Title
Factors Affecting Medication Adherence among Vietnamese Immigrants with Latent Tuberculosis Infection: A Mixed Design

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Factors Affecting Medication Adherence among Vietnamese Immigrants
with Latent Tuberculosis Infection: A Mixed Design

A dissertation proposal submitted in partial satisfaction of the
requirements for the degree of Doctor of Philosophy
in Nursing

by

Fayette Khue Nguyen Truax

2016
Completion of latent tuberculosis infection (LTBI) treatment among foreign-born Asians in the United States (US) is suboptimal, thus leading to high rates of reactivation tuberculosis (TB) among this population. Approximately 77% of TB cases in the US are from reactivation TB and foreign-born Asians have a higher reactivation rate compared to Blacks, Hispanics and Whites. In Orange County (O.C.), the annual TB case rate continues to remain steady at 6.0 cases per 100,000 in 2014 with foreign-born persons from Vietnam leading with a TB rate of 49.7%, Mexico at 14.4% and the Philippines at 12.6%. Overall the high number of active TB cases among Vietnamese immigrants, coupled with low LTBI treatment completion rate of approximately 50.1% in the overall Asian population, presents an important challenge to the national strategy of eliminating TB (Li et al., 2010). At this time, there is limited data on Vietnamese immigrants with LTBI in the US.

The purpose of this mixed methods study is to identify the factors related to LTBI treatment acceptance and completion in addition to exploring the decision-making process of LTBI treatment adherence among Vietnamese immigrants. Predictors for phase 1 included:
socio-demographic characteristics, basic health history, behavioral survey scores measured by Morisky Medication Adherence Scale (MMAS-8), Champion Health Belief Model Scale (CHBMS-29) and the Self-Efficacy for Appropriate Medication Use (SEAM-9). Significant predictors for multivariate analysis for treatment acceptance included individuals with a history of smoking and recent contact with an infectious TB case. For treatment completion, the top two most significant predictors in the univariate analysis included age group between 18-44 years and current employment. No significant predictors were identified in the multivariate analysis for treatment completion. There were also no significant correlations identified between the psychosocial measurements (SEAM-9, CHBMS-29, MMAS-8) and treatment completion.

In phase 2, a decision-making grounded theory model entitled “The Decision-Making Model for Latent TB Infection Treatment Acceptance and Completion” was developed from the stories and testimonies of 17 Vietnamese participants. Three primary decision-making points were identified that was critical to the development of the proposed model: treatment acceptance, treatment initiation and treatment completion. Three categories emerged from participants’ data that were directly related to the decision to accept LTBI treatment, “beliefs”, “TB awareness” and “trust in healthcare”. Findings revealed the only category to influence treatment initiation was “barriers” to scheduling. Lastly, the decision to maintain adherence and complete treatment were strongly influenced by self-determination, medication side effects, and having family support.

Based on this study’s findings, target screening of Vietnamese immigrants at highest risk for latent TB reactivation should be done more frequently in private community clinics and focus on reducing barriers to treatment acceptance, initiation and completion.
The dissertation of Fayette Khue Nguyen Truax is approved.

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Donald E. Morisky
Adeline M. Nyamathi, Committee Chair

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Dedication

First and foremost I thank God for guiding me through this incredible journey of becoming a researcher so I can continue my life ministry of helping vulnerable populations defeat the health disparities they cannot overcome themselves. I dedicate this work to my immigrant parents, Doyen Nguyen and Ha Xuan Nguyen, for their unconditional love and all the sacrifices they have made for their children to be here in the United States. Without them, I would not be here today. I would like to thank my seven siblings for being supportive of my dreams since I was a young child. This study is also dedicated to my beloved husband, Billy Truax, who never left my side throughout this entire journey and who was always there for me. As for my friends and colleagues, I am forever thankful for your encouragement and for always believing in me. All of you have a special place in my heart and I would like to thank everyone for your support throughout my doctoral journey.

I especially would like to thank my Dissertation Committee Chair, Dr. Adeline Nyamathi for her unwavering dedicated mentorship and guidance throughout the entire process. Without her, this work would not be possible. I thank my Dissertation Committee Members, Dr. Morisky, Dr. Maliski and Dr. Hodge. Lastly, Dr. Brecht your unconditional statistical support and guidance will never be forgotten.

I would like to thank the wonderful Orange County Pulmonary Department staff for allowing me to be a part of your team. Special thanks to Dr. Julie Low, Mike Carson, and Haimanot Girma for always being available and extremely supportive of my research endeavors.

Lastly, I would like to thank the Vietnamese immigrants who dedicated their time to participate in this research and motivated me to continue working on improving the health of our Vietnamese community.
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<tr>
<td><strong>CHBMS</strong>: Champion Health Belief Model</td>
<td>The Health Belief Model scale is used to measure individuals' perceived risks of</td>
</tr>
<tr>
<td><strong>MMAS</strong>: Morisky Medication Adherence Scale</td>
<td>Medication Adherence (MA) measures self-reported behaviors in daily medication administration of prescribed drugs.</td>
</tr>
<tr>
<td><strong>SDS</strong>: Social Desirability Scale</td>
<td>This survey measures means of socially desirable responses and is used in conjunction with other self-report measures to control for socially desirable response tendencies in behavioral research.</td>
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<tr>
<td><strong>SEAMS</strong>: Self-Efficacy for Appropriate Medication Use</td>
<td>This scale is used to measure if patients' self-efficacy for appropriate medication use is related to better medication adherence.</td>
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CHAPTER 1
Introduction and Background of the Problem

An estimated more than 11 million people currently living in the United States (US) have latent tuberculosis infection (LTBI), and on average 5-10% of these individuals will go on to develop active tuberculosis (TB) if left untreated (Center for Disease Control and Prevention [CDC]), 2013). Evidence from large cohort studies have shown that foreign-born persons account for the majority of TB cases in the U.S. with approximately 4 out of 5 cases of TB attributed to latent TB activation, also known as reactivation TB within the last decade (Ricks, Cain, Oeltmann, Kammerer & Moonan, 2011; Shea, Kammerer, Winston, Navin & Horsburgh, 2014). Some of the risk factors associated with reactivation among foreign-born persons identified in the literature include older age, healed lung disease, poor nutrition or other immunosuppressive conditions (Horsburgh, 2004; Shea et al., 2014). The key to controlling the number of active TB cases in the US lies in identifying and treating LTBI with an emphasis on increasing medication adherence rates. Treatment of LTBI is a key component of the national strategy for eliminating TB in the US (Horsburgh & Rubin, 2011).

Adherence is defined as “the extent to which a person’s behavior, in terms of taking medication, following diets, or executing lifestyle changes, coincides with medical or health advice” (Haynes, 2001, p. 4). Adherence to LTBI treatment is suboptimal because the regimens are lengthy and require strict daily adherence of medication ingestion. Data from clinical trials indicate that completion of LTBI medication treatment has a 90% efficacy rate of eliminating Mycobacterium tuberculosis bacteria in individuals infected (Lobato, Wang, Becerra, Simone & Castro, 2006). The overall consequences of inadequate LTBI treatment will result in an increase
of new TB cases, emergence of drug-resistant strains, and higher overall treatment costs to the patient and health care system.

**TB Trends in Immigrants and Racial/Ethnic Minorities**

In 2014, TB surveillance data reported the US national trend was slowly declining and has now reached its lowest rate of 3.0 TB cases per 100,000 populations (MMRW, 2015). Despite this decline in TB cases, foreign-born persons and racial/ethnic minorities continue to be affected disproportionately with rates of TB incident cases 13.4 times greater than US-born persons (CDC, 2015). Among foreign-born groups, non-Hispanic Asians, have continue to exceed all other minority groups in the country with the highest TB incidence rate annually for over a decade now (CDC, 2015). This persistent pattern has both national and local TB health departments calling for increased awareness and surveillance of TB in foreign-born persons throughout the country, focusing specifically on Asian minority groups. Currently, California still has the largest Asian-American population of over 4 million persons compared to other states around the country (US Census Bureau, 2015). In 2015, California’s overall TB incidence rate was 5.5 cases per 100,000 populations, with Asian minority TB rates at 19.5 cases per 100,000 populations (California Department of Public Health [CDHP] TB Facts, 2016). Hispanic minority groups followed behind at only 5.0 cases per 100,000 populations (CDPH TB Facts, 2016).

In Orange County (O.C.), the overall TB case rate continues to decrease slowly but remained steady at 6.0 cases per 100,000 in 2014 with foreign-born persons from Vietnam leading with an annual TB rate of 49.7%, Mexico at 14.4% and the Philippines at 12.6% (Orange County Health Care Agency [OCHCA], 2014). Overall the high number of active TB cases among Vietnamese immigrants, coupled with low expected LTBI treatment completion rate of
approximately 50.1% in the overall Asian population, presents an important challenge to the national strategy of eliminating TB (Li, Munsiff & Agerton, 2010). In addition, a majority of Vietnamese immigrants arriving to the US are at high risk for LTBI because of emigrating from a TB endemic country (Vietnam) where the national rate of TB was 140 cases per 100,000 populations in 2014 (WHO, 2014). That rate is strikingly high compared to the US all time low TB rate of 3.0 cases per 100,000 in 2015 (CDC, 2015). As country of origin is a critical TB risk factor that should be addressed by health care providers working with immigrant populations, ensuring adherence of LTBI therapy among high-risk minorities is key to the prevention of new active TB cases in the future.

For this study, the target population will be Southeast Asian Vietnamese adult immigrants with LTBI. These immigrants are foreign-born Vietnamese individuals who have immigrated to the US and are qualified to receive free LTBI treatment at the OC Public Health TB clinic because of their latent TB status. However, there is currently no mandate for these immigrants to start or complete the recommended LTBI medication as LTBI individuals are asymptomatic and cannot spread the disease to others. Since these individuals are not a public threat, county clinics have not enforced their adherence to LTBI medication. Yet on average, 5%-10% of individuals with LTBI will go on to develop active TB in their lifetime with most at risk soon after initial infection, if they are young children, or have predisposing factors, such as chronic illnesses and a weak immune system (WHO, 2015). It is critical that this group of latent TB-infected individuals are screened and treated promptly to prevent reactivation of TB disease later in life.

**Knowledge, Attitude and Behaviors Related to LTBI**
There is great need to examine knowledge, attitudes and beliefs (KAB) related to LTBI therapy and LTBI medication adherence in Vietnamese immigrants entering the US. Very few qualitative studies have been conducted in the late 1990s regarding KAB of Vietnamese refugees’ related to TB disease. Findings revealed that Vietnamese immigrants reported erroneous perceptions of how TB is transmitted such as the consequence of social isolation if TB is discovered (Long, Johansson, Diwan & Winkvist, 2001), and that TB is a problem of the lungs only (Carey et al., 1997; Long, Johansson, Diwan & Winkvist, 1999). Another qualitative study determined Vietnamese refugees that arrived in New York State in the 1990s disbelieved the existence of asymptomatic LTBI (Carey et al., 1997). Although these studies did not address how KAB of TB impacted adherence to LTBI medication directly, it provided a foundation for understanding Vietnamese people’s beliefs about TB and how those beliefs can affect their adherence to both TB and LTBI medication regimens. Understanding these specific cultural beliefs can assist health care providers in providing culturally sensitive LTBI care to foreign-born minorities that are receiving treatment in US public health county clinics.

**Literature on Adherence to LTBI among Vietnamese Immigrants**

Currently, while there is a dearth of data on Vietnamese immigrants’ adherence to LTBI treatment provided in the US, a total of 20 older research studies were identified in the literature that specifically examined Vietnamese immigrants/refugees with TB or LTBI. However, only eight were done within the last two decades and the majority of articles found were focused on active TB disease among Vietnamese patients. In one study, TB compliance to directly observed therapy was examined (Macq, Theobald, Diej & Dembele, 2003), while two other studies looked at barriers to TB screening in populations including Vietnamese (Nelson, Bui & Samet, 1997; Plant et al., 2002). The literature search also revealed only one study examining outcomes of

In a study conducted in King County Washington, investigators found the incidence of active TB cases in Vietnamese refugees to be as high as 9.6 cases per 1,000 persons even after completion of LTBI treatment (Nolan, Aitken, Elarth, Anderson & Miller, 1986). While the findings indicated that isoniazid (INH) resistance was quite common among this immigrant group, medication non-adherence was also found to be a key predictor variable of LTBI conversion to active TB state. Through case-control analysis, investigators in this study discovered that poor adherence to treatment, defined as taking isoniazid (INH) for three months or less, were associated with a six-fold increase in risk for subsequent isoniazid-susceptible tuberculosis. However this study did not investigate further the reasons behind medication non-adherence in their Vietnamese refugee participants.

Only one article published in the late 1990s was found to specifically examine the relationship between LTBI therapy and medication adherence in Vietnamese refugees (Ito, 1999). With a focus on assessing health culture elements that influenced compliance of LTBI therapy among Vietnamese refugees residing in the US, findings revealed key factors of compliance were related to 1) cultural interpretations of the therapy’s side effects, 2) the role of family members and peers, and 3) community perceptions of the drug treatment (Ito, 1999). This study encouraged researchers interested in LTBI adherence to focus on understanding the health culture of the patients in which illness is interpreted. The researcher defined health culture as the broader sociocultural context of the patient within which his or her illness is interpreted and understood (Ito, 1999).
At this time, the gap in LTBI literature among Vietnamese immigrants is large and is in desperate need of study, due to the urgency of current local and national TB data indicating foreign-born Asian minorities having the highest TB incidence in the country (CDC, 2015). Research in this population must move forward to fill the current literature gap; therefore this study hopes to contribute to the scientific body of knowledge related to LTBI medication adherence in Vietnamese immigrants to the nursing literature that can further be used by other disciplines in the community.

**Introduction to the HBM Theoretical Framework**

The Health Belief Model (HBM) will provide a framework for understanding the phenomenon of medication adherence to LTBI treatment in Vietnamese immigrants. The HBM is a conceptual framework that has been around since the 1950s and has been one of the most widely used psychosocial approaches to explaining health-related behaviors (Strecher & Rosenstock, 1997). It is a psychological model that attempts to explain, predict and influence health behaviors by focusing on the attitudes and beliefs of individuals. In addition, the model has now been adapted to explore a variety of long and short-term health behaviors across numerous diseases and disciplines.

The HBM has been used widely to guide research studies interested in examining medication adherence specifically in chronic diseases such as asthma, HIV/AIDS and chronic obstructive pulmonary disease (Khdour, Hawwa, Kidney, Smyth & McElnay, 2012; Trueman, 2000; Wutoh et al., 2005). Only a few studies related to TB have been found to implement the HBM in its design, perhaps most likely due to the limited amount of research done in this area. One qualitative study used the HBM to interpret health beliefs in migrant farm workers diagnosed with latent TB infection in the Midwestern US (Wyss & Alderman, 2006). Another
qualitative study utilized the HBM to guide the creation of an in-depth semi-structured interview questions based on the principles of the model to further understand the barriers to adherence in home treatment of tuberculous meningitis (Van Elsland et al., 2012).

Although no research was found utilizing HBM to better understand KAB of LTBI or predict risk factors associated with LTBI medication adherence among Vietnamese immigrants, utilization of the model to help examine predictors of medication adherence in other research studies with infectious diseases have shown significant results with the findings (Cox, 2009).

Research Design

The purpose of this mixed methods prospective cohort study is to identify predictors and rates of LTBI treatment acceptance and completion among Vietnamese immigrants who are receiving care under OC Public Health TB clinic. Descriptive qualitative design will be used to assess perspectives that influence treatment completion and non-completion to LTBI therapy among Vietnamese immigrants. The investigator will 1) conduct an assessment of the rate of LTBI treatment acceptance and completion including its predictors among an estimated 50-100 Vietnamese immigrant adults; 2) conduct one-on-one interviews among a subgroup of approximately 20 participants with prescribed LTBI treatment to explore their perceptions and beliefs as it relates to the therapy, and 3) develop a theory grounded in the voice of Vietnamese men and women experiences and perspectives related to the decision-making process of medication adherence of LTBI treatment. The specific aims are as follows:

Aim 1: To determine LTBI treatment acceptance rate among Vietnamese immigrants offered treatment by the O.C. Public Health TB clinic.
Hypothesis 1: Based on the literature review on LTBI treatment acceptance rate among minorities, it is projected that Vietnamese immigrants treatment acceptance rate will be between 65-85% (Horsburgh et al., 2010; Li, Munsiff, Trantino & Dorsinville, 2010; Nuzzo, Golub, Chaulk & Maunank, 2015).

Aim 2: To determine associations and predictors among the following variables to treatment acceptance: 1) socio-demographic factors (age, gender, marital status, English skills, employment status, smoking history, alcohol history, travel history, time lived in U.S., LTBI category [contacts, Class B, recent immigrants]); 2) health history (chronic disease history, current medication, chest x-ray results, Bacillus Calmette-Guerin [BCG] history, Interferon Gamma Release Assay [IGRA] results).

Hypothesis 2: Based on the literature review, it is projected that predictors of LTBI treatment acceptance among Vietnamese immigrants are: ages between 18-45, recent TB contacts, some English skills, marriage and self-report of previous LTBI treatment (Colson et al., 2013; Horsburgh et al., 2010; Nuzzo et al., 2015).

Specific Aim 3: To determine LTBI treatment completion rate among the enrolled group of Vietnamese participants offered treatment by the O.C. Public Health TB clinic.

Hypothesis 3: Based on the literature review on LTBI treatment completion among minorities, it is estimated that Vietnamese immigrants treatment completion rate are expected to be between 40-60% (Li et al., 2010; Goswami et al., 2012; Nuzzo et al., 2015).
**Specific Aim 4:** To determine associations and predictors among the following variables for the enrolled group to treatment completion: 1) socio-demographic factors (age, gender, income, marital status, number of children, education, English skills, employment, smoking history, alcohol history, travel history, time lived in U.S., patient category); 2) health history (chronic disease history, current medication, chest x-ray results, BCG history, IGRA results, as well as number of pills missed during treatment, knowing someone with TB or LTBI, and 3) behavioral survey scores (Morisky Medication Adherence Scale [MMAS-8], Champion Health Belief Model Scale [CHBMS-29], Self-Efficacy for Appropriate Medication Use [SEAM-9]).

**Hypothesis 4:** Based on the constructs from the Health Belief Model (HBM), it is hypothesized that the following variables are correlated to treatment completion among Vietnamese immigrants: perceived moderate disease susceptibility, perceived moderate disease severity, perceived moderate benefits, perceived low barriers and perceived moderate self-efficacy. In addition, scores >6 on the Morisky medication adherence scale and scores >6 of the SEAM-9 scale are expected. Other predictors of LTBI treatment completion among Vietnamese immigrants are: employment, marriage, age between 18-45 years, smoking history and alcohol history (Goswami et al., 2012; Hirsch-Moverman et al., 2010; Nuzzo et al., 2015).

**Aim 5:** To describe and explore the perceptions and experiences of approximately 20 Vietnamese immigrants LTBI experience under the care of the O.C. Public Health TB clinic.

**Aim 6:** To generate a theoretical framework that is grounded in the voices and narratives of Vietnamese immigrants regarding their experiences and perspectives related to the decision-making process of medication adherence of LTBI treatment.
Significance for Nursing Practice and Research

Nursing research is a vital component to the health care field because it can be used to develop interventions or improve current practice to provide the most optimum level of care to sick and vulnerable populations. Social behavioral research studies that explore phenomenon like medication adherence can help researchers in the scientific community understand why certain groups behave the way they do. An understanding of such phenomenon can assist researchers from different disciplines develop vigorous interventions such as community programs that are designed to improve patient adherence and overall health outcomes in various sub-populations. Since TB trends in the US have now completely shifted from US-born individuals in the 1980s to foreign-born individuals in the twenty-first century, there is an urgent need to produce research in this new minority population. Untreated or incomplete treatment of latent TB infection is the greatest contributor to active TB cases in the US. Therefore, identifying predictors of LTBI medication adherence in Vietnamese immigrants is the first step to controlling potential TB outbreaks. We believe the results from this study will be beneficial in designing culturally sensitive nursing interventions that can improve LTBI medication adherence in this population. Success in these types of nursing interventions can influence and change nursing practice so that TB can be significantly reduced or eliminated in the US with the ultimate goal to reduce morbidity and mortality associated with TB in the general public.
CHAPTER 2

Review of Literature

This chapter will review the literature as it relates to medication adherence to treatment for latent tuberculosis infection (LTBI) among Asian immigrants residing in the United States (US). An overview of LTBI screening, treatment completion rates and adherence measures used in the US will be discussed. Database articles and research studies published between 2002-2016 from PubMed, CINAHL, and PsychINFO were synthesized and analyzed to develop this literature review that was guided by the research aims of this study.

Prevalence of LTBI Among Foreign-Born Asians

An estimated 11 million people living in the US have LTBI and approximately 5-10% of these infected individuals will go on to develop clinical symptoms of active tuberculosis (TB) disease within the first five years after exposure if they have predisposing risk factors (WHO, 2015). Evidence from large cohort studies have shown that foreign-born persons account for the majority of TB cases in the U.S. with approximately 4 out of 5 cases of TB attributed to latent TB activation, also known as reactivation TB within the last decade (Ricks et al., 2011; Shea et al., 2014). Some of the risk factors associated with reactivation among foreign-born persons identified in the literature include older age, healed lung disease, poor nutrition or other immunosuppressive conditions (Horsburgh et al., 2004; Shea et al., 2014).

In the US, minorities are disproportionately affected by tuberculosis compared to US born individuals (CDC, 2015). During the past 15 years, TB trends have shifted from foreign-born Latinos to foreign-born Asians as the ethnic minority group with the most active TB cases reported annually (CDC, 2015). According to the CDC Morbidity and Mortality Weekly Report (MMRW) released on March 20, 2015, foreign-born Asians with active TB in the US continues
to be disproportionately affected as their TB rate was 28.5 times higher than non-Hispanic whites in 2014. Although TB rates among Asians have decreased slightly from 18.6 cases per 100,000 in 2013 to 17.9 in 2014, they are still far ahead of all other ethnic groups, with Blacks coming in second at 5.1 cases and Hispanics following at 5.0 cases (MMRW, 2015). In the same year, one third of the annual TB cases reported to the CDC came from the following Asian countries: Philippines (12.1%), Vietnam (8.1%), India (7.7%) and China (6.8%). Furthermore, approximately 95% of Asians with TB in 2014 were estimated to be foreign-born (MMRW, 2015).

In 2015, California’s overall TB incidence rate was 5.5 cases per 100,000 populations, with Asian minority TB rates at 19.5 cases per 100,000 population (California Department of Public Health [CDPH] TB Facts, 2016). In Orange County, the overall TB case rate continues to decrease slowly and remained steady at 6.0 cases per 100,000 in 2014 with foreign-born persons from Vietnam still leading with an annual TB rate of 49.7%, Mexico at 14.4% and the Philippines at 12.6% (Orange County Health Care Agency [OCHCA], 2014). Overall the high numbers of active TB cases in Asians, including Vietnamese immigrants, coupled with low LTBI treatment completion rate of approximately 50.1% in the Asian population, presents an important challenge to the national strategy of eliminating TB (Li et al., 2010).

There is currently limited research on the prevalence and predictors associated with LTBI medication adherence among the Asian population, more specifically, among Vietnamese immigrants. In order to control the rise of active TB cases, LTBI must first be identified through proper screening. Medication adherence to recommended LTBI treatment is necessary for the prevention of active TB progression. Since TB cases have been on the slow decline nationally, LTBI has been gaining national recognition for its potential contribution to the active infectious
TB pool if left untreated. Due to the renewed interest of identifying and treating LTBI as an important strategy to eliminate TB disease, the World Health Organization (WHO) recently proposed to give LTBI its own International Classification of Disease (ICD) code instead of listing it as a subclinical disease under the broader TB diagnosis (Tebruegge, Salo & Kampmann, 2012). This change in international coding signals the importance of LTBI as a significant disease that is worthy of recognition (Tebruegge, Salo & Kampmann, 2012).

The impact of identifying predictors of medication adherence and non-adherence behaviors among Asian immigrants, specifically among Vietnamese immigrants, will lead to the development of culturally-specific interventions aimed at improving LTBI medication adherence rates and lower overall active TB cases among foreign-born Asians.

**Screening for LTBI**

According to the Census Bureau data by the Center for Immigration Studies, the US immigrant population had the highest record of 42.1 million in the second quarter of 2015, which was an increase of 1.7 million in the same quarter of 2014 (Ziegler & Camarota, 2015). Data from the CDC continues to report the immigrant population comprising the majority of active TB cases in the US in the last decade (CDC, 2015). One of the first steps in eliminating TB nationally is to correctly screen and identify populations who are infected with the TB bacteria. Currently, CDC guidelines only require TB screening of high-risk immigrants requesting permanent residence in the US, which consist mainly of tuberculin skin test (TST) and chest x-rays only. Populations that are considered high-risk include foreign-born immigrants from TB endemic countries, HIV and injection drug users, refugees, sponsored individuals from TB endemic countries, individuals with a history of positive LTBI and those who have been exposed to active TB (CDC, 2013). Approximately 30% of immigrants entering the US are international
students, temporary workers and undocumented immigrants that do not undergo this screening process (Grieco et al., 2010). This unscreened population is an active part of the communities they reside in all over the country and should also be offered LTBI screening and treatment as well.

The purpose of TB screening is to provide early treatment to prevent the likelihood of latent disease progressing to active TB (American Thoracic Society, 2005). With the majority of TB cases resulting from reactivation of TB, it is crucial that available diagnostic tests capture the population at highest risk in addition to being sensitive for detecting true LTBI infections. Several US studies have shown the impact of screening high-risk groups such as foreign-born individuals for TB as being necessary in the goal of TB reduction. Kempker et al. (2012) found TST placed in their foreign-born sample population to be 44% positive for LTBI; with 7% positive for active TB disease. Another study screened 41,022 individuals from 10 New York City health department centers; the prevalence of TST positivity among foreign-born individuals from high TB endemic countries in that study was 39.5% compared to 8.8% in the US born sample (Li, Munsiff & Agerton, 2010). Both studies stressed the need for quality improvement of TB screening in foreign-born populations, especially in groups from high TB endemic countries due to the evidence from their studies that support a higher prevalence of TST positivity among the group.

Screening for LTBI through TST remains the cornerstone for identifying individuals with latent infection. However, TST screening has relatively low sensitivity and specificity for detecting TB infection, especially in individuals with a history of Bacilli Calmette-Guerin (BCG) vaccination given in their country of origin (Brodie et al., 2008; Orlando et al., 2010). The concern with utilizing TST to screen LTBI is its inability to adequately detect true positives and
negatives among high-risk individuals. Due to this reason, many immigrants are reluctant to adhere to recommended LTBI treatments because of the belief that skin tests give false positive results among those with a history of BCG vaccination. More recently, interferon gamma release assay (IGRA) blood tests have become more popular as the long-term cost effective diagnostic method of identifying LTBI among high-risk populations because of its better sensitivity and specificity results. Unlike the TST, the IGRA test consists of collecting a venous sample instead of an intradermal skin injection. Due to its invasiveness and high cost, this method is rarely used as the first line of screening for LTBI in massive screening. Furthermore, the IGRA differs from the TST in that it specifically detects bacterial infection among three types of tuberculin bacteria responsible for TB, which can help accurately identify if there is TB disease in individuals with a history of BCG vaccination.

Currently, there are two types of IGRAs on the market for clinical use in screening for LTBI. They are the 1) Quantiferon-TB Gold test and 2) T-SPOT.TB test. A recent study comparing the TST and Quantiferon-TB Gold test found that LTBI prevalence was higher based on TST than Quantiferon-TB Gold test (Bozkanat et al., 2016). This difference could lead to the assumption that TST tests are giving more false positives results if the IGRA is negative. Results from another study in which the T-SPOT.TB test was used on 96 subjects from a New York health department revealed the IGRA test to be more specific for identifying close TB contact and for differentiating those with a history of BCG compared to the TST (p <0.001) (Brodie et al., 2008). The study reported the specificity of the test in BCG vaccinated individuals to be 3% for the TST compared with 70% for the T-SPOT.TB test (Brodie et al., 2008). The Quantiferon-TB Gold test is the second venous blood test that is currently in the market to detect LTBI among potentially infected individuals. This test is not sensitive for individuals with a history of BCG vaccination.
vaccination and is used mainly as a confirmatory test for those with positive TST results (Brodie et al., 2008). A comparative study of 100 patients revealed that the agreement between the Quantiferon-TB Gold test and TST was 100% for TST negative results and only 34% for TST positive results (Carvalho et al., 2007).

