Assessing Tuberculosis Needs among Health Centers serving Asian Americans, Native Hawaiians, and other Pacific Islanders

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The Association of Asian Pacific Community Health Organizations (AAPCHO), the Mayo Clinic Center for Tuberculosis (TB) and the U.S. Centers for Disease Control and Prevention (CDC) conducted a project to better understand TB-related practices at community health centers (CHCs). AAPCHO conducted nine key informant interviews from their member health centers, which serve primarily Asian Americans, Native Hawaiians and other Pacific Islanders (AA&NHPIs). The three domains covered in the interviews were TB knowledge, TB practices at the clinic, and patients’ and providers’ attitudes towards TB testing and treatment. The interview results indicated that while providers were aware of the TB recommendations, they were not actionable in practice due to the need for even more targeted and clearer guidelines. Also, confusion about bacille Calmette-Guerin vaccine (BCG) was cited as a common barrier for patients to get tested and accept treatment. In practice, CHCs often worked with their local hospitals or state health department. Also, because a large portion of the high-risk patients was limited English proficient, CHCs recommended in-language print patient materials, graphics, or videos as helpful strategies for providing TB education to patients. Several health centers also indicated that a clinic-wide protocol and Electronic Health Record (EHR) system to track testing and treatment would be helpful.

Based on these results, we provide the following recommendations to encourage LTBI testing and treatment: 1) Development of more detailed and actionable TB recommendations and guidelines targeting priority populations needing testing and treatment; 2) Development of clinic-wide protocols with decision trees/algorithms for the detailed TB recommendations; 3) Integration of the detailed guidelines into EHRs that can monitor and track patients through treatment completion; 4) Development of culturally sensitive, in-language print materials and graphics/videos that could help patients better understand the need for testing and treatment; 5) Assessment of patient social barriers to screening and treatment and the appropriate interventions that address them; 6) Strengthening collaborations between CHCs, hospitals, state/local health departments, and other community partners.
Introduction

Tuberculosis (TB) disproportionately affects the patients and communities that community health centers (CHCs) serve. In order for the United States to progress towards TB elimination, efforts must be made to screen and treat populations at high-risk for latent TB infection (LTBI) to prevent the development of TB disease. Particularly, Non-U.S.-born Asian Americans accounted for 33% of the total number of reported TB cases in the United States in 2016. Of the approximately 9,300 annual new U.S. cases of TB, foreign-born Asian Americans have the highest rates of any racial/ethnic group, 10.3 times higher than that among foreign-born non-Hispanic whites.\(^1\) The overall number of TB cases in the United States increased in 2015 compared to 2014, and it was the first increase in number of TB cases since 1993. Although the number of TB cases decreased 2.9% from 2015 to 2016, the increase in the overall case count in 2015 and leveling of the U.S. incidence rate since 2013 raises concern that current TB control practices may no longer be sufficient to sustain the previously observed rate of decrease in U.S. TB incidence.\(^1\) One strategy to increase TB screening and treatment is to engage CHCs, whose patients are disproportionately affected by TB.

Given these concerns and the need to engage CHCs who serve high-risk populations, the Association of Asian Pacific Community Health Organizations (AAPCHO) and the Mayo Clinic Center for Tuberculosis conducted a project to better understand TB-related practices at community health centers. This project was sponsored by the Mayo Center for Tuberculosis, a TB Regional Training and Medical Consultation Center funded by the U.S. Centers for Disease Control and Prevention. AAPCHO was established in 1987 with a mission to improve health status and health access to care for Asian Americans, Native Hawaiians, and other Pacific Islanders (AA&NHPIs). AAPCHO represents 33 community health organizations, primarily Federally Qualified Health Centers (FQHCs) serving predominantly medically underserved AA&NHPIs. AAPCHO member CHCs served over half a million patients, and AA&NHPI patients accounted for 65% of those served in 2016. Thus, TB is a highly relevant issue for AAPCHO members. Depending on the location of the CHC and the population served, staff of AAPCHO member health centers have different levels of experience in terms of TB testing and treatment. The goal of this project was to engage with community health care providers in the AAPCHO network to understand their current knowledge, attitudes, and practices regarding LTBI testing and treatment and to identify potential solutions to expand LTBI testing and treatment within this community.

The two aims of the project were:

1. To identify AAPCHO’s clinicians’ knowledge, attitudes, and practices regarding LTBI testing and treatment
2. To identify potential solutions to expand LTBI testing and treatment among high-risk populations served by these community health centers

Method

We first developed a semi-structured interview protocol in collaboration with a team of staff from the Centers for Disease Control and Prevention (CDC) and the Mayo Clinic as well as experts with experience working on TB prevention. Given our project timeline requirements, we decided to

conduct key informants interviews with AAPCHO member centers and use the preliminary results to inform an online survey targeting a broader set of health centers serving AA&NHPI populations. We conducted a total of nine key informant interviews among AAPCHO member health centers, located in both urban and rural areas serving predominantly Asian American, Native Hawaiian, and other Pacific Islander patients. A recruitment email with an information flyer (Appendix A), along with a one-week reminder, was sent to all AAPCHO member contacts asking them to forward the information to their appropriate staff. After the CHC staff contacted project staff, preliminary interview questions were sent to confirm the participants’ capacity to address the interview questions as well as to understand the clinic’s TB care experience. Taking into consideration the geographical diversity and different levels of experience, the project staff arranged 60-90 minute interviews with nine staff from AAPCHO member health centers. Prior to the interview, project staff sent the list of questions along with the CDC TB recommendations and resources (Appendix B) as handouts to facilitate the interview.

**Preliminary Interview Questions**

1) Does your health center provide TB testing, prevention education, and/or treatment?
   (1) If yes, how big of a problem is TB in your patient population (1 being not a problem, 5 being a major problem)?

2) Are you primarily clinic staff that provides direct patient care for TB or at-risk TB patients (e.g. foreign-born) or an administrator who has knowledge of TB policies and practices, or both? If you are clinic staff:
   (1) Have you diagnosed someone with TB in the last 5 years? Were you involved with treatment?
   (2) Have you diagnosed anyone with LTBI in your current practice setting? Have you treated LTBI in your current setting?

**Interview Questions**

The interviews were conducted using a semi-structured interview guide that included response category prompts. Given the limited project timeline, they were arranged and conducted over the telephone. After introducing the project, the project staff requested permission from the key informants to record the interview, and informed them that all information discussed would be confidential and shared only with project staff. The recordings were then transcribed without names or other identifying information, and kept on a password-protected computer. A stipend was provided for each key informant after the interview.

The questions consisted of the following domains: a) TB knowledge, b) the clinic’s patient population, c) awareness of TB recommendations, d) the clinic’s TB testing policies and practices, e) LTBI treatment practices, f) barriers and facilitators to testing and treatment, g) provider and patient education, g) clinic medical records in supporting TB practices, and e) future collaboration and support for TB prevention. Please see the interview protocol in Appendix C.

