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Tuberculosis among Foreign-Born Residents of Southern Florida, 1995

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SYNOPSIS

Objective. To examine the characteristics of foreign-born people with tuberculosis (TB) in Southern Florida, their contribution to the total number of TB cases, and available data on their HIV status as well as to determine the number of cases detected by the overseas medical screening of immigrants and refugees.

Methods. The authors reviewed TB cases reported by Broward, Dade, and Palm Beach counties in 1995. Case records were matched against the CDC Division of Quarantine database of immigrants and refugees suspected to have TB at the time of visa application overseas.

Results. Nearly half (49%) of TB cases in the three counties were among people born outside the United States—34% in Broward County, 58% in Dade County, and 40% in Palm Beach County. A high percentage (26%) were co-infected with HIV. Of those with known date of arrival, 68% had been in the United States for five or more years. Only three cases had been identified by overseas immigrant screening.

Conclusions. A low percentage of TB cases in foreign-born people were identified through the overseas screening system. Controlling TB in South Florida will require efforts targeted toward high risk populations, including people with HIV infection.

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People who were born in other countries represent a growing number and proportion of those in the United States with tuberculosis (TB). Between 1986 and 1996, the number of foreign-born residents with TB increased from 4925 (22% of the national total of TB cases) to 7739 (37% of the national total).[1] This increase appears to be the result of increased immigration from regions of the world with high prevalences of TB.[2-4]

Clinical tuberculosis can develop through progression of recently acquired infection (primary disease), reactivation of latent infection, or reinfection. A recently infected immunocompetent person has about a 10% lifetime risk of developing an active case of TB disease, with an approximately 5% risk during the first two years. Although it is widely believed that 90% of TB cases are the result of reactivation of latent infection after many years,[5] current data suggest that in urban areas recent transmission may account for a larger proportion of cases. Previous work has shown that foreign-born people who arrive in the United States after the age of 5 years have a decreased risk of developing TB, supporting the hypothesis that TB among the foreign-born reflects early infection in the country of origin before their arrival in the United States.[4]

Previous reports have documented important regional variations across the United States in the epidemiology of TB among foreign-born residents. In particular, studies have shown considerable variation across regions in the incidence of TB among immigrants and refugees, the countries of origin of foreign-born residents with TB, and the proportion of TB cases occurring among foreign-born new arrivals, including people identified through mandatory overseas screening of immigrants and refugees.[6-8]

Immigration authorities distinguish between immigrants and refugees. People in both groups are applying for permanent legal status and undergo medical screening overseas as part of the application process. To be granted refugee status requires demonstrating that one is fleeing persecution in the country of origin. For the purposes of this paper, we distinguish "asylum seekers" from immigrants and refugees, emphasizing that people in this category have not gone through a formal visa application process or overseas medical screening.

Large numbers of people from the Caribbean—in particular from Haiti and Cuba—have arrived in Southern Florida over the last 30 years. Many of these people have entered as asylum seekers or as undocumented aliens, which complicates measures designed for medically evaluating prospective long-term residents. For legal immigrants and refugees, the medical evaluation takes place prior to arrival, but asylum seekers are examined after they appear before an immigration judge, months or even years after their arrival in the United States.

We reviewed TB cases reported to the state of Florida's TB registry by the health departments of Broward, Dade, and Palm Beach counties—areas with large communities of foreign-born people—to identify the main characteristics of foreign-born people with TB and their contribution to total TB cases as well as to determine the number of cases among newly arrived immigrants and refugees detected by the current overseas screening system.

METHODS

We included in our analyses all TB cases reported to the state TB registry from Broward, Dade, and Palm Beach Counties between January 1 and December 31, 1995, and verified by state TB control authorities according to the Centers for Disease Control and Prevention (CDC) surveillance case definition.[9] Dade County is dominated by Miami, a large cosmopolitan city. Broward County includes the city of Fort Lauderdale as well as a considerable agricultural industry. Palm Beach County includes affluent West Palm Beach as well as a large foreign-born agricultural workforce.

The State TB Registry provided information on sex, date of birth, country of birth, date of arrival in the United States, the CDC diagnostic criteria met, and case outcome.