IGRAs are currently not feasible to use on a routine basis due to its high cost compared to the TST. However, one study found that utilizing IGRAs in high risk groups is cost-saving compared with TST in the following groups: 1) TB contacts and HIV infected persons, 2) the foreign-born, 3) vulnerable populations (homeless, drug users, or former prisoners) and 4) in persons with medical comorbidities (Linas et al., 2011). Since IGRAs have a high sensitivity rate, it is able to detect true TB positive results so that providers can confidently start LTBI treatment and ensure skeptical immigrants that their diagnosis is accurate. Furthermore, its specificity for true negatives prevents the initiation of a highly burdensome treatment plan that is costly in both time and money for patients and the health care system. Despite its overall high cost and invasiveness, IGRAs are slowly being utilized more in targeted screening programs solely for the purpose of identifying high-risk populations for LTBI. Furthermore, its higher specificity rate can prevent unnecessary health care costs in treating false positive TSTs (Orlando et al., 2010).

LTBI Treatment Regimens

Multiple treatment options for LTBI are currently available for infected patients; however the recommended standard of treatment is still the six to nine months of daily isoniazid (INH) medication with shorter routes using combination drugs for higher risk groups, those with drug resistance or reactions according to the CDC treatment guidelines for LTBI (CDC, 2014). Past studies have shown the efficacy, safety and cost effectiveness of INH as a single daily treatment
regimen given over six-nine months in LTBI patients despite its overall effectiveness being limited by modest completion rates (Lobue & Moser, 2003; Blumberg, Leonard & Jasmer, 2005). A more recent study on adverse effects of isoniazid wanted to expand the list of adverse effects beyond liver toxicity to include real-world symptoms that are profoundly milder. Study results found 56% of their patients cohort reported at least one adverse effect at some stage during treatment, with 6% experiencing a grade 3-4 adverse effects according to the World Health Organization guidelines (Denholm et al., 2014). Despite the relatively high numbers of adverse effects reported, results indicated a majority of the cohort completed treatment.

A small number of alternative regimens currently exist for the treatment of LTBI that are much shorter than the gold standard. The issues with utilizing shorter regimens are related to cost and the potential for greater side effects (Blumberg, Leonard & Jasmer, 2005). These concerns have made these regimens a second line of treatment option thus far. In a study involving a short two-month regimen of rifampin and pyrazinamide used to treat LTBI in 2000 patients, 48 cases of severe liver injury and deaths were reported (CDC, 2003). The CDC immediately removed the regimen as an option for LTBI treatment due to the danger reported. A different and more successful treatment regimen that consisted of four months of daily Rifampicin reported high completion rates and minimal side effects in a study of 749 foreign-born patients with LTBI (Haley, Stephan, Sherfy, Laserson & Kainer, 2008). In a more recent study, the 4-month rifampicin therapy was also associated with a significant completion rates in addition to also being cost effective (Ziakas & Mylonakis, 2009).

In recent years, the CDC announced its support of a new and shorter LTBI treatment regimen that consisted of a weekly dose of both INH and rifapentine through direct observation by health professionals for 12 weeks only. The shorter duration of this treatment plan is
favorable by both providers and patients. Reports of side effects of this shorter duration have been minimal; but the cost of direct observation therapy (DOT) and dual LTBI medications has prevented the implementation of this medication regimen in most clinics currently in the US. As of 2015, the CDC has endorsed the use of the 12-dose treatment regimen of once-weekly isoniazid and rifapentine for 3 months by directly self-administered therapy (SAT) thus beginning the slow transition away from the expensive DOT route (Belknap et al., 2015).

Lastly, it is critical to properly screen and start LTBI treatment in high-risk foreign-born groups as soon as their TST or IGRA is positive for LTBI. Current guidelines have changed over the years to recommend screening and treating patients for LTBI according to their risk category, specifically focusing on foreign-born immigrants (CDC, 2013). Other studies claim that immigrants who have lived in the US over five years have the same risks of LTBI reactivation and should be included in target screening and LTBI treatment along with the new immigrant groups as well (Page et al., 2008). In order to eliminate TB disease, it is imperative that improved LTBI screening and treatment plans become available and accessible to populations that are at high risk for converting to active TB disease in the community.

**Predictors of LTBI Treatment**

Medication adherence issues continue to be a multi-faceted and complex phenomenon to study. Multiple psychosocial and behavioral factors have been associated with predicting LTBI medication adherence among foreign-born immigrants in the US; however the problem is that there are many inconsistencies among the findings from numerous studies in the literature (Hirsch-Moverman, Daftary, Franks & Colson, 2008).

One study examined predictors of LTBI treatment completion rates in an inner city population of those who initiated treatment among a general foreign-born immigrant population
that included Blacks, Latinos, Africans and others (Hirsch-Moverman, Bethel, Colson, Franks & El-Sadr, 2010). Results from the study indicated that social circumstances such as marriage and alcohol use among homeless individuals were the strongest predictors of LTBI treatment completion. The authors believed the correlation between the latter could have some connection with the homeless sample that was also concurrently enrolled in a rehabilitation program at the time. The main predictor of non-completion of LTBI treatment was having a history of alcohol use. Race/ethnicity was inconsistent in showing significance for treatment completion among the various groups in the sample. Further, this study did not find knowledge and attitudes about TB to be significant predictors of LTBI completion (Hirsch-Moverman et al., 2010).

A few studies in the LTBI literature examined predictors of both medication completion and non-completion of LTBI treatment in sub populations that included Asians. In a study by Shieh et al. (2006), 30.9% of the study population reported to have come from Asian/Pacific ethnic backgrounds. Findings revealed the two strongest independent predictors of treatment non-completion were low risk perception of disease progression and patients not wanting venipuncture as part of the treatment plan. Both of these predictors together accounted for 75% of non-completers. Interestingly, a majority of the LTBI participants in the study claimed that they did not feel sick or infected with TB and had strong beliefs that their history of BCG vaccination was adequate enough to protect them from developing active TB in the future (Shieh et al., 2006).

Another study examined 1375 foreign-born participants for predictors of medication non-completion to LTBI treatment among Whites (13%), Blacks (33%), Asians (24%) and Hispanics (9%) (Parysan, Saukkonen, Barry, Sharmprapai & Horsburgh, 2007). This study was unique because it further stratified the Asian population into Chinese (14%) and Vietnamese (10%). For
this study, the authors defined treatment success as both acceptance and completion of the treatment regimen. The predictor variables that were examined included: age, gender, race/ethnicity and country of origin. Of the 1572 individuals who accepted treatment, only 607 (38.6%) completed at least six months of the regimen. The authors further reported that 54% of individuals who failed to complete treatment dropped out before the end of the first month. Results suggested that individuals born in Haiti or Dominican Republic were at greatest risk for non-completing LTBI compared to other predictor variables in the study (Parysan et al., 2007).

A recent study by Goswami et al. (2012) examined 496 foreign-born individuals for LTBI treatment adherence. The variables assessed included socio-demographic characteristics, medical, behavioral, attitude-based and geographic factors. Findings revealed predictors of LTBI treatment completion in this study to include participants’ birth country of Africa or Asia, absence of tobacco history, prior incarceration, and plan to tell friends/family about positive TST (Goswami et al., 2012). Geospatial analysis reported participants’ residential distance from the health department was not significantly related to LTBI treatment initiation among this population. The authors concluded that the biggest challenge in LTBI adherence is in getting participants to initiate treatment. The recommendation to improve TB control include expanding TB screening to non-employment related persons, improved social support and treatment completion among high-risk individuals with LTBI (Goswami et al., 2012).

Lastly a study by Colson et al. (2013) enrolled 1692 participants from 30 different clinics across North America and found predictors of treatment acceptance to include believing one could spread TB germs, having greater TB knowledge, convenient clinic schedule and having low acculturation. Predictors of not accepting treatment include being a health care worker,
being previously recommended for treatment and believing that taking medications would be problematic.

The five studies briefly mentioned above presented varying results regarding predictors of LTBI medication acceptance and completion. Each study examined slightly different predictor variables and the various ethnic backgrounds of the participants further complicated the generalizability of the findings to any one particular sub ethnic population.

**Knowledge, Attitude and Beliefs about TB/LTBI**

Based on the Health Belief Model (Strecher & Rosenstock, 1997), knowledge, attitudes and beliefs (KAB) can play an important role in the decision-making process related to medication adherence. However, these variables have been examined primarily with only TB disease and not with LTBI. Currently, only a limited number of recent studies in the US have been conducted on TB KAB among foreign-born immigrants. A total of three published studies that examined a variety of ethnic groups were found in the literature within the last ten years.

A mixed methods study by Gao et al., (2015) used focus group discussions to explore knowledge and perceptions of Chinese immigrants toward LTBI, including administering surveys to test for LTBI knowledge. A total of two focus group discussions, 6 participants in each group, were conducted in Mandarin by two facilitators. A total of 912 surveys were returned and both focus groups had full participation. Results identified mean knowledge score of 40% among the study cohort. In addition data from two focus groups confirmed low LTBI knowledge in Chinese immigrants because of the confusion with TB infection. Furthermore, participants discussed their concerns with navigating the healthy system.

In a qualitative study of 54 immigrants and refugees, Wieland et al. (2012) conducted focus groups to identify KAB related to TB using a community-based-participatory research
approach. Approximately 20% of the participants were categorized as Asians from various countries that included Vietnam, Cambodia, Laos, China and Pakistan. Findings revealed a variety of misperceptions about TB transmission and lack of knowledge regarding LTBI. For example, one participant stated, “I think of (TB as a problem) a long time ago, but not a problem in America anymore” (Wieland et al., p.17, 2012). Other focus group participants were convinced that TB was transmitted by touch, contaminated food or water, blood, sexual contact, and through smoking and alcohol consumption. Participants also agreed that medication barriers were related to side effects and verbalized suspicion of generic medications used to treat TB (Wieland et al., 2012). Members of one focus group discussed their dislike of generic medications for LTBI treatment. The overall agreement among these participants was that generic medications were not effective when compared to non-generic medicine (Wieland et al. p.20, 2012). Furthermore, some of the feelings surrounding TB were found to include shame, fear, secrecy and even isolation from others. Among this sample, TB screening barriers included: poor LTBI knowledge, transportation issues, cost of treatment, low awareness, and work schedule conflicts.

Another study of 251 LTBI patients, including a small sample of Asians, examined KAB related to TB disease among 81 US-born and 167 foreign-born LTBI patients (Colson et al., 2010). The most significant findings related to LTBI knowledge pertained to attitudinal factors. Foreign-born participants overall were less likely to acknowledge that they had LTBI and believed that they were protected from developing TB disease compared to the US-born LTBI group (Colson et al., 2010). The differences in LTBI beliefs among foreign-born individuals can pose challenges to treatment adherence and should be considered when developing intervention plans to improve adherence.
One study published in the early 2000 conducted a study that examined KAB and practices related to TB specifically among Vietnamese immigrants in the U.S. (Nguyen, Yamada, Matsunaga, & Caballero, 2000). Investigators in this study conducted three focus groups at a community health center in California with the aim to answer questions regarding TB causes, medical consequences, treatment and the impact of the disease on social relationships. Findings revealed that Vietnamese immigrants attributed TB to malnutrition, stress, smoking, alcohol consumption and hard labor. In addition, this group believed TB was extremely contagious with the main mechanism of transmission occurring through eating utensils and towels. Furthermore, participants expressed the belief that Western medicine was more effective in treating TB compared to alternative therapies such as acupuncture or herbal medicines. Lastly, they also believed that social isolation, a consequence of being diagnosed with TB would lead to psychological distress down the road (Nguyen et al., 2000).

**Adherence Measurements for LTBI**

Medication adherence is a critical component to the treatment of diseases and infections in health care. Medication non-adherence behaviors related to LTBI can lead to significant negative consequences that include drug resistance, higher treatment costs and progression to active TB disease (Lobue & Moser, 2003). Health care providers caring for LTBI patients continue to face the challenge of medication non-adherence related to accepting and completing LTBI treatment primarily among foreign-born immigrants.

To ensure patients’ adherence to LTBI drug regimens, providers must be able to measure adherence, which can be challenging. While there are many methods of measuring adherence, only a few techniques are applicable to LTBI patients. The first method available, but often not used with LTBI patients due to its high cost and lack of feasibility, is direct observed therapy.
(DOT). This method requires a large staff to observe patients’ ingestion of LTBI pills in a variety of settings such as home, work and school sites. One study in Santa Clara County, California reported 100% adherence among Vietnamese patients with active TB disease that were enrolled in the county DOT program compared to only 84% adherence among the controlled group (Mac, Doordan & Carr, 1999).

Although the DOT method can generate good compliance outcomes, it is often not popular among patients because of the paternalistic approach. One exploratory qualitative study examined a new model of care that viewed patients and DOT providers as equitable (Macq, Theobald & Dembele, 2003). Researchers from the study explored different DOT approaches around the world while specifically looking for DOT programs that had the most flexibility in application. The interest was in observing programs that were set up to reduce the power imbalance between patients and DOT providers. One strategy thought to have most potential for success was the training of lay people in the community to observe TB patients take their medications instead of utilizing health care providers. The goal was for a more personal relationship to be developed between the dyad that can foster better medication adherence (Macq, Theobald & Dembele, 2003). Examples of lay DOT providers from the study included: village doctors, lay health care workers, peers, neighbors, guardians, family members and children’s parents. One nurse from the study agreed the emphasis with DOT should be patient support and she quoted, “It certainly worked less well if it was seen as solely a control measure” (Macq, Theobald & Dembele, p. 105, 2003). Findings from this qualitative study raised key questions for further discussions on the different approaches to DOT from various parts of the world. Due to its descriptive nature, results from the study does not allow for a conclusion to be drawn as to the effectiveness of DOT in various contexts.
Biological analysis, such as drug levels or urine testing for metabolites, is available to assess patients for INH medication adherence to LTBI treatment; however, this method is not without concerns. For INH metabolites to be detected in urine, only the most recently ingested dose is counted for examination. Results can be altered if patients are on multiple drugs or if there is food interactions. Although some studies have reported urine testing to be robust with high sensitivity and specificity, it is still rarely used routinely in clinical settings due to the high lab costs and strict requirements (Perry et al., 2002). Blood analyses have similar pros and cons because it is affected by the drug interactions of multiple drugs and the expense is relatively high compared to other methods.

Medication event monitoring system (MEMS) is a form of electronic monitoring that involves pill bottles that can electronically keep track of pills ingested by patients every time a bottle is open. This method has been gaining popularity in recent years and has shown high sensitivity results. However, several disadvantages of this method have been reported. For example, not being able to prove dose ingestion, tracking the number of pills removed from the bottle each time, cost and hardware malfunctions (Deschamp et al., 2004).

Pill counting is another form of adherence measurement in LTBI treatment that has been used in TB clinics across the country because of its relative inexpensive cost and ease of implementation. However, patients are required to make return visits and bring their pill bottles with them when routinely meeting with the LTBI nurse for this method to be successful. With this method, there still is no absolute confirmation that patients actually ingest their pills even though the bottles may be empty on scheduled visits.

Clinic attendance has also been used as a form of measuring LTBI adherence; however, the disadvantage to this method is that good attendance does not necessarily mean good
medication adherence. Poor clinic attendance is a good indicator of non-adherence. Patients can come back for return visits, but providers can’t really assess their adherence behaviors. Provider assessment is usually done during return clinic visits and in general has been shown to overestimate medication adherence in patients. This method has both low sensitivity and specificity and is rarely used as the only method to determine medication adherence in LTBI patients (Hirsch-Moverman et al., 2008).

Patient self-report is currently one of the most popular methods for measuring medication adherence with patients who are on self-administered treatment regimens for LTBI as it is quick, inexpensive, and has a high sensitivity for non-adherence. Patients utilizing this method are not subject to judgment or pressure at each return visit. The most common self-report questionnaires available that are both valid and reliable include the Morisky-Medication Adherence Scale (MMAS), the Medication Adherence Questionnaire (MAQ), the Self-Efficacy for Appropriate Medication use Scale (SEAMS) and the Brief Medication Questionnaire (BMQ) (Lavasa, Holzworth & Ansani, 2011). The MMAS is a simple 8-item questionnaire that takes less than ten minutes for patients to complete and is easy to administer. Of all the questionnaires mentioned above, the MMAS is the only tool that has been tested for reliability and validity across multiple languages and applied to many other chronic diseases besides hypertension, which was the original disease the survey was developed for.

**LTBI Completion Rates**

For LTBI treatment to be successful, patients have to both initiate and complete the recommended regimen as advised by health care providers. Much of the literature tends to overestimate LTBI completion rates because of failure to address individuals who do not accept or initiate treatment in the early phase of the treatment plan. Goswami et al. (2012) indicated the
initiation of LTBI treatment was the major challenge in their LTBI medication adherence study. Among 496 participants enrolled in their study, only 26% qualified for LTBI treatment accepted and initiated treatment. Furthermore, Parysan et al. (2007) expressed rates of LTBI non-acceptance to be underestimated because the number of individuals with LTBI who were referred for treatment and never showed up is currently unknown.

LTBI medication adherence, defined as completion rates in either number of medication doses taken or months of treatment, is extremely low across the US despite advances in screening and treatment modalities offered by TB clinics. Medication adherence to LTBI poses a challenge for patients because the disease does not produce active symptoms among infected individuals. Having LTBI means that individuals are infected but the bacteria lies dormant without causing any active symptoms to the host. Due to its asymptomatic state, most patients who are diagnosed with LTBI do not feel sick and often mistrust health care providers’ diagnosis; thus leading to medication non-adherence behaviors.

A primary objective of the national strategy for TB control aims for 85% successful completion of LTBI treatment among high-risk individuals (Department of Health Science, 2010). Unfortunately, LTBI adherence rates have reported to be lower than the national recommendation. In reality, the rate of LTBI treatment completion has been reported to range from 44.6%- 65% in studies among foreign-born immigrants (Li et al., 2010; Hirsch-Moverman et al., 2010; Goswami et al., 2012). However two studies specifically examining LTBI completion rates among refugees have found a much higher compliance rate with the prescribed treatment leading to completion rates of 75% and 75.4% (Nuzzo et al., 2015; Subedi et al., 2015). Other studies that have examined LTBI completion rates among foreign-born Asians reported much lower completion rates that range from 18%-50.1% (Shieh et al., 2006; Li et al.,
The challenge with reported rates of LTBI completion in the literature lies in the lack of data stratification of sub-ethnic groups within the Asian population. The act of lumping data from various Asian countries into a single variable undermines the unique differences of adherence among individual sub-ethnic groups. Although Asian countries may share some similar values in general, their sub-cultural values and beliefs are different and can impact their medication behaviors in different ways. The study of Parysan et al. (2007) was the only report found in the literature reporting LTBI completion rate of 56% among Vietnamese immigrants.

LTBI risk categories are also an important factor to consider when examining LTBI adherence completion rates due to the potential for higher risk groups to advance to active TB. For example, TB contacts and newly arrived immigrants with LTBI are the groups with the highest risk of disease advancement. Both groups are poorly studied in the literature and most often are lumped together in the LTBI pool of participants. Non-adherence to LTBI treatment among this group poses a significantly higher risk for disease progression thus contributing to the rise of national TB cases.

**Gaps in the Literature**

A comprehensive review of literature pertaining to LTBI medication non-adherence among Asian immigrants identified a large gap in the knowledge of LTBI prevalence, predictors of medication acceptance and completion rates among Asians and their sub groups in the US. The most critical gap is in the lack of LTBI studies that examined only Asian immigrants as a high-risk population by itself. In comparison, dozens of published LTBI studies in the literature focused solely on the Latino population in addition to their sub-population of Mexican immigrants with LTBI (Zuniga, 2012).
Studies on LTBI adherence that fail to stratify sub-ethnic groups within the Asian population will not be useful to the scientific community interested in developing culture-specific intervention studies. Existing studies currently lump all Asian countries under one ethnic variable and do not distinguish one from another when reporting their findings. In addition, published studies only have a small percentage of the entire sample of their study as Asians, which makes it even more difficult to generalize the findings to the larger Asian population. New research focusing on Asians LTBI medication adherence need to be develop with further research examining sub-ethnic groups differences to enhance scientific knowledge and pave the way for culturally specific intervention programs.

Summary

LTBI is a disease that has recently resurfaced as a national public health concern ever since the overall rate of active TB cases in the US has been on a slow decline in recent years. The foreign-born ethnic group of most interest at this present time is Asian immigrants with LTBI because they currently have the highest number of TB cases reported annually to the CDC (CDC, 2014). In order to better address the needs of the Asian population with LTBI, it is essential that the Asian sample in future studies be stratified to include sub-groups such as Vietnamese, Chinese and Philippines, so that cultural differences are appreciated. As noted earlier, the three Asian countries with the largest number of TB cases reported nationally are Philippines, Vietnam, and India. This literature review supports the need for research studies that will focus on examining predictors of medication non-acceptance and completion behaviors among Asian sub-groups like Vietnamese immigrants in Southern California as they have the largest number of active TB cases in Orange County. As this group is at greatest risk for converting to TB, efforts should be made to study and understand this
populations’ perceived barriers, threat and disease susceptibility including other predictors of medication non-adherence such as self-efficacy, health beliefs, social support and medication adherence behaviors.
CHAPTER 3
Theoretical Background and Philosophical Underpinnings

This chapter will discuss the theoretical framework and philosophical underpinnings chosen to guide the proposed mixed method study. The first section will present an overview of the Health Belief Model (HBM) and its major constructs as it relates to the quantitative phase of the research proposal. The second section is qualitative and will utilize Glaser and Strauss’s (1968) Grounded Theory methodology for building a theory from the data generated in the proposed study. The two philosophical underpinnings that will be discussed in this section include Symbolic Interactionism (SI) and pragmatism. SI will be used to provide a unique perspective related to the many decisions and choices people make as they interact with themselves, others and their environment.

Phase One: Quantitative

Overview of the Health Belief Model

The HBM is a well-known psychosocial theoretical framework that is still being used today by researchers to help predict human behaviors. The model’s foundation was influenced by two main key figures at the time, Kurt Lewin and Godfrey Hochbaum. The conceptual basis of the HBM was heavily influenced by Kurt Lewin’s value-expectancy theory that was derived from the basic concept that individuals’ perception of reality influenced their behaviors (Lewin, 1935). Lewin made the attempt to connect common health behaviors to factors that were linked to individual perceptions related to the value of their actions. Hochbaum (1956) was well known for his extensive involvement in the development of the HBM and was able to bridge theory and real health issues to resolve public health problems. In the 1950s, he applied the HBM to his research study that explored factors related to participation in TB screening with the US Public
Health Services (Hochbaum, 1958). The HBM was chosen as the theoretical framework for the proposed study for its health promotion background and potential to predict behaviors related to the utilization of preventative measures among healthy individuals. The model has been well cited and utilized in nursing literature in issues pertaining to patient compliance and preventative health practices (Ar-Yuwat, Clark, Hunter & James, 2013; Brown, Ottney & Nguyen, 2011; Petro-Nustas, Tsangari, Phellas & Constantinou, 2013).

The history of the HBM dates back to the 1950s when a group of public health social psychologists were attempting to understand why the general public failed to utilize free county screening programs aimed at early detection of asymptomatic diseases such as tuberculosis (Rosenstock, 1974). Disease prevention was not yet a health trend during this period of time; therefore the public did not have much interest in adopting new health behaviors. Due to the apathy observed, researchers started looking at utilization studies to increase understanding of why certain services were used compared to other services (Rosenstock, 1974). Unfortunately, this area of research did not produce any new knowledge and was perceived as unsuccessful. Shortly thereafter, Hochbaum, Rosenstock and Kegels, working for the U.S. Public Health Services, took on the task of developing a theory to explain preventative health behaviors observed in the public sector (Rosenstock, 1974). These social psychologists were clear that their theory would be describing health behaviors of individuals who were not currently diagnosed with chronic disabling diseases. It was their passion and drive for health promotion that led to the development of the HBM, which became the first theory that attempted to explain and predict health related behaviors of individuals.

The HBM postulates that the following four major constructs represented in the framework could both explain and predict health-related behaviors: perceived seriousness,
perceived susceptibility, perceived benefits, and perceived barriers (Rosenstock, 1974). It was also anticipated that each of the constructs could explain particular human health behaviors either by itself or in conjunction with another construct. In the 1980s, the HBM was expanded to include other concepts, such as cues to action and self-efficacy, which further supplemented the model to explain preventative and health promotion behaviors as well as sick role behaviors (Janz & Becker, 1984). The adapted model is now capable of exploring a variety of short- and long-term health behaviors such as smoking cessation, unsafe sexual practices, cancer screening, etc. (Rosenstock, Strecher & Becker, 1988). The HBM will be useful for the proposed study because it provides a framework in which to understand the process of decision-making among immigrants who are offered latent tuberculosis infection (LTBI) treatment by public health clinics.

**HBM Theoretical Constructs**

The HBM has four major constructs that were proposed to account for people’s readiness to act. Each of the constructs represented the perceived threats and net benefits of an individual’s behavior and include: perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers (Pender, 2011). All four of these perceptions influence what a healthy person is thinking before making a decision to perform an action that promotes his or her current state of health. Each perception can persuade an individual’s action either individually or in conjunction with another perception. The benefit of utilizing this model is in its ability to provide insight as to why people behave in certain ways with regard to health-related participants and what affects their decision-making process (Mikhail, 1981).

**Perceived seriousness** is the construct that describes an individual’s belief about the seriousness or severity of a health condition if left untreated (Pender, 2011). For this construct,
the individual has to have the ability to perceive the risk and consequences of the current behavior to be motivated to change. The positive association between perceived seriousness of a health condition and a health-related behavior has been supported by research studies on a variety of behaviors through the years (Mikhail, 1981). In studies of participants with high degree of perceived seriousness of acquiring a health condition, it was found that perception was related to preventative behaviors such as immunizations and making preventative dental visits (Becker et al., 1977; Kegeles, 1963; Rundall & Wheeler, 1979).

Often times one’s perception of seriousness can be related to knowledge; however it can also be related to personal beliefs a person has about the potential burden of a disease. For example, if an individual with asymptomatic LTBI has no knowledge of the risk of progression to active tuberculosis (TB), then the individual is more likely to be non-adherent to the recommended treatment. The fact that the individual does not feel sick and does not know anyone who has become sick with LTBI would negatively influence the perceived seriousness of the current health condition. It is likely that persons who have a low perceived seriousness of a disease would not be proactive in their health. Therefore the significance of perceived susceptibility is in specifying the consequences of the risk and the condition of the disease.

Perceived susceptibility describes how peoples’ perception of acquiring diseases can greatly influence their health and the behaviors related to their condition (Janz & Becker, 1984). For individuals with an established diagnosis, the concept has been changed to include acceptance of the diagnoses, personal estimates of being susceptible again, and susceptibility to illness in general (Strecher & Rosenstock, 1997). This construct has been identified as a powerful perception that prompts people to adopt healthier behaviors because it examines personal risk of disease advancement. Individuals have to believe that their health is in jeopardy
and that there is a chance for the current asymptomatic condition to advance into active disease. If perceived susceptibility is heightened, then there is a greater chance that individuals will do whatever it takes to decrease the probability of becoming ill. Due to this reasoning, affected persons will purposefully be more adherent in the health care system and take actions to prevent acquiring the disease. Alternatively, if affected people do not believe they are at risk or have low risk of susceptibility, then the chance of unhealthy behaviors will likely occur.

Among Vietnamese immigrants for example, most who have emigrated from their highly endemic TB country are required to receive a Bacille-Calmette Guerin (BCG) vaccination to prevent active TB disease. Thus, these immigrants often perceive their susceptibility of progressing to active TB to be extremely low (Colson et al., 2010). When diagnosed with LTBI, a large number of these Vietnamese immigrants in the US mistrust the system because of they believe their history of BCG vaccine is what caused their skin test to be positive. This belief coupled with asymptomatic symptoms could be the reason why immigrants are not accepting LTBI treatment. Alternatively, a heightened perception of susceptibility due to knowledge of another person having advanced active TB may result in greater likelihood of accepting and maintaining adherence of LTBI treatment. These external variables act as modifying agents and can influence behavior in the positive or negative way.

Perceived benefits are individuals’ beliefs that the outcomes of performing an action will lead to positive results (Pender, 2011). When assessing a circumstance, individuals must be convinced that the recommended behavior will outweigh the overall costs and inconvenience projected. In general, people will tend to adopt new behaviors when they believe the new behavior will decrease their chance of developing a disease.
The benefit of LTBI medication adherence is the decreased chance of the individual converting to active TB disease. This benefit not only affects the patient, but also can be further extended to reducing the risk of exposing close family and friends to TB. There is no perceived threat or danger in taking the planned action with this perception.