Project staff then conducted descriptive quantitative analysis and qualitative content analysis on the transcription of the interviews.
Characteristics of Participant Community Health Centers (CHCs) (Tables 1a, 1b, and 1c)
The nine participating CHCs were geographically diverse, located in eight different states and in both rural and urban areas. Based on 2016 UDS, the average size of the nine CHC patient populations was 18,927, ranging from 1,318 to 52,346 patients. The average proportion of the AA&NHPI population was 64%, ranging from 27% to 94%. The AA&NHPI populations served at the nine CHCs included Chinese, Vietnamese, Korean, Japanese, Lao, Burmese, Nepalese, Indian, Pakistani, Filipino, Samoan, Chamorro, and Afghans. The average proportion of the Non-white population was 81%, ranging from 55% to 98%. The health centers’ patients were also largely limited English proficient with an average proportion of 58%, ranging from 4% to 88%. Based on the estimates given by the key informants, the average proportion of the foreign-born population was 50%, ranging from 25% to 95%.

Among the nine key informants from AAPCHO member health centers, four identified as clinical staff (e.g. physician, nurse), and five identified as both clinical and administrative staff (e.g. medical director, CEO). All nine CHCs provided treatment for latent TB infection. On average, CHCs rated TB as a problem in their patient population (mean = 3.6 out of 5 being a major problem). All CHCs used EHRs in their clinical practice, although EHR type varied across CHCs. Seven CHCs did not use EHR to alert or track testing for LTBI treatment, 1 CHC used EHR alerts only, and 1 CHC used EHR to track patients through treatment. About half of CHCs collected data on country of birth.

Descriptive Quantitative Results

Knowledge (Table 2)
When presented with CDC’s TB recommendations (Appendix B), all key informants indicated they were aware of them. Some indicated that the recommendations could be improved with more detailed guidelines regarding priorities of testing as well as definition of terms. For example, key informants stated that since the majority of patients at health centers were foreign-born, it was not realistic to test all of them given the challenge in treating patients presenting with a multitude health concerns as well as social barriers. They also indicated that the recommendation to test diabetic patients could be clarified in terms of their hemoglobin A1c levels denoting levels of high risk.

The participants were also aware of the CDC website and www.uptodate.com, citing them as the 2 most common go-to resources for providers to access TB information, although some did mention that the information on www.uptodate.com may be outdated. All interviewees were interested in learning more about TB prevention, latent TB infection testing, and treatment.

Practices (Table 3)
According to the key informants, most patients who were at risk were tested for LTBI. All CHCs tested patients who identify as health care workers and who request testing for occupation or school requirements. Patients who live in large group settings such as homeless shelters or prisons are least likely to be tested (n=5). It may be possible that homeless status is not assessed for patients in the clinic and thus providers may not be aware of this group’s need for testing.

Tuberculin skin testing (TST) (n=7) and interferon gamma release assay (IGRA) (n=6) were the most common testing methods. Three CHCs also supplemented with TST if the IGRA result was positive.
In cases of suspected active TB disease, patients were most often referred out—five CHCs refer patients to the local health department and four send the patient to the emergency department of the local hospital. Three CHCs also conducted in-clinic evaluations.

Only three out of the nine CHCs have a clinic-wide protocol for TB testing; thus the decision of who should have a TB test is left to individual clinicians at the other six CHCs.

One CHC provided TB testing and treatment with no cost to uninsured patients, while the other CHCs used a sliding scale. For some of the CHCs that provided sliding scale, they provided the services at no cost to certain special populations (refugee, etc.) but not all uninsured patients. In general CHCs indicated they worked with the patients to offer the financial needs for treatment as needed or mentioned that treatment was an inexpensive cost for patients. To obtain the necessary treatment, participants indicated that an onsite or nearby pharmacy was available for patients at all CHCs.

The most common regimen for positive LTBI was nine months of isoniazid, with six CHCs using it as the first choice. Six months of daily isoniazid was not the first choice for any CHC, but it was the second choice for four CHCs. Four months of daily isoniazid was the first choice for two CHCs, as well as second choice for another two CHCs. Three months of once-weekly rifapentine plus isoniazid was the first choice for two CHCs, and second choice for one CHC.

Most CHCs agreed that at least “some” patients accepted treatment for LTBI – four CHCs said “most,” and three CHCs said “some.” Only one CHC said only “few” of their patients accepted treatment. Among those who accepted treatment, “most” but not all patients complete treatment. One CHC said “all” of their patients completed treatment, six said “most,” and one said “few.” One interviewee did not know the answer for these two questions. All participants moderately or strongly encouraged patients to complete treatment with a mean score of 4.6 (1=do not encourage; 5 = strongly encourage).

*Attitudes (Table 4)*
The participants cited various barriers for providers to test for TB, including lack of awareness of risk factors or testing recommendations (n=3), belief that TB is not a problem (n=2), lack of time within a visit (n=1), lack of need to test again for patients who have already been tested elsewhere and have records (n=1), cost for patients (n=1), and stigma (n=1). Barriers for providers to offer LTBI treatment include a belief that treatment is not beneficial (n=3), long course of treatment (n=2), lack of knowledge of available treatment regimens (n=1), and a belief that testing is not a priority issue (n=1). Three CHCs did indicate that there was generally “no barrier” in their clinics.

CHCs believed that the best way to encourage providers to test and treat LTBI was through education and training on available testing and treatment guidelines (n=6). Two key informants would also like to have TB expert consultation available, and one key informant thought clinic protocols and procedures would help. Other ways to encourage providers include making testing protocols readily available (n=1), monitoring providers’ use of EHR and providing feedback (n=1), and having dedicated resources for CHCs to conduct TB testing and treatment (n=1).

Various messages to encourage testing/treatment were highly motivating for providers. On a scale of 1 to 5 with 1 denoting “not motivating at all” and 5 as “highly motivating,” the message that “Treating latent TB infection is 90% effective in preventing development of TB disease” had the highest mean score of 4.6, followed by the message, “A high percentage of the TB cases in my state
come from areas served by my clinic,” with a mean score of 4.3. The messages, “TB case rates are 29 times higher for Asians than whites,” “More U.S. TB cases are occurring among non-U.S.–born persons,” and “More than 85% of U.S. TB cases are believed to be associated with longstanding, untreated latent TB infection” have mean scores of 3.9, 3.8 and 3.8 respectively.

Common patient barriers for LTBI testing included fear of stigma (n=5), not believing they are at risk (n=3), and not able to afford tests (n=3). Other barriers included distrust of TB test results (n=1), blood tests requiring patients to come back for another visit (n=1), and distrust of western medicine (n=1). Common patient barriers for acceptance of LTBI treatment included distrust of TB test results because of BCG (n=5) and not believing they are at risk for developing active TB disease (n=4). Other barriers included lack of awareness of the benefits of treatment in preventing development of TB disease (n=3), concerns about risks from the side effects of the medication (n=2), unable to make it to the appointment (n=1), not understanding TB test results (n=1) and fear of stigma (n=1). Long course of treatment was the most common patient barrier for completing LTBI treatment (n=8). Other barriers for completion of the treatment included side effects of medication (n=4), cost of treatment (n=3), treatment inconvenience (n=1), and distrust of western medicine (n=1).

