Screening for Tuberculosis at an Adult Education Center: Results of a Community-Based Participatory Process

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Objectives. We used a community-based participatory research (CBPR) approach to plan and implement free TB skin testing at an adult education center to determine the efficacy of CBPR with voluntary tuberculosis (TB) screening and the prevalence of TB infection among immigrant and refugee populations.

Methods. We formed a CBPR partnership to address TB screening at an adult education center that serves a large immigrant and refugee population in Rochester, Minnesota. We conducted focus groups involving educators, health providers, and students of the education center, and used this input to implement TB education and TB skin testing among the center's students.

Results. A total of 259 adult learners volunteered to be skin-tested in April 2009; 48 (18.5%) had positive TB skin tests.

Conclusions. Our results imply that TB skin testing at adult education centers that serve large foreign-born populations may be effective. Our findings also show that a participatory process may enhance the willingness of foreign-born persons to participate in TB skin-testing efforts. (*Am J Public Health*. 2011;101: 1264–1267. doi:10.2105/AJPH.2010.300024)

Incidence of tuberculosis (TB) infection in the United States has declined over the past decade, but a disparity has emerged wherein this decline has been much less pronounced among foreign-born Americans. More than half of active TB cases in the United States occur in foreign-born individuals,[1] and the majority of these cases are attributable to reactivation of latent TB infection (LTBI).[2,3] The Centers for Disease Control and Prevention (CDC) has recommended testing for and treating LTBI among foreign-born individuals from countries with a high incidence of TB who have lived in the United States for 5 years or less.[4] This strategy may be particularly effective for individuals from sub-Saharan Africa and Southeast Asia.[4] The risk of TB remains elevated even for foreign-born individuals who live in the United States for longer than 5 years.[3]

In spite of the CDC's recommendation, LTBI screening of foreign-born individuals is not commonly practiced in the community setting because of a lack of funding and limited availability of local resources.[5] Previous studies have demonstrated that school-based targeted testing of asymptomatic foreign-born children is both effective and cost-effective for identifying and treating LTBI.[6–11] However, concerns have been raised that mandatory testing practices may be stigmatizing to these immigrant groups.[12a]

Community-based participatory research (CBPR) is a way to collaboratively investigate health topics within a community, whereby community members and academics work as partners in an equitable relationship.[12b–14] CBPR has been particularly successful in identifying and addressing health disparities, because it empowers communities and promotes understanding of cultural issues pertinent to health.[15,16] The CDC recommends forging these types of partnerships to address TB in the United States.[17a]

Hawthorne Education Center (HEC), a constituent of the Rochester (MN) Public Schools district, provides education with an emphasis on literacy to Rochester adults. HEC serves a large foreign-born population through classes that teach English as a second language (ESL) and other programs. HEC has evolved into a community center, providing instruction for cultural adjustment, citizenship, and even training for driver's license exams. More than 70 different languages are spoken within HEC, which supports approximately 2500 students yearly from diverse backgrounds. An estimated 85% of HEC's students have incomes at or below the federal poverty level, and less than half (40%) have completed high school.

The Hawthorne Health Service at HEC emerged as a collaborative free clinic and health-literacy campaign for adult learners and their families. Most Hawthorne learners have some of the strongest indicators of TB risk in the United States, including recent emigration from regions of the world where TB is endemic. The HEC community has experienced several cases of active TB among its students in recent years.

In 2006, HEC leadership approached Mayo Clinic faculty who volunteered at HEC to suggest working together to address the problem of TB among the center's learners. Two years earlier, these 2 agencies had formed a CBPR partnership to broadly address health concerns at HEC. They established operating norms, held monthly meetings, and conducted a health needs assessment. This partnership grew to include 5 more community-based organizations, 2 more academic centers, and many more volunteers to form the Rochester Healthy Community Partnership, whose mission is to promote health and well-being among the Rochester population through CBPR, education, and civic engagement.