*Perceived barrier* to change is the last major construct of the HBM. This construct describes the perceptions related to obstacles that interfere with carrying out a health action including potential negative effects (Pender, 2011). These effects can be viewed as negative emotional or physical outcomes that individuals anticipate feeling with the recommended health behavior change. Examples include financial cost, medication side effects, emotional pain and inconvenience such as time from their daily work. According to Janz and Becker (1984), this construct is the most significant in determining behavior change. For individuals to overcome their perceived barriers, they must believe that the new behavior will outweigh the consequences of continuing the old behavior.

The task of overcoming perceived barriers of adopting a new health behavior for Vietnamese immigrants is further complicated by outside factors such as their lack of English skills, financial instability and work commitments. These social factors can greatly influence their decision to adopt a new health related behavior because it could cost money and time away from family and work. Most immigrants who enter the US are eager to find work and become financially stable in order to support their families. The thought of leaving work for monthly TB appointments to treat an asymptomatic condition is not likely on their priority list. If this barrier is perceived to be too difficult to overcome, then the likelihood of adopting the new recommended health behavior would not be practical. The end result would be refusal to accept or maintain adherence to LTBI treatment.
**Modifying Variables.** Over the years, the four major constructs of perception have been modified by other variables, such as culture, education level, past experiences, skills and motivation (Janz & Becker, 1984). These are individual characteristics that influence personal perceptions. Modifying variables differ from the four primary perceptions in that it focuses on external instead of internal factors that influence how the individual feels about the outcomes of continuing the same behaviors that put him at risk.

**Cues to actions** are external modifiable variables such as events, people, or things that move people to change their behaviors through activating their readiness (Janz & Becker, 1984). Illness of a family member, media reports, mass media campaigns, advice from others and even health warning labels on products can influence persons to change their behavior. According to the HBM, these daily reminders play a critical role in people’s lives to stay on target and be more aware of their health behaviors (Janz & Becker, 1984). Vietnamese immigrants who are resistant to starting LTBI treatment may rethink their decision if they were to see news report of a TB outbreak in their local community. As mentioned earlier, a cue that would influence their decision would be knowing someone close who had LTBI and advanced to active TB because of their unwillingness to either start or adhere to the treatment plan. Although cues to action may not be one of the strongest predictors, it should be taken into account when utilizing the HBM to understand health related behaviors.

**Self-efficacy** was added to the HBM in 1988 to address various challenges of changing people’s habitual unhealthy lifestyle behaviors, such as sedentary lifestyle, eating habits, drinking, exercising and smoking (Rosenstock, Strecher, & Becker, 1988). This variable was not a part of the original model because the earlier focus of the framework was on preventative actions. The model could have accounted for a lot more variance in behavior had it include self-
efficacy in the early years. However, not until there was a need to describe and predict behaviors in individuals with complex chronic diseases did self-efficacy become important. Theorists realized they were missing a very important variable that could further help predict complex human behaviors. Their decision to supplement the HBM with this new concept was further supported by a surmounting pile of evidence in the literature supporting the significance of self-efficacy in helping to account for initiation and maintenance of behavioral changes (Rosenstock, Strecher, & Becker, 1988). It was quite clear then that Bandura’s concept of self-efficacy was going to be a significant supplement to the HBM.

Bandura (1977) defined self-efficacy as the belief in one’s own ability to do something. People in general may have motivation to make changes or understand that change is good for them; however if they do not believe they can carry out the change, then most likely it would not happen. For example, Vietnamese immigrant women with LTBI may have self-efficacy concerns related to taking daily medication for LTBI treatment if they were to feel overwhelmed by responsibilities of being a mother, wife and employee. This belief in addition to feeling asymptomatic will most likely affect women’s decision to not carry through with their treatment plan. Both the variables of perceived barrier and self-efficacy has been shown to have the most effect in changing health-related behaviors among individuals.

The HBM and the Identified Research Focus

The HBM has been applied to explain, predict and even modify broad ranges of health behaviors in various populations since the 1950s. According to Kirscht (1988), application of the model has been divided into three broad areas over the years: 1) preventive health services, such as yearly vaccines, attendance at screening programs and contraceptive practices; 2) sick role behaviors, which refer to compliance with recommended medical regimens usually following
professional diagnosis of illness, such as following anti-hypertensive regimens; and 3) clinic use, which include physician visits for a variety of reasons. The proposed research is aimed at understanding the decision-making process related to the acceptance and adherence of medication used to treat LTBI.

The HBM is an appropriate choice as the framework for the proposed LTBI study because it is aligned with the original model’s purpose, which was to understand why people were not utilizing free public health services for screening and prevention of infectious diseases. For the proposed study, all four of the model’s major constructs of perceived seriousness, susceptibility, barriers and benefits were examined to better understand the influences those variables have on Vietnamese immigrants’ likelihood of accepting the recommended LTBI treatment. Furthermore, modifying factors such as demographics, socio-psychological factors, self-efficacy and cues to action will be analyzed to supplement the understanding of adherence.

Phase Two: Qualitative

Philosophical Underpinnings

The proposed study will utilize grounded theory methodology by Glaser & Strauss (1968) to analyze data and generate a theory that would describe the decision-making process of Vietnamese immigrants’ medication non-adherence behaviors. Symbolic interactionism (SI), a great influence to the development of grounded theory, has been adopted as the philosophical underpinning for the proposed study to help explain participants’ behaviors that have been shaped through social interactions within a particular content. The philosophies of pragmatism, Darwinism and behaviorism will also be briefly discussed to further understand their influence on George Herbert Mead and the development of SI in the early stages. The foundation of SI is critical to understanding behaviors and meanings people give to their experience with others and
their environment. Therefore understanding this approach will be helpful in exploring the qualitative aims of this research study as it relates to medication non-adherence behaviors.

**Historical Background of Symbolic Interactionism**

The history of SI dates back to its founder, an American philosopher, sociologist and pragmatist named George Herbert Mead who was a professor of philosophy at the University of Chicago in the early 1900s. Mead spent over forty years of his academic career publishing numerous articles including book reviews; however his greatest failure was not publishing any books about his philosophy of SI. It was only after his death that Mead’s work was published with the help of his former students. Soon after his work became public, the philosophy of SI started to flourish throughout social psychology and other disciplines almost immediately. Herbert Blumer, one of Mead’s former students, spent his career expanding on Mead’s philosophy of SI in the social psychology discipline. Blumer was a sociologist that believed individuals create their own social reality through collective and individual actions. His philosophy aligned very well with Mead’s work with SI; thus it was a great contribution the discipline.

The work of Mead and Blumer with SI brought a new perspective to social psychology. It lead to the conceptualizing of human behavior in its context to help researchers examine why people act the way they do in various social circumstances and conditions that govern the shared meanings of objects that affect human behavior (Chenitz & Swanson, 1986). Qualitative researchers utilizing grounded theory methodology have adopted SI as the lens to help understand human behaviors through the observations of their participants’ daily social interactions. Furthermore, it is critical to point out that pragmatism, Darwinism, and social
behaviorism heavily influenced Mead’s work with the development of SI; therefore these influences will be discussed briefly in the following sections.

As mentioned earlier, pragmatism was influential in the early stages of SI development for Mead. Pragmatism emphasized knowledge as a form of practical involvement which is summarized as “knowing is doing” (Magee, p. 186, 2001). American pragmatists, Charles Pierce, William James and John Dewey, provided Mead with an extraordinary springboard in which to build SI. In summary, pragmatism asserts the following four main points: 1) knowledge is believed and remembered only because it is useful, 2) objects in our environment are defined according to their use to us, 3) humans are always involved in deciding what experiences are real, and 4) humans must be understood mainly through their actions in situations (Charon, 2010). These concepts from pragmatism are important to SI, primarily in understanding how humans relate to their environment (Charon, 2010). Thus to Mead and other symbolic interactionists, human consciousness is not separated from action and interaction, but instead is an integral part of both (Mead, 1967).

Mead’s work was also influenced by Darwinism’s naturalistic approach to understanding the world without having to turn to supernatural explanations. Mead appreciated Darwin’s concept that described human development as a part of the evolutionary process including the idea that the human species have unique characteristics (Charon, 2007). The biggest influences of Darwinism on Mead’s work included the idea of looking for human qualities in natural terms and to view humans as part of a changing universe rather than a static one (Charon, 2007). Mead applied this Darwinism concept to SI by viewing everything humans do as a process instead of something stable or fixed. He understood the individual as a dynamic changing actor that is constantly unfolding and acting with the environment. Therefore, the evolution of
Darwinism together with pragmatism formed the foundation of Mead’s SI philosophy, which allowed others like Blumer to build on. However, Mead did not stop with just Darwinism and pragmatism. He was searching for a third piece of the puzzle, and found something from the social behavioral discipline of psychology that completed his SI philosophy (Charon, 2010).

As a behaviorist, Mead was drawn to the teachings from his philosophy background that supported the idea that humans must be understood in terms of what they do rather than who they are (Mead, 1967). However, Mead had disagreements with a few of the major tenets from social behaviorism. The one that was most pressing was the idea that social behaviorism believed observation is the primary key to understanding humans; however Mead did not believe that behavior was simply something physical but rather that it could include things that were not physically observed (Mead, 1967). He used the example of thinking or mind action to illustrate his point. This concept became evident later in his SI philosophy and played a critical role in understanding human behavior including what led people to act in certain ways. SI ultimately is a philosophy that arose from the use of shared symbols to construct realities that are seen as the basic social processes occurring in everyday life experiences (Charon, 2010).

**Overview of Symbolic Interactionism**

SI is a very unique perspective that views humans as an active participant with their social environment both physically and mentally. There are five major tenets that support the foundation of SI and they are as follow: 1) human beings are created through the ongoing social process of interacting among and within individuals; 2) the ability to think, always conversing with ourselves is an intricate part of human beings; 3) humans define the situation they are in instead of just simply existing in an environment; 4) human action is a result of the present situation that includes social interaction, thinking and definition of situation; 5) human beings are
described as active beings in relation to their environment (Charon, 2010). Each one of the
tenets mentioned is crucial in describing the relationship between the mind, body, and social
environment. Symbolic interactionists understand that these individual actors are not just simply
shaped and controlled by their environment but instead act towards it based on perspectives that
are continuously changing and influenced by social processes (Charon, 2010).

SI takes the position that the meanings human create through social interactions are
central in their own world. Because this perspective focuses on dynamic relationships between
meaning and actions, it addresses the active processes through which people create and mediate
meanings through language and communication (Charon, 2010). Meanings arise out of actions,
and in turn influence actions. The tenets above assume that individuals are active, creative, and
reflective and that social life consists of processes. In other words, SI is a perspective in which to
observe human behavior with themselves and their environment to elicit meaning from all forms
of interactions.

**Symbolic Interactionism and the Social Meaning of Symbols**

The social meanings in symbols are developed through society and the socialization of
the individual living within it. Physical objects are often seen as fixed while social objects
constantly change as they are defined and redefined through interactions (Charon, 2010). Social
objects become significant when humans define that object to have value. In addition, humans
give meaning to social objects according to its use for those involved in those specific situations.

Blumer categorized objects into three groups: physical, social and abstract objects.
Objects in its physical form coexist with human beings in the environment and is given meaning
though social interactions because objects are never viewed in just its raw form (Charon, 2010).
Social objects are defined according to their use for people involved in situations, such as a
pencil is used for writing or a pot is used for cooking. In SI, social objects have no permanent meanings assigned to it because it is dynamic. The meanings of objects were products of social interactions between human beings and are constantly changing. The social meanings of these objects are the most important predictors of human behaviors (Chenitz & Swanson, 1986).

To gain a deeper understanding of how humans give meaning to the symbols in their surrounding, the concepts of reality and social objects are introduced. Social interactionists would claim that reality is how humans interpret their world according to the social definitions of what they observe in their environment and within themselves (Charon, 2010). There are two types of reality, objective and social. First, objective reality pertains to reality, which SI refers to as the situation “as it exists” (Charon, p.43, 2010). Second, social reality is when humans start to define the situation “as it exists” to give it meaning. For example, Charon (2010) gave an example of a person who was shoved while he was standing in a line. The objective reality is that he is now physically displaced from the line he was standing in. However, if he interpreted the shove as hostile and offensive, he could report the person who shoved him for harassment because he defined the situation as an unfriendly gesture.

In another example, any typical building can be viewed as a large, physical object. However, if a sign on that building reads “Tuberculosis Clinic”, then that building, which is a physical object, now is socially defined as a place where sick people go to get care. Vietnamese immigrants who attend county public health TB clinics for care may associate the meaning of that building to shame and stigma because of their infectious condition. The meaning of the social object, which is the clinic building, can influence these immigrants’ decision to be compliant with the required monthly clinic attendance. Being able to understand the meaning Vietnamese immigrants assigned to social objects, like the TB clinic building, could further help
understand why some immigrants choose to get treatment while others choose to have the latent infection and not receive free care from these clinics.

**Symbolic Interactionism and the Self**

In SI, the self is not one’s identity; instead, it is defined in a unique way that does not share some of the common definitions society refers to, such as the “real person” or the “productive person” (Charon, p. 71, 2010). According to symbolic interactionists, the self is viewed as the object of one’s own action (Charon, 2010). This perspective claims that the individual is an actor who acts and that it is not the self that acts. In other words, the self is a social object just like other objects in our surroundings that interacts with the social environment we live in. What distinguishes humans from other beings is the ability to think and interact with themselves in the form of internal conversation. In order to understand human behavior, it is critical to first gain an understanding of the meaning of the self-concept. There are four social stages for self-development that includes: preparatory stage, play stage, game stage and the reference group stage that play a large role in the identity of the self (Charon, 2010).

The SI perspective of the “self” is unique to LTBI participants because how one views themselves in the social context of others is extremely important to their decision-making process. Individuals may define themselves differently based on different social interactions with their environment. When examining the reference group stage of the self in adulthood, it is important to note that each reference group influences a different view of the self and making the self somewhat different in each situation. When immigrants are diagnosed with LTBI, their immediate reference groups, which usually consist of family and friends, can have a significant impact on whether they will initiate treatment or not. If the reference group did not receive treatment for LTBI, then it is likely that the infected immigrants would not want to initiate
treatment either because of the social influence the reference group has on the immigrant’s social “self”. However it is important to note the decision the “self” makes is not concrete and can change again if the actor interacts with different social environments or reference groups.

Depending on what experiences immigrants have related to TB from childhood to adulthood, those experiences can have an impact on their decision-making process to be adherent or not to the treatment offered to them by the county TB clinics. In addition, their own perception of themselves as not being sick is influential when determining whether they should start treatment for LTBI.

**Symbolic Interactionism and the Mind**

Symbolic interactionists causally refer to the mind as one’s thinking (Charon, 2010). Anytime a person stops to think about a decision, thought, or idea, symbolic interactionists would claim that your mind is in action. SI clearly points out that your mind is not the same as your physical brain and that it is always active when you are awake. SI defines the mind as, “all symbolic covert action toward oneself” (Charon, p.91, 2010). The two qualities that make the mind possible are symbols and the self. According to SI, the mind is not the same as the self or symbols, but instead it depends on both the self and symbols for its very existence. Mind action is a series of ongoing conversations that takes various forms and functions that include the ability to control overt action and problem solve. Furthermore, it is described as being a part of all social interaction. It is most purposeful and conscious when one must stop to figure out how to solve a problem when faced with a situation.

The mind action of individuals who are faced with a decision-making task is fascinating to examine if only those individuals could share that source of information. SI is used to assist the researcher in this proposed qualitative section to understand Vietnamese immigrants’ mind.
action because it is crucial to understanding their decision-making process. The goal is to explain why people with similar characteristics behave in certain ways. By just understanding the idea that mind action is constantly influenced by the environment, it can help researchers to be more aware of their interaction with the participants. This awareness can translate into the types of questions that are asked during the interviews help immigrants verbalize what they are thinking.

**Symbolic Interactionism and Taking the Role**

According to SI, the essence of being human involves symbols, self, mind and taking the role of the other. Taking the role of the other means understanding the perspectives of others as we act (Charon, 2010). Others include significant others, our reference groups, our generalized other or the perspectives of those we are acting in situations. This concept is essential for symbolic communication and for the development of the self. It is also the most important of all mind activities. Furthermore, taking the role of the other is significant in that it is necessary for continuing successful operation of any group, organization or society. This concept is largely responsible for successful learning, cooperating, influencing, controlling our own actions and perceiving consequences of actions to just name a few. Taking the role of others is one of the most important parts of social intelligence and an active process of the actor taking control of his or her situation. Without role taking, humans will be lost in symbolic communication, not understand each other and end up becoming a response to a physical stimulus (Charon, 2010).

In understanding the decision-making process of medication non-adherence, it is crucial to understand how Vietnamese immigrants take on the role of others in order to explain such complex behavior. This process allows the immigrant (actor) to define their providers’ intentions, plans, and actions. For example, an immigrant may use their providers past experiences of taking care of LTBI patients who have advanced to active TB in order to help
them decide on whether or not they should initiate TB treatment. Taking the role of the others enables immigrants to reshape their own identity of the self, make decisions and engage in overt actions in these types of social situations.

**Symbolic Interactionism and Society**

Social interaction is central to the human species because it brings the entire symbolic interactionist perspective together. It describes the life in all human communication and is an essential part of what people are. According to SI, social interaction is defined as the “mutual social action that involves symbolic communication and interpretation of one another’s acts” (Charon, p. 149, 2010). It is important to understand that according to SI, social interaction creates society and that human beings are all social symbolic actors. Furthermore, social interactions contribute to the development of a healthy self-concept, encourages human beings to resist behaviors that violate personal values, and promotes self-confirming lines of action (LaRossa & Reitzes, 1993). Depending on the interactions that occur among humans, the meanings are constantly changing and being refined (Charon, 2010).

For example, certain Vietnamese immigrants may not choose to initiate LTBI treatment if their social interaction with community people leads them to believe that LTBI does not need to be treated. LTBI is a very common diagnosis among Vietnamese immigrants, and many have had this diagnosis for decades without symptoms or treatment. Most Vietnamese immigrants even believe their history of BCG vaccination from their home country would protect them from advancing to active TB. It is these shared beliefs, personal stories, and social interactions that have a huge impact on an infected immigrant’s decision to be adherent to LTBI treatment.

**The Congruency of Symbolic Interactionism, Grounded Theory and The Proposed Research**
The assumptions and concepts from both classical Grounded Theory and Symbolic Interactionism have a strong historical relationship that has shown to work well together. Research that use grounded theory methods must understand how the concepts of SI, such as social interactions, can influence participants’ behaviors, especially when it relates to the decision-making process. To gain a full understanding of why certain people or groups behave in certain ways, researchers need to collect data to discover, generate, and understand 1) the pattern and consequence of the interaction between individuals; b) their self definition and share meaning about certain behaviors and the influence of the contextual factors on that behavior; and 3) their interpretive process (Aldiabat, 2011). All of these processes would lead to a theoretical framework that would help provide researchers and clinicians some understanding as to why people behave the way they do in certain social circumstances.

Summary

This chapter provided a review of the theoretical background and philosophical underpinnings that will guide the proposed research study. The HBM was chosen as the primary framework for the quantitative section of this study for its ability to explain and predict health-related behaviors. Furthermore the collection of data on various constructs including health beliefs and self-efficacy, along with other data pertinent to the Vietnamese immigrant group can assist in the planning of more effective intervention programs aimed at improving LTBI medication adherence rates. The qualitative section of the study will use SI’s philosophy as a tool to elicit qualitative data that can assist the researcher in exploring the decision-making process related to the phenomenon of medication non-adherence among Vietnamese immigrants. Both the theoretical framework and the philosophical foundation of SI will assist and guide the researcher in examining the aims of this mixed method research proposal.
CHAPTER 4

Research Methodology

Chapter 4 will provide a detailed description of the research methodology for this two phased mixed methods study. Phase one will discuss the statistical analysis used to answer research aims 1 through 4. Phase two will describe the grounded theory methodology chosen to guide the exploration of the participants’ experiences related to latent tuberculosis infection (LTBI) treatment adherence. The proposed study seek to understand predictors related to treatment acceptance and completion of those with LTBI in addition to learning more about the decision-making process related to treatment adherence or non-adherence of Vietnamese immigrants at different stages of their prescribed treatment regimen.

Phase One: Quantitative

Purpose and Aims of the Quantitative Study

The purpose of this descriptive, prospective cohort study was to identify predictors and rates of LTBI treatment acceptance and completion among Vietnamese immigrants who received care under Orange County (O.C.) Public Health TB clinic. Predictors chosen for treatment acceptance and completion include basic socio-demographic and health history variables. In addition, three psychosocial measurements were added and examined for correlation. The outcome variables of treatment acceptance and completion are dichotomous and were collected as Yes/No for treatment acceptance and completion according to the discharge summary from the patient charts. The Orange County Health Care Agency (OCHCA) TB department defined LTBI completion as consuming a minimum of 180 out of 270 pills prescribed over a 6 to 9-month treatment regimen. Patients who complete less than 180 out of 270 pills in a 9-month
period are categorized as “not completing care”/(no) while patients that complete a minimum of 180 out of the 270 pills prescribed within 6-9 months are categorized as “completing care”/(yes). All patients who did not meet the criteria of “completing care” were dropped from the program.

The major research questions for this phase are:

1. What are the LTBI treatment acceptance and completion rates (acceptance is defined as picking up first month of LTBI medication and completion is taking at least 180 of 270 doses of Isoniazid in 6-9 months) among Vietnamese immigrants who received treatment from Orange County public health TB clinics?

2. What are the predictors associated with LTBI treatment acceptance and completion among Vietnamese immigrants who received LTBI treatment at O.C. Public Health TB clinics?

The research aims are as follows:

**Aim 1**: To determine LTBI treatment acceptance rate among Vietnamese immigrants (aged 18 and older) offered treatment by the O.C. Public Health TB clinic.

**Hypothesis 1**: Based on the literature review on LTBI treatment acceptance rate among minorities, it is projected that Vietnamese immigrants treatment acceptance rate will be between 65-85% (Horsburgh et al., 2010; Li et al., 2010; Nuzzo et al., 2015).

**Aim 2**: To determine associations and predictors among the following variables to treatment acceptance: 1) socio-demographic factors (age, gender, marital status, English skills, employment status, smoking history, alcohol history, travel history, time lived in U.S., LTBI category [contacts, Class B, recent immigrants]); 2) health history (chronic disease history,

**Hypothesis 2:** Based on the literature review, it is projected that predictors of LTBI treatment acceptance among Vietnamese immigrants are: ages between 18-45, recent TB contacts, some English skills, marriage and self-report of previous LTBI treatment (Colson et al., 2013; Horsburgh et al., 2010; Nuzzo et al., 2015).

**Aim 3:** To determine LTBI treatment completion rate among the enrolled group of Vietnamese immigrant participants offered treatment by the O.C. Public Health TB clinic.

**Hypothesis 3:** Based on the literature review on LTBI treatment completion among minorities, it is estimated that Vietnamese immigrants treatment completion rate are expected to be between 40-60% (Li et al., 2010; Goswami et al., 2012; Nuzzo et al., 2015).

**Aim 4:** To determine associations and predictors of LTBI treatment completion among the following variables for the enrolled group of Vietnamese immigrants: 1) socio-demographic factors (age, gender, income, marital status, number of children, education, English skills, employment, smoking history, alcohol history, travel history, time lived in U.S., patient category); 2) health history (chronic disease history, current medication, chest x-ray results, BCG history, IGRA results, as well as number of pills missed during treatment, knowing someone with TB or LTBI, and 3) behavioral survey scores (Morisky Medication Adherence Scale [MMAS-8], Champion Health Belief Model Scale [CHBMS-29], Self-Efficacy for Appropriate Medication Use [SEAM-9]).
Hypothesis 4: Based on the constructs from the Health Belief Model (HBM), it is hypothesized that the following variables are correlated to treatment completion among Vietnamese immigrants: perceived moderate disease susceptibility, perceived moderate disease severity, perceived moderate benefits, perceived low barriers and perceived moderate self-efficacy. In addition, scores >6 on the Morisky medication adherence scale and scores >6 of the SEAM-9 scale are expected. Other predictors of LTBI treatment completion among Vietnamese immigrants are: employment, marriage, age between 18-45 years, smoking history and alcohol history (Goswami et al., 2012; Hirsch-Moverman et al., 2010; Nuzzo et al., 2015).

Study Design

This prospective cohort study determined the rate and predictors of LTBI treatment acceptance and completion among Vietnamese immigrants (aged 18 and older) that underwent treatment at the O.C. public health TB clinic. The prospective approach was chosen because it has fewer potential sources of bias and confounding issues than retrospective studies (Hulley et al., 2007). In addition, measuring independent variables before the dependent variable outcome has been observed prevents the independent variable from being influenced by knowledge of the dependent variable outcomes. For this study, a timeline was created to indicate when the questionnaires should be administered to the target population. Timing related to administering the questionnaires are discussed in details in the data collection section. All potential participants were asked if they could read English or Vietnamese and those who knew either one or both languages were qualified to enroll in the study, as the PI is fluent in conversational Vietnamese.

Study Setting. This study was conducted at the OC Public Health TB clinic located in the city of Santa Ana in Southern California. This site was chosen because OC is home to the largest
Vietnamese population living in the US, making it the ideal place to recruit research participants for this study (U.S. Census Bureau, 2015). Furthermore, according to the OC TB statistics, foreign-born Vietnamese living in OC had the most number of active TB cases (49.7%) reported in recent years compared to all other ethnic groups (OCHCA, 2014).

**Study Sample and Selection**

The target population for this study is foreign-born Vietnamese adult immigrants age 18 and older, diagnosed and qualified for LTBI treatment from OC Public Health TB department in California. A convenience sample was used to recruit Vietnamese immigrants that meet the eligibility criteria from the OC TB clinics sites. Based on G*Power analysis using a medium effect size of 0.12, alpha of 0.05, power of 0.8, and 13 test predictors, the estimated number of participants expected for the study was a minimum of 160, however major barriers to recruitment were unexpected and they had a profound effect on the overall expected enrollment number. The dissertation committee considered a smaller sample of 50 participants as more realistic since it took about ten months to reach 50 participants. The limitation to convenience sampling was the inability to control for selection bias by consecutively selecting every accessible person who met the study inclusion criteria in addition to minimizing volunteerism among the participants (Hulley et al., 2007). However, this sampling method was chosen because it was feasible and attainable for the purpose of answering the research questions.

*Inclusion:* Participants were screened for eligibility based on the following inclusion criteria: 1) an immigrant from Vietnam, 2) 18 years of age and older, 3) presently under the care of OC Public Health TB clinic, 4) have a positive TST result diagnosed by the OC TB clinics (≥ 10mm), 5) have a current negative chest x-ray for active TB disease, 6) have a negative sputum
cultures for TB, 7) placed on a Isoniazid (INH) medication for 6-9 months of treatment, 8) is asymptomatic at the time of diagnosis and 9) categorized by the County TB Clinic as either a recent TB contact, class B1 immigrant or an immigrant living in the US than < 2 years.

**Exclusion:** The following are exclusion criteria for the study: 1) patients categorized as refugee status; 2) presence of other severe or immunosuppressive health conditions such as HIV, cancer or hepatitis, and 3) previous history of LTBI treatment documented. The rationale for excluding Vietnamese refugees from this study had to do with their risk of advancing to active TB being much greater than other groups due to their long-term exposure to poor living conditions at refugee camps. In addition, the OC TB clinic had an incentive program of $5 a month that was only given specifically to this group of refugees to assist them maintain adherence to treatment.

Patients with severe chronic health problems were also excluded because their medication adherence behaviors were dependent on the state of their chronic disease condition. Depending on what their chronic illness was, they could suffer from drug interactions or unwanted side effects that could affect their medication adherence behaviors much differently than immigrants who were healthy and asymptomatic. Both groups were excluded to prevent medication adherence bias. Lastly, immigrants under 18 years of age were not invited to join because this group was more dependent on their parents for maintaining medication adherence due to their young age. Therefore children less than 18 years of age were excluded to prevent having to examine parental medication adherence behaviors at the time.