All key informants believed that removing barriers to treatment could improve treatment completion, and most believed that education and counseling for patients and families could help as well (n=6). Other methods to support completion of patient treatment also included providing shorter courses of treatment (n=1), and dedicating resources to clinics where patients see familiar faces, having someone who speaks their language, and having existing trust for their providers (n=1).

In terms of messages to encourage patients for testing and treatment of LTBI, three CHCs mentioned implications for transmission to family members as highly motivating, indicating that family might be an important cultural factor for consideration in messaging. Other messages, “Treating latent TB infection prevents the development of TB disease,” “Many TB cases in the U.S. are a result of reactivation of TB infection acquired many years ago in countries where TB disease is more common,” “TB case rates are 29 times higher for Asians than whites,” and “TB blood tests do not react with previous BCG vaccine,” had similar ratings with mean scores of 4.1, 3.9, 3.8 and 3.6 respectively. One key informant did mention that statements about individuals or families usually worked better in motivating patients than statements about the population in general.

**Interview Themes**

1. There was a consistent theme from CHCs that while they were aware of the TB recommendations, they were not actionable in practice due to the need for even more targeted and clearer guidelines. Statements from respondents included:
   a. “The recommendations are challenging to comply with, because the majority of our patients are at risk and should [all] be tested according to the recommendations. We are going more with targeted testing…”
   b. “[I think we should] prioritize those who are at high risk of TB; [we] need a clearer guideline [for this]. [We] can’t say [we need] to test the whole diabetes population. Maybe the ones that are less controlled? And then what [does] less controlled [mean]? HbA1c greater than 8%? 9%?”
   c. “What HbA1c should be tested for TB? What does “recent” immigrant [mean]?”
   d. “It’s an overly broad idea [to] test everyone to eliminate TB. Don’t want to target people just because they are foreign born.”

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e. “[I would like some] longitudinal recommendations. When should patients be tested again?...We don’t know who has been tested before. There is no standard protocol of who[m] to screen and how frequently to screen. Screening the general population is not recommended.”

2. Confusion about BCG was cited as a common barrier for patients to get tested and accept treatment. Statements from respondents included the following:
   a. “BCG particularly patients who are 30-40 and they got BCG when they were young and don’t remember...CDC recommendations are not detailed enough in this case to be put into a decision tree.”
   b. “We have had to educate patients that BCG doesn’t affect the result of blood test.”

3. CHCs often worked with their local hospitals or state health department. Statements from respondents included the following:
   a. “I will call the physician at the local TB clinic to seek clinical consultation for patients with latent TB infection or suspected TB. There was one particular hard case, I called the public health commissions.”
   b. “We will refer the active cases to the state health department TB clinic.”
   c. “We send our x-rays to the local hospital for interpretation.”

4. In-language print patient materials, graphics, or videos were also commonly cited as helpful strategies for CHCs to provide TB education for patients who are largely limited English proficient. Statements from respondents included the following:
   a. “Some patients don’t speak or read English, so in language print-outs would be helpful”
   b. “Translate everything into [an oral language]. Older folks don’t read very well. There is no information at all on the internet in [this oral language].”
   c. “Video format...would be great. And short brochures.”

5. Several health centers also indicated that a clinic-wide protocol and EHR system to track testing and treatment would be helpful. Statements from respondents included the following:
   a. “We don’t use EHR to track now...It’s something we need to figure out how to do. It’ll help track testing and treatment for latent TB infection... If anybody has any best practices, that’d be great.”
   b. “We are interested in some sort of decision tree that providers can follow for TB testing and treatment.”
   c. “Training on a clearer guideline [that can be implemented clinic-wide] would be helpful.”

Discussion and Recommendations

Overall, this study provided a valuable preliminary assessment of the needs of TB testing and treatment for Asian American, Native Hawaiian, and other Pacific Islander populations, predominantly served by AAPCHO community health centers. The study demonstrated the critical need to continue efforts working with health organizations serving these populations who are at high risk of TB infection with their majority foreign-born and limited English proficient (often used as a proxy) populations.
With the limited project timeframe, this pilot project only consisted of nine key informants. The interview results may thus be subjected to selection bias. Due to the volunteer nature of the recruitment process, participants may be champions who may have better knowledge, attitudes, and practices. The results may also be affected by social desirability bias – providers may communicate better practices than what actually exists in the clinic. In the future, an anonymous survey with multiple provider and clinic staff level viewpoints implemented nationally to a larger group of health centers may reduce these biases.

**Recommendations**

In light of the preliminary study results, we provide the following recommendations to encourage LTBI testing and treatment.

1. **Development of more detailed and actionable TB recommendations and guidelines targeting priority populations needing testing and treatment.** Given that AAPCHO health centers serve a large majority of patients needing testing and treatment under the current CDC guidelines (e.g. foreign-born population), the more detailed targeting of populations by priority can be useful to help health centers set priorities for groups representing the highest need for testing, enabling them to be more realistic about testing their highest need populations as opposed to broadly testing their entire foreign-born population.

2. **Development of clinic-wide protocols with decision trees/algorithms for the detailed TB recommendations.** The protocols must be feasible and actionable to be used in practice. In addition, given the high risk, comorbidity rates, and similar screening needs for TB, hepatitis b, and diabetes in foreign-born Asian American, Native Hawaiian and other Pacific Islander populations, it is recommended that screening protocols be integrated for these disease areas to facilitate efficient and feasible clinic visits for both providers and patients. Screening and treatment data should be collected for effective monitoring. These protocols should be developed and tested in collaboration with clinics serving these high-priority populations to determine their usability and uptake.

3. **Integrate the detailed guidelines into Electronic Health Records (EHRs) that can monitor and track patients through treatment completion.** The EHR systems integrating the guidelines could serve to reinforce the clinic-wide protocol for testing and treatment. Many CHCs lacked EHR systems with TB testing and tracking capabilities and believed that this could help providers better understand and follow the recommendations. Note that stand-alone systems may not be as useful as systems integrated into the EHR because providers often are unwilling to switch in and out of systems in the busy clinic setting.

4. **Develop culturally sensitive, in-language print materials and graphics/videos that could help patients better understand the need for testing and treatment.** Given the challenge reported by providers for patients to understand their need for treatment for an asymptomatic disease such as TB, the use of culturally appropriate references such as importance of family may be helpful for patients to understand the need for testing and treatment. For example, informing patients about the risk of transmission to family members such as grandchildren was often a highly-motivating message for providers to use for patient compliance. Similar materials could be developed to address stigma related to TB. Videos or graphic materials can also help patients, especially the elderly, who cannot read or write in their own language. These materials should be developed in collaboration with providers serving these populations and tested on the ground with patients.

5. **Assess patient social barriers to screening and treatment and the appropriate interventions that address them.** Health centers cited the need to reduce social barriers to care in order for patients to pay attention to medical needs. For example, if patients are homeless and unable to pay for food, they will likely not prioritize TB screening and treatment.
In collaboration with the National Association of Community Health Centers and the Oregon Primary Care Association, AAPCHO has launched a successful national initiative to develop, test, and disseminate PRAPARE (Protocol for Responding to and Assessing Patients’ Assets, Risks, and Experiences), a national standardized patient risk assessment protocol and Implementation and Action Toolkit. Through better understanding of patient social determinants of health and other barriers to care as well as appropriate interventions or enabling services (e.g., interpretation, transportation that facilitate access to care) to address them, we can work together to address patients’ basic social needs that are often a prerequisite for medical compliance for high-risk patients, especially one that is asymptomatic as TB.

