

CureTB and Continuity of Care for Globally Mobile TB Patients, 2012–2015

Argelia Figueroa¹, Laura Vonnahme², Kellan Burrell², Carlos Vera-García¹, Christine Murto³, Kathleen Moser¹

¹Division of Global Migration and Quarantine, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention; ²Division of Tuberculosis Elimination, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention; ³San Diego County Health and Human Services Agency

Background

- Continuity of care for TB is a key element in assuring timely completion of therapy and achieving cure, which in turn reduces disease transmission and development of drug-resistant strains.
- In 2015, 241 or 2.5% of patients in the United States with newly diagnosed TB were reported as having moved outside the United States (to 50 destination countries) before completing therapy.
- One in five patients with newly diagnosed TB (58, or 24.1%) who moved out of the United States went to Mexico, making it the most frequent destination country.

CureTB

The County of San Diego Health and Human Services Agency (SDHHS), TB Control Branch established the CureTB program in 1997 to provide services in the border region. In 2016, the program moved to CDC's Division of Global Migration and Quarantine and runs as a collaborative project with the TB Control and Refugee Health Branch within SDHHS. Currently, CureTB provides referrals and continuity of care for patients with TB traveling to all countries outside the United States before completing treatment.

- Facilitates and supports continuity of care for active TB patients
 - Works with health authorities in other countries to link patients with TB to care as they move between the United States and other countries to ensure continuity of treatment for active TB disease
 - Facilitates exchange of clinical and treatment management information between providers and health authorities in the United States and other countries
 - Provides referrals from health authorities in other countries to CureTB
- Accepts referrals from all states in the United States for patients bound for all countries across the globe, with special expertise in referrals between the United States and Mexico and other Latin American countries
- Educes patients
 - Provides information on how and where to get treatment and diagnostic services
 - Helps patients understand their TB disease or infection and the importance of continuing care

Analysis Objectives

- Describe demographics, comorbidities, incarceration status, and geographic movement of patients referred to CureTB
- Assess outcomes of patients referred to care by CureTB
- Identify barriers and factors contributing to successful outcomes among referred transnational patients

Methods

Using SAS version 9.3, we analyzed CureTB data reported between 2012 and 2015 to describe referral type, referring and destination jurisdictions, outcomes, and comorbidities. Verified cases of TB were defined using counting criteria by microbiologic diagnosis or clinical factors described by the Division of Tuberculosis Elimination (DTE). Possible cases were defined as patients who had pending laboratory tests, but preliminary clinical evidence consistent with active TB disease. We calculated the risk of being lost to follow-up by circumstantial factors and comorbidities of referred patients. Mantel-Haenszel chi-square was used for tables with expected cell counts greater than five, and Fisher's Exact test was used for tables with expected cell counts fewer than five; we assessed significance at $p < 0.05$.

Results

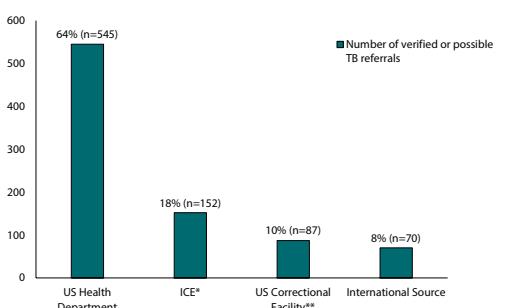
CureTB Referrals, 2012–2015

- CureTB received 1,347 referrals (median age: 39 years)
- The majority of referrals (n=858) were for patients with verified (40%) or possible TB disease (24%)
- Among possible TB patients, 21% were later verified, 33% could not be confirmed by lab results, and 46% were ruled out for active TB
- Other referrals were for contacts of verified patients (22%), requests for past medical histories of patients (12%), or to identify a source case in another country (2%)

Map 1. Referring US states and receiving jurisdictions (country or Mexican state) of verified or possible TB referrals to CureTB from US health departments. Of patients referred by US health departments, the majority were referred to Mexico (88%) or to other Latin American countries (8%).