**Sample size:** To calculate the appropriate sample size for recruitment in this study, G*Power a priori power analyses was used. Using multiple regression, R2 increase statistical test
with a priori, a sample size of 160 subjects will detect a medium effect size (0.12) at an alpha-level of 0.05 and a power of 0.80 with 13 tested predictors. However as previously discussed, major barriers to recruitment were not anticipated initially until recruitment started, thus the dissertation committee had to reconsider a smaller sample of 50 participants to be more realistic to achieve the study goals in a timely manner. Furthermore, literatures studying LTBI medication adherence strictly in other minority groups, such as Latinos, used on average samples between 50-100 participants in their LTBI adherence studies (Ailinger, Moore, Nguyen & Lasus, 2006; Zuniga, 2012).

**Procedure**

Prior to initiation of the study, the PI met with county administrators (TB controller, TB Nursing Director) and outlined the study protocols and methods for participant recruitment. The plan called for TB physicians and LTBI nurses’ assistance to hand out study flyers to all potential Vietnamese participants at their initial and first clinic visit after a LTBI diagnosis was confirmed by the county. Participants who were interested would either contact the PI by phone or leave their names with the LTBI nurses so the PI can contact them at a later time. In addition, flyers were made available in the county TB clinic waiting room and treatment rooms.

*Obtaining Consent.* The PI arranged face-to-face meetings with all interested participants to explain the study details, assess for eligibility and obtained informed consent. All participants had at least six to nine monthly face-to-face visits with the LTBI clinic nurse to receive their INH medication refills and for routine assessment of potential side effects as part of the treatment regimen. Participants who consented to be a part of the study received a $20 dollar gift card to Wal-Mart for their time in completing the study questionnaires. This minimal amount
reduced the possibility of monetary coercion of study participation. Furthermore, all participants were informed that: 1) study participation was voluntary, 2) information provided in the questionnaires and results of the study would be used solely for scientific purposes, 3) their care at the county TB clinics would not be compromised if they refused to participate, 4) they have the right to decline answering any questions or withdraw from the study at any time, and 5) their personal telephone number or address was for follow-up of study questionnaire completion only if participants agreed. In the informed consent process, written explanation of the study objectives, protocol and researcher affiliation was provided.

*Administration of Questionnaires.* The PI administered baseline assessment instruments and collected all data at the end of the first nurse visit except for the medication adherence scale score. The adherence survey was required to be administered at the second nurse visit because sufficient time was needed for participants to take their new prescribed medication. Previous study in the literature that examined predictors of medication adherence in participants have also suggested to wait at least one month into the treatment regimen before collecting data on medication adherence (Morisky & Coly, 2004). After the second questionnaire was administered and data collected, the PI observed participants until the end of their treatment plan only. Monthly medication calendars were collected from the LTBI nurses to monitor monthly pills consumed by each participants. The self-report medication calendars became a part of the county’s internal system to measure adherence in their LTBI patients. No post-test or additional questionnaires were administered other than the questionnaires mentioned above. For determining treatment completion, the PI reviewed each participant’s medical record at time of discharge from the TB clinic. An official red stamp stating “treatment completion” is the indicator the county used for treatment success.
Data Collection Plan

*Socio-demographic Questionnaires. All four questionnaires used in this study were translated in to Vietnamese as close to the international guidelines as possible according to the following steps:

1) The surveys were translated from English to Vietnamese by a professional Vietnamese healthcare worker with a college background in Vietnam. Cross-cultural adaptation was achieved in a panel consisting of Vietnamese professionals from the O.C. public health TB clinic consisting of one TB physician, 2 public health nurses, 1 medical assistant, 3 back office TB staff and 1 Vietnamese translator.

2) The reverse translation from Vietnamese to English was carried out by another bilingual translator who was not involved in developing the initial version.

3) The original and back-translated English versions was compared by a Vietnamese-American community activist in the Vietnamese community who graduated from high school in Vietnam and has a junior college degree in the U.S. Any inconsistencies with either version was resolved in a consensus meeting with the panel.

4) A pilot test was performed in a Vietnamese population (n=15) with LTBI to ensure patient understanding of the wording of the Vietnamese version. No inconsistencies were identified. The patients who participated in the face-validity pilot phase were not included in the research study and were strictly volunteers. The LTBI nurses asked patients randomly if they would like to participate by giving feedback on the surveys strictly for the purpose of developing a new instrument. The process took about ten minutes or less to complete for each volunteer.
A questionnaire developed by the PI that included pertinent socio-demographic questions commonly asked from other LTBI studies was given to all enrolled participants prior to starting the study. The time allotted for participants to complete the questionnaire was less than 5 minutes. The questionnaire included the following socio-demographic questions:

a)  *Age*: Chronological age of study participants was collected as a continuous variable. In addition age groups were categorized into three sub groups for categorical analysis: 18-44, 45-64, 65 and older.

b)  *Gender*: Data was collected as a categorical variable as male or female.

c)  *Employment status*: Data was collected as a categorical variable as part-time, full-time, retired, in school, unemployed.

d)  *Marital status*: Data was collected as a categorical variable as either married or not married.

e)  *Number of children*: Data was collected as a continuous variable.

f)  *Income level*: Data was be collected as a categorical variable based on the current OC public health income guidelines.

g)  *Education level*: Data was collected as a continuous variable in number of years of schooling/education since most immigrants have been educated in their country of origin.

h)  *Bacille Calmette Guerin (BCG) vaccination history*: Data was collected as a categorical variable as either Yes or No.
i) *Time lived in the US*: Data was collected as a continuous variable in number of months participants have lived in the US.

j) *Primary language spoken at home*: Data was collected as a categorical variable of English, Vietnamese, or both.

k.) *Chest X-ray results*: Data was collected as a categorical variable as either normal or abnormal.

l.) *Tuberculin skin test (TST) results*: Data was collected as both a continuous variable in millimeters and as a categorical variable as either positive or negative.

m.) *Patient categories*: Data was collected as a categorical variable as either TB contact, Class B1 immigrants, immigrants living in the US < 2 years.

n.) *Known contact with TB/LTBI case*: Data was collected as a categorical variable as either Yes or No answer.

**Champion Health Belief Model Scale (CHBMS-29).** The Champion Health Belief Model Scale (CHBMS) was developed to measure constructs from the Health Belief Model (Rosenstock, Strecher, & Becker, 1988) and is a reliable and valid instrument developed for American women to measure beliefs about breast cancer and breast self-examination (Champion, 1984). The original CHBMS was developed and tested in 1984 by Champion and then revised several times through the years to include the construct of self-efficacy in 1993. Over time, the CHBMS has been adapted and translated in various languages including various behaviors. The author encouraged the scale to be tested with other health behaviors with the recommendation to substitute words or phrases in the current scale (Champion, 1984).
The revised CHBMS currently includes six concepts: 1) perceptions about susceptibility; 2) perceptions about severity of the disease; 3) perceived benefits for the presumed action; 4) perceived barriers for the presumed action; 5) confidence in one’s ability (self-efficacy); and 6) health motivation. The questionnaire had subscale items ranging between five and 12 items with responses measured on a Likert scale from 1 to 5; strongly agree was scored as 5 and strongly disagree as 1. Overall internal consistency of the original scale with all subscale items had a Cronbach alpha of 0.7. Test retest correlation coefficients were found to be above 0.7 and significant (p ≤0.001). Construct validity was tested by factor analysis and a factor loading of 0.35 for each item was used as an arbitrary criterion. The overall factor analysis for the scale yielded strong evidence for construct validity by substantiating the independence of constructs as used in the HBM (Champion, 1984).

The CHBMS has been tested mostly in western cultures; however the literature does have Arabic, Korean, Malaysian and Turkish language versions of the scale which were evaluated and found to be a valid and reliable tool for use among women (Champion & Scott, 1987; Poss, 2001; Mikhail & Petro-Nustas, 2001; Lee, Kim & Song, 2002; Secginli & Nahcivan, 2004). Currently, the CHBMS has not been used in the Vietnamese immigrant population. For this study, the author of the CHBMS gave permission for the PI to adapt the scale for use in the Vietnamese immigrant population with LTBI to examine the behavior and beliefs related to medication adherence. This scale was translated into Vietnamese according to the recommendations from the International guidelines.

**Morisky Medication Adherence Scale- 8 (MMAS-8)**. While there are two versions of the Morisky Medication Adherence Scale (MMAS), the most current 8-item scale was used for
the proposed study. The MMAS is one of the most adaptable and widely used adherence scales in literature. Currently it has been translated in multiple languages and has been used to measure medication adherence in a variety of diseases. The PI received permission from the author to translate the tool into the Vietnamese language and utilize it for measuring medication adherence of LTBI medication among Vietnamese immigrants. The MMAS-8 is a short questionnaire with only 8 items that is quick to administer with the average patient completing the questionnaire in 6-8 minutes.

The 8-item MMAS is a self-administered questionnaire with dichotomous response categories as yes or no for items number one through seven. Item number eight is a 5-point Likert scale response (0=all the time, 1=usually, 2=sometimes, 3=once in a while, 4=never/rarely). Scoring for items 1-7 on the scale is No=1 and Yes=0 points. Coding of item number 5 was reversed in a positive direction and item 8 had a standardized code of 0-4. It is important to note that item 8 had to be divided by 4 when calculating a summated score. The total points in the scale ranged from 0-8 with high adherence correlating with a higher overall score.

The MMAS-8 scale used criterion validity which involved looking at correlations between the measurement tool and a criterion variable taken as representative of the construct to be measured. Both concurrent and predictive validity were used to validate the MMAS-8 scale. To measure concurrent validity, the author examined the correlation between the results from the MMAS-8 and the MMAS-4 that were taken at the same time by the patients. Pearson’s correlation coefficient from the two scale was r=0.64 with a significant value of p<0.05 indicating that there was concurrent validity of the MMAS-8 when compared to the MMAS-4 as a criterion (Morisky et al., 2008). Predictive validity was assessed through associations with
blood pressure measurements, knowledge, attitude, social support, stress, coping, and patient satisfaction with clinic visits. The scale was validated in 1367 hypertensive patients with a mean age of 52.5 years of age and showed a good sensitivity (93%) and specificity (53%) for medication non-adherence behaviors (Morisky et al., 2008). In addition, the instrument reliability was reported with a Cronbach’s alpha of 0.83 (Morisky et al., 2008). Currently, the Vietnamese version of the MMAS-8 has not been validated beyond construct validity. In addition it has not been used among Vietnamese immigrants with LTBI. For this study, the author of the MMAS has given approval for the PI to adapt the scale for use in the Vietnamese immigrant population with LTBI to examine the behavior of medication non-adherence. This scale was translated into Vietnamese according to the recommendations from the International guidelines.

**Self-Efficacy for Appropriate Medication Use Scale-12.** A multidisciplinary team developed the SEAM scale with expertise in medication adherence and health literacy. The authors of the SEAM scale determined that self-efficacy was an important predictor of medication adherence and developed their instrument to assess self-efficacy in a broader range of chronic diseases, specifically among patients with low literacy. The scale’s psychometric properties were tested among 436 participants with coronary heart disease.

The SEAMS-13 has a total of 13 items on a 3 point Likert scale that rates the level of confidence about taking medication correctly (1=not confident, 2= somewhat confident, and 3 = very confident). Scores can range from 13-39, with higher scores indicating higher levels of self-efficacy for medication adherence. The reliability and validity analyses of the original 13-item scale had good internal consistency reliability ($\alpha = 0.89$) (Risser, Jacobson & Kripalani, 2007). The author of the scale gave permission to translate and adapt the tool for LTBI use. Authors of
the scale notified the PI of this study to drop items 9 and 10 from the scale if it is administered
cross culturally as their data suggest the wording of those questions sometimes confuse patients.
In addition, it was also suggested that item 12 be dropped if patients in the study were taking the
same medication for the period of interest. This scale was translated into Vietnamese according
to the recommendations from the International guidelines.

**Social Desirability Scale.** The Marlowe-Crowne Social Desirability Scale (MCSDS) was
developed in 1960 as a means of measuring social desirable responses (Marlowe & Crowne 1960). The MCSDS has 33 true-false items that describe culturally-approved behaviors and is
generally used in conjunction with other self-report measures to control for socially desirable
response tendencies in behavioral research (Fischer & Fick, 1993). The original scale had
adequate internal consistency ($\alpha=0.73$), and the scores were normally distributed (skewness =
-0.043, $p>0.30$) with a mean of 17.2 (Barker, 2002). Through the years, many short versions of
the MCDS have been created and tested for validity and reliability to attract investigators
particularly those who have plans to use a battery of self-report measures in their studies. Theses
numerous short forms continue to be popular and have been adopted in diverse literature (Barger,
2010).

For this study, Reynolds (1982) short version of the MCSDS was used because it is
currently the most popular short form of the MCSDS and offers most flexibility to be used in
various situations. Reynolds developed three short forms (A, B, and C) that contained 11, 12, and
13 items. Internal consistency reliabilities for his three forms ranged from 0.74 to 0.76 and he
concluded that these were reliable and valid short forms that could assist researchers to consider
response biases in research using self-reports (Reynolds, 1982). The shortest Reynolds version of
the MCSDS was used in the proposed research. The purpose again was to assess the participants’ tendency to respond to questions in such a manner that pleases the researcher. The scale scores were correlated to the SEAM-9 and MMAS-8 self-report to assess if there were any social desirability bias. The goal was to not find any relationship as it can mean that the MMAS self-report is not measuring accurately the level of medication adherence or the SEAM self-report is not measuring self-efficacy for appropriate medication use appropriately. This scale was translated into Vietnamese according to the recommendations from the International guidelines.

**Statistical Analysis**

Four important stages occurred in the statistical analyses phase. First, the PI had to enter the data collected into a database in the computer using SPSS 20.0 (IBM, 2011) and excel program. Secondly, data cleaning was a crucial part of the data analysis because misleading research findings can occur if not done accurately. This step was done by running frequencies on every variable and examining those frequencies carefully for invalid values, unusual values, large amounts of missing data, and adequate variability. In addition, code cleaning was equally important in this step. Code cleaning involved checking to see that only the codes assigned to answer the choices for each question appeared in the data file. This routine procedure is about cleaning up mistakes from step one which included but was not limited to incorrect coding, incorrect reading of codes, missing data and so forth (Plichta & Kelvin, 2013).

Step three involved utilizing descriptive statistics to summarize and describe the dependent and independent variables. For this study, the following descriptive statistics of frequency and percentage was used for categorical variables (i.e. age, education, income, gender, employment status, marital status, BCG history, size of TST, chest x-ray result, language spoken
at home, patient category, having chronic disease and currently taking medication). Means and standard deviations were used for continuous variables (i.e. CHBMS scores, MMAS-8 scores, age, and time lived in the U.S., TST results). In addition, tables were created to display sample socio-demographic characteristics such as those mentioned above. This step was needed to help provide a clear description of the target population.

Lastly, the following statistical analyses were used in this study: descriptive statistics, chi-square test of independence, and multiple logistic regression analysis. A multiple logistic regression model was chosen because it allowed the independent variables to be of any measurement scale while the dependent variable remained dichotomous. Since the outcome variables of this study are dichotomous (Yes/No) for treatment acceptance and completion and the independent variables are both continuous and categorical, this statistical test was most appropriate to apply. All data was checked for assumptions of each analysis model to verify if the data appropriately fits the statistical test before performing the analysis (Plichta & Kelvin, 2013). The goal of running a logistic regression was to find the best fitting model to describe the relationship between the dichotomous variable of treatment acceptance (DV) and a set of independent predictor variables (IV). The assumptions for running a logistic regression are as follows: the dependent variable must be dichotomous; the independent variables are either continuous, categorical or nominal; the dependent variable must have mutually exhaustive categories; and a linear relationship between the continuous variable and dependent variable should be observed (Plichta & Kelvin, 2013).

Protection of Human Subjects in Research

University human subject protection approval was obtained from the University of
California, Los Angeles Institutional Review Board and from the Orange County Health Care Agency IRB department prior to enrollment of study participants. The principal investigator completed the Collaborative Institutional Training Initiative and the Health Insurance Portability and Accountability Act certification required for research with human subjects.

This descriptive prospective cohort study had minimal risk associated with participation. Although the questionnaires were not expected to illicit information that was suppose to evoke strong negative psychological responses from the participants, the topic of having LTBI may bring up emotional social concerns such as stigma, stress and feelings of anxiety during the interviews. The participants’ emotional concerns were addressed by having a list of local County and private mental health providers/clinic referrals available to hand out if needed. Questionnaires used measured basic demographics (age, gender, education, socioeconomic class, time lived in the US), health history (history of BCG vaccination, chest x-ray results, size of TST, chronic health conditions, and current medications taken daily), health beliefs (perceived seriousness, susceptibility, barriers, benefits, self-efficacy), and medication adherence scores.

In accordance to IRB standards, all data retrieved from participants in this study were recoded with an identification number to protect patients’ anonymity and privacy. Participants were all assigned a code in lieu of their personal names upon enrollment and all future correspondence utilized the assigned code number instead of participants name (i.e. all questionnaires from one participant will have the same identification code). A master list with participants’ name and identification number was stored in a locked file cabinet in a locked room at the county TB clinic with limited access by the PI and dissertation chair throughout the entire study. In addition, electronic data stored in computers all had password protection software to ensure safety.
Summary

In summary, phase one of this study was set up to focus on collecting and examining predictor variables related to the outcome variable of LTBI treatment acceptance and completion. This quantitative phase used various statistical models to analyze the data collected and to look for correlations with significance between the independent variables and the dependent variables. Significant findings in this phase assisted the PI to better understand the Vietnamese immigrant population in order to develop future cultural-specific intervention programs aimed at improving LTBI adherence. Current programs lack culturally sensitive interventions embedded in the structure and delivery of LTBI care.

Phase 2: Qualitative

Methodology and Design

The qualitative section of the proposed study utilized grounded theory (GT) methodology to explore treatment adherence behaviors among Vietnamese immigrants diagnosed with LTBI from OC Public Health TB clinics. This phase of the study sought to understand the decision-making process of Vietnamese immigrants who were either adherent or non-adherent to the LTBI treatment recommended by OC health providers. In addition, a theoretical framework grounded in the narratives of the Vietnamese immigrants was generated regarding their perceptions and experiences related to LTBI medication adherence.

This section of chapter 4 will discuss the grounded theory approach that was used in the study’s research design methods, participant recruitment, research confidentiality measures, data
collection and analysis in addition to ethics related to the conduct of research with human subjects.

Aim of the Qualitative Study

1. To describe and explore the perceptions and experiences of 17 Vietnamese immigrants LTBI experience under the care of the O.C. Public Health TB Clinic.

   Areas of Focused Questioning
   
   Q1: How do immigrants that are non-adherent to LTBI treatment, perceived the seriousness and susceptibility of acquiring TB disease later in life?
   
   Q2: What do immigrants perceive as the benefits and barriers to LTBI treatment?
   
   Q3: What are the internal and external factors influencing immigrants’ decision to adhere or not adhere to LTBI treatment?

2. To generate a theoretical framework that is grounded in the voices and narratives of Vietnamese immigrants regarding their experiences and perspectives related to the decision-making process of medication adherence to LTBI treatment.

Grounded Theory (GT) Approach

GT approach was chosen for this study because unlike other qualitative approaches, the goal of GT is to move beyond description and to generate or discover a theory for a process or action based on the data collected from individuals (Creswell, 2013). Initially, GT was challenged by the positivist’s paradigm for its ways of knowing; which was through interpreting meanings or intuitive realizations (Charmaz, 2006). However, overtime Glaser and Strauss’s methodological rigor of GT during the mid century quickly flourished among social researchers and became an acceptable qualitative research method among social scholars. Since then, several
different GT perspectives have emerged, however this study focused mainly on the GT perspective from both Corbin and Strauss (2007) in addition to Charmaz’s (2006) constructivist and interpretive perspective.

The rigorous structured process of GT provided in-depth information that sought to answer and explore perspectives related to the human experience of Vietnamese immigrants with LTBI. Furthermore, the philosophical underpinnings of pragmatism and symbolic interactionism provided the foundation for GT to formulate a theory from the data obtained through the participants’ daily experiences and interactions with their environment, other humans, and with themselves.

**Study Sample and Selection**

Study participants were recruited from the OC public health TB clinic. During phase one of the proposed research, interested participants who agreed to enroll in the study at the time were asked to consent for phase two if they were interested in being interviewed about their LTBI experience despite if they completed their treatment or not. The primary purpose of the qualitative interviews was to gain a better understanding of the decision-making processes related to treatment adherence at different stages of the LTBI process. All qualified participants were consented again in phase 2. This purposeful sampling method used to recruit participants gained insight and understanding to the decision-making process of Vietnamese immigrants. Therefore the PI purposefully made attempts to contact participants who did not initiate treatment but was very unsuccessful to reach that population because they were lost to follow up. In addition, LTBI nurses also flagged participants who have missed appointments or complained of adherence issues for the PI for further consideration of eligibility.

The proposed study’s sample size was estimated to be 20 individuals, although GT does
not specify or require a specific sample size. GT methodology however does mandate that all themes and categories derived from participants’ data be saturated before recruitment is stopped. In cases when additional data collection was required for validation of a category or a theme, theoretical sampling was initiated to aid in the understanding and final development of the categories or themes in limbo. According to Corbin and Strauss (2007), theoretical sampling is a method of data collection that aims to develop concepts in terms of their properties and dimensions, to uncover variations, and to identify relationships between concepts. Theoretical sampling is necessary to develop the properties of the categories until no new properties emerge in order to move forward to theory development. This data collection process reached saturation when all emergent categories are theoretically saturated (Corbin and Strauss, 2007).

Procedure

Obtaining consent for phase two. The PI re-consented all participants who were eligible and interested in participating in phase two of the study on the day of the interview. Each participant in phase two received a $40 gift card to Wal-Mart for participating in a 60-minute interview with the PI. This fair amount reduced the possibility of monetary coercion of study participation. Furthermore, all participants in this phase were informed that: 1) study participation was voluntary, 2) their care at the county TB clinics was not compromised if they refused to participate, 3) they have the right to decline answering any questions or withdraw from the study at any time and 5) their personal telephone number or address was for follow-up only if further interviews was necessary and participants agreed. In the informed consent process, written explanation of phase two objectives and researcher affiliation was provided.

Data collection plan. Semi structured interview questions (SSIQ) were developed by the
PI with the help of a Community Advisory Board (CAB) created specifically for this proposed research study (see Appendix G). In addition, the development of the SSQI was based on an in-depth review of the literature. The CAB consisted of two TB clinic administrators, one LTBI clinic nurses, and 2 Vietnamese immigrants from the local Vietnamese community who experienced LTBI treatment in the U.S. public health system. The CAB was given a small compensation for their advisement in the form of a paid luncheon from the PI at two meetings. The SSQ was used as a guide for the PI to ask appropriate questions and helped ensure all required information was obtained while giving participants freedom to share their personal experiences in their own words of choice. The PI ensured the interview guide used open-ended questions, non-leading questions and probes that were appropriate to the exploration of the proposed research questions and aims. All questions focused on understanding the LTBI medication experience through the lens of participants who were either successful or not successful completers of the treatment regimen. The following are a few sample questions:

Sample Questions from SSQ:

1) Tell me why you decided to accept LTBI treatment.

2) Please describe what you feel most influenced your decision to complete LTBI medication?

3) Tell me about your experience of taking LTBI medication during the 6-9 months.

4) Please share with me about a time when you forgot to take your isoniazid pill.

5) Describe how you feel about being diagnosed with LTBI.

6) Please comment on any barriers or challenges you have faced while taking LTBI medication.
The time allotted for collecting interview data was 60-minutes. Only one semi-structured interview was planned for this study per person, and no follow-up interviews were needed to expand certain properties or categories. Once theoretical saturation was achieved, the PI stopped conducting interviews because no new information was identified.

Socio-demographic data collection plan. The same socio-demographic questionnaire used in phase one of the study was applied to the participants in phase two. No new socio-demographic data was collected.

Data Analysis Plan

The process of analyzing data through grounded theory methodology is dynamic, systematic and data driven (Charmaz, 2006). The analysis process involved interpretation of data through constant comparisons to give meaning and understanding to the events related to the participants (Corbin & Strauss, 2007). The goal was to move raw data from the basic descriptive levels of initial coding to conceptual categories that intersect and have relationships to become a theory.

There are currently several different ways to analyze grounded theory data and they ranges from Corbin & Strauss’s very structured methodology to Charmaz’s less structured methods. For this study, Charmaz’s (2006) constructivist grounded theory methodology was used to provide guidelines for qualitative data analysis because it is less rigid than the single process or core category suggested by Strauss and Corbin’s (1998) approach. Being less rigid allows for more room to be creative with the data analysis. Charmaz’s (2006) method differed from her predecessors because she advocated for a social constructivist perspective that include emphasizing diverse local worlds, multiple realities, and the complexities of particular worlds,
views, and actions. In addition, Chamaz (2006) placed more emphasis on the views, values, beliefs, feelings, assumptions, and ideologies of individuals rather than on the methods of research (Charmaz, 2006). Her process of theory development is by piecing together implicit meanings about a category. Through this analysis process, the researcher is encouraged to remain reflexive about their personal perspectives as well as those of the study participants.

Initial coding. The first step of data analysis involved initial coding of participants interviews immediately after data was collected (Charmaz, 2006). It is critical to start the comparison method of line-by-line initial coding within the interview and then between the completed interviews right away instead of waiting to the end. The purpose of the initial coding step was to move the researcher toward later decisions about defining the core conceptual categories for the construction of a theory. During this phase, the researcher kept initial coding open-ended at the same time acknowledging that researchers too hold prior ideas and skills that may bias the data (Charmaz, 2006). All initial codes were provisional, comparative and grounded in participants’ data. In addition, close attention was given to in vivo codes because they often are characteristics of social worlds and organizational settings (Charmaz, 2006).

Focused coding. Focused coding is the process of assessing for the most significant or frequent initial codes that are more general and abstract than initial codes (Charmaz, 2006). This process required the researcher to make decisions about which initial codes made the most analytic sense to categorize the data incisively and completely. Through focused coding, the researcher was able to move across interviews and observations and compare people’s experiences, actions, and interpretations. Consistent with the logic of grounded theory, coding is an emergent process.
**Axial coding.** Next, axial coding described by Strauss and Corbin (1998) brought data back together again in a more synthesized manner after it was dissected through initial coding. The goal of axial coding was to link categories with subcategories and to ask how they were related in order to move towards a more abstract understanding of the descriptive data (Charmaz, 2006). Lastly, theoretical coding was the most sophisticated level of coding because it began to specify possible relationships between categories to help move the data towards building a theory (Glaser, 1978).

As the analysis continued throughout the research, the goal was advancement of theory development grounded in the data from participants who have experienced the process (Strauss & Corbin, 1998). Regardless of what GT perspective was used to analyze data, the process was definitely non-linear and it involved moving back and forward constantly to re-code data and alter properties or categories until it best fits the overall theme of what was being observed in all the interviews. This process of constant comparisons of codes and categories helped the researcher advanced from basic descriptive analysis to more abstract categories. Since confirmation of themes and categories could be quite a challenge for one qualitative researcher to decide, the PI needed to work closely with the qualitative committee member in order to help confirm themes and categories that emerged from the data. Throughout the data analysis phase, the PI met regularly with the qualitative research committee member to validate the interpreted data and to insure inter-rater-reliability.

**Field Notes.** Writing field notes was an extremely vital part of documenting the qualitative GT journey because the data was helpful for exploring the complex interactions between the researcher and study participants during and after interview encounters. Some researchers suggested field notes are a form of memo writing that occurred when out in the field.
However, an important distinction to make is that field notes are not the same as memo notes because they are not as in depth or as lengthy as memos. During the data collection phase in the field, theoretical ideas stimulate the researcher’s mind triggering deep thoughts that should be jotted down while they are still fresh so that they can be analyzed at a later time. If the researcher does not take advantage of the ideas that occurred in the field, then the opportunity might pass and whatever the idea was may have been pivotal to the research. Schatzman and Strauss (1973) suggested writing observational field notes that describe actual events and writing theoretical notes that described the researcher’s thoughts about those events. This way, field notes can supplement the analysis phase later on and not distract the researcher from paying attention to what was going on the field.