Members of the Rochester Healthy Community Partnership conducted 10 focus groups with HEC adult learners and staff to elicit their perceptions of TB and their recommended solutions for addressing this issue.[17b] In conducting the focus groups, we used principles of CBPR, including community involvement in every aspect of project design and analysis. One theme that emerged from the focus groups was a recommendation for free on-site TB testing.

Therefore, to determine the efficacy of a CBPR approach to voluntary TB screening, and to determine the prevalence of LTBI at this adult education center, the partnership used a CBPR approach to plan and implement free TB skin testing at HEC. Every component of subsequent program planning and assessment was initiated and implemented under the supervision of the Rochester Healthy Community Partnership community–academic working group.

METHODS

After the study protocol was approved, we assembled a planning committee with representation from the community and academic partners, including HEC learners and staff, and the local health department. The committee agreed that TB testing should take place only after the adult learners had been presented with opportunities to learn about TB. The first such activity was a World TB Day fair in March 2009, at which 500 HEC students learned about various aspects of TB, TB testing, and treatment from presentations offered in interactive educational booths. The second activity involved 10 minutes of TB education in the classrooms (584 students) presented by a volunteer school physician, followed by a demonstration of TB skin testing on consenting classroom teachers.

In April 2009, HEC staff placed sign-up sheets for TB skin testing in each classroom. Before skin testing, a volunteer school physician verbally screened each learner with the following questions: (1) Have you had a TB test before? (2) If yes, was it positive? (3) Did you take pills because of the test? Those who answered "yes" to questions 2 or 3 were not tested; these learners were referred as appropriate. Skin testing was performed according to CDC guidelines, and a positive test was recorded for skin reactions of 10 milimeters or larger.[18] The skin tests were administered and read by trained registered nurses, and all positive tests were confirmed by a single on-site physician. Individuals with positive tests were immediately counseled by both the nurse and the physician. Appointments were made for each of these patients at a TB clinic located at the local health department, where subsequent diagnostic and therapeutic interventions were delivered free of charge. We performed chart reviews to determine patients' compliance with recommendations for evaluation and treatment of TB.

From 2003 through 2006, TB education and skin testing had been offered at HEC via a traditional, non–CBPR screening strategy (for methods of the traditional approach, see Table A available as a supplement to the online version of this article at http://www.ajph.org). We performed a chart review to determine TB skin-test participation rates for the 2003–2006 initiative, and we compared those rates to the participation rates for the current study.

Skin-test results are reported by means of standard descriptive statistics. Comparisons of positive tests by demographic characteristics are reported as the Pearson χ^2 or Fisher's exact test, as appropriate.

RESULTS

A total of 340 learners signed up for skin testing. Screening questions disqualified 33 learners from testing, 32 individuals did not show up to have the skin test performed, and 7 people had the skin test performed but did not return for interpretation of results. Therefore, 268 participants returned 2 days later to have their skin test read. Finally, 9 individuals with positive tests were not included in the analysis because further evaluation determined that they had been previously diagnosed with LTBI, despite answering "no" to the relevant screening questions, giving us a final study sample of 259 individuals. The demographic characteristics of the study population are shown in Table 1.

Overall, there were 48 (18.5%) positive tests and 211 (81.5%) negative tests. All but 1 (98%) of the positive test results occurred among individuals from Africa, Latin America, and Asia. No difference in test positivity associated with age, gender, or years of residence in the United States was found (Table 1).

Of the 48 individuals with positive skin tests, 45 followed through with further evaluation at the TB clinic at the health department; all of these patients were ruled out for active TB. Among those 45 patients, 9 were not offered LTBI treatment secondary to negative interferon γ release assay tests, per agency protocol. Of the remaining 36 patients, 23 (63.9%) completed therapy for LTBI.