6. **Strengthen collaborations between CHCs, hospitals, state/local health departments, and other community partners.** By working with partners at multiple levels, we can leverage similar initiatives as well as better collaborate on ways to improve many of the social barriers often characteristic of high-risk TB patients. Collaboration with community partners such as social service providers, senior community centers, local churches, food banks, or housing authorities can also lead to better targeted approaches and overall community health improvement.

**Next Steps**

Based on the information we gathered from the key informant interviews, we modified the questions and integrated them into an online survey using SurveyMonkey with mostly multiple choice, likert scale, and ranking questions. The survey takes approximately 15 minutes to complete, and has now been approved by the Office of Management and Budget (OMB). This survey will reach a higher sample size with recruitment targeted at 150 AANHPI-serving CHCs. With additional respondents, we will be able to better understand multiple clinic staff viewpoints that likely vary as well as capture a more realistic understanding of clinic knowledge, attitudes, and practices given the anonymity relative to interviews. The survey results will be valuable for validating the recommendations provided above that were based on the small sample of interviews.

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2 AA&NHPI-serving CHCs defined as those that serve at least 5% or more AA&NHPIs, totaling at least 1,000 AA&NHPIs, based on 2016 UDS data. Smaller health centers serving at least 25% of AA&NHPIs but did not reach the threshold of 1,000 are also included.
Table 1a: Community Health Center (CHC) Characteristics (N = 9 CHCs)

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<td>94.4%</td>
<td>87.9%</td>
<td>80.4%</td>
<td>73.0%</td>
<td>82.9%</td>
<td>94.5%</td>
<td>97.9%</td>
<td>98.6%</td>
<td><strong>88.6%</strong></td>
</tr>
<tr>
<td><strong>Insurance Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Uninsured</td>
<td>24.4%</td>
<td>21.6%</td>
<td>14.0%</td>
<td>11.0%</td>
<td>10.7%</td>
<td>6.5%</td>
<td>8.8%</td>
<td>17.9%</td>
<td>42.2%</td>
<td><strong>14.7%</strong></td>
</tr>
<tr>
<td>% On Medicaid</td>
<td>53.7%</td>
<td>59.6%</td>
<td>59.7%</td>
<td>59.2%</td>
<td>17.5%</td>
<td>66.7%</td>
<td>63.3%</td>
<td>57.2%</td>
<td>47.5%</td>
<td><strong>59.3%</strong></td>
</tr>
<tr>
<td>% Foreign born (estimate)**</td>
<td>33%</td>
<td>95%</td>
<td>70%</td>
<td>60%</td>
<td>30%</td>
<td>30%</td>
<td>NA</td>
<td>60%</td>
<td>80%</td>
<td><strong>49.8%</strong></td>
</tr>
<tr>
<td><strong>Immunocompromising Conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% HIV</td>
<td>0.08%</td>
<td>0.15%</td>
<td>0.01%</td>
<td>0.08%</td>
<td>0%</td>
<td>1.14%</td>
<td>0.11%</td>
<td>NA</td>
<td>0.04%</td>
<td><strong>0.2%</strong></td>
</tr>
<tr>
<td>% Diabetes</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
<td>10%</td>
<td>8%</td>
<td>9%</td>
<td>10%</td>
<td>19%</td>
<td>12%</td>
<td><strong>8.7%</strong></td>
</tr>
</tbody>
</table>

* Based on data from the Uniform Data Set (2016)
** Estimated percentages provided by the key informants
### Table 1b: Tuberculosis (TB) Problem at CHCs (N = 9 CHCs)

<table>
<thead>
<tr>
<th>Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How big of a problem is TB in your patient population?</strong> (Mean Score out of 5, 1 = “not a problem” and 5 = “major problem”)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td><strong>3.6</strong></td>
</tr>
</tbody>
</table>

### Table 1c: Other Community Health Center (CHC) Characteristics (N = 9 CHCs)

<table>
<thead>
<tr>
<th>Collection of country of birth</th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes for all</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Yes only for some patients</td>
<td>1</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Does your clinic provide treatment for latent TB infection?</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Do you use your medical records to alert for and/or track testing and treatment for latent TB?</td>
<td>2</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Is the clinic able to track patients through treatment?</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you typically follow the recommendations in the EMR prompts?</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>Are you aware of the TB recommendations?</td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Are you interested in learning more about TB prevention, latent TB infection testing, and treatment?</td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
# Table 3: Tuberculosis (TB) Practices (N = 9 CHCs)

## Patients recommended for TB testing

<table>
<thead>
<tr>
<th>Note</th>
<th>Number of CHCs</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients who identify as health care workers</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Patients who are born outside the United States</td>
<td>8</td>
<td>Not everyone</td>
</tr>
<tr>
<td>Patients who currently, or used to, live in large group settings, such as homeless shelters or prisons</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Patients who are immunosuppressed</td>
<td>7</td>
<td>For some, not everyone</td>
</tr>
<tr>
<td>Patients who request testing for occupation or school requirements</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

## Latent TB Infection (LTBI) testing method

<table>
<thead>
<tr>
<th>Method</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST only</td>
<td>7</td>
</tr>
<tr>
<td>TST with IGRA if positive</td>
<td>3</td>
</tr>
<tr>
<td>IGRA only</td>
<td>6</td>
</tr>
</tbody>
</table>

## What would you do if you suspected active TB disease in a patient?

<table>
<thead>
<tr>
<th>Action</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct a clinical evaluation of the patient at your facility</td>
<td>3</td>
</tr>
<tr>
<td>Have the patient sent to the emergency department (local hospital)</td>
<td>4</td>
</tr>
<tr>
<td>Refer the patient to the health department</td>
<td>5</td>
</tr>
</tbody>
</table>
Is there a protocol that describes who should have a TB test or is this left to the individual clinician?

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Individual clinician</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3*</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

* One CHC indicated: “There is a protocol but there is no monitoring of who’s using the protocol.”