*Memos & Diagrams.* Memo writing was a critical process of developing the theory because its purpose was to document the comparisons and connections that were seen in the data, and clarify questions the researchers had about advancing the data from a descriptive point (Charmaz, 2006). The notes allowed the researcher to be immersed in the data collected at the same time it guided the researcher’s analysis. A major qualitative methodology research error is in the lack of memo-writing during the data analyses phase, which often can cause researchers to have an analytic block and prevents data from moving up into categories. Another analytical tool other than memo-writing is diagramming or mapping. To supplement memos, the researcher used mapping to provide a visual document that depicted relationships between analytic concepts. Clarke’s (2005) postmodern situational analysis perspective of GT supported diagramming as an analytical process to examining relationships among elements and concepts. She introduced three types of situational analysis mapping that would help stimulate the researcher to analyze more deeply and they are: 1) situational maps, 2) social world/arenas, and
3) positional maps (Clarke, 2005). Of the three situational analysis mapping recommended by Clark (2005), the researcher chose situational mapping to assist with data navigation. As a research instrument, a researcher’s own experience should be used when making the map as suggested by Clarke. Both memo-writing and diagramming were extremely useful in this process because it involved analysis of the data and was useful to the researcher for the analysis phase because it 1) forced the researcher to work with concepts rather than raw data; 2) provided reflection of analytic thoughts; 3) enabled the researcher to be creative and imaginative; and 4) provided a warehouse of analytic ideas that could be sorted and retrieved at a later time (Corbin and Strauss, 2008).

**Ethical Conduct of Qualitative Research**

University human subject protection approval was obtained from the University of California, Los Angeles Institutional Review Board and from the Orange County Health Care Agency IRB department prior to enrollment of study participants. The researcher completed the Collaborative Institutional Training Initiative and the Health Insurance Portability and Accountability Act certification required for research with human subjects.

Patient confidentiality information discussed in phase one of the study also applied to phase two. In addition to the provisions mentioned in phase one, extra precautions were taken to maintain patient confidentiality during the qualitative phase. Once participants re-consented to participate in phase two, any documents pertaining to that participant such as memos, field notes and transcriptions was coded with the participant’s identification code number that was assigned to them in phase one of the study. Another master list was created to store the code numbers assigned to each study participants in phase two. This document was stored both in a password-
protected computer and in a secure locked file cabinet where only the principle investigator and the dissertation committee chair had access. Furthermore, the computer that was used for all transcriptions and analysis of the data had password protection and was only accessible to the PI and dissertation chair. Any materials related to the research were kept in the locked secure file cabinet with the master list. Plans are in placed to erase all interview recordings after it has been transcribed in addition to the study receiving final approval from the dissertation committee.

Only minimal risk was expected from participants in this phase of the study because there was no anticipated physical or emotional threat to the research participants who have consented to participate. Other minor possible risks included participant discomfort in talking about their LTBI experience, personal background including events that led to their immigration to the U.S. and embarrassment related to adherence issues. The PI prepared a list of resources within Orange County (i.e. mental health providers, primary family care providers and social workers) for participants upon request. The PI was also properly trained to report any suspicion of abuse or suicidal ideation among participants to the committee chair and appropriate hotline within 24 hours of the event.

As for benefits of participating in this research study, there were no direct benefits for participants enrolled in either phase one or two of the study. However through their participation, some found talking about their LTBI experience to be helpful and meaningful to themselves and their family. Potential benefits from the results of this study to society were as follows: 1) for the first time providers will have some information about predictors of LTBI treatment acceptance and completion specifically for the Vietnamese immigrant population, 2) a new theory about the decision-making-process related to LTBI treatment will be available for the public, 3) results from the study will help provide a foundation for developing culture-specific interventions aimed
at improving overall LTBI treatment acceptance, and 4) study findings will add to the current LTBI literature related to medication acceptance and completion.

**Summary**

In summary, phase two of this study utilized constructivist grounded theory methodology to guide the exploration of Vietnamese immigrants’ decision-making processes related to LTBI medication adherence. Studies in the past have found grounded theory to be helpful for the examination of topics that are related to human behaviors such as adherence to medication. A total of 17 participants diagnosed with LTBI offered to share their experiences and stories to assist in the development of a model that could help explain factors that affect Vietnamese immigrants LTBI treatment completion. The proposed study has potential to offer a working framework that can assist LTBI providers in developing appropriate culture specific interventions aimed at improving LTBI adherence.

**Chapter Conclusion**

As the numbers of active TB cases continue to rise among Vietnamese immigrants across the country, there is a desperate need for research to help explain factors influencing this pattern. Currently, the national strategy to eliminate TB in the U.S. is to have correct diagnosis and treatment of LTBI. Low LTBI completion rates at the national and local levels have public health officials concern about reactivation TB, especially among foreign-born Asian individuals. More studies are recommended to examine LTBI non-adherence behaviors specifically among foreign-
born Asian ethnic minority groups as their numbers are disproportionately higher than other
groups. The purpose of this study was to fill the gap related to LTBI medication non-adherence
behaviors specifically among Vietnamese immigrants who currently rank fourth nationally in
active TB cases. The study was divided into two sections, phase 1 (quantitative) and phase 2
(qualitative). The purpose of phase one was to determine the rate and factors related to LTBI
treatment acceptance and completion among Vietnamese immigrants with LTBI. Phase two
explored the decision-making process related to medication non-adherence behaviors among
Vietnamese immigrants that received care from the same OC TB clinics. Findings from this
research can impact the LTBI community by reducing the numbers of reactivation TB in
Vietnamese immigrants at both the local and national level, thus reducing overall active cases in
the U.S.
CHAPTER 5 RESULTS

Phase I: Quantitative

The objective for phase one of this dissertation study was to 1) determine latent tuberculosis infection (LTBI) treatment acceptance and completion rates, and 2) to identify predictors of LTBI treatment acceptance and completion among a vulnerable population of Vietnamese immigrants that were under the care of Orange County Public Health Pulmonary Department. Selected predictors were examined to determine relationships with the dependent variables of treatment acceptance and completion. These predictors included socio-demographic data, medical history, health history, medication adherence (Morisky Medication Adherence Scale [MMAS-8]), self-efficacy for appropriate medication use (Self Efficacy for Appropriate Medication Use Scale [SEAMS-13] and personal health beliefs (Champion Health Belief Model Scale [CHBMS-29]). The Social Desirability Scale (SDS-13) was used as an adjunct measure to assess the impact of social desirability on self-reports of medication adherence, self-efficacy for appropriate medication use and personal health beliefs related to LTBI.

Results of this study are organized into 4 sub-sections: specific aims and procedure, descriptive results, statistical results and summary. Chi-Square test of independence and logistic regression were used to analyze correlations and predicting relationships among the factors mentioned above to LTBI treatment acceptance and completion.

Specific Aims

Specific Aim 1: To determine LTBI treatment acceptance rate in the combined group (enrolled and comparison groups) of 97 immigrants offered treatment by the O.C. Public Health TB clinic.
Specific Aim 2: To determine associations and predictors of treatment acceptance among the following variables for the combined group (n=97): 1) socio-demographic factors (age, gender, marital status, English skills, employment status, smoking history, alcohol history, travel history, time lived in U.S., LTBI patient category status assigned by the County [contacts, Class B, recent immigrants]; 2) health history (chronic disease history, current medication, chest x-ray results, Bacillus Calmette-Guerin [BCG] history, Interferon Gamma Release Assay [IGRA] results); and 3) the dependent variable of treatment acceptance.

Specific Aim 3: To determine LTBI treatment completion rate among the enrolled group (n=51) of participants offered treatment by the O.C. Public Health TB clinic.

Specific Aim 4: To determine associations and predictors of treatment completion among the following variables for the enrolled group (n=51): 1) socio-demographic factors (age, gender, income, marital status, number of children, education, language spoken at home, English speaking, employment, smoking history, alcohol history, travel history, time lived in U.S., patient category); 2) health history (chronic disease history, current medication, chest x-ray results, BCG history, IGRA results, as well as number of pills missed during treatment, knowing someone with TB or LTBI; and 3) behavioral survey scores (MMAS-8, CHBMS-29, SEAM-19); and 4) the dependent variable of treatment completion.

**Overview of Study Procedure**

Study participants in phase 1 were recruited through clinic flyers posted in the TB clinic waiting room. In addition, county LTBI nurses handed out study flyers during all of their LTBI appointments and instructed patients to contact the PI for preliminary screening if interested. If patients were interested on the same day the PI was on site, the LTBI nurse would call the PI to take the patient to a private room for screening and phase 1 consent if qualified. Average time to
complete informed consent and five surveys was approximately 25-30 minutes. Participants were also asked during phase 1 to sign a form to be contacted for phase two of the study if they would like to be interviewed about their LTBI experience. Seventeen immigrants agreed to be re-contacted by the PI and were recruited for the one-on-one interviews at different phases of their LTBI treatment as recommended by the dissertation committee to capture different perspectives of adherence. Data from their interviews will be discussed in phase two of this chapter.

Descriptive Results

Sample Characteristics

An estimated 160 participants were planned to be recruited for phase 1 of this study based on the G power analysis performed prior to the initiation of the study. Barriers to recruitment were not anticipated at the time. From August of 2014 to June of 2015, only 51 out of 72 participants approached by the principal investigator (PI) agreed to enroll in phase 1 of this study. The primary concern for the immigrants refusing to participate was the signature requirement for consent to participate. Other barriers to recruitment in addition to reasons for declining are discussed in more details and can be found in chapter 6 of this dissertation.

The concern about the smaller sample size and the barriers encountered were discussed with the dissertation committee. The chair and members of the committee agreed and gave permission for the PI to stop recruitment at 50 participants due to the unexpected recruitment barriers. To reach a goal of 160 participants would have taken more than one year.

Due to a smaller enrollment sample in phase 1, dissertation committee members (Dr. Morisky and Dr. Nyamathi) also recommended that the socio-demographic and basic health information from a group of immigrants that declined LTBI treatment be collected and analyzed for comparison of predictors of treatment acceptance. The comparison group consisted of
individuals who met the same eligibility criteria as the recruited group during the same enrollment period. Data from the comparison group (n=46) consisted of only de-identified socio-demographic and basic health information that included reasons for treatment decline. This additional data was analyzed strictly as a comparison to the enrolled group’s socio-demographic and basic health information. All variables collected for both groups were identical for analysis. An IRB addendum was not required for this additional step.

**Descriptive data for the enrolled group.** A final sample of 51 participants were recruited, between the ages of 18 to 83 years of age; with a mean age of 48.5 years (SD=17.3) (see Table 5.1). Participants between the ages of 45-64 years represented the largest subgroup (45.1%). About 85% of the participants were classified as a case contact with recent exposure to an active TB case; however only 57.4% reported knowing someone with TB infection and 46.8% reported knowing someone with LTBI.

Other characteristics of the participants in the enrolled group include living in the U.S. for over ten years (68.6%), spoke English (43.1%) and employment status of either full time (33.3%) or part time (11.8%) at the time of enrollment. Most were married (58.8%) with children (70%) and reported speaking primarily Vietnamese (72%) at home. Wide ranges of occupations were observed in the cohort. These included: college students, retired seniors, community activists and current employees of local Vietnamese businesses such as nail salons and factories. The average income reported was between $0-$9,000 annually (54.3%). All participants had personal transportation or at least understood how to use public transportation. Overall, the enrolled group was composed of active participants that were engaged in their community.

**Descriptive data from the comparison group.** A total of 46 inactive charts were reviewed for socio-demographic and basic health history data to use for analysis. This
information was collected for all individuals who had LTBI and declined to initiate treatment when the County offered it. Only de-identified information available in the charts were collected from this group which included: age, gender, marital status, patient category, years lived in U.S., English skills, employment, smoking history, recent travel out of U.S., alcohol history, chest x-ray history, IGRA history, BCG history, chronic disease history and current medication use.

**Results of Statistical Differences Between Groups.** Statistically significant differences were noted among the following variables between the enrolled and comparison group (see Table 5.1): age (p<0.001), marital status (p=0.014), patient category (p<0.001), years lived in the U.S. (p<0.001), recent travel out of the U.S. (p<0.001), English speaking (p<0.001), employment (p=0.011), smoking (p=0.009), chest x-ray results (p<0.001) and IGRA results (p<0.001). Most patients in the comparison group were mainly non-English speakers (87%) and lived in the U.S. for less than five years (91.3%) compared to the enrolled group that had a larger percentage of English speakers (43.2%) who have lived in the U.S. for over 10 years (68.6%). Approximately 89% of the comparison group was categorized as Class B immigrants by the County, which is defined as individuals with LTBI with no evidence of active TB disease.

The enrolled group only had 11.8% Class B immigrants with 84.3% of the patients classified as Contacts because of their recent exposure to an active TB case. More patients were married (80.5%) and unemployed (82.6%) in the comparison group compared to the enrolled group, which had less married couples (58.8%) with most reported current employment (58.8%). A majority of the recent immigrants from the comparison group have only lived in the U.S. between 0-5 years (91.3%) compared to only 25.5% in the enrolled group. They also had more abnormal chest x-rays (62.2%), higher percentage of reported smokers (31.1%) and IGRA positive test results (68.2%). There were no significant differences noted for gender, alcohol
history, BCG history, current medications, and chronic disease history.

Together, both groups make up the combined group (n=97) data set that will be examined for correlational and predicting relationships using Chi-Square and multivariate logistic regression analysis for treatment acceptance.

Table 5.1 Socio-demographic and Health History Characteristics of the Enrolled and Comparison Groups

<table>
<thead>
<tr>
<th>Characteristics of Enrolled Group (N=51)</th>
<th>N</th>
<th>%</th>
<th>Between group p value</th>
<th>Characteristics of Comparison Group (N=46)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
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<td></td>
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<td>Group 18-44</td>
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<td>Group 45-64</td>
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<td>94.6</td>
<td></td>
<td>Mean Age SD=10.6 Age range 36-83</td>
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<td></td>
</tr>
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</table>

Note. p<0.05, * % Calculated after removing unknown; Bacillus-Calmette Guerin (BCG); Interferon-Gamma Release Assay (IGRA)
## Table 5.1 Socio-demographic and Health History Characteristics of the Enrolled and Comparison Groups

<table>
<thead>
<tr>
<th>Characteristics of Enrolled Group (N=51)</th>
<th>N</th>
<th>%</th>
<th>Between group p value</th>
<th>Characteristics of Comparison Group (N=46)</th>
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<th>%</th>
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<td>10.8</td>
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Note. p<0.05, * % Calculated after removing unknown; Bacillus-Calmette Guerin (BCG); Interferon-Gamma Release Assay (IGRA).
Table 5.1 Socio-demographic and Health History Characteristics of the Enrolled Groups
(Additional variables collected for enrolled group only)

<table>
<thead>
<tr>
<th>Characteristics of Enrolled Group (N=51)</th>
<th>N</th>
<th>%</th>
<th>Characteristics of Enrolled Group (N=51)</th>
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<th>%</th>
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<td>Education*</td>
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<td>Missed Pills*</td>
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<td>0-4 pills</td>
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<td>Unemployed</td>
<td>6</td>
<td>11.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>13</td>
<td>25.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school</td>
<td>9</td>
<td>17.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows Someone with TB*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>42.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27</td>
<td>57.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows Someone with LTBI*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>53.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22</td>
<td>46.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. p<0.05, * % Calculated after removing unknown.

Psychosocial Measures

Instrument Preparation. Four psychosocial measurements used in this study were translated to Vietnamese utilizing the international guidelines of instrument translation by Wild et al. (2005) as follows:

1) The surveys were translated from English to Vietnamese by a professional Vietnamese healthcare worker with a college background from Vietnam. Cross-cultural adaptation was achieved by a panel consisting of Vietnamese professionals from the O.C. Public Health TB department consisting of one TB physician, 2 public health nurses, 1 medical assistant, 3 back office TB staff and 1 Vietnamese translator.

2) The reverse translation from Vietnamese to English was carried out by another bilingual translator who had a college background from both Vietnam and the U.S. and was not
involved in developing the initial version.

3) The original and back-translated English versions was compared by a Vietnamese-American community activist in the Vietnamese community who graduated from high school in Vietnam and has a junior college degree in the U.S. Any inconsistencies with either version was resolved in a consensus meeting with the panel.

4) A pilot test was performed in a Vietnamese population (n=15) with LTBI to ensure patient understanding of the wording of the Vietnamese version. No inconsistencies were identified. The patients who participated in the face-validity pilot phase were not included in the research study and were strictly volunteers. The LTBI nurses asked patients randomly if they would like to participate by giving feedback on the surveys strictly for the purpose of developing a new instrument. The process took about ten minutes or less to complete for each volunteer.

**Challenges with Instrument Completion.** All 51 enrolled participants answered five surveys at the time of enrollment that included a detailed socio-demographic questionnaire, SEAMS-9, MMAS-8, SDS-13, and CHBS-29. The PI gave instructions in Vietnamese to all recruited participants and was available the entire time for questions. On average, participants took approximately 25 minutes to complete all five surveys. Despite prompting, not everyone answered all items on the surveys; hence there were random questions that were missing data.

It was noted that a small percent of participants intentionally did not answer three socio-demographic questions even though the PI returned the survey back to the participants for completion. Those three items were related to annual income (8%), education history (4%) and if they know someone who had TB or LTBI (6%). Missed questions may have been intentional because participants did not feel comfortable answering those questions in a research study. No reasons were given by the participants when they handed their surveys back in. Missing survey
data was statistically handled by coding. Questions that were intentionally unanswered were coded 888 and 999 for questions that were unintentionally answered. Both types of missing data were accounted for during statistical analysis.

**Challenges with Missing Surveys.** A summary table of the descriptive data from each measurement is presented in Table 5.2 below. Although there were a total of 51 participants in the study, not every enrolled participant answered all of the surveys. A total of 7 (14%) enrolled participants dropped out before their first clinic appointment to pick up medication and so they were not able to take the MMAS-8. Three participants who were enrolled in the study had to leave unexpectedly before completing all of the surveys because of transportation issues.

**Table 5.2 Descriptive Statistics for Psychosocial Measures (N=51)**

<table>
<thead>
<tr>
<th>Scales</th>
<th>N</th>
<th>Items</th>
<th>Alpha Score</th>
<th>Min Score</th>
<th>Max Score</th>
<th>Mean Score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MMAS-8</strong>*</td>
<td>44</td>
<td>8</td>
<td>0.712</td>
<td>2</td>
<td>8</td>
<td>6.3</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>SEAMS-9</strong></td>
<td>51</td>
<td>9</td>
<td>0.817</td>
<td>10</td>
<td>30</td>
<td>22.0</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>SDS-13</strong>*</td>
<td>48</td>
<td>13</td>
<td>0.612</td>
<td>5</td>
<td>13</td>
<td>9.5</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>CHBMS-29</strong>*</td>
<td>49</td>
<td>29</td>
<td>0.837</td>
<td>67</td>
<td>134</td>
<td>107.5</td>
<td>11.9</td>
</tr>
<tr>
<td><strong>CHBMS-SU-5</strong>*</td>
<td>49</td>
<td>5</td>
<td>0.603</td>
<td>7</td>
<td>25</td>
<td>15.2</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Subcategory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CHBMS-SE-6</strong>*</td>
<td>49</td>
<td>6</td>
<td>0.868</td>
<td>9</td>
<td>30</td>
<td>20.3</td>
<td>5.5</td>
</tr>
<tr>
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<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>CHBMS-BE-4</strong>*</td>
<td>49</td>
<td>4</td>
<td>0.776</td>
<td>6</td>
<td>20</td>
<td>17.0</td>
<td>2.7</td>
</tr>
<tr>
<td><strong>Subcategory</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>CHBMS-BA-8</strong>*</td>
<td>49</td>
<td>8</td>
<td>0.830</td>
<td>21</td>
<td>40</td>
<td>30.8</td>
<td>4.9</td>
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<tr>
<td><strong>Subcategory</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CHBMS-HM-6</strong>*</td>
<td>49</td>
<td>6</td>
<td>0.880</td>
<td>9</td>
<td>30</td>
<td>23.8</td>
<td>3.5</td>
</tr>
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<td><strong>Subcategory</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *Missing surveys. Morisky Medication Adherence Scale (MMAS-8); Self-Efficacy Adherence Medication Scale (SEAMS-9); Social Desirability Scale (SDS); Champion Health Belief Model Scale (CHBMS-29); CHBMS Susceptibility (SU), Seriousness (SE), Benefits (BE), Barriers (BA), Health Motivation (HM).
They asked to take the remainder surveys home to complete and promise to return it on the next visit to the clinic. Unfortunately they never returned and dropped out of treatment. Altogether, the MMAS-8 has 7 (14%) missing surveys, the SDS-13 has 3(6%) missing surveys and the CHBMS-29 has 2 (4%) missing surveys.

**Descriptive Statistics for Psychosocial Measures.**

**Morisky Medication Adherence Scale (MMAS-8).** Self-reported questionnaires are widely used to measure self-adherence due to the low cost and easy administration. The MMAS-8 was chosen because of its simplicity. The self-report scale has 8 items with dichotomous response categories Yes/No for the first 7 items and a 5-item Likert response for item 8. The MMAS-8 scores can range from 0-8 or can be categorized into three levels of adherence: high adherence (score =8), medium adherence (score of 6 to <8), and low adherence (Score <6). The 8-item MMAS was tested among 1367 patients diagnosed with hypertension in a large outpatient clinic and has a reported alpha reliability score of 0.83.

A total of 44 scale responses were collected for the MMAS-8 in this study; which revealed a minimum score of 2 and maximum score of 8. The scale had a mean score of 6.3 (SD=1.6), which indicated moderate adherence to LTBI medication. Item 5 and item 8 were reverse recoded in a positive direction that resulted in a measurement of adherence from low to high. The standardize reliability alpha score for the translated MMAS-8 was moderately high at 0.712, which is acceptable for this study but significantly lower than the original MMAS-8 alpha reliability of 0.83. Translated items in the Vietnamese version of the MMAS-8 could have likely lowered the reliability scores in addition to the low number of surveys completed for the study.

**Self-Efficacy for Appropriate Use of Medication Scale (SEAMS-9).** The SEAMS was developed by a multidisciplinary team with expertise in medication adherence and health
literacy. The authors of the SEAM scale determined that self-efficacy was an important predictor of medication adherence and developed their instrument to assess self-efficacy in a broader range of chronic diseases, specifically among patients with low literacy. The scale’s psychometric properties were tested among 436 participants with coronary heart disease.

The SEAMS-13 has a total of 13 items on a 3 point Likert scale that rates the level of confidence about taking medication correctly (1=not confident, 2= somewhat confident, and 3 = very confident). Scores can range from 13-39, with higher scores indicate higher levels of self-efficacy for medication adherence. The reliability and validity analyses of the original 13-item scale had good internal consistency reliability (α= 0.89).

Authors of the scale notified the PI of this study to drop items 9 and 10 from the scale if it is administered cross culturally as their data suggest the wording of those questions sometimes confuse patients. In addition, it was also suggested that item 12 be dropped if patients in the study were taking the same medication for the period of interest. The reliability alphas for the translated SEAMS-13 (α=0.847) and SEAMS-9 (α=0.817) were quite similar. Both values were >0.70 and only the results from the SEAMS-9 were used for analysis. A total of 51 scale responses were collected for the SEAM-9 in this study; which revealed a minimum score of 9 and maximum score of 30. Scores from the SEAMS-9 in this study ranged from 10 to 30, with the mean score of 22.0 (SD=4.9) and a median of 22.0 also. High scores indicated higher levels of self-efficacy for appropriate medication is the enrolled group.

**Social Desirability Scale (SDS-13).** This scale served as an adjunct measure to assess the impact of social desirability on self-report measures such as the MMAS adherence and self-efficacy for appropriate medication use scale utilized in this study. The short version of the Marlowe-Crowne Form C used for this study had 13 dichotomous items with either true or false
choices with scores ranging from 0-13. Higher scores on the scale indicated a higher desirability for social acceptance. The scale had a KR-20 reliability score of 0.75. It was chosen because it compared favorably with the reliability of the original standard 33-item Marlowe-Crowne scale and was shorter in length.

A total of 48 scale responses were collected. Participants in the study struggled most with completing this survey because many needed clarifications for several items. The maximum score was 13 and the minimum score was 5, with a mean score of 9.5 (SD=2.2). The translated survey originally had a reliability alpha score of 0.549, but after reviewing the inter-item correlation matrix, item 2 on the scale was noted to have the most discrepancy when compared to the other items from the scale. In addition, item 2 had the most discussion among the expert panel members and also needed the most clarification from participants. After it was dropped, the reliability score increased to 0.612. The new reliability score was the highest score the translated SDS-13 could achieve because other items were not significant in increasing the reliability score if also dropped. Since the original reliability score of the English version of the SDS-13 was 0.73, a reliable score of 0.612 was minimally acceptable. Translated items in the Vietnamese version of the SDS-13 including the low number of survey responses could have affected the reliability scores, thus lowering the inter-item correlations. This scale would need further refinement of the items translated and larger sample of participants in the next pilot study in order to improve the reliability score.

**Champion Health Belief Model Scale (CHBMS-29).** The CHBMS was originally developed to understand patients’ beliefs toward breast cancer screening. The sub scales in the instrument were initially developed to measure five concepts as follow: 6-items related to susceptibility ($\alpha=0.77$), 12-items related to seriousness ($\alpha=0.78$), 5-items related to benefits
(α=0.61), 8-items related to barriers (α=0.76) and 8-items related to health motivation (α=0.60) (Champion, 1984). All of the items were measured on a Likert Scale from 5 to 1 with strongly agree as 5 and strongly disagree as 1. Scores were calculated for the entire scale in addition to each subscale.

This instrument had an overall reliability alpha score of 0.7 for all the subscales combined with a minimum score of 39 and maximum score of 195 points. The scale was tested in a convenience sample of 301 women. This instrument was adapted to survey patients’ beliefs toward LTBI treatment and any question related specifically to breast cancer screening was dropped from the adapted scale. Permission to use, adapt and translate the CHBMS into Vietnamese was obtained from Victoria Champion.

The Vietnamese version of the adapted CHBM scale had 29-items with an overall minimum score of 29 and a maximum score of 145. Minimum and maximum scores for each subscale are as follow: susceptibility (5-25), seriousness (6-30), benefits (4-20), barriers (8-40) and health motivation (6-30). The translated CHBMS-29 had an overall reliability alpha score of 0.84 and a mean score of 107.5 (SD=11.9) among the 29 items. The reliability scores and participants responses for each subscales are as follow: perceived susceptibility (α=0.60) had a minimum score of 7 and a maximum score of 25, with a mean of 15.2 (SD=3.6); perceived seriousness (α=0.87) had a minimum score of 9 and a maximum score of 30 with a mean of 20.3 (SD=5.5); perceived benefits (α=0.78) had a minimum score of 6 and a maximum score of 20, with a mean of 17 (SD=2.7); perceived barriers (α=0.83) had a minimum score of 21 and a maximum score of 40, with a mean of 30.8 (SD= 4.9); and perceived self-efficacy (α=0.88) had a minimum score of 9 and maximum score of 30, with a mean of 23.8 (SD=3.5). Perceived barrier was the only subcategory that required reverse coding.
Higher scores on the Champion Health Belief Model Scale (CHBMS) indicate higher perceived overall threat of having active TB related latent tuberculosis in the future, along with increase perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers and perceived self-efficacy related to LTBI treatment acceptance and completion.

For this study, it was not feasible for the investigator to conduct factor analysis due to the unexpected small sample. Furthermore, not all patients answered the surveys either due to early discharge or self-termination. Psychometric testing of the translated tools will be addressed with an adequate sample of participants in future studies.

**Results for Specific Aims**

Results in this section will be presented based on the four specific aims of the study.

**Specific Aim 1:** To determine LTBI treatment acceptance rate in the combined group (enrolled and comparison groups) of 97 immigrants offered treatment by the O.C. Public Health TB clinic. The combined group consisted of a sample of 97 immigrants eligible for county services to treat their LTBI from August 2014 to June 2015.

Of the 97 participants, 50 (51.5%) accepted LTBI treatment and 47 (48.5%) declined. Participants that accepted LTBI treatment (enrolled group) agreed to take daily Isoniazid for six months and were required to return monthly for medication refills. A total of 7 participants (14%) that accepted treatment did not return to initiate treatment for two primary reasons: failed appointments (43%) and change of mind to initiate treatment (57%). Participants that declined LTBI treatment (comparison group) were dismissed for a variety of reasons, which were captured in the LTBI database upon dismissal. The primary reasons included self-report of previous LTBI treatment (37%), concerns with medication side effects (17%), and beliefs that they were not sick and did not need medication (15%) (see Table 5.3).
Table 5.3 Reasons for Declining LTBI treatment in Comparison Group

<table>
<thead>
<tr>
<th>Reasons (N=46)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self report of past treatment for LTBI/TB. No documentation.</td>
<td>17 (37%)</td>
</tr>
<tr>
<td>Concern with medication side effects.</td>
<td>8 (17%)</td>
</tr>
<tr>
<td>Believe they are not sick and do not need medication.</td>
<td>7 (15%)</td>
</tr>
<tr>
<td>Unknown/Refuse</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Busy/follow-up at a later time</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Other health problems/taking too many medication</td>
<td>4 (9%)</td>
</tr>
</tbody>
</table>

**Specific Aim 2:** To determine associations and predictors of treatment acceptance among the following variables for the combined group (n=97): 1) socio-demographic factors (age, gender, marital status, English skills, employment status, smoking history, alcohol history, travel history, time lived in U.S., patient category); 2) health history (chronic disease history, current medication, chest x-ray results, Bacillus Calmette-Guerin (BCG) history, Interferon Gamma Release Assay (IGRA) results).

