- international travelers.

Clinicians should "think TB" for all foreign-born patients and ensure that such patients have been screened domestically for TB disease and infection and have received adequate therapy, as indicated. The MDH Refugee Health Assessment Form (available through the MDH Refugee Health Program) outlines components of an initial domestic health examination appropriate for any foreign-born person.

Cross-Cultural Suggestions for Successful Tuberculosis Evaluation and Treatment

Successful diagnosis, treatment, and follow-up for TB among culturally diverse populations requires sensitivity, collaboration, and culturally-specific resources to educate and support the patient. The following are suggestions to facilitate the evaluation and treatment of culturally diverse patients.

- If language is a barrier, use professionally-trained interpreters. Avoid using the patient's family members and friends as interpreters whenever possible.
- Provide educational materials in the patient's language. TB-related educational brochures for patients are available in nine languages on the MDH TB Program's web site (www.health.state.mn.us/divs/dpc/ades/tb/tb.htm). Be aware that some patients may not be literate in their native language.
- Recommend Directly Observed Therapy (DOT). Consider DOT for all foreign-born patients with TB disease, particularly those with linguistic, cultural, or socio-economic barriers that may inhibit adherence to therapy. Contact the MDH TB Program to arrange for DOT provided by a local public health nurse.
- Approach TB therapy as a partnership between clinician and patient. Respect the patient's culturally-based beliefs about TB. Explain what you believe caused the illness, how you propose to treat it, possible side effects, and consequences of not taking medications. Try to gain the patient's trust and "buy-in" for the prescribed therapy. Do not discourage the use of traditional healing practices unless they are harmful.
- Be sensitive to the social implications of TB. Culturally-based social stigma may interfere with a patient's willingness to seek medical care, identify contacts, and adhere to prescribed therapy. Learn how your patient feels about TB. Ask open-ended questions such as: What problems will TB cause for you? Why do you think you got sick? How will your friends and family react to your diagnosis?
- Maintain patient confidentiality. Explain that TB disease must be reported to the health department, but neither you nor the health department will disclose information without the patient's consent.
- Be attentive to financial issues. Learn about local referral options for patients whom you cannot serve due to financial reasons. Assure foreign-born persons that applying for Medicaid (MA) neither designates them as a "public charge" nor makes them ineligible for a change in status or U.S. citizenship.

TB-Related Resources

Clinical Issues/Treatment Guidelines (available through MDH)

- Core Curriculum on Tuberculosis: What the Clinician Should Know (3rd edition), CDC, 1994
- Treatment of Tuberculosis and Tuberculosis Infection in Adults and Children, American Thoracic Society and CDC, 1994
- Six Steps Toward Cultural Competence: How To Meet the Health Care Needs of Immigrants and Refugees, Minnesota Public Health Association's Immigrant Health Task Force, 1996

Minnesota Department of Health

- Tuberculosis Prevention and Control Program: (612) 676-5414 or 1-877-676-5414, www.health.state.mn.us/divs/dpc/ades/tb/tb.htm (includes links to other TB-related web sites)
- Clinical Mycobacteriology Laboratory: (612) 676-5250
- Refugee Health Program: (612) 676-5237, www.health.state.mn.us/divs/dpc/adps/refugee/refugee.htm

Public Health TB Clinics

- Hennepin County Health Assessment and Promotion Clinic: (612) 348-3033
- St. Paul/Ramsey County Department of Public Health TB Clinic: (651) 292-7767

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