Cost for testing

<table>
<thead>
<tr>
<th>Cost for testing</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cost for indigent/uninsured patients</td>
<td>1</td>
</tr>
<tr>
<td>Sliding scale</td>
<td>8*</td>
</tr>
</tbody>
</table>

* For some CHCs that provide sliding scale, they provide testing at no cost for some patients but not all uninsured patients

### Treatment regimens for positive LTBI

<table>
<thead>
<tr>
<th>Treatment Regimen</th>
<th>Never</th>
<th>1st choice</th>
<th>2nd choice</th>
<th>3rd choice</th>
<th>4th choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 months daily isoniazid</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6 months daily isoniazid*</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>4 months daily rifampin*</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3 months of once-weekly rifapentine plus isoniazid (3HP)</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify__________________)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* One CHC wasn’t sure about 6 months isoniazid and 4 months rifampin

### Location of pharmacy

<table>
<thead>
<tr>
<th>Location of pharmacy</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an on-site pharmacy or a pharmacy physically close to clinic for patients to access TB medication as needed?</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

Cost for treatment

<table>
<thead>
<tr>
<th>Cost for treatment</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cost for indigent/uninsured patients</td>
<td>1</td>
</tr>
<tr>
<td>Sliding scale</td>
<td>8</td>
</tr>
</tbody>
</table>
### Patient acceptance of treatment for LTBI

*On average, how many of your patients accept treatment for LTBI?*

<table>
<thead>
<tr>
<th>Number of CHCs</th>
<th>All</th>
<th>Most</th>
<th>Some</th>
<th>Few</th>
<th>None</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CHCs</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

### Patient completion of treatment for LTBI

*On average, how many of your patients complete treatment for LTBI?*

<table>
<thead>
<tr>
<th>Number of CHCs</th>
<th>All</th>
<th>Most</th>
<th>Some</th>
<th>Few</th>
<th>None</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CHCs</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

### Encouragement of patients to complete treatment for LTBI

(Mean score out of 5; 1 = do not encourage, 5 = strongly encourage)

<table>
<thead>
<tr>
<th>Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouragement of patients to complete treatment for LTBI</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td><strong>4.6</strong></td>
</tr>
</tbody>
</table>
Table 4: Attitude towards TB Testing and Treatment (N = 9 CHCs)

<table>
<thead>
<tr>
<th>Common barriers for providers to order testing</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unaware of risk factors or testing recommendations</td>
<td>3</td>
</tr>
<tr>
<td>Don’t believe TB is a problem (e.g., TB infection does not rise to the level of so many other issues that clinicians need to think about during the clinical encounter in a very busy clinic.)</td>
<td>2</td>
</tr>
<tr>
<td>Other: Confusion about the testing sequence</td>
<td>2</td>
</tr>
<tr>
<td>Other: Providers feel it’s not necessary to test again for patients who already been tested and have records</td>
<td>1</td>
</tr>
<tr>
<td>Other: Not a priority</td>
<td>1</td>
</tr>
<tr>
<td>Other: Lack of time within a visit for providers to talk about different screening recommendations</td>
<td>1</td>
</tr>
<tr>
<td>Other: Language barrier between patients and providers</td>
<td>1</td>
</tr>
<tr>
<td>Other: Stigma</td>
<td>1</td>
</tr>
<tr>
<td>Other: Cost</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.

<table>
<thead>
<tr>
<th>Common barriers for providers to order treatment</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge of available treatment regimens</td>
<td>1</td>
</tr>
<tr>
<td>Don’t believe treatment is beneficial</td>
<td>3</td>
</tr>
<tr>
<td>Not a high priority issue among so many high priority issues that are already on the plate of providers</td>
<td>1</td>
</tr>
<tr>
<td>Other: Long course of treatment</td>
<td>2</td>
</tr>
<tr>
<td>Other: Cost related to treatment</td>
<td>1</td>
</tr>
<tr>
<td>Other: Patients’ financial cost related to treatment</td>
<td>1</td>
</tr>
<tr>
<td>Other: No provider barrier</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.
### Ways to encourage providers to test and treat LTBI

<table>
<thead>
<tr>
<th></th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and training on available testing and treatment guidelines</td>
<td>6</td>
</tr>
<tr>
<td>Having TB expert consultation available</td>
<td>2</td>
</tr>
<tr>
<td>Clinic protocols and procedures</td>
<td>1</td>
</tr>
<tr>
<td>Other: Make testing protocol readily available</td>
<td>1</td>
</tr>
<tr>
<td>Other: Check for patients who have not had TB testing in the past year</td>
<td>1</td>
</tr>
<tr>
<td>Other: Have electronic observed therapy</td>
<td>1</td>
</tr>
<tr>
<td>Other: Monitor providers</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.

### Messages to encourage provider testing and treatment of at-risk populations for latent TB infection

*(1 = not at all motivating and 5 = highly motivating)*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treating latent TB infection is 90% effective in preventing development of TB disease.</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td></td>
<td>4.6</td>
</tr>
<tr>
<td>A high percentage of the TB cases in my state come from areas served by my clinic.</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>More U.S. TB cases are occurring among non-U.S.–born persons who have been in the U.S. for 10 years or longer, than among those who have recently arrived.</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>4.0</td>
</tr>
<tr>
<td>TB case rates are 29 times higher for Asians than whites.</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>More than 85% of U.S. TB cases are believed to be associated with longstanding, untreated latent TB infection.</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.
### Common patient barriers for LTBI testing

<table>
<thead>
<tr>
<th>Reason for non-testing</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afraid of stigma if test result is positive</td>
<td>5</td>
</tr>
<tr>
<td>Don’t believe they are at risk</td>
<td>3</td>
</tr>
<tr>
<td>Test not covered by insurance/can’t afford test</td>
<td>3</td>
</tr>
<tr>
<td>Don’t trust TB test results</td>
<td>1</td>
</tr>
<tr>
<td>Other: Blood test requires patients to come back for another visit</td>
<td>1</td>
</tr>
<tr>
<td>Other: no problem from patients</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.

### Common patient barriers for acceptance of LTBI treatment

<table>
<thead>
<tr>
<th>Reason for refusal</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't trust TB test results because of BCG</td>
<td>5</td>
</tr>
<tr>
<td>Don’t believe they are at risk for developing active TB disease</td>
<td>4</td>
</tr>
<tr>
<td>Unable to afford treatment</td>
<td>3</td>
</tr>
<tr>
<td>Unaware of the benefits of treatment in preventing development of TB disease</td>
<td>2</td>
</tr>
<tr>
<td>Other: Concerned about risks from the side effects of the medication</td>
<td>1</td>
</tr>
<tr>
<td>Other: Do not understand TB test results</td>
<td>1</td>
</tr>
<tr>
<td>Other: Stigma</td>
<td>1</td>
</tr>
<tr>
<td>Other: Can’t make it to appointment</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.

### Common patient barriers for completing LTBI treatment

<table>
<thead>
<tr>
<th>Reason for non-completion</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long course of treatment</td>
<td>8</td>
</tr>
<tr>
<td>Side effects of medication</td>
<td>4</td>
</tr>
<tr>
<td>Cost of treatment</td>
<td>3</td>
</tr>
<tr>
<td>Treatment inconvenient (time, distance to clinic)</td>
<td>1</td>
</tr>
<tr>
<td>Other: Do not trust western medicine/medication</td>
<td>1</td>
</tr>
</tbody>
</table>
### Methods to support completion of patient treatment

<table>
<thead>
<tr>
<th>Support Method</th>
<th>Number of CHCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removing barriers to treatment (transportation support, language barrier, etc.)</td>
<td>9</td>
</tr>
<tr>
<td>Education and counseling for patients and families</td>
<td>6</td>
</tr>
<tr>
<td>Other: Shorter course of treatment</td>
<td>1</td>
</tr>
<tr>
<td>Other: Resources for clinics where patients see familiar faces, have someone who speaks their language, and trust their providers.</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.