*Chi-Square test of independence results.* Socio-demographic data and basic health history information collected from both the enrolled and comparison group were used to examine correlates to LTBI treatment acceptance. A variety of variables were chosen to test the relationships that included both socio-demographic (age, gender, years lived in the U.S., English skills, marital status, employment, history of alcohol and smoking, recent traveled out U.S.) and health history (chest x-ray and IGRA results, BCG vaccination history, medication history, history chronic diseases) data to the dependent variable of treatment acceptance. The Chi-Square test of independence was used to examine the correlation of both the socio-demographic and health history variables in the combined group to treatment acceptance. Predictor variables with more than two subcategories were recoded to have one primary group and one reference group.
that consisted of collapsed subcategories that were less significant so it could be entered as a dichotomous variable in the Chi-Square correlation analysis. Results of the Chi-Square analysis are presented in Table 5.4 below.

**Table 5.4 Chi-Square Analysis of Socio-demographic and Health History Variables for Treatment Acceptance in the Combined Group (Enrolled and Comparison) N=97**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Acceptance N (%)</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>Univariate P ≤ 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live in US &gt;10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference group</td>
<td>35/39 (89.7%)</td>
<td>25.1</td>
<td>7.6-82.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>0-5 years</td>
<td>15/58 (25.9%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 18-44 years*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference group</td>
<td>17/19 (89.5%)</td>
<td>11.3</td>
<td>2.5-52.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>45-64 years</td>
<td>33/77 (42.9%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+ years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference group</td>
<td>43/47(91.5%)</td>
<td>66.0</td>
<td>18.0-242.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Class B1</td>
<td>7/50(14%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent Imm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English-yes/little</td>
<td>33/40(82.5%)</td>
<td>11.0</td>
<td>4.1-29.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No English</td>
<td>17/57 (29.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent Travel (yes/no)</td>
<td>18 (28.6%)</td>
<td>0.0</td>
<td>0.0-0.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CXR-ABN (yes/no)</td>
<td>5 (14.7%)</td>
<td>0.1</td>
<td>0.0-0.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IGRA-POS (yes/no)</td>
<td>6 (16.2%)</td>
<td>0.1</td>
<td>0.0-0.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Not married</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference group</td>
<td>14/17 (82.4%)</td>
<td>5.7</td>
<td>1.5-21.4</td>
<td>0.005</td>
</tr>
<tr>
<td>Married</td>
<td>36/80 (45%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed (yes/no)</td>
<td>21 (72.4%)</td>
<td>3.5</td>
<td>1.4-9.1</td>
<td>0.007</td>
</tr>
<tr>
<td>Smoking (yes/no)</td>
<td>5 (26.3%)</td>
<td>0.3</td>
<td>0.1-0.8</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Note. * % Calculated after removing unknown. Variables with multiple subcategories were recoded and collapsed into a new reference sub-group. For example the variable “Contacts” was recoded to have two categories. The primary category was labeled “contacts” while the reference group included Class B1, recent immigrants and others.
For example, marital status is a variable with four subcategories: not married, married, widowed and divorced. To analyze if marital status is correlated with treatment acceptance in Chi-Square analysis, each of its subcategories have to stand on its own and be recoded to become a dichotomous variable i.e. “Married” Yes=1 No=0; “Widowed” Yes=1, No=0, “Not married” Yes=1, No=0; and “Divorced” Yes=1, No=0.

Any sub-category that was significant in the initial correlation analysis became the primary category and its non-significant sub-categories were collapsed to become the new reference group for that variable. For example, the category “Not Married” was significant in the correlation analysis (p=0.005) because 14/17 (82.4%) of the unmarried immigrants accepted treatment compared to smaller percentages of acceptance from other marital status subcategories that included married, widowed, and divorced. The new reference group for the variable “Not Married” included those that were married, widowed and divorced which had only a 45% treatment acceptance rate combined.

For the variable, “Live in the U.S.” the sub-category “lived >10 years in the U.S.” was the only one significantly correlated (p ≤ 0.001) with treatment acceptance. Therefore the new reference group now included both “Lived 0-5 years” and “Lived 6-10 years”. For the age group variable, the subcategory significantly correlated to treatment acceptance was “Age group 18-44 years” (p ≤0.001) and the new reference group now included “Age group 45-64 years” and “Age group ≥65 years”. Patients that were categorized as TB “Contacts” were significantly correlated with treatment acceptance (p<0.001). The other sub groups were collapsed to become the reference group and included Class B, recent immigrants and others.

The English category was the only variable in this analysis that was re-categorized. The sub-category of “English-Yes” and English-Little” were collapsed into one subcategory labeled
“English-Yes/Little” with the new reference group being “English-No”. This was done primarily because of the similarities between the two groups that spoke English. One claimed they “spoke English” and the other that claimed they spoke “some English”. County documents require all patients or the in-take nurse to mark one of the three check boxes pertaining to English skills: Yes, No, or Little. Since there were no specific guidelines, the categories were collapsed to avoid any biases.

Overall, the following variables, all dichotomized as Yes/No, were significantly correlated to LTBI acceptance for the combined group in the Chi-Square analysis: not married (p=0.005), lived in the U.S. >10 years (p≤0.001), age group 18-44 years (p≤0.001), contacts to a recent TB case (p≤0.001), current employment (p=0.007), abnormal chest x-ray (p ≤0.001), IGRA positive (p ≤0.001), smoking history (p=0.012), English skills (p ≤0.001) and recent travel (p ≤0.001) (see Table 5.4). The significant variables were next entered into the binary logistic regression to identify predictors of treatment acceptance.

**Multivariate logistic regression results.** Variables that were significant in the Chi-Square analysis were entered into the logistic regression for computation, which often requires a large sample size to reduce biases. As the sample size increases, the size of bias in logistic regression parameter estimates approaches zero. For this study, the sample is size was much smaller than expected; therefore caution must be taken when interpreting the results of the analysis (see Table 5.5).

Findings revealed that the two factors significant for treatment acceptance in the multivariate logistic regression were only smoking (p=0.026) and contacts (p=0.049). Patients who were categorized as recent “contacts” to an infectious TB case were more likely to accept LTBI treatment over other groups likely because of concerns related to disease susceptibility in
their future that could affect their employment or education goals. Those who were smokers may have felt more susceptible to getting TB more than those who did not smoke and therefore were more likely to accept treatment. Recent travel was close to significant and generally travel back and forth to Vietman increases risk for exposure.

Table 5.5 Multiple Logistic Regression of Socio-demographic and Health History Variables for Treatment Acceptance in the Combined Group (N=97)

<table>
<thead>
<tr>
<th>Factors</th>
<th>B</th>
<th>S.E.</th>
<th>df</th>
<th>p ≤0.05</th>
<th>Odds Ratio</th>
<th>95% CI for EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>-4.292</td>
<td>1.931</td>
<td>1</td>
<td>0.026</td>
<td>0.014</td>
<td>0.000-0.602</td>
</tr>
<tr>
<td>Contacts</td>
<td>4.045</td>
<td>2.054</td>
<td>1</td>
<td>0.049</td>
<td>57.139</td>
<td>1.019-3202.5</td>
</tr>
<tr>
<td>Recent Travel</td>
<td>-2.536</td>
<td>1.339</td>
<td>1</td>
<td>0.058</td>
<td>0.079</td>
<td>0.006-1.092</td>
</tr>
<tr>
<td>Age 18-44 years</td>
<td>2.590</td>
<td>2.222</td>
<td>1</td>
<td>0.244</td>
<td>13.331</td>
<td>0.171-1037</td>
</tr>
<tr>
<td>CXR-ABN</td>
<td>-1.029</td>
<td>0.934</td>
<td>1</td>
<td>0.270</td>
<td>0.357</td>
<td>0.057-2.227</td>
</tr>
<tr>
<td>Eng_Yes_Little</td>
<td>-1.763</td>
<td>1.809</td>
<td>1</td>
<td>0.330</td>
<td>0.172</td>
<td>0.005-5.947</td>
</tr>
<tr>
<td>Employed</td>
<td>0.697</td>
<td>1.025</td>
<td>1</td>
<td>0.497</td>
<td>2.007</td>
<td>0.269-14.961</td>
</tr>
<tr>
<td>Lived in U.S. &gt;10 years</td>
<td>0.663</td>
<td>1.419</td>
<td>1</td>
<td>0.641</td>
<td>1.940</td>
<td>0.120-31.320</td>
</tr>
<tr>
<td>IGRA-POS</td>
<td>-0.393</td>
<td>0.909</td>
<td>1</td>
<td>0.665</td>
<td>0.675</td>
<td>0.114-4.006</td>
</tr>
<tr>
<td>Not married</td>
<td>0.416</td>
<td>1.422</td>
<td>1</td>
<td>0.770</td>
<td>1.515</td>
<td>0.093-24.618</td>
</tr>
</tbody>
</table>

Note. P ≤ 0.05 Abnormal chest x-ray (CXR_ABN); Interferon-Gamma Release Assay Positive (IGRA-POS).

Specific Aim 3: To determine LTBI treatment completion rate among the enrolled sample of 51 participants offered treatment by the O.C. Public Health TB clinic.

Of the 51 participants that were recruited for the enrolled group, 33 (64.7%) completed treatment and 18 (35.3%) did not. Primary reasons for not completing treatment include: reactions to Isoniazid (22.2%); adverse events such as generalized discomfort (22.2%); lack of
interest (17.1%), failed follow-up appointments (11%), busy/work schedule (11%), moved (5.5%), switch to different treatment plan (5.5%) and unknown reason (5.5%) (see Table 5.6).

Table 5.6  Reasons for Incomplete Treatment.

<table>
<thead>
<tr>
<th>Reasons (N=18)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe side effects (GI bleeding, elevated LFTs)</td>
<td>4 (22.2%)</td>
</tr>
<tr>
<td>Adverse events: fatigue, dizziness, nightmares, generalized pain</td>
<td>4 (22.2%)</td>
</tr>
<tr>
<td>Change mind or don’t want it anymore.</td>
<td>3 (17.1%)</td>
</tr>
<tr>
<td>Failed appointments</td>
<td>2 (11%)</td>
</tr>
<tr>
<td>Too busy/work schedule</td>
<td>2 (11%)</td>
</tr>
<tr>
<td>Moved</td>
<td>1 (5.5%)</td>
</tr>
<tr>
<td>Switch treatment</td>
<td>1 (5.5%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (5.5%)</td>
</tr>
</tbody>
</table>

**Specific Aim 4:** To determine associations and predictors of treatment completion among the following variables for the enrolled group (n=51) for the following variables: 1) socio-demographic factors (age, gender, income, marital status, number of children, education, language spoken at home, English speaking, employment, smoking history, alcohol history, travel history, time lived in U.S., patient category); 2) health history (chronic disease history, current medication, chest x-ray results, BCG history, IGRA results, number of pills missed during treatment, knowing someone with TB or LTBI); and 3) behavioral survey scores (MMAS-8, CHBMS-29, SEAM-19).

**Chi-Square test of independence.** The Chi-Square test of independence was selected to examine the correlation between socio-demographic and health history variables to treatment completion (see Table 5.7). Since the sample size for this phase was small and there was very little power with too many predictor variables in the univariate analysis, one way to build a parsimonious model was to not take all predictors collected. Any predictors with multiple sub-
categories were re-coded to have only two categories: one primary category that was significant and a reference category that included all other insignificant sub-categories.

Table 5.7 Chi-Square Analysis of Socio-demographic and Health History Data for Treatment Completion in the Enrolled Group (N=51)

<table>
<thead>
<tr>
<th>Factors</th>
<th>N (%) Complete</th>
<th>N (%) Did not complete</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>Univariate p ≤ 0.25</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work-FT/PT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed 3/6 (50%)</td>
<td>19/23 (82.6%)</td>
<td>4(17.4%)</td>
<td>4.8</td>
<td>1.3-17.6</td>
<td>0.015</td>
</tr>
<tr>
<td>Retired 6/13 (46.2%)</td>
<td>14/28 (50.0%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-school 5/9 (55.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age 18-44 years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-64 yrs 13/23 (56.5%)</td>
<td>15/18 (83.3%)</td>
<td>3(16.7%)</td>
<td>4.2</td>
<td>1.0-17.17</td>
<td>0.040</td>
</tr>
<tr>
<td>65+ yrs 5/10 (50%)</td>
<td>18/33(54.5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Concurrent Meds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>9 (47.4%)</td>
<td>10(52.6%)</td>
<td>0.3</td>
<td>0.1-1.0</td>
<td>0.055</td>
</tr>
<tr>
<td><strong>Has Chronic Disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>10 (50.0%)</td>
<td>10(50.0%)</td>
<td>0.4</td>
<td>0.1-1.1</td>
<td>0.078</td>
</tr>
<tr>
<td><strong>Married</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married 9/15 (60%)</td>
<td>22/30 (73.3%)</td>
<td>7(24.1%)</td>
<td>2.5</td>
<td>0.8-8.1</td>
<td>0.123</td>
</tr>
<tr>
<td>Divorced 1/2(50%)</td>
<td>11/21(52.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed 1/4 (25%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Income ≥9-36K</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-&lt;9K 13/25 (52.0%)</td>
<td>11/14(78.6%)</td>
<td>3(21.4%)</td>
<td>2.9</td>
<td>0.6-12.2</td>
<td>0.149</td>
</tr>
<tr>
<td>≥36-87K 2/3 (66.7%)</td>
<td>18/32 (56.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥88K 3/4 (75%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recent travel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>10 (52.6%)</td>
<td>9(47.4%)</td>
<td>0.4</td>
<td>0.1-1.4</td>
<td>0.164</td>
</tr>
<tr>
<td><strong>No English</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>9 (52.9%)</td>
<td>8(47.1%)</td>
<td>0.5</td>
<td>0.1-1.6</td>
<td>0.214</td>
</tr>
<tr>
<td><strong>Live in US 6-10 years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Reference group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 yrs 9/13 (69.2%)</td>
<td>1/3 (33.3%)</td>
<td>2(66.7%)</td>
<td>0.3</td>
<td>0.0-3.0</td>
<td>0.241</td>
</tr>
<tr>
<td>10+ yrs 23/35 (65.7%)</td>
<td>32/48 (66.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * Refers to collapsed sub-categories into new reference group. The variable “work” was recoded to have two categories. The primary category “work” includes both full time and part time status, while the reference group includes unemployed, retired, and students in school.
In addition, a less conservative p-value <0.25 was used for this univariate analysis to ensure as many predictors as possible were captured so it could be enter into the multivariate logistic regression model next. The following variables or categories were significantly correlated to LTBI acceptance after analysis: working full time or part time (p=0.015); age group 18-44 years (p=0.040); concurrent medication (p=0.055); has other chronic diseases (0.078); married (p=0.123), annual income between 9-35K (p=0.149); recent travel (p=0.164); speaks no English (p=0.214); lived in the U.S. 6-10 years (p=0.241).

Variables that were significant in the Chi-Square analysis were used as predictors in the multivariate logistic regression model for analysis. The only predictor that trended toward significance for treatment completion in the multivariate logistic regression was age group between 18-44 years (p=0.075) (see Table 5.8). It is likely younger immigrants were more concerned about their future related to work or school than the older immigrant group.

Table 5.8. Logistic Regression of Socio-demographic and Health History Variables for Treatment Completion in the Enrolled Group (N=51)

<table>
<thead>
<tr>
<th>Factors</th>
<th>B</th>
<th>S.E.</th>
<th>df</th>
<th>Multivariate P ≤0.05</th>
<th>Odds Ratio</th>
<th>95% CI for EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 18-44 years</td>
<td>2.913</td>
<td>1.636</td>
<td>1</td>
<td>0.075</td>
<td>18.421</td>
<td>0.75-455.26</td>
</tr>
<tr>
<td>Married</td>
<td>1.633</td>
<td>1.046</td>
<td>1</td>
<td>0.119</td>
<td>5.119</td>
<td>0.66-39.79</td>
</tr>
<tr>
<td>Employ-FT PT</td>
<td>1.989</td>
<td>1.234</td>
<td>1</td>
<td>0.107</td>
<td>7.308</td>
<td>0.65-82.08</td>
</tr>
<tr>
<td>Recent Travel</td>
<td>-1.040</td>
<td>0.900</td>
<td>1</td>
<td>0.246</td>
<td>0.352</td>
<td>0.06-2.06</td>
</tr>
<tr>
<td>Lived in US 6-10 years</td>
<td>-1.853</td>
<td>1.688</td>
<td>1</td>
<td>0.272</td>
<td>0.157</td>
<td>0.00-4.29</td>
</tr>
<tr>
<td>On Medications</td>
<td>-1.317</td>
<td>1.358</td>
<td>1</td>
<td>0.332</td>
<td>0.268</td>
<td>0.02-3.84</td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>0.831</td>
<td>1.336</td>
<td>1</td>
<td>0.534</td>
<td>2.295</td>
<td>0.17-31.47</td>
</tr>
<tr>
<td>Income 9-35K</td>
<td>0.432</td>
<td>1.153</td>
<td>1</td>
<td>0.708</td>
<td>1.540</td>
<td>0.16-14.75</td>
</tr>
<tr>
<td>No English</td>
<td>-0.196</td>
<td>1.100</td>
<td>1</td>
<td>0.858</td>
<td>0.822</td>
<td>0.10-7.09</td>
</tr>
</tbody>
</table>

Note. P≤0.05. Full-time (FT), part-time (PT).
Psychosocial Analyses

*Correlation between SDS-13 to the MMAS-8 and SEAM-9.* Assessing potential biases related to social desirable responses in surveys are extremely important when working with self-report measurements. The MMAS-8 and SEAMS-9 were analyzed for correlation with the SDS-13 to examine whether participants were responding truthfully or misrepresenting themselves in order to manage their self-presentation. The Pearson correlation coefficient, \( r \), was used to examine the results and its value can range from +1 to -1. A value of 0 indicates there is no association between the two scales. Strengths of associations are described as follows: 0.1 to 0.3 is a small positive association, 0.3 to 0.5 is medium positive association, and 0.5 to 1.0 is large positive association. The association is reversed for negatives values. Results of the Pearson correlation to the SEAM-9 and MMAS-8 are listed below (see Table 5.9).

**Table 5.9 Pearson Correlation for SDS-13 and Psychosocial Measures**

<table>
<thead>
<tr>
<th>Scales</th>
<th>p-Value</th>
<th>Pearson Correlation (( r ))</th>
<th>Interpretation of Association to SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMAS-8</td>
<td>0.847</td>
<td>-0.031</td>
<td>Small negative</td>
</tr>
<tr>
<td>SEAM-9</td>
<td>0.185</td>
<td>0.195</td>
<td>Small positive</td>
</tr>
</tbody>
</table>

The Pearson coefficient value for the MMAS-8 and SD S-13 is -0.031. This slight negative value, which is close to zero, indicates no bias or social desirability among patient responses to the MMAS-8 survey. The scores from the MMAS-8 can then be used in the regression logistic analysis without concerns of possible bias from the participant answers.

The SEAM-9 (\( r=0.195 \)) Pearson *coefficient* value had a small positive correlation to the SDS-13, indicating a chance that social desirability may have slightly influenced the results of the survey but not high enough to be a concerning factor for social bias. The SEAM-9 results
were used in the logistic regression analysis with caution. Examining social desirability intention is important when working with behavioral scales because of the risk that people naturally respond to please others when in a public setting. In addition, utilization of the scale can help identify the social bias in research to reduce chances of error in interpreting study results.

**Predictors of treatment acceptance.** Once potential social bias was ruled out for the psychosocial measurements, results from the MMAS-8, SEAM-9 and the CHBMS-29 scales were entered into a binary logistic regression analysis to predict relationship between the scales and the dependent variable of treatment completion. Logistic regression results were as follows: SEAM-9 (p=0.228), MMAS-8 (p=0.468) and CHBMS (p=0.311) (see Table 5.10).

**Table 5.10 Binary Logistic Regression for Psychosocial Measures and Treatment Completion**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Sig</th>
<th>Exp (B)</th>
<th>95% C.I. for EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>SEAM</td>
<td>0.102</td>
<td>0.084</td>
<td>0.228</td>
<td>1.107</td>
<td>0.938</td>
</tr>
<tr>
<td>MMAS</td>
<td>0.153</td>
<td>0.210</td>
<td>0.468</td>
<td>1.165</td>
<td>0.771</td>
</tr>
<tr>
<td>CHBMS</td>
<td>0.107</td>
<td>0.107</td>
<td>0.311</td>
<td>1.113</td>
<td>0.904</td>
</tr>
</tbody>
</table>

No psychosocial measures were found to be significant predictors of treatment completion, likely due to several factors. First, the sample size for this study was too small. A larger sample size would give a better estimate of the population and can detect smaller effects. Only a small number of surveys were answered by the enrolled group and so that could have affected the analysis; thus revealing no significant results. Second, not all participants answered all three of the surveys given. The MMAS-8 had to be administered at least one month after participants started taking Isoniazid in their treatment plan. It was noted that 14% of the participants did not take that survey. If participants were enrolled before picking up their first
month of medication supply, they had to be tracked down on the next visit to complete the MMAS-8. If participants dropped out and or moved away, it was difficult to locate them to administer the survey.

**Summary of Results for Phase 1**

Four specific aims were addressed in this chapter that focused on identifying predictors and rates of LTBI treatment acceptance and completion. Aim 1 examined treatment acceptance rate in the combined group of patients and identified 50 (51.5%) participants accepted LTBI treatment and 47 (48.5%) declined. Aim 2 assessed associations and predictors of sociodemographic and health history variables to treatment acceptance. Results that were significant for both univariate and multivariate analysis for treatment acceptance included those with a history of smoking in addition to those having recent contact to an infectious TB case as predictors to treatment acceptance. Aim 3 examined LTBI completion rate among the enrolled group of participants and found treatment completion among a cohort of 51 participants to be 64.7% (n=33). Aim 4 analyzed associations of treatment completion among the enrolled group of participants using a less conservative p-value of ≤ 0.25 for the univariate analysis due to the small sample size and large numbers of predictor variables. A total of nine variables were found to be significant in the Chi-Square analysis with the top two variables identified as current employment and age group between 18-44 years. For the multivariate analysis, no significant predictors of treatment completion were identified.

The psychosocial measurements administered to the enrolled group were not significant predictors of treatment completion. The lack of significance may have been due to the smaller sample of participants anticipated to enroll in phase 1 of this study. Future studies should
focus on recruiting a larger study sample with at least 10 participants per item on a survey scale. Further discussion of phase 1 results will be examined in chapter 6.

CHAPTER FIVE
Phase 2: Qualitative Results

The purpose of this constructivist ground theory study was to generate a substantive theory that describes and explains the experiences of Vietnamese immigrants making decisions to accept, initiate and complete treatment for latent tuberculosis infection (LTBI). Specific aims for phase two were 1) to explore the perceptions and experiences of Vietnamese immigrants making decisions throughout the LTBI treatment process; and 2) to generate a theoretical model describing factors that influence those decisions every step of the way. Having a firm understanding of key factors that influence Vietnamese immigrants’ decisions to successfully complete their LTBI treatment will assist researchers in improving overall adherence. The semi-structured interview guide used in this qualitative phase was developed from a comprehensive review of the current LTBI literature in addition to guidance provided by a Community Advisory Board (CAB) from the county TB clinic. This chapter will begin with a description of the data collection process including participants’ socio-demographic characteristics. The remainder of the chapter will focus on each step of the Decision Making Model for LTBI Treatment (see Appendix B) by examining major decisions related to treatment acceptance, initiation and completion. Key categories identified to most be influential at each decision step will be introduced and discussed further in details.
Description of the Phase 2 Data Collection Process

Participants recruited in phase one of this study were asked at the time of enrollment to give permission for the PI to contact them at a later time for an interview session in phase two if they were interested. Of the 51 participants enrolled in phase one, 34 were interested and marked yes, 13 declined, and 4 left the question blank. From the 34 participants who agreed to be re-contacted, only 17 followed up and re-consented to participate in phase two. The rest were either lost to follow-up, dropped out from the program, reconsidered, or was not an ideal candidate due to the timing of their treatment. Purposefully sampling was used to recruit participants for the interviews as recommended by the dissertation committee to capture patients’ experience that covered the treatment span of 6 months.

Fifteen interviews were conducted in Vietnamese and two were conducted in English as requested by the participants. Interview sessions lasted between 35 to 70 minutes and were taped in various locations that included: county clinic (41%), participant residence (35%), and local coffee shops (24%). Participants that entered phase 2 of the study were primarily enrolled within the first three months of their treatment regimen, with one third entering the study between the third and sixth month of their treatment plan. Of the 17 participants that were offered treatment, one refused to accept treatment, four made a decision to drop out of treatment on their own, three were dismissed by county officials due to severe side effects of treatment, and nine participants completed treatment.

Socio-demographic Characteristics

The age of the participants interviewed ranged from 18-68 years, with a mean of 45 years (SD=17.6) (see Table 5.11).
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* % Calculated after removing unknown

There were 7 males (41%) and 10 females (59%); 53% spoke English and 47% reported that they had either little or no English skills. The majority of the participants were either married (52.9%) or single (41.2%), and one participant was divorced (5.9%). Eight participants had children. The average income for 11 of the participants was less than $8,925 a year, while four participants reported an income between $8,925-$36,250. Two participants did not want to disclose their annual income.
Educational level ranged from some high school (63%), high school degree (6%) and some college (31%). All participants had some form of insurance coverage although all were qualified to receive LTBI medication by the County. Employment status varied widely, with 35% reported current student status, 18% full time employment, 6% part time employment, 18% unemployment, and 24% retired. Length of time lived in the United States (U.S.) also varied greatly. As depicted in table Table 5.1, the majority (47%) resided in the U.S. for over 10 years, while 41% reported living in the U.S. for five years or less. Of the 17 participants who participated in the qualitative phase and were offered LTBI treatment, 53% completed and 47% did not. Multiple factors played a role in the decision-making process related to treatment completion from beginning to end as depicted in the proposed model and further discussed in the following section.

**Overview of the Decision-Making Model for LTBI Treatment**

Medication adherence is critical for eliminating TB infections and for controlling long-term costs associated with medication resistance. Healthcare providers working with infectious diseases understand the critical role medication adherence has in treatment plans. Unfortunately providers are unable to control their patients’ adherence at home because of multiple social cultural factors that come into play. The constant influence from family, friends, tradition, culture and personal beliefs all affect the drive and motivation of an individual’s adherence behaviors. The choice to be adherent or non-adherent involves a complex decision-making process that is very common among treatment plans involving long-term medication use.

The grounded theory model titled, “Decision-Making Model for LTBI Treatment” (see Appendix A), depicts the complex decision-making process related to accepting, initiating and
completing LTBI treatment for Vietnamese immigrants in this study. The model display three critical decision points and includes key categories most influential to each of those steps.

In terms of the process, once LTBI diagnosis is confirmed through a positive tuberculin skin test (TST) or Interferon Gamma Release Assay (IGRA) blood test result, participants are then asked by the LTBI nurse to accept or decline LTBI treatment at the same appointment visit. This decision is stressful because patients are given very little time to weigh the pros and cons of LTBI treatment and most are not proficient in English to feel comfortable asking questions. Vietnamese translators are available but waiting for one adds additional time to an already lengthy visit at the County. Categories that emerged from the data to support the decision to either accept or decline treatment include Personal Beliefs, TB Awareness, Trust in the U.S. Healthcare System and Personal Barriers. Only one participant out of 17 declined treatment when offered.

The second decision in the model refers to treatment initiation. Those that accepted treatment initiation were given an appointment to return and pick up their first month supply of medication within four weeks. Participants who decide to initiate will maintain their first appointment while those that change their minds will not return for the follow-up appointment. One participant from the study did not return to pick up her medication because of scheduling issues. “Barriers” to scheduling was identified as the category most influential to treatment initiation based on the data.