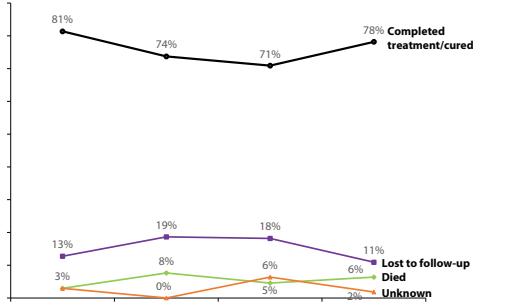


Figure 1. Verified or possible TB referrals to CureTB, by referring agency, 2012–2015. The majority of referrals came from US state or local health departments (64%). Less than 1% of referrals were from agencies that did not fall into the above categories.



*Immigration and Customs Enforcement detention facilities, US Department of Homeland Security
**Bureau of Prisons, US Marshals, city/state/county corrections center
Other sources (Centers for Disease Control and Prevention, Customs and Border Protection, medical centers) accounted for 0.5% of all TB referrals

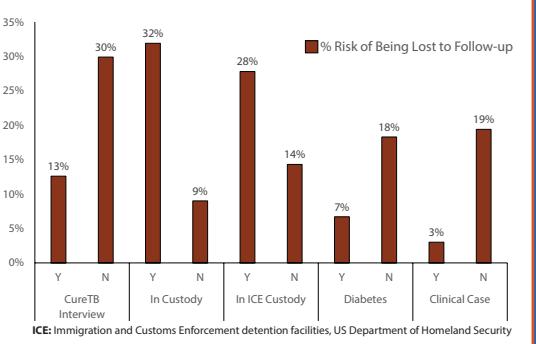
Figure 2. Outcomes of verified TB referrals to CureTB by year of referral (n=437), 2012–2015. Overall, most of the verified patients (76%) completed treatment.



Map 2. Referring state and receiving jurisdiction (country or Mexican state) of verified or possible TB referrals to CureTB from Immigration and Customs Enforcement (ICE) or other US correctional facilities. Most patients were referred to Mexico (73%) or to other Latin American countries (20%).



Figure 3. Relative risk of CureTB-referred patients with verified TB (n=541) being lost to follow-up, by circumstantial factors and comorbidities, 2012–2015. Patients lost to follow-up (n=67) were more likely to have not been interviewed by Cure TB ($p > 0.001$), have been in custody ($p < 0.0001$) or in ICE custody specifically ($p = 0.012$), not be diabetic ($p = 0.026$), and not have a clinical TB diagnosis ($p = 0.0011$).



Discussion

- Before 2016, the majority of referrals to CureTB originated with US state and local health departments, ICE, or another US correctional facility, and were referred to Mexico. Since 2016, after moving to CDC, CureTB routinely provides referrals to all countries around the world, over 40 countries to date.
- Before 2016, CureTB often received referrals from correctional facilities after individuals had been released from custody, making pre-departure interviews impossible to complete. Currently, referrals are received immediately upon diagnosis, thus facilitating interview, education, and rapport building.
- Most referrals were for verified or possible TB patients; the majority of these patients successfully completed treatment to cure.
 - The average TB treatment completion rate among referrals for verified cases of TB (76%) is lower than the average treatment completion rate among verified cases in the United States in 2014 (90%).
- Patients lost to follow-up were more likely to have not been interviewed by CureTB before leaving the United States, have been in custody, not be diabetic, and not have a clinical TB diagnosis.

Conclusions

- CureTB helps ensure continuity of care for globally mobile persons with TB by notifying and exchanging patient information with public health authorities in other countries. In the absence of this type of reliable and medically relevant information from the originating jurisdiction, health authorities in destination countries may not be aware of an arriving patient, may not continue treatment, or may inadvertently switch to inadequate regimens.
- Direct interaction with patients is important to provide motivation and ongoing assistance in continuing care upon arrival to destination countries. Individualized patient education about TB disease or infection and the importance of treatment in preventing transmission and drug resistance is essential for patients to successfully complete treatment.
- Referring patients in correctional facilities to CureTB before they are released will likely improve outcomes among this high-risk population.
- Promoting continuity of TB care for mobile patients with TB worldwide is likely to help reduce the burden and transmission of TB globally.

Limitations

- Limited data collection capabilities; changing priorities for data collection as program continues to expand

Acknowledgments

San Diego County Health and Human Services Agency: Lawrence Wang, Margarita Brooks, Rebecca Zurek and Dr. Wilma Wooten

Centers for Disease Control and Prevention: Dr. Reena Gulati and Steve Kammerer



National Center for Emerging and Zoonotic Infectious Diseases
Division of Global Migration and Quarantine