To evaluate the effectiveness of overseas screening in identifying TB cases, we compared names in the Registry with the names of people with suspect TB designating Florida as their intended place of residence who were included in the CDC Division of Quarantine's tracking system database for immigrants and refugees. In order to determine how many immigrants and refugees were evaluated by country health departments, we also matched the names in both databases against the county records of Form 75.17, the CDC Division of Quarantine form reporting the results of overseas medical examinations.[10]

To complete the database on the foreign-born TB patients in each county, we reviewed the patients' medical charts to collect information including length of U.S. residence, legal status, country of origin, and age.

To determine HIV status, we matched our list of foreign-born TB patients with a separate database containing HIV data that is maintained in each county.

Data analysis was conducted with Epi Info version 6.02.[11] We used the Krukal-Wallis test to compare age and length of U.S. residence among different groups.

RESULTS

In 1995, there were a total of 629 TB cases in the three counties. Forty-nine percent (309/629) of the people with TB in the three counties had been born outside of the United States. People born in other countries represented 34% of the TB cases in Broward County, 58% in Dade County, and 40% in Palm Beach County. Almost all (298/309; 96%) of the foreign-born residents with TB in the three counties were culture-positive for *Mycobacterium tuberculosis*.

Characteristics. Overall, 63% of the foreign-born residents with TB in the three counties were males (Table 1). The median age was 41 years (range 1–90, mean 44), with the largest percentage (23%) found in the 25–34 age group. The median ages were 36 in Broward County (range 18–79), 43 in Dade County (range 3–90), and 36 in Palm Beach County (range 1–86).

Information regarding arrival date in the United States was available for 246 (80%) of the 309 residents with TB. Among them, the majority (68%, 168/246) had been in the United States five or more years at the time of diagnosis (Table 1). Only 27 cases were diagnosed during 1995 as part of routine TB control activities among people who had been in the United States for less than one year at the time of diagnosis. Of these, three had been identified during overseas screening.

People with TB came from 40 countries. Overall, more than 40% of the 309 people with TB were from Haiti; Haiti was the country of origin for 53% of the people with TB in Broward County, 38% in Dade County, and 55% in Palm Beach County (Table 1). Dade County had the highest percentage of Cuban origin.

The median age and length of residency in the United States differed for those from Haiti, Cuba, and other countries. Those from Cuba were significantly more likely to be older (median age 56 for Cubans, 36 for Haitians, and 41 for others; $P < 0.001$) and to have resided longer in the United States at the time of diagnosis than people of other nationalities.

HIV co-infection. HIV serology results were available for 152 (49%) of the 309 cases reviewed (Table 2). Of these people with TB, 79 (52%) were HIV-seropositive. Neither the country of origin nor the time in the United States was associated with an increased likelihood of having been tested for HIV. However, males were significantly more likely to have HIV test results recorded (106/195 males, compared with 46/114 females, $P < 0.05$).

The CDC includes data on HIV prevalence among

Table 1. Characteristics of foreign-born tuberculosis patients, three Southern Florida counties, 1995 (*N* = 309)

Characteristic	3 counties		Broward County n = 45		Dade County n = 217		Palm Beach County n = 47	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sex								
Female	114	37	27	60	70	32	17	36
Male	195	63	18	40	147	68	30	64
Country of origin								
Haiti	132	43	24	53	82	38	26	55
Cuba	69	22	2	4	65	30	2	4
Other Latin America[a]	85	28	10	22	61	28	14	30
Other	23	7	9	20	9	4	5	11
Years in United States	(*n* = 246)		(*n* = 39)		(*n* = 173)		(*n* = 34)	
Less than 1	27	11	3	8	16	9	8	24
1–4	51	21	10	26	30	17	11	32
5 or more	168	68	26	67	127	73	15	44

NOTE: Percentages may not add to 100 due to rounding errors.
[a]Includes all Caribbean countries other than Haiti and Cuba

Table 2. HIV testing results, foreign-born residents with TB, by country of origin, three Southern Florida counties, 1995 (*N* = 309)

Country of origin	Number	Test results available	HIV-positive	
		Number	Number	Percent of patients for whom tests results available
All patients	309	152	79	52
Haiti	132	71	53	75
Cuba	69	33	12	36
Other Latin America[a]	85	48	14	29
Other	23	0	0	0
Patients ages 25–44	143	84	55	65
Haiti	83	44	35	80
Cuba	16	12	8	67
Other Latin America	40	28	12	43
Other	4	0	0	0

[a]Includes all Caribbean countries other than Haiti and Cuba

people with TB in the 25–44 age group in its annual TB surveillance report.[12] HIV testing results were available for 59% (84/143) of the people in this age category; of them, 55 (65%) were HIV-positive.