Comparison of TB skin-test participation obtained when using a "traditional" approach (90 participants during 2002–2006 at HEC; average 30 per year) demonstrated that the participatory process garnered a significantly higher turnout (259 participants in 1 month; Table A available as a supplement to the online version of this article at http://www.ajph.org).

DISCUSSION

Our results demonstrate that prevalence of LTBI at an adult education center was relatively high and that the majority of positive tests were among foreign-born individuals. This finding implies that TB skin testing at adult education centers that serve large immigrant and refugee populations may serve as an effective TB-control strategy in the United States. This is consistent with a previous report of TB skin testing among children enrolled in ESL classes.[19]

We used a participatory approach to TB education and testing that effectively addresses concerns of stigmatization raised by mandatory testing of foreign-born individuals. This effectiveness is demonstrated by the fact that large numbers of learners voluntarily chose to be tested. Previous research has shown that TB-related stigma and negative perceptions of TB are prevalent among immigrants to the United States, but these negative feelings are attenuated by exposure to TB education.[20–22] Furthermore, a CBPR approach has successfully identified sociocultural factors influencing TB prevention and control in Canada.[23]

The CBPR approach may also account for the large number of learners who participated in skin testing, compared with the lower participation seen as a result of traditional approaches used previously at the same institution. Factors that may have contributed to this success are the involvement of HEC students and staff in every phase of the project and the fact that the testing process was informed by input from focus groups attended by many of the learners. Furthermore, the participatory approach may have contributed to the low number of missed return appointments and the level of compliance with LTBI therapy, which was higher than the national average.[24] Indeed, despite the inherent linguistic and cultural challenges facing immigrant and refugee health

TABLE 1—Results of Tuberculosis (TB) Skin Tests Among Learners at an Adult Education Center, by Demographic Characteristics: Rochester, MN, April 2009

	Total (n = 259), No. (%)	Positive TB Tests (n = 48), No.	Negative TB Tests (n = 211), No.	P[a]
Age, y				.26
18–24	61 (23.5)	8	53	
25–34	84 (32.4)	15	69	
35–44	58 (22.4)	13	45	
45–54	30 (11.6)	9	21	
≥55	26 (10)	3	23	
Gender				.224
Women	155 (59.8)	25	130	
Men	104 (40.2)	23	81	
Region of birth				.001
Africa	93 (35.9)	28	65	
Latin America	71 (27.4)	11	60	
Asia	51 (19.7)	8	43	
United States	21 (8.1)	0	21	
Middle East	20 (7.7)	1	19	
Europe	2 (0.8)	0	2	
Oceania	1 (0.4)	0	1	
Residency in United States,[b] y				.061
≤2	82 (36.6)	12	70	
3–5	67 (29.9)	12	55	
≥5	75 (33.5)	22	53	

[a]*P* value represents the Pearson χ^2 or Fisher's exact test, as appropriate.
[b]Includes foreign-born individuals only. Data not obtained from 14 participants.

programs,[25] a participatory approach may be a particularly successful means of engagement with these populations.[26]

These cross-sectional prevalence data at a single site may not be generalizable to other communities. However, communities with large immigrant and refugee populations may wish to use these results to propose participatory collaborations with their adult education centers and ESL programs, to target these institutions for implementation of TB-prevention strategies. Future research should test the hypothesis that a participatory approach reduces TB stigma and should assess the role of reduced stigma in voluntary TB testing. Because the majority of time that HEC staff, HEC learners, and academic partners spent working on this project was volunteered, costs of the project were low. This outcome is a positive reflection on the CBPR process, but it does not allow assessment of whether a programatic adoption of this process would be cost-effective when applied more broadly.

Our results show that adult education centers that serve large immigrant and refugee populations may be effective venues for TB prevention in the United States. Engaging learners and staff in a participatory process may be an effective strategy to optimize participation in these programs. ■

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Human Participant Protection

This study protocol was approved by institutional review boards at Mayo Clinic and Winona State University and by the Rochester (MN) Public Schools district.

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