### Messages to encourage patients for testing and treatment of LTBI (1 = not motivating and 5 = highly motivating)

<table>
<thead>
<tr>
<th>Message</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other: If not treated, patients could transmit the disease to their family (children, grandchildren etc)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td>Treating latent TB infection prevents the development of TB disease.</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>Many TB cases in the U.S. are a result of reactivation of TB infection acquired many years ago in countries where TB disease is more common.</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>TB case rates are 29 times higher for Asians than whites.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3.8</td>
</tr>
<tr>
<td>TB blood tests do not react with previous BCG vaccine.</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Note: “Other” denotes responses that were not prompted by the interviewer.
Appendix A

12/13/2017

AAPCHO Mail - Seeking Clinic Staff Participants for AAPCHO Tuberculosis Project

Vivian Li <vli@AAPCHO.org>

Seeking Clinic Staff Participants for AAPCHO Tuberculosis Project
1 message

Jeffrey Caballero <jeff@AAPCHO.org>
Reply-To: vli@AAPCHO.org
To: vli@AAPCHO.org

Thu, Sep 21, 2017 at 4:15 PM

Dear AAPCHO Members,

As you may know, tuberculosis (TB) disproportionately affects the patients and communities we serve. In 2015, Asian Americans accounted for 33 percent of the total number of reported TB cases in the United States. Of the approximately 9,500 annual new U.S. cases of TB, foreign-born Asian Americans have the highest rates of any racial/ethnic group, 28.5 times higher than that among non-Hispanic whites.

AAPCHO and the Mayo Clinic Center for Tuberculosis are conducting a project to better understand TB-related practices at community health centers. This project is funded by the U.S. Centers for Disease Control and Prevention. **We are seeking AAPCHO member staff to participate in a one-hour discussion about screening and treatment for TB to be conducted within the next couple of months.**

We are looking to speak with clinic staff who screen or treat patients with TB and/or administrative staff who have knowledge regarding these practices at your clinic. All information discussed will be confidential and will be seen only by project staff. A stipend will be provided in appreciation of your staff’s time. By participating, your health center will help identify high-priority gaps that, if filled, could enhance the care you provide and ultimately the health of your patients.

If you are willing to participate or are interested in learning more about this project, please email Vivian Li at vli@AAPCHO.org by **Friday, October 6.**

You may also forward this email to your staff as appropriate or send us your staff’s contact information so that we may follow up. We will coordinate the best time and mode (e.g., phone call, in-person) based on your staff’s preference.

More information about this project can be found here and is also included below. Please let us know if you have any questions or need more information. Thank you in advance for your participation in this important initiative to improve TB disparities for our populations.

Sincerely,

Jeffrey B. Caballero, MPH  
Executive Director

https://mail.google.com/mail/u/1/?ui=2&ik=09987de9e&jsver=gm2j2lgr4D46K&plid=0&vc=q-from%3A%20jeff%40aapcho.org%20subject%3A%20tuberculosis... 1/3
AAPCHo Tuberculosis Project

**WHAT:** A one-hour discussion about screening and treatment for tuberculosis (TB) as part of a project that AAPCHO and the Mayo Clinic Center for Tuberculosis are conducting to better understand TB-related practices at community health centers.

**WHY:** By participating, you will help identify high-priority gaps that, if filled, could enhance the care you provide and ultimately the health of your patients.

**WHO:** Clinic staff who screen or treat patients with TB and/or administrative staff who have knowledge regarding these practices at your clinic.

**WHEN:** Within the next few months, based on staff’s convenience.

**WHERE:** Phone call or in-person, based on staff’s preference.

If you are willing to participate or are interested in learning more, please contact by Friday, October 6, 2017:

Vivian Li  
vli@aapcho.org  
510-746-5079

Thank you!
The Centers for Disease Control and Prevention (CDC) and the U.S. Preventive Services Task Force (USPSTF) recommend testing populations that are at increased risk for TB infection. These groups include:

- People born in or who frequently travel to countries where TB disease is common, including Mexico, the Philippines, Vietnam, India, China, Haiti, and Guatemala, or other countries with high rates of TB. (Of note, people born in Canada, Australia, New Zealand, or Western and Northern European countries are not considered at high risk for TB infection, unless they spent time in a country with a high rate of TB.)
- People who currently, or used to, live in large group settings, such as homeless shelters or prisons and jails where TB is more common.

CDC also recommends testing for TB infection for other high-risk groups. These groups include:

- Health care workers and others who work in places at high risk for TB transmission, such as hospitals, homeless shelters, correctional facilities, nursing homes, and residential homes for those with HIV.
- Someone who has spent time with a person who has infectious TB disease.

People with weaker immune systems, such as those with certain health conditions or taking certain medications, have a higher risk of developing TB disease once infected. Testing for TB infection should be part of their regular medical care. Health problems that increase a person’s risk of developing TB disease once infected include:

- HIV
- Substance abuse (such as smoking, alcohol abuse, or injection drug use)
- Silicosis
- Diabetes mellitus
- Severe kidney disease
- Low body weight
- Organ transplants
- Head and neck cancer
- Medical treatments such as corticosteroids or organ transplant
- Specialized treatment for rheumatoid arthritis or Crohn’s disease

Children, especially those under age 5, have a higher risk of developing TB disease once infected. Therefore, testing for TB infection in children is important if they are in one of the risk groups noted above.
Eliminating tuberculosis (TB) in the United States requires expanding testing and treatment of latent TB infection. The Centers for Disease Control and Prevention (CDC) and the U.S. Preventive Services Task Force (USPSTF) recommend testing populations that are at increased risk for TB infection.

The Latent TB Infection Online Resource Hub is a collection of downloadable materials for informing and educating the public, health care providers, policy makers, and other partners about the importance of expanded latent TB infection testing and treatment. Available resources include:

- Guidance Documents
- Fact Sheets for Clinicians & Patients
- Communication Templates
- Key Messages & Social Media Content
- Slide Sets
- Images & Videos
- Infographics
- Helpful Links & More

https://www.cdc.gov/tb/publications/ltbi/ltbiresources.htm
AAPCHO / MAYO CLINIC TUBERCULOSIS ASSESSMENT
AAPCHO Members Key Informant Interview Guide

The interviews will be conducted in a semi-structured manner over the telephone or in-person depending on the feasibility of the participant and interviewer. Participants may include AAPCHO member clinic staff (e.g., physician, nurse) who screen or treat patients with tuberculosis and/or administrative staff who have knowledge regarding these practices at the clinic. Questions aimed at establishing the respondent’s perceptions and interpretations use an indirect rather than a direct format; for example, “Why do you think it is easy or difficult to screen for tuberculosis?” Direct questions are used to elicit specific details and indicate the need for follow-up questions, for example “Do you use your EHR to help manage your screening and treatment of tuberculosis?” For some questions, response prompts will be used. However, interviewers will give respondents some time to respond to the question asked before using answer prompts.

STEP 1: PRELIMINARY INTERVIEW QUESTIONS

Note: This information should be gathered prior to the interview (e.g. over email or during introductory meeting with the CHC) to allow for extra time during the interview.