Haitians, regardless of age, were no more likely to have test results available than people of other nationalities; however, among those for whom results were available, Haitians were more likely to be HIV-seropositive than people from other countries (75% vs 32%, $P < 0.001$).

DISCUSSION

The findings of this study illustrate the major contribution of people born outside the United States to TB in Southern Florida. Nearly half of the TB cases reviewed from the three counties in Southern Florida were among foreign-born people. A large number of these people were from areas of the world such as Haiti with high prevalences of TB according to the World Health Organization.[13]

Effectiveness of screening. Data from Hawaii, the Los Angeles area, and the Seattle area have shown that the overseas screening and tracking system for immigrants and refugees efficiently identified people with TB or at risk of developing TB among new arrivals.[6-8] Few of the Southern Florida TB cases were identified through overseas screening, perhaps due to:

- the large number of people who entered as asylum seekers and who were not examined until their hearing dates;
- inadequate overseas screening of immigrants and refugees for TB;
- incomplete notification of suspect TB cases to the county TB programs.

Planned improvements in the screening and tracking system should improve case finding and make it easier for researchers to evaluate the system's effectiveness in identifying newly arrived immigrants and refugees who are possible candidates for treatment or prophylaxis.[14]

HIV co-infection. Our study underscores the high prevalence of HIV among foreign-born residents with TB in Southern Florida. We found an HIV seroprevalence of 52% among those for whom HIV testing results were available, and an even higher prevalence (65%) among those in the 25–44 age group for whom results were available. A nationwide survey of more than 19,000 TB patients conducted in 28 clinics in major metropolitan areas in four regions of the United States between 1989 and 1996 found an HIV seroprevalence of 6% among 9400 foreign-born patients and 19% among 9995 U.S.-born patients.[15] Another study also found low rates of HIV infection among foreign-born residents of the

United States.[16] Our data on HIV infection were incomplete, but we did find a high rate of HIV infection (26%) among TB-infected Haitians for whom HIV results were available. CDC guidelines recommend testing all TB-infected individuals for HIV;[17] however, recent studies suggest that these guidelines are not universally applied and that physicians are more likely to test men and people they believe are in high risk categories.[18]

In the face of the high prevalence of TB and HIV coinfection among Haitian-born people in southern Florida, which increases the likelihood of developing active TB,[19] it makes sense to focus HIV screening on Haitians with active TB. The potential benefits of early diagnosis of HIV infection include the ability to provide early treatment for HIV-related disease, the opportunity to provide education about risk behaviors, and increased physician and patient awareness of the potential for the development of TB.[16]

Conclusion. Reducing the burden of TB among foreign-born people residing in the United States is a complex issue. While the follow-up of new immigrants and refugees can be effective in identifying TB among those who are screened overseas,[7,8] in Southern Florida, as in the United States as a whole,[4,20] the majority of TB cases in this population occur among those who have resided in the country for one or more years. We need to develop strategies to control TB effectively in longer-term residents, including aggressive contact evaluations as well as selective screening and preventive therapy efforts.

As part of an ongoing effort to better understand TB among immigrants and refugees, one of the three counties in Southern Florida is currently developing a questionnaire for foreign-born people with TB. Information regarding country of origin, length of time in the United States, and age at time of arrival helps better define people at risk for TB and can be used to focus local strategies to strengthen case finding. Such strategies might include the identification and training of outreach workers with linguistic and cultural skills appropriate to the predominant communities to be served, outreach to religious and community groups, and working with physicians and other health care providers to increase their awareness of TB and strengthen cooperation with county TB programs.

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