The final major decision in the model is related to maintaining adherence over six months. Categories that influence treatment completion and success include Self-Determination, Side Effects and Family Support. Altogether, 17 participants were offered LTBI treatment, 9 completed (53%) treatment and 8 (47%) dropped out. The following sections will discuss the
stories and experiences of the Vietnamese participants’ journey with LTBI treatment. Pseudonyms have been assigned to each participant to protect their privacy and will be used when referencing their stories.

Deciding to Accept LTBI Treatment

County officials encourage patients with confirmed LTBI diagnosis to accept treatment, however current policies do not mandate it. All 17 participants in this study had their treatment expenses covered by either private or state insurance; hence insurance did not play a factor in their decision to accept treatment. The following three categories: 1) Trust in the U.S. Healthcare system; 2) TB Awareness and 3) Personal Beliefs were identified as most influential factors related to accepting LTBI treatment and will be discussed in the following sections. Of the 17 participants interviewed for this study, 16 participants accepted treatment and one declined.

Trust in U.S. Healthcare System

Trust in the U.S. healthcare system was one of three major categories that emerged from the data to support Vietnamese immigrants’ decision to accept LTBI treatment. Many immigrants interviewed in this study shared similar beliefs about the corruption they observed in the Vietnamese healthcare system. One participant explained the Vietnamese government condoned inequitable services and catered healthcare primarily to the wealthy. There was a strong consensus that the U.S. healthcare system was superior because of highly trained physicians as well as the technology available to diagnose diseases. When participants were asked if they trust their diagnosis by county officials in the U.S., Mrs. Diep, a 43-year-old participant, replied:
Of course it’s (her diagnosis) correct because here they have specialize programs and research, so of course I would believe them.

Mrs. Diep and her immediate family were recently sponsored to the U.S. by her parents. At the time, she was looking for a job and praised the U.S. for all the services she has received for her family.

Another 57-year-old female participant name Mrs. Kieu, shared her opinion that U.S. technology is far more advance compared to the technology in Vietnam. She believed her diagnosis was accurate when she said:

No, I believe in my results over here. Anything regarding government services here is more accurate here unlike Vietnam. …but sometimes it could be because the machines are not advanced and the doctors in Vietnam are not specialized. They may lack the knowledge compared to doctors over here. . . I believe the tests are more accurate over here.

Mr. Bao, a 57-year-old man who is a recent immigrant to the U.S., had a full TB screening with negative results completed at a well-known TB clinic in Vietnam before arriving to the U.S. Once he arrived here, he was screened by the County again and was found to have scars in his lung including a positive TB skin test. County physicians advised him to start LTBI treatment. He complied because he trusted his results in the U.S. more than the screening he received in Vietnam. He commented:

In Vietnam, they said I didn’t have anything but over there when they ran the tests, I don’t think they have state of the art machines so they couldn’t see the TB bacteria I had like they saw over here in the U.S.
In addition to trusting physicians and diagnostic tests in the U.S., having access to medication regardless of income or status was very important to Vietnamese participants. It was emotionally reassuring for them to trust and know that the U.S. government will treat anyone regardless of their background or income. Several participants felt that people who did not have money in Vietnam were denied treatment because of the shortage of medication. Mrs. Kim, a 68 year-old woman, was not worried about medication shortages here in the U.S. She stated:

Yes, over here they cure TB casually without any worries. Now back home, there is no medication to treat it, but over here there is abundance. So that is why they can cure it here.

Knowing there is no shortage of good medication for the lower income class here in the U.S. eased many participants’ stress and apprehension regarding access to reliable healthcare. Other participants commented on how medication dispensed in the U.S. is trustworthy compared to medications dispensed in Vietnam. Mrs. Hang, a 59-year-old woman, stated:

People have been studying it (medication) for many years here, and then they have to research it a lot before they come up with the medication. It’s not like they just got the medicine naturally.

Trust in the U.S. healthcare system was a general theme that was redundant among many participants despite the difference in their ages. A young participant name Ben, who was a 22-year-old college student, was asked why he chose to accept his LTBI treatment without hesitation. He firmly stated:

I believe in America… I believe in the American medical system… so that’s my belief.
Dung, a recently arrived male immigrant, who was only 24-year-old, expressed how disappointed he was with the corruption in the Vietnamese government’s healthcare. He believed it was developed primarily to only service wealthy individuals. He stated:

So I do believe in the American healthcare system. Just talking about it sounds a bit sad, but that is the truth about the Vietnamese healthcare system.

It was noted that many participants felt their Vietnamese government failed them when they lived there. Several participants went as far as stating they firmly believe the U.S. value human lives more than their Vietnamese government. Mrs. Kim, a 68 year-old woman, stated:

Well over here in the U.S. they have everything. If you need anything, it would be taken care of. For example, they will send you to the hospital if needed. Over here, they value human beings.

Having trust in the U.S. healthcare system to correctly diagnose an infection and offer treatment with safe, quality medication is extremely critical to gain the trust of Vietnamese immigrant participants who have experienced healthcare corruption in their past. To accept six months of medication for an infection with no physical symptoms, a brand new relationship between the provider and patient built on a foundation of trust is required.

**LTBI AWARENESS**

LTBI treatment can be confusing and difficult to comprehend for Vietnamese immigrants new to the U.S. because they come from a country that does not recommend routine treatment for LTBI. Furthermore, their personal experiences with TB infection, such as stories passed down from immediate families and common cultural TB beliefs gave them a different perspective from those that live in the U.S. For example, a common belief shared by a few
participants was the idea that LTBI is very common and everyone in Vietnam has it because of the Bacillus-Calmette-Guerin (BCG) vaccination that was given to all Vietnamese-born children in grade school. The BCG vaccine is often administered in third world countries to prevent TB disease.

Mrs. Kieu, a 57-year-old woman, explained this theory to the researcher when she was asked about it. She stated:

It is because when we were young, everyone had to get the shot to prevent TB, which means if you were young and you went to school, then you got the vaccination. So that is why older people like your parents would think that of course, if they got the vaccine then they would have the TB bacteria in their blood. Some people will have their blood test and it will show in their blood while others won’t. So out of ten Vietnamese people, all ten will say they have latent TB infection.

Mrs. Hang, a 59-year-old woman, also shared her perspective on the same topic. She was very vocal about her opinion and stated she believed every Vietnamese person has the latent infection without referring to the BCG vaccination. For example, county officials offered Mrs. Hang LTBI treatment on two separate occasions. The first time was because she was exposed to a TB case at the nail salon she was employed at. Mrs. Hang explained why she declined that treatment below:

I was feeling normal without symptoms. I know that everyone has the TB bacteria and I felt normal at the time. That is why I don’t feel the need to take medicine.

A year later, Mrs. Hang was offered LTBI treatment again from county officials. This time she was at higher risk because of her direct contact with another active TB case. Her husband of
many years fell ill and was diagnosed with active TB. She had to change her life around to take care of her husband while he was in isolation at home for almost a year. After this experience, she changed her mind and dismissed her previous beliefs about LTBI. At the time of the interview, Mrs. Hang understood taking LTBI medication was her best prevention to avoid active TB in her future.

According to the participants interviewed in this study, very scarce amount of resources were designated for public TB education in Vietnam. The Vietnamese government’s priorities were primarily HIV, smoking and cancer prevention. Trung, a 23-year-old college student that lived in the capital of Vietnam, recently immigrated to the U.S. as an international student. He was asked if he received any TB education when he was in Vietnam or if he had seen any public health announcements when he was there last. Regarding public bulletins, he stated:

Normally they have HIV stuff, but TB stuff...I don’t see very many things on TB in the city.

Due to limited public TB education, people generally were unaware of the severity of TB infection. Lack of TB awareness can lead to inaccurate assumptions and apathy about an infection that can be fatal to individuals and their community. People with correct TB knowledge from trustworthy resources are in a better position to make informed decisions about their treatment compared to individuals with inaccurate knowledge. Health disparities occur when the general public does not have reliable information about infectious diseases to make a decision for themself and their families. For example when Mr. Hung, a 67-year-old retired man, was asked if he knew what the difference between LTBI and TB disease was he replied:

All I know is that when I have TB symptom then that’s when I have TB disease.

Other than that, I don’t know what latent infection means.
Other participants in the study were asked if they could explain the difference between LTBI and active TB infection. Most have a general idea about the primary differences. Mrs. Kim, a 68-year-old female, stated:

Latent TB is when you cannot see the symptoms because it is not active. So you have the infection in your body but you may not know it. It is not until you go to the doctor and they test your blood would they know you have the infection.

Trung, the 23-year-old male international college student did not know what LTBI was. He only learned about it after he received education from the nurse when his tuberculin skin test result came back positive. He commented:

It was pretty easy for me to understand. My vaccine’s reaction was large and so they measured the length of it and then after that they told me I had a reaction. They explained to me that the TB bacteria is inside my body but it is not active so I am not contagious to other people... I went home and ‘google’ it so then I trusted her.

For those with limited knowledge about LTBI, the Internet served as either their source of information or source of confirmation. Participants used the term “google” when asked to describe how they learned about LTBI as noted above. Trang, an 18-year-old female, was another international college student who was recently diagnosed with LTBI at the time of the study. She stated:

Yes, the nurse explained latent TB to me. Before that, I did look into what that meant on the Internet through ‘google’, so when I heard the nurse explained it to me, it was not confusing to me.
Many young participants mentioned “googling” as the new trend in Vietnam for those who have money and are able to afford smart phones or access to the Internet. It is not surprising that young international Vietnamese students interviewed in this cohort relied heavily on the Internet for information here in the U.S. These students’ TB awareness came primarily through the Internet and not from a classroom or curriculum that was taught in Vietnam. A large majority of the participants stated that they did not get any formal education on TB when they lived in Vietnam.

There is still limited understanding for the need to treat LTBI at this time among Vietnamese immigrants living in Orange County (O.C.). In 2012, the O.C. Public Health Department identified 37% of Vietnamese immigrants declined LTBI treatment when offered. Their decision to decline was likely due to lack of TB awareness in the community. For example Mr. Bao, a 57-year-old male, who recently arrived in the U.S. from Vietnam within the last three months stated:

So regarding TB education, if you are educated and read often then you know that TB is dangerous, but most people don’t know. They just know that if you have TB then you have to take medication. They don’t really know anything else. So in general that topic is not heavily emphasized. The Vietnamese government doesn’t really care about the people.

Participants who had personal experiences knowing someone with TB disease in their past had increase awareness of the infection which could have some impact on their decision to accept treatment. For example, although Mr. Bao was a new immigrant to the U.S., he was an educated man back in Vietnam. He decided to accept LTBI treatment because he had accurate
knowledge about the infection and his sister who also went through LTBI treatment encouraged him to accept. He stated:

No I decided it on my own because my sister went through the same thing when she first arrived over here also. It's not from this same clinic…well she just said taking the medication is a good thing to do.

Mr. Tri, a 60-year-old man who is disabled because of a previous stroke, was convinced he needed to accept LTBI treatment no matter what. As an elderly disabled man now, he feared his risk of LTBI reactivation being very high later in life. When asked if he knew anyone in Vietnam with TB, he replied:

Not in Vietnam, but over here my younger brother died of tuberculosis complications. He died about five or six years ago.

The death of Mr. Tri’s younger brother made him more aware of how dangerous TB can be and so he accepted LTBI treatment without any hesitation. Mrs. Thuy, a 40-year-old female and mother of two young little girls, accepted LTBI treatment right away also. When asked if she knew anyone with TB, she replied:

I have an uncle (father’s older brother) who had TB, but they didn’t find out he had the infection until he was admitted to the hospital.

Her uncle at the time lived with her mother in a home she visited frequently with her two younger children. Mrs. Thuy made the decision to accept treatment for her family because she was concerned about falling ill and not being able to care for her kids in the future.

TB awareness is extremely influential to an immigrant’s decision to accept LTBI treatment. Lack of or inaccurate TB knowledge can lead to low perceived threat of infection that can translate to high rates of rejecting free LTBI treatment because of the perception that barriers
outweigh the benefits of treatment. For those who have a more accurate understanding of LTBI and had exposure to a TB case, they were more likely to accept treatment because they wanted to decrease their chances of LTBI reactivation in the future.

**Personal Beliefs**

The last major category in the Decision-Model that emerged under “treatment acceptance” is related to personal beliefs. Three sub-categories were identified. The first is related to personal beliefs securing one’s future. The second is personal beliefs about protecting the safety of the participants’ family and community. The last sub-category is related to personal beliefs about medications.

**Securing one’s future.** Participants talked about accepting LTBI treatment because they want to secure their future and not worry about the possibility of having active TB later in life. Participants believe that if they complete the recommended treatment now, they will no longer have to worry about it again. Dung, a 24-year-old tire salesman, stated:

> I was a little concern about the idea of taking medication because it was strange, asking myself why am I taking medication when I perceive myself to be healthy.

> But after that, I realized I needed to do it because it’s for my future.

Ms. Nga, a 47-year-old single female, shared the same view. She currently works at a company and did not want her future at her current job jeopardized. She valued the importance of taking care of her current infection despite some inconvenience in her schedule. She firmly believed her actions would benefit her in the years to come. She stated:

> Drinking this medication does protect me so that I don’t get the infection in the future.
Protecting the safety of the family and community. Personal beliefs related to treatment acceptance to protect one’s family and community emerged from several participants’ interviews. Mrs. Thuy, a 40-year-old mother of two young children, was adamant that her children were her priority and she was going to do everything in her means to protect them. Her cousins who were also diagnosed with LTBI, at the same time, convinced her not to accept LTBI treatment because of the strict commitment required. Despite her cousins warning, she moved forward with her treatment without any hesitation. When asked why she accepted LTBI treatment, she replied as follow:

I need to take the medication so I don’t infect my young kids because my kids are around me all of the time. If I don’t take the medication and I get sick, then no one will be there to take care of them. So that is why I have to do it because I need to.

Dung, the 24-year-old tire salesman stated his reason for accepting LTBI treatment was for his future. He doesn’t want to be a threat to others or even his potential partner. His response for accepting LTBI treatment was as follows:

Well it is because I don’t want my girlfriend or maybe my fiancé or my wife later on to get the latent infection. I don’t want that to happen, so I need to take care of it the sooner the better.

Mr. Nguyen, a 65-year-old retired gentleman, was very frank about his decision. He understood the benefit of accepting LTBI treatment because as stated below, he wanted to protect the people in his life and did not see the treatment as a big deal.

So I drink it for my health, for my family and relatives. I am not drinking it forever.
The drive to protect one’s own family was definitely a strong influence on the decision to accept treatment for the above participants.

**Personal beliefs.** Lastly, personal beliefs related to medication came up multiple times during the interviews. One of particular interest was the belief that medication from the U.S. is more safe and authentic compared to medication made from Vietnam. This belief lead many participants to accept treatment here in the U.S. despite the rumors of side effects related to LTBI medication from friends and family. Trung, the 23-year-old male international college student shared his view about Vietnamese medication. He stated:

> For example in Vietnam people have beliefs that imported medication is better than medication within the country.

He continued talking about his medication beliefs. Although he heard about the rumors of side effects from western medication, he was convinced that LTBI medication offered to him by the County is beneficial to his condition, despite the potential risk of side effects. He stated:

> I think if our body is healthy then we don’t have to worry too much about the side effects unless it is very obvious and we are of older age then its different.

Immigrants who believed medication was created to help and not harm people were very likely to accept treatment happily. Mrs. Hang who recently accepted LTBI treatment because her husband was diagnosed with TB stated:

> I think that when people create medicine, it should be good for you because its purpose is to treat TB so it should make you better if you complete the medication. It makes you better and shouldn’t be harmful.

**LTBI treatment decline.** Lastly, only one participant out of the 17 that was interviewed did not accept LTBI treatment offered to her by the County. Quynh, a 34-year-old female new to
the U.S, stated her primary reason for declining was because of personal barriers that included her dislike of taking medication since she was a young child. She agreed that her father, who was against taking medication for any symptoms, was very influential in her life. She subconsciously adopted his habits and recalled always refusing to take medication since early childhood. Quynh was asked to further explain why she felt that way and she replied:

Well because my way of thinking all these years, I rarely take medication for anything much. When I get colds, I just deal with it and let it pass. In cases where it’s severe then I will only take it for a few days but then I am already tired of taking it. I feel that the medication is suppose to heal sickness but I see it as a two edge sword. The first part is that it cures illness but I see the other side where it can be harmful to some parts of my body. So the recommendation of taking LTBI medication for six months makes me really not want to take it.

Quynh was also asked to explain why she refused LTBI treatment despite the LTBI nurse’s encouragement and education. She responded:

Well it is because I don’t see or feel myself being sick at this time. So that is why I feel it is ok not to do it because taking medication is just too troublesome.

LTBI treatment acceptance remains a challenge for many patients because of the different factors that influence the decision to accept. For this study on Vietnamese immigrants, Trust in U.S. Healthcare System, TB Awareness and Personal Beliefs all played significant roles in the decision to accept LTBI treatment. Immigrants that accept treatment at this stage are then faced with another major decision soon thereafter. The decision to initiate or not initiate LTBI
treatment depends on what happens from the time of treatment acceptance to the next follow-up appointment scheduled with the LTBI nurse for medication pick up.

**Deciding to Initiate Treatment**

Treatment initiation is the second point in the Decision-Making Model for LTBI Treatment. The 16 participants that agreed to accept treatment from the last decision-making process needed to decide if they would initiate treatment. A four-week gap before the next appointment is scheduled for medication pick up from the time of treatment acceptance. This waiting period is critical because patients get a second chance to reconsider if they really want to take Isoniazid for six months. There is time to weigh the pros and cons during this waiting period. For example, factors that can come into play include: work or school schedule, barriers to making follow-up appointments, stigma related to taking LTBI medication, and lack of time in a day to take the medication. Family and friends are extremely influential during this time period and can offer positive or negative advice to patients.

If a patient decides to withdraw from treatment, the process is very simple. They can call and cancel their appointment over the phone or just not show up to their first appointment. Declining treatment is a simple task without the guilt of having to provide an explanation to a provider. Of the 16 participants that decided to accept LTBI treatment, only one participant did not return to pick up her first supply of medication. The category identified to be most influential in her decision-making process was “barriers” specifically to rescheduling her appointment. Her testimonies will be discussed in the next section. Participants who made it to their first appointment were more likely to continue on with their treatment.
Barriers to Initiating Treatment

One of the biggest barriers to medication adherence in a long-term treatment regimen is the ability for patients to return for follow-up appointments. Patients placed on LTBI treatment are required to return to the TB clinic on a monthly basis to pick up additional medication before they run out. All patients are urged by county officials to not miss their follow up appointment due to the limited appointments available for rescheduling. Barriers to rescheduling were identified by the TB clinic as one of the primary reasons for patient drop out after treatment acceptance. In this study, participants who had jobs or were in school had the most trouble scheduling a return visit for their first appointment. Mrs. Thuy, who was a working mother, discussed her experience with scheduling issues initially. She stated:

So in the beginning I had trouble with the timing of the appointments because it conflicted with my work schedule and the appointments here ended too early. So it was hard for me to get in because of my schedule. It then worked out ok and I was able to make the appointment.

Although Mrs. Thuy had a rough start, she was able to schedule her TB appointments around her work schedule and remained adherent to all of her appointments during her regimen.

Nancy, a 23-year-old Vietnamese college student who was in school to become a school psychologist, faced many barriers to treatment initiation. Her primary problem was rescheduling her first appointment with the LTBI nurse for medication pick-up. Nancy described the process as an impossible task. She stated:

I knew I was going to miss that appointment and I tried to call back, but the phone just kept ringing and ringing and ringing, and I called and called. I looked up a different number, just in general, and I called them and then I was like ‘is there
any way you can get me to a direct person, so I can talk to them to reschedule?’
And they were like, ‘let me just send you to a new office.’ And I was like ‘No!
Get me to a direct person, so I can talk to them to reschedule.’ And I just got so
frustrated and I was like ‘you know what, never mind!’ And I just hung up. So,
there’s that. So, the difficulty is trying to find the time to go and trying to call and
make an appointment to go.

Nancy was asked to comment on her thoughts of being adherent to LTBI treatment if she was to
successfully pick up her medication. She stated:

Yes. I already missed my first follow-up. So, I don’t know the chances of me
following through because even with birth control, I had to stop it because I don’t
remember to take it. So, that’s why. I even wrote it down on your survey. Yeah,
it’s hard for me to remember to take medication.

During the interview, Nancy discussed her other current life priorities and emphasized LTBI
medication was not important to her at this time. Although her father had active TB and was
recently treated, she did not believe she was at risk because she did not live at home for the last
few years. Although she does see him occasionally, she still decided not to initiate LTBI
treatment as advised by the LTBI nurse.

Nancy never returned for her follow-up appointment and dropped out of the program.
Two participants out of the 17 that were initially offered LTBI treatment by the County were
non-adherent to the recommendation. The remaining 15 participants did not experience any
problems with scheduling and picked up their medication on time. They all moved forward with
their medication schedule as planned. The third point in the Decision-Making Model is the most
difficult because the decision to stay adherent is influenced by so many outside factors that are
sometimes not in the participants’ control. The task to maintain strict adherence on a daily basis for six months starts as soon as they take their first pill at home.

**Treatment Completion**

According to the Decision-Making Model for LTBI, the last major decision in the model has to do with maintaining treatment adherence until completion. Major categories that emerged in this phase are: Self-Determination, Side Effects, Self-Management and Family Support. The following section will discuss the journey of the last 15 participants, specifically focusing on 8 participants that did not complete their LTBI treatment due to various reasons.

**Self-Determination**

The word self-determination is defined as the freedom to make one’s own choices without external influences (Dictionary.com). People with self-determination accomplish tasks because they chose to; not because of others advise or influence. These people are self-motivated and will persevere through difficult times unlike those without self-determination who are more likely to give up at the first sign of trouble. Individuals that lack self-determination have difficulty adjusting when situations are not favorable. Two of the 15 participants that entered this last phase dropped out of treatment within the first three months of taking Isoniazid. Their interviews were conducted prior to their decision to stop treatment on their own. Thus, no reason was identified in their charts for dropping out. Lack of self-determination was a possible cause. The following section will discuss their backgrounds and present their interview testimonies to help provide insight to their decision to drop out.

**Dropping out of treatment:** Trung, a 23-year-old single male, and Ms. Lan, a 51-year-old single female, were dropped from the LTBI program by county officials after both
participants missed three consecutive return appointments for their medication refills. Little is known as to why these two participants decided not to return. Besides their gender and age differences, both participants shared a number of similar characteristics, such as both having lived in the U.S. for approximately two years, were currently enrolled at a junior college, and had moderate English skills. Trung showed up to three nurse appointments and Ms. Lan only showed up to the first nurse appointment before they each decided to drop out.

Trung was a full time international college student from Vietnam. He was renting a room from a Vietnamese family in the area and has no family members or relatives living in the U.S. His junior college campus is within walking distance to the TB clinic. When asked what his immediate goals were, he stated:

I plan to stay here to study for four to five years. I will go to a junior college first and then transfer to a university.

Trung is a young healthy man who has a dream to return to Vietnam after he completes his education in the U.S. to work in a large business company in the main capital of Hanoi. During his interview, Trung was asked if he was concerned about his LTBI diagnosis and the effects it may have in his future. He smiled and replied:

When I hear the word TB, I am a bit scared if it is active with symptoms because it can hurt the body. But because it is latent, then it just feels normal to me. So I don’t feel scared.

Trung’s apathetic emotions toward his LTBI diagnosis could be a reason he was not determined to continue his treatment. He shared that his mother from Vietnam often called him to give him advice about his decision including his most recent decision to accept LTBI treatment. His mother told him that many people in Vietnam have LTBI including herself. He shared that she
did take medication for her infection over 20 years ago and did fine. When asked if he thought people born in Vietnam all had LTBI, he replied:

Yes so I did hear of that... so it’s just latent TB. It is because...well I am not too sure why but many people do have latent TB. I spoke with my mom in Vietnam about it and she agreed that there are many in Vietnam that has latent TB infection.

He was then asked to talk about his understanding of LTBI and what he believed his chances of getting TB disease later in life. He said:

Well I think latent TB is not active in my body, but if my body is weak then it has the ability to activate and turn into active disease. Now if you already have TB then your body is weak and your immune system cannot fight it back.

Trung was also asked if he believed LTBI medication was good or bad for his body. He commented:

I think it is helpful for my body, but I also know it can also be harmful to my liver because this medication is a bit poisonous to the liver.

Although Trung understood taking LTBI medication could prevent him from getting TB disease later in life, he was a bit skeptical about taking six months of Isoniazid for infection he does not have symptoms for. In addition, he believed his chances for re-infection in the future could depend on where he lives and the possibility of being re-exposed to TB again. He stated:

Taking medication is only for now, but later on we don’t know what may happen.

Now that Trung has lived in the U.S. for several years, he noted a difference between the U.S. and Vietnam’s healthcare. He valued what he has over here and believed the U.S. is a very
powerful place that can cure anything. When asked if he was afraid of getting TB later in life, his response was:

I think since I live in the US, the chance of getting TB disease later is low.

Not worrying about the future is common for young adults especially when their priorities in life are centered on their immediate goals. For Trung, it was to graduate from a U.S. college. He was also not determined to complete his LTBI treatment because his chart indicated he missed a total of 12 pills within the first three months of his treatment. Although he did not provide the county with a reason for dropping out, it could be implied that his busy school schedule, personal beliefs and lack of determination may have led him to be non-adherent to his treatment plan. Additionally, living in the U.S. may have given him a false sense of security that anything can be cured. Low perception of disease susceptibility, coupled with an infection that is asymptomatic, may have also influenced his decision to drop out.

Ms. Lan, on the other hand, had a slightly different story, but her concern related to LTBI treatment was quite similar. She discussed her understanding of where LTBI came from and how it could turn into an active infection in the following excerpt:

So this is my understanding. In Vietnam, lets just say for accuracy, those who did get a little education and were willing to study.... learned in school that everyone has the TB bacteria in their body that is latent or sleeping but whether or not it becomes active is dependent on if our body is weak. Then it will be active.

The common belief that everyone in Vietnam has latent TB was heard from Trung’s interview also. Mrs. Lan shared similar views about the triggers of LTBI reactivation. She was asked to
elaborate more on that belief and to share her thoughts about the possible triggers of LTBI reactivation. She commented:

So the belief among Vietnamese people is that everyone has the TB bacteria in their body, so when one over exerts energy, or is over worked without the proper nutritional replacement for their body, then they will get TB disease.

Mrs. Lan believed that her latent TB infection would not reactivate if she kept her body healthy through proper nutrition, exercise and regular sleep. This was a very common belief shared by multiple participants in the study. She also believed that the purpose of LTBI medication was to help her body stay strong so she can eat and sleep well. She stated:

Well I think LTBI medication is there to help get rid of the infection. So I have always known that TB comes from lack of sleep and poor nutrition. So the medication they give is supposed to prevent um …I mean it prevents lack of sleep and keeps your body healthy so you can eat well. Like I said, lack of sleep and poor nutrition is what turns latent TB into active TB…I think the medication makes my lungs work better and prevents TB from occurring. That is my thoughts.

Ms. Lan does not have accurate knowledge about LTBI medication even though she already met with the LTBI nurse and was educated on LTBI during her first visit. At this point in the treatment plan, she finished three weeks of medication by using the alarm on her watch as a reminder and reported no side effects. When asked if she was concerned about the stigma associated with taking LTBI medication, she replied:

Oh no, I am not afraid of anything like that over here. I am not afraid. I have a younger brother who lives here, and when I told him about it, he
said ‘Oh that’s ok. It’s nothing to worry about.’ I don’t need to hide anything. It might just be my personality, but I think it’s a good thing they know I am taking medication especially being over here… People who worked in the same restaurant I was at are uneducated and more likely to be afraid, but not me.

She was then asked if she was concerned about her current LTBI diagnosis and the possibility of reactivation later in life. She stated:

I believe that TB cannot kill anyone. For example, if I do not take my medication and I end up getting sick, they can still cure me. I also believe that if I have other problems or symptoms, they are able to take care of me over here. I am not worried that they can’t treat any illness I have. Oh no, not over here! I am not worried about that at all. Like I mentioned, my father had TB but his infection was treated one hundred percent. My grandmother also had TB that was severe and was treated too. My uncle also did well. So you see, that is why I am not afraid of TB at all. That infection is not something that cannot be cured, so why be afraid.