Date of interview: _____________________________
Place/mode of interview: ______________________
Name of medical practice: _____________________
Representative Name/Alias: ____________________
Gender: _________________________________
Position/role at CHC: _________________________

1) Does your health center provide TB testing, prevention education, and/or treatment? If yes, how big of a problem is TB in your patient population (1 being not a problem, 5 being a major problem)?
2) Are you primarily clinic staff that provides direct patient care for TB or at-risk TB patients (e.g. foreign-born) or an administrative staff who has knowledge of TB policies and practices, or both?
   a) If you are clinic staff:
      1) Have you diagnosed someone with TB disease in the last 5 years? Were you involved with treatment?
      2) Have you diagnosed anyone with latent TB infection in your current practice setting?
      Have you treated anyone with latent TB infection in your current setting?
3) Do you prefer over the phone or in-person interview? We estimate the interview to range from 60-90 minutes. Please let us know of any time restrictions you have in the month of October when you will not be available (e.g. planned vacations, etc).
4) Please see the attached interview protocol and please note that we may ask you some questions regarding your health center patient demographics. We ask that you prepare your answers as needed.
STEP 2: SET THE STAGE FOR THE INTERVIEW
1. Ensure that interviewer has the participant’s health center UDS information as referenced in Interview Question #2 below.
2. If face to face interview: ensure participant readiness and privacy (e.g. door is closed)
3. If face to face interview: ensure comfort and put the participant at ease (e.g. have tea/water available at the table, housekeeping, etc.)
4. Welcome the participant.
5. Use the participant’s alias as appropriate.
6. Introduce self and identify specific role.

Thank you for agreeing to be interviewed for this study. AAPCHO and the Mayo Clinic Center for Tuberculosis are conducting this project funded by the CDC to better understand tuberculosis-related screening and treatment practices at community health centers. We have invited you to participate in this interview today to learn about your experiences because we believe you can help us identify high-priority gaps that, if filled, could enhance the care you provide and ultimately improve the health of your patients. We would like to record our conversation as we don’t want to miss any of your valuable comments. All information discussed will be confidential and will be shared only with project staff. The recordings will be transcribed without your name or other identifying information, and they’ll be kept on a password protected computer.
7. Informed consent with participant and agreement to record the interview

Do you agree to participate in this 60-90 minute conversation and are you comfortable with us recording our conversation?
8. Ensure participant has a copy of the questions and responses for the interview.
9. Ensure participant has a copy of the CDC Recommendations and Resources handouts.
10. Do you have any questions before we start?

STEP 3: THE INTERVIEW
We are interested in learning more about your tuberculosis services and care delivery at your clinic. [Ask participant any preliminary questions above, if not already assessed.]

General Tuberculosis (TB) Knowledge
1. We’d like to first understand what you know about tuberculosis. Can you briefly tell me what your thoughts are about tuberculosis risk at your health center?

[PROMPTS – no need to prompt for all subquestions. Purpose is to motivate thinking about TB]
• Risk factors?
• Symptoms?
• Pathogenesis?
• Testing?
• Treatment?

About Your Patient Population
2. Now I’d like to better understand your clinic’s patient population for context. Here is some of the information we pulled from your clinic’s UDS that we’d like to confirm with you but we also have some additional questions as well. [Pull info from UDS as available and ask participant to confirm]
• Age of adults 18+ vs children _________________________________
• Race/ethnicities served _________________________________
  • What AA&NHPI ethnicities do you serve? _________________
• Limited English proficient patients _____________________________
  • What languages do your patients speak? _________________
  •
• Federal poverty level rate less than 200% FPL ________________
• Health insurance status: % of uninsured patients ______________
• Health insurance status: % of patients on Medicaid _____________

3. Does your medical record system collect country of birth?
   a. Yes
   b. No

4. Approximately what percentage of your general patient population is born outside of the United States? [Try to get actual percent, but if not, ask participant to choose one answer below.]
   a. Less than 30%
   b. 30 to 60%
   c. Greater than 60%
   d. Plan to provide answer after additional investigation
   e. Not available/not collected
   f. Don’t know

5. Approximately what percentage of your patient population have the following immunocompromising conditions ...HIV, diabetes? [Confirm data from UDS, but if not, ask participant to choose one answer below.]
   a. Less than 30%
   b. 30 to 60%
   c. Greater than 60%
   d. Not sure
   e. Not available/not collected.

Recommendation on Latent Tuberculosis Infection Testing

Did you have a chance to review the recommendations from CDC and the U.S. Preventive Services Task Force on latent tuberculosis testing that we sent to you over email? Please take a moment to review.

6. Were you aware of these recommendations?

7. What do you think about the recommendation?
TB infection Testing Policies and Practices

Now we’d like to learn about your TB infection testing practices in your clinic.

8. Do you provide TB tests (either tuberculin skin tests (TST) or interferon-gamma release assay (IGRA) at your clinic? If so, what patients are recommended to be tested for TB infection? [Please see the answer choices on the Question Handout we sent to you]
   a. ___Patients who identify as health care workers
   b. ___Patients who are born outside the United States.
   c. ___Patients who currently, or used to, live in large group settings, such as homeless shelters or prisons.
   d. ___Patients who are immunosuppressed
   e. ___Patients who request testing for occupation or school requirements
   f. ___Don’t know

9. How do you test patients for latent TB infection? [Please see the answer choices on the Question Handout we sent to you. You may choose more than one]
   a. ___TST only
   b. ___TST with IGRA if positive
   c. ___IGRA only

10. If a patient has a positive TST or IGRA, what additional diagnostic services are performed to rule out TB disease? (Allow respondents time to discuss before prompting)
    ___Symptom screening
    ___Chest radiograph
    a) on site with immediate interpretation, b) send to another facility for X-ray
    ___Sputum AFB smear
    ___Other (please specify)______________________________

11. What would you do if you suspected TB disease in a patient? [Please see the answer choices on the Question Handout we sent to you]
    a. _____Conduct a clinical evaluation of the patient at your facility
    b. ____Have the patient sent to the emergency department (local hospital)
    c. ____Refer the patient to the health department
    d. ____Other (please describe):

12. Is there a protocol that describes who should have a TB test or is the decision left to the individual clinician?

13. Is latent TB infection testing provided to indigent/uninsured patients without cost? If so, are they on a sliding scale?
**Latent TB Infection Treatment Practices**

Now we’d like to learn what happens in your medical practice after a patient is identified as having a positive TB skin test or IGRA and TB disease has been excluded; so for example, we’ll discuss the clinic’s approach to treatment or referrals for treatment.

14. First, does your clinic provide treatment for latent TB infection?
   a. If YES, how do you provide treatment to patients diagnosed with latent TB infection? (e.g., directly observed therapy, self-administered therapy, electronic directly observed therapy)
   b. If NO, and patients are referred for treatment, to what organization(s) are patients referred? (e.g. the local public health department TB clinic)

15. On a scale of 1-5, how strongly do you encourage patients to complete treatment for latent TB infection? (1 being “do not encourage treatment to 5 “strongly encourage treatment”) Please elaborate on your reasons for discouraging/encouraging treatment.
   Do you push harder for “high risk” patients, such as HIV and children under 2?

16. What treatment regimens are most often offered to patients who test positive for latent TB infection? Please rank your regimens from 1st to last choice for treatment, or please indicate if you never offer these regimens. You can refer to the answer choices on your Interview Questions handout.
   Number the options as 0-never, 1-first choice, 2-2nd choice, 3-3rd choice, 4-4th choice, as we want to indicate %s in the final report.
   Do you offer ______ as a first choice, 2nd choice, 3rd choice, or 4th treatment choice, or you never offer this regimen?
   a. ______9 months daily isoniazid [eyes-zon-eye-azid or INH]
   b. ____6 months daily isoniazid
   c. ____4 months daily rifampin [riff-ampin]
   d. ____3 months of once-weekly rifapentine plus isoniazid (3HP) [riff-a-pen-tyne]
   e. ___Other (please specify______________

17. If the clinic prescribes latent TB infection treatment, is there an on-site pharmacy or a pharmacy physically close to clinic that patients can easily access?

18. Is latent TB infection treatment provided to indigent/uninsured patients without cost? Are they on a sliding scale?

19. If you treat LTBI in your clinic, on average, how many of your patients accept treatment for latent TB infection?
   a. _____All
   b. ___Most
20. On average, how many of your patients complete treatment for latent TB infection?
   a. __All
   b. __Most
   c. __Some
   d. __Few
   e. __None
   f. __Don’t Know

21. Now I’d like to learn about the barriers and facilitators experienced at your clinic in regards to TB practices. In your experience, what are the most common barriers for providers in your clinic in testing for TB infection? [You can refer to the answer choices on the Question Handout sent to you]
   a. Unaware of risk factors or testing recommendations
   b. TB infection does not rise to the level of so many other issues that clinicians need to think about during the clinical encounter in a very busy clinic.
   c. Testing for TB infection not incorporated into electronic medical records system
   d. Other?

22. In your experience, what are the most common barriers for providers in your clinic to treating latent TB infection? [Please see the answer choices on the Question Handout we sent to you]
   a. Lack of knowledge of available treatment regimens
   b. Don’t believe treatment is beneficial
   c. Unable to support directly observed therapy at clinic
   d. Not a high priority issue among so many high priority issues that are already on the plate of providers
   e. Other?

23. In your opinion, what would be the best ways to encourage providers to test and treat latent TB infection? [Please see the answer choices on the Question Handout we sent to you]
   a. Incorporation into electronic medical records system
   b. Education and training on available testing and treatment guidelines
   c. Having TB expert consultation available
   d. Clinic protocols and procedures
   e. Other?
24. On a scale of 1-5, how motivating are the following messages to encourage providers to test and treat at-risk populations for latent TB infection (1 being not motivating and 5 being highly motivating)? [Please refer to the messages listed on the Question Handout we sent to you]
   a. _____ More than 85% of U.S. TB cases are believed to be associated with longstanding, untreated latent TB infection.
   b. _____ A high percentage of the TB cases in my state come from areas served by my clinic.
   c. _____ TB case rates are 29 times higher for Asians than whites.
   d. _____ Treating latent TB infection is 90% effective in preventing development of TB disease.
   e. _____ More U.S. TB cases are occurring among non-U.S.–born persons who have been in the United States for 10 years or longer, than among those who have recently arrived.

25. In your experience, what are the most common barriers preventing patients from getting tested for TB infection? [Please see the answer choices on the Question Handout we sent to you]
   a. Don’t believe they are at risk
   b. Test not covered by insurance/can’t afford test
   c. Don’t trust TB test results
   d. Afraid of stigma if test result is positive
   e. Other?

26. In your experience, what are the most common barriers preventing patients from accepting latent TB infection treatment? [You can refer to the answer choices on the Question Handout sent to you]
   a. Don’t believe they are at risk for developing TB disease
   b. Unaware of the benefits of treatment in preventing development of TB disease
   c. Don’t trust TB test results because of BCG
   d. Unable to afford treatment
   e. Others?

27. In your experience, what are the most common barriers preventing patients from completing latent TB infection treatment? [Please see the answer choices on the Question Handout we sent to you]
   a. Side effects of medication
   b. Long course of treatment
   c. Treatment inconvenient (time, distance to clinic)
   d. Cost of treatment
   e. Other?
28. To improve treatment completion among patients with latent TB infection, what do you think are the best ways to support patients? [Please see the answer choices on the Question Handout we sent to you]
   a. Education and counseling for patients and families
   b. Removing barriers to treatment (transportation support, electronic directly observed therapy, etc.)
   c. Other (please specify)

29. On a scale of 1-5 (1 being not motivating and 5 being highly motivating), how motivating are the following messages to encourage patients to get tested and treated for latent TB infection? [You can refer to the list of messages on the Question Handout we sent to you]
   a. _____TB blood tests do not react with previous BCG vaccines.
   b. _____TB case rates are 29 times higher for Asians than whites.
   c. _____Treating latent TB infection prevents the development of TB disease.
   d. _____Many TB cases in the U.S. are a result of reactivation of TB infection acquired many years ago in countries where TB disease is more common.
   e. _____Others?

**Provider and Patient Education**

30. Now I’d like to learn more about TB education practices at your clinic. Where would you seek clinical consultation for patients with latent TB infection or suspected TB?

31. What are your go-to resources for updated medical information on TB?
   a. Where do you go to find information on TB or latent TB infection?
   b. What are your preferred formats for clinical education? (e.g. mobile medical apps, print materials, face to face education, annual medical conferences)

32. What types of patient education materials are preferred in your clinic? (e.g., print materials in clinic, videos in clinic, graphics/posters, patient education sessions)

**About Your Medical Records**

33. What EMR system does your clinic use? Pull CHC info from UDS and confirm ____________

34. Do you use your medical record to alert for or track testing and treatment for latent TB infection? If so, how?
   a. If YES: If you do track through EHR, is the clinic able to track patients through treatment?
   b. If YES: If an EHR is available to track testing and treatment: Do you typically follow the recommendations in the EHR prompts?
Future Collaboration and Support (*If out of time, ask these questions in follow-up email*)

35. Now I’d like to learn about your interest in future collaborations. Are you interested in learning more about TB prevention, latent TB infection testing, and treatment?

36. Are there others in your organization we should involve in further communications about collaborations to strengthen TB prevention? If yes, please indicate name and position in the organization.

37. Do you have any other comments or information regarding your clinic’s tuberculosis screening and treatment practices and needs that you would like to add?

38. May we contact you if we have further clarification questions after reviewing our discussion?

**STEP 4: ENDING THE INTERVIEW**

Thank you very much for all the time you’ve spent with us to answer these important questions which will help us better understand the gaps and needs for tuberculosis care for at-risk patients served at AAPCHO member health centers and nationally. You should soon be receiving an interview incentive via email as a token of appreciation for your time. You may also take the handout and CDC recommendation statement and feel free to share with others. Again, thank you so much for your valuable time.

**STEP 5: DEBRIEF**

When the interview is finished for the day, the researchers who participated in the interview will debrief. The debriefing session will be used to discuss any concerns or limitations the interviewer might have related to the interview, major takeaways, and review the data collection form for accuracy and clarity.