Ms. Lan was definitely more concerned about cancer than TB because she had relatives and friends in Vietnam that recently passed away from breast and stomach cancer before she came to the U.S. She was at their bedside and witnessed everything. For Ms. Lan, dropping out of LTBI treatment after the first month was likely due to her busy schedule and lack of self-determination to stay on a strict daily routine for an infection she did not have symptoms for. Although she understood the importance of taking LTBI medication and believed she was diagnosed correctly, it was not an immediate threat to her.
Two participants that dropped out provided testimonies of their thoughts and beliefs about LTBI. Both accepted treatment at the beginning and both went to their first LTBI nurse appointment. They were genuinely interested and wanted to be on treatment. However, the lack of motivation to stay on a strict regimen was likely due to their schedules since both were college students. Rescheduling appointments is not an easy task to do at the county TB clinic as Nancy had shared earlier. Low perceived disease susceptibility was likely the main reason for Trung and Ms. Lan dropping out at this point in their treatment plan.

For the remaining 13 participants who agreed to accept and start their medication, self-determination played a major role in their decision to remain adherent over the next six months of their lives. These participants made a decision to complete their prescribed treatment, so pill taking became a routine and not a chore. Participants with other chronic medical conditions had an easier time taking their Isoniazid because they already had a pill schedule and only needed to add one more pill to their routine.

For example, Mrs. Hang was asked if she felt pill taking was a burden to her daily routine. She explained:

Before I leave anywhere, since I know I have an illness, I just have to remember to bring my medicine. For me, everywhere I go I also have my cholesterol medicine, my hypertension medication, and my asthma medication. So I would always have my medicine by my side in my purse just in case because of my illnesses. So I just have to take care of it.

Others made pill taking a part of their daily routine so there was minimum disturbances in their daily schedule. Miss Nga worked, but she incorporated it into her routine as noted below:
I work the night shift so I take it around 12 am. It is pretty easy to remember because at break time I take it and when I get home at 1pm I just go to sleep.

For Mr. Bao who is unemployed, he made pill taking a daily task before he went to bed every night. He stated:

Well I put a note at the top of my bed where there is a mirror and I paste it there. So every time I go to bed, I would see that note and take my pill.

Mr. Hung, a 59-year-old retired man, believed pill taking was such an easy task and not much of a problem at all. He takes it daily and states he never forgets.

Before I go to bed...which is after dinner before bedtime. I just leave the pill there so before I go to sleep I take it.

Mr. Hung was praised for his attitude towards pill taking and was asked what he thought about other patients who are non-adherent to their daily medication. He stated:

I don’t know what they are talking about, you don’t forget. Those who forget are the ones who go to parties, weddings, or birthday parties...or some other event. They are too busy having fun so they go to sleep forgetting to take their medication, which is very normal.

Ben, a young college student, also shared how he took his daily pill without forgetting. He stated that having a routine is a consistent way to remind him to take his medication. He shared:

I put my medication on the right side of my computer desk and my calendar in front of me. So, it’s always there, you know.

Although these participants all have routines to help them remember take their medication, the determination to keep the momentum going was noted to be inspired by their
concern of LTBI reactivation in the future. Most of the participants understood that if they do not take their daily pills as prescribed over the six months period, their body will either become resistant to the medication and their chances of having TB disease later in life will increase. Mr. Bao was asked if he could keep up with his daily medication and he stated:

I would just have to try because drinking any other medication you can drop anytime, but drinking to prevent TB, I would have to finish taking the whole prescription. Stopping half way is dangerous and the risk of getting TB is even higher.

Ben understood the possibility of medication resistance if he did not take his pill on schedule each day. He stated:

But if someone that doesn’t take it like half the time then the medicine becomes ineffective and the TB bacteria probably will learn how to fight back.

Mrs. Kieu was very proactive and asked a lot of questions about her diagnosis. She made sure she understood her commitment when she accepted to start treatment. She asked the LTBI nurse to explain the pros and cons of LTBI treatment in details. She stated:

I did ask them what could happen if I don’t take the medication and they told me that if I don’t take the medication then later on in life when I am much older and weaker, I can get the TB disease.

Trang, an 18-year-old female college student, understood it as noted below:

Well it is because right now my body has the bacteria. I already have it, but it is just not visible yet. So my body immune system can still suppress it at this time but one day it can become active.
For participants who have made a decision to initiate taking Isoniazid for six months, they all have a good understanding of their LTBI and prognosis. At this point, only 13 participants remained in the study. A total of 4 participants have decided to drop out of treatment on their own.

**Experiencing Side Effects**

Adverse reactions are major side effects caused by taking a specific medication. It may occur following a single dose or prolonged administration of one drug or multiple drugs. Adverse events are unpleasant physical symptoms that occur after the ingestion of a medication without direct causal relationship.

Less than 1% of patients taking Isoniazid for LTBI treatment suffer from side effects related to clinical hepatitis (Chee et al. 2012). Eight participants from this study experienced various side effects during their six months treatment. Three (20%) suffered from adverse reactions and five (33%) suffered from adverse events. However, only four participants dropped out treatment during this phase due to side effects. Altogether 8 out of 17 participants (47%) that were offered LTBI treatment at the beginning did not complete their LTBI treatment. The following section will discuss the experience of the participants that reported side effects during their treatment.

**Severe side effects.** Three participants, Mrs. Kieu, Mr. Bao, and Mr. Tri, suffered major side effects from Isoniazid and had their treatment terminated early by the county doctor. Mrs. Kieu and Mr. Bao experienced their side effects after they were interviewed for this study. Their testimonies were not captured during the interview but their clinic charts documented the reasons for discharge. Mr. Bao had consecutive elevated liver enzyme results two months after treatment was initiated and Mrs. Kieu suffered from a pulmonary embolism that required hospitalization.
for treatment. The county doctor ruled both participants’ symptoms as adverse reactions and referred both cases back to their family physician for follow up care. Mr. Tri, the third patient terminated for an adverse reaction, initially reported severe gastrointestinal symptoms and was being monitored by the county doctor at the time of his interview. When Mr. Tri was asked to describe the symptoms he experienced during his treatment, he stated the following:

Oh at that time I had a lot diarrhea and when I urinated it was red. My stool was red for three days, then it stopped. So I started taking the medication again and it happened again so I had to come back in.

This participant wanted to continue on with his treatment because he felt the need to get rid of his latent TB infection. His younger brother died of tuberculosis complication five years ago and his older son was recently diagnosed with TB by the county clinic. Mr. Tri was determined to continue with his treatment and wanted to try other medication options. He stated:

I am taking the medicine because I want to prevent the infection. I am sixty years old. So maybe ten or twenty years later I may get the disease. I should prevent it now because it is better.

A few weeks after the interview, the county doctor terminated Mr. Tri’s treatment early and referred him to follow up with his family doctor for further management of his gastrointestinal problems.

Patients on LTBI treatment can experience a variety of symptoms that mimic side effects during the six months period of their regimen. These adverse events are often mistaken as side effects from Isoniazid by patients and are usually the primary reason patients choose to discontinue their treatment.
Five participants in this study reported minor side effects but were not terminated from the program by county officials. Mrs. Kim, a 68-year-old female, decided to discontinue her treatment because she believed her symptoms were caused by Isoniazid ingestion despite the county nurse’s explanation that it was not likely. She described her experience as follow:

I took it for about one week before I started feeling the side effects. When it happened the first time, I remember that morning I couldn’t wake up. My body was extremely weak and limp. I had to call my husband in and I told him that I don’t know why I can’t get up even if I tried. So then he held my hands and pulled me to sit up. Then I came in here (clinic).

Mrs. Kim had her own set of beliefs and fear of medication before she started her treatment, but she decided to start Isoniazid after talking with the LTBI nurse. However, the unpleasant physical symptoms she experienced after taking the medication made her extremely nervous. She explained what happened in more details:

Well normally I can sleep but specifically those days I had so many strange dreams and had trouble sleeping…well then my body felt like it was falling into pieces. So after that day I did not take the medication again. Yes I had no energy and strength. I was so healthy and then all of the sudden I felt like I was falling apart.

When Mrs. Kim followed-up with the LTBI nurse regarding her symptoms, the nurse ordered a complete blood work-up including urine tests and vitals. Everything came back normal and Mrs. Kim was reassured that her symptoms were not related to Isoniazid ingestion. The nurse offered Mrs. Kim a different LTBI medication and the following was her response:
I don’t want anymore medication. I believe I don’t have the TB infection in my body and that they just want to give it to me as a prevention. Since I am of old age and weak, my body cannot handle the medication. So I asked for permission to not take any more medication that day I saw you at the clinic.

Mrs. Kim was very skeptical about her diagnosis and the need for her to be on LTBI treatment. She weighed the pros and cons of her decision and decided not to come back for anymore medication. She took herself off LTBI treatment and her case was closed.

**Self-management of side effects.** Four other participants who experienced mild side effects from their LTBI treatment continued on their treatment to the end. All four participants self-managed their own symptoms and were not afraid.

Dung, a 24-year-old male, developed a minor rash and pruritus sensations in the middle of his LTBI treatment. He has a known history of mild food allergies that was under control. Dung was confident his symptoms were related to his food allergies but still notified his LTBI doctor for reassurance. He explained:

Yes, I am lucky that I don’t have any side effects from the medication. Occasionally I do get a little itchy but it was probably related to what I ate. I get allergic hives when I eat shrimp or anything that is seafood. But I did double check with my TB doctor and asked him about the symptoms I was experiencing and he told me that it was due to me eating certain types of seafood which caused eruption on my skin, but after some time if I don’t eat it anymore then it doesn’t come back. What’s important is that when I am having an infection and I am under LTBI treatment with medication, I need to communicate with my doctor when I get any side effect symptoms. I believe I shouldn’t be too quick to
blame the rash on the foods I recently ate or think the reaction is a normal allergic response while I am taking latent TB medication.

Dung moved forward with his medication regimen and completed his treatment in six months as prescribed by the county doctor.

Miss Nga, a 47-year-old female, was asked if she experienced any side effects from taking Isoniazid during her treatment. She stated:

No in general nothing changed recently. My body just feels hot but I am still healthy.

The word “hot” used by Miss Nga is a common word that was repeated in other Vietnamese participants’ interviews also. For Miss Nga, she defined the word “hot” as follow:

Hot means for example your body is constipated or your face now has acne all over. It does not mean a fever. It may cause hives but I didn’t have those symptoms.

The word “hot” used in the Vietnamese culture depicts sensations and feelings of imbalance usually related to ingesting western medication. According to Miss Nga, her symptoms were not of a concern to her. She stated:

I can still work and do things the same. It is just hot because I am having acne and trouble using the restroom, so it makes me feel uncomfortable.

She shared that her constipation problem did not start until a few months into her medication regimen. She did not feel the need to discontinue her medication and found ways to treat her symptoms at home without following up with the county nurse or doctor. She explained below why she did not schedule a follow-up appointment.
Regarding my bowel issues, I would just have to watch what I eat like eating less rice and meat and eating more vegetables and drinking lots of water. As for other symptoms like acne, I just have to put on over the counter creams to treat it. So it’s not like I have to call the nurse right away with these symptoms and expect to come down to get checked for it. A lot of time they can’t accommodate my needs and it is harder to walk in too. So it’s better for me to self-treat through eating right and following the doctor’s recommendations.

For Miss Nga, it was easy for her to self manage the minor side effects she experienced. She had self-determination and wanted to complete her LTBI treatment for herself. She went on to complete her treatment as prescribed.

Mrs. Thuy, a 40-year-old mother of two young children, also reported acne symptoms similar to Miss Nga, but her condition was more severe. She stated:

In the beginning I didn’t have anything. But I remember around July and August of this year, all of the sudden the skin on my face started having pimples. There were a lot of them to the point I was scared and ran to the clinic to tell the nurse and she wasn’t sure if it was the medication or not. So she tested my liver and told me it wasn’t my liver that caused it. So what she just told me was that, it could have been related to my irregular periods during those months which may have affected it but I was hoping that now I am done with the medication I won’t have it anymore.

Mrs. Thuy made the right decision by going in to see the LTBI nurse for advice and not discontinue the medication on her own. She took time to think about her decision and did not immediately blame her condition on Isoniazid. The LTBI nurse did order blood tests to ensure
her liver was not the problem, since Mrs. Thuy was most fearful of that. The negative lab results gave Mrs. Thuy piece of mind to continue on with her treatment. However, as time went on she experienced other mild symptoms such as irregular menses and feelings of dryness or “hot” conditions in which she self-managed at home. She described her symptoms below:

When I was drinking this medication it took like many months for me to finally get my period back regularly. It has now been several months. But my body, felt like… like it was missing water the whole time. It made me feel like I need to drink more water than usual.

Mrs. Thuy managed her sensations of feeling “hot” by increasing her daily fluids until her treatment was completed. She was able to take care of her problems and had no interruption throughout the entire six months. When she was asked to explain what her definition of feeling “hot” was, she replied:

So when your body is hot…um. Well I have seen and heard of people who have taken this latent TB medication say that it makes the body “hot” such as your body needing more water, and when others are cold you don’t feel cold. For example, if its cold and people feel the need to put on their sweater, people like me don’t feel that way and won’t put on our sweater…it’s not a “fever” like when you get a temperature. You only get the sensation that your body is hot inside.

Despite her acne, irregular menses and “hot” symptoms that made her feel dry and dehydrated, Mrs. Thuy was determined to complete her LTBI treatment. As mentioned earlier in her interview, she is completing LTBI treatment for her children because she wants to be healthy and not have the fear of passing a potential infection to her children.
Trang, an 18-year-old college student, also reported mild side effects during her treatment. She developed a few minor symptoms during the winter season and admitted to treating herself with over the counter medications at home. Trang did not feel the need to report her condition to the LTBI nurse and wanted to take care of things herself. She stated:

Well I stopped it on my own and several days later when I felt back to normal I restarted the medication again.

When asked if she forgotten or missed any pills during her treatment, she commented:

I actually stopped taking my pills for those three days because I had headaches and bloody noses but it was because of a cold I had.

Trang understood maintaining adherence to her treatment was important. She understood the difference between medication side effects and the common cold. Trang reads a lot about LTBI symptoms on google and had all her questions answered by the LTBI nurse before she initiated treatment. Due to her confidence and self-determination, she finished her six months of treatment without any interruption.

Side effects have been cited as one of the most common reason patients stop LTBI treatment prematurely in the literature. Eight (47%) of the 17 participants in this study reported some variation of side effects from taking Isoniazid long term. Three were dropped out by county officials, one discontinued on her own and four self-managed their symptoms to move and complete treatment. Altogether, only nine participants that were offered LTBI treatment at the beginning of this study made it to the end and were given a certificate of LTBI completion by the County. The treatment success rate for Isoniazid was only 53% for this cohort of patients. The last category that emerged to support the nine participants completion of treatment was Family Support.
**Family Support**

The final category influencing participants LTBI treatment success is Family Support. Family members support or lack of can play a crucial role in a participant’s decision to accept, initiate and complete LTBI treatment. For this study, only one participant (Mrs. Thuy) had relatives that tried to sway her from accepting treatment. However her determination to accept and complete treatment for her children was far more important than their opinions. For the rest of the participants who completed their six months of treatment, family support was very important for their success because they helped participants stay on their daily medication routine.

Participants were asked if they had any support throughout their treatment. Mrs. Hang, a 59-year-old woman whose husband is currently under TB treatment stated:

> Well my family supports me, and my kids remind me that I am suppose to take my medicine. They said ‘mom and dad both have the problem so you both should keep taking your medicine.’

Mrs. Diep, a 43-year-old woman, and her entire family were placed on LTBI treatment because they all had a positive tuberculin skin test (TST) upon arrival to the U.S. She was in charge of making sure everyone took their pill daily. When asked if she had any difficulty making her family take their LTBI medication daily, she said they did not have a choice. She explained her role as a mother is to remind everyone to take their pill when the alarm goes off. She stated:

> I put it (alarm) on my phone so when the time comes I just drink it and hand out the medication evenly to all four of us (husband and two kids).
Mrs. Diep took on the role to ensure everyone is adherent to their LTBI treatment including herself. Her youngest daughter, who was only 12-years-old, took her own medication without any problems.

As for Mr. Hung, a retired male, his wife and adult children were very supportive of his treatment as well. At 67-years-old, he sometimes still need a little reminder from those around him. He stated:

There are times when my daughter reminds me. She would say ‘dad don’t forget to take your medication’.

Mr. Nguyen, a 65-year-old male, talked about how supportive his family was before he picked up his medication. He described his wife and sisters nagging him about starting his medication. The following except was his description of the incidence:

So my wife asked me why I wasn’t taking the medication. I said if they tell me to then I will. But I kept waiting for them (County) to call. She told me why don’t I contact them to get my medication. I told her they said it would take a few weeks so we can just wait. So my wife, I am sorry is nervous, started talking to my sisters and told them that she thought I didn’t want to ‘cooperate’ and take the medication ordered. Then my younger sister called me and told me to take my medication. I told them ‘I don’t have any medication to take yet, no one gave me anything.’ So I asked ‘why everybody has to get so nervous like this?’ In the case I have medication but I shake my head no and don’t want to take it, then that is a problem.
Mr. Nguyen had no problems completing his treatment once he started Isoniazid because his wife was very involved in his daily routine and would not allow him to forget his pills. His sisters did their part to remind him when they visited him weekly.

Miss Nga, a single 47-year-old woman, lived with her elderly mother and younger brother. She was very responsible at taking her medication, but was happy that her brother was there to remind her on days when work kept her busy. She stated:

My sibling is supportive. My younger brother always reminds me to take my medication. He usually reminds me that I have an infection, so I need to take all of my medication, because if I don’t and it gets really bad then I might not be able to get rid of it and it might lead to death, which he is fearful of.

The statements above described how family members play such a critical role in helping participants make the decision to accept, initiate and complete LTBI treatment. Of the eight participants that did not complete LTBI treatment, four participants that reported single status dropped out of treatment. The other four dropped out because of symptoms related to side effects as mentioned earlier. Participants that lack family support have no one to hold them accountable for their decisions. Those participants are more likely to drop out of treatment as seen in this study. For the nine participants that completed their treatment, having family support played a very important role to their treatment success.

Summary

The Decision-Making Model for LTBI treatment depicts a complicated process that describes multiple stages and factors that affect an individual’s decision to accept, initiate and complete treatment once a diagnosis have been made. Multiple categories emerged from the
participant interviews that influenced each major decision in the model. Personal Beliefs, TB awareness and Trust in the U.S. Healthcare were categories that had the most impact on treatment acceptance. Scheduling barrier was the only significant obstacle to treatment initiation. For treatment completion, Self-determination, Self-management of side effects and Family support were the three major categories that were most influential.

Of the 17 participants that were offered LTBI treatment, 9 participants (53%) completed the full six-month regimen. These 9 participants shared similar thought patterns and decisions that lead them down the path of treatment completion. Influential factors that drove them to accept treatment include having trust in the U.S. health care system, TB/LTBI awareness and personal beliefs that support the use of medication for treating infections and diseases. All of these participants initiated treatment after agreeing to accept because they did not experience barriers such as scheduling concerns. The main influencing factor that kept them adherent to completion was their self-determination to get rid of their infection and to protect their own future and family from any chance of acquiring the infection. Self-determination coupled with family support were the main influencing factors the helped these participants complete treatment.

A total of 8 participants (47%) did not complete treatment. County officials dismissed 3 participants due to the seriousness of their side effects. Of the remainder five participants that did not complete, two did not state a reason for dropping out. The last three participants gave reasons for not continuing on that included: barriers to scheduling, perceived side effects related to Isoniazid and not wanting to take any medication. Chapter 6 will provide a further discussion of the findings from phase 2.
CHAPTER 6  DISCUSSION

PHASE 1

Quantitative Discussion

Foreign-born Vietnamese TB case rates have slowly been on the rise at the national level, moving from 7.2% in 2012 to 8.1% in 2014 (Morbidity Mortality Weekly Report [MMWR] 2014). Currently this population is only second to the Philippines with the most annual TB cases reported among the Asian population. Moreover, in Orange County California, foreign-born Vietnamese have persistently ranked first with the most TB case rates for the last five consecutive years, thus increasing the risk of TB morbidity and mortality in the Vietnamese community (Orange County Health Care Agency [OCHCA], 2014). At this time, there is a paucity of literature on the predictors of latent tuberculosis infection (LTBI) adherence rate among Vietnamese immigrants or their behaviors towards completion of LTBI treatment. Our study is one of the first to examine predictors of LTBI treatment acceptance and completion specifically for Vietnamese immigrants. This phase 1 section will include a discussion of the quantitative findings with comparison to similar studies in the literature.

Major Study Findings

For the multivariate analysis, recent contacts to an infectious TB case and history of smoking were identified as predictors to treatment acceptance. No significant multivariate predictors were found to be significant for treatment completion. As for the analysis with the three psychosocial measurements (SEAM-9, CHBMS-29, MMAS-8) to treatment completion, there were also no significant correlations identified. The small sample size (n=51) of the enrolled group could have contributed to the insignificant findings.
LTBI Treatment Acceptance

For this section, results are presented for the combined group (n=97), which includes the enrolled group (n=51) and data from the comparison group (n=46) in the analyses. LTBI adherence studies should report rates for treatment completion to include all those that accepted and not just for those who initiated treatment, as they both are equally important to determine true rates of adherence. Otherwise, the findings can be skewed and the overall interpretation of the reported completion rates appear higher than what may be actually apparent. For this study, the completion rate is calculated to include all those who accepted LTBI treatment.

Treatment acceptance rate. In our study, the combined group (n=97) observed an acceptance rate of 51.5% (n=50), with the primary predictors to include smoking, recent contacts to an infectious TB case, recent travel out of the U.S. and being between the ages of 18-44 years. These characteristics describe a younger group of immigrants who may have some fear of LTBI since most have recently been exposed to an infectious TB case. Several large-scale studies in the literature reported much higher treatment acceptance rates than our study. A large LTBI study (n=1692) conducted by Colson et al. (2013) across North America examined LTBI treatment acceptance in a diverse population including Asians (29.7%) and foreign-born immigrants (73.2%). Of the Asians who qualified for LTBI treatment, 88.2% accepted treatment. Parysan et al. (2007) reported an overall acceptance rate of 91.2% (n=1572) in their clinical cohort in which foreign-born and US-born patients (n=1572) with LTBI were assessed at an urban TB clinic. In this sample, 9% were Vietnamese participants. Investigators of the study believe the high rate could be an overestimate because the total numbers of those referred to the clinic was unknown.

Horsburgh et al. (2010) reported 82.9% LTBI treatment acceptance in their study
population consisting of U.S. born and foreign-born (49.1%) ethnic minorities. High rates of LTBI treatment acceptance in all three studies could be attributed to the diverse population that was recruited to include both US-born and foreign-born individuals, including health care workers and the homeless population. Lack of homogeneity in large samples makes it difficult to interpret results and most acceptance rates were not stratified according to ethnic groups. Asians were also underrepresented in a majority of the large multi-center studies; therefore, those results were minimally useful to improve understanding of adherence problems in Asian minority groups.

Predictors of treatment acceptance. Factors that were significant predictors of treatment acceptance for the multivariate analyses in the combined group included smoking and recent contacts to a TB case. Vietnamese immigrants with both of these characteristics are more likely to accept LTBI treatment compared to the other groups because a history of smoking increases the risk of lung infections and even cancer. Someone who has that risk factor and has been exposed to a recent infectious TB case probably views himself or herself more susceptible to converting to active TB later down the road. Contact to an infectious TB case was also reported by a large LTBI study consisting of 52.7% foreign-born participants as a significant factor to accepting LTBI treatment (Horsburgh et al., 2010). Colson et al., (2013) identified predictors of treatment acceptance in their cohort to include high TB knowledge, convenient clinic schedules, low acculturation scores and believing that one could personally spread TB germs to others.

Participants with high TB knowledge and those with low acculturation scores represent two different subgroups within one large cohort. The more knowledge participants have about TB infection, the more likely they would accept treatment because of their understanding of the disease process. Those with low acculturation are usually foreign born immigrants with limited
or no English skills. This subgroup may be more willing to trust their diagnosis by U.S. providers and be more receptive to accepting free public health treatment for their LTBI.

There is still a current lack of consistency in LTBI adherence studies regarding predictors of treatment acceptance in the literature. This discrepancy may have stem from the major differences in patients’ background and numerous treatment options regarding medications and regimens for LTBI treatment.

**Reasons for declining treatment.** Participants’ self report reasons for declining LTBI treatment in our study include self-report of past LTBI treatment without documentation (37%), concerns with medication side effects (17%), and the belief that they are not sick and did not need medication (15%). Colson et al. (2013) reported similar findings confirming reasons for treatment non-acceptance in their foreign-born cohort to also include previous recommendation of LTBI treatment and those who anticipated having problems taking TB medicine.

Treatment acceptance continues to be a huge problem in foreign-born immigrants due to fear of medication side effects and perceived low risk of disease advancement due to lack of symptoms. Health care providers should focus on offering targeted education with accurate information on the rates of possible side effects and the efficacy of LTBI medicines to ease the concerns of Vietnamese immigrants so they can understand the importance of accepting LTBI treatment.

**Treatment initiation.** Identifying the rate of treatment initiators is critical to a better understanding of LTBI adherence as those who fail to return for treatment initiation are classified as non-adherent patients. More efforts should be focused on reaching this population to better understand their barriers to treatment initiation. Measures must be taken to include these individuals in the final treatment completion reports and address the issues related to their
We reported in our study an 86% initiation rate among Vietnamese participants. This rate is higher than other studies in the literature that ranged from 26% to 83% (Goswami et al., 2012; Horsburgh et al., 2013; Nuzzo et al., 2015). Our higher initiation rate is likely due to the very small enrollment sample of 50 participants that accepted treatment for LTBI. In addition, the Vietnamese immigrants enrolled shared very similar socio-demographic and clinical characteristics such as English speaking, recent contacts to an infectious TB case, and having lived in the U.S. for over 10 years. While we did not analyze predictors of treatment initiation as the sample size was only 7, only one study in the literature reported an extremely low rate of treatment initiation of 26% in their study cohort (Goswami et al., 2012). The low rate could have been related to the diverse study population background. Approximately 65% of those enrolled were foreign-born adults with 87% from various ethnic minority groups that included Hispanics, African Americans and Asians. All of the participants were receiving LTBI treatment from a public health TB clinic at the time of enrollment. Investigators of the study found predictors of treatment initiation to include close contact with an infectious TB case, non-employment, lower educational levels, having a regular provider, and fear of getting sick with TB. Of those that initiated, 54% successfully completed the prescribed treatment.

Treatment non-initiation. Participants who do not return to their follow up appointment for medication pick up are classified as non-adherers. Very little information is available to describe this group of patients in the literature, and even less has been documented by clinics as to why they do not return. For our study, a total of 7(14%) participants did not return after agreeing to accept LTBI treatment. The most common reasons were being too busy and not wanting treatment anymore. The only study identified in the literature by Goswami et al. (2012)
reported predictors of treatment initiation. These predictors included the following: non-employment reason for screening, close contact to an infectious TB case, and history of incarceration. The group of treatment initiators identified by the investigators all had a reason to treat their LTBI infection, especially for those with a history of incarceration or recent TB exposure. As for those who got tested for non-employment reasons, their motive for testing is unknown. However they may need TB clearance for personal reasons that made them more likely to accept treatment for their own benefit.

Our numbers are comparable to other LTBI non-initiation rates of 9% to 34% in the literature (Colson et al., 2013, Horsburgh et al., 2010, Parysan et al., 2007; Nuzzo et al., 2010). The most frequent reasons reported for failure to return to the first follow up clinic visit was either lost to follow-up or busy schedules. Although only 14% did not return to initiate treatment in our study, those individuals are automatically categorized as non-adherent and are included in the overall number of treatment non-completers for the county report. Non-initiators have a 5% to 10% risk for reactivation TB in their future, therefore, extra measures need to be taken to screen them for barriers to treatment initiation. In addition, providing culturally sensitive LTBI education on the risks of reactivation when patients are first diagnosed with the infection could be helpful.

**LTBI Treatment Completion**

*Treatment completion rate.* As stated earlier, it is critical to calculate LTBI treatment completion rate based on all participants who accepted treatment and not focus just those who initiated treatment as the latter action will inflate the overall percent of completion rate. Due to the inconsistencies of how treatment completion has been determined in past studies, reports of LTBI treatment completion rates have varied widely from 22% to 90% according to a systematic
review by Hirsch-Moverman et al. (2008). Since more recent LTBI studies have been publishing treatment completion rates to include all individuals that accepted and initiated treatment, there have been more consistent completion rates reported with smaller ranges between 44.6% - 53% (Goswami et al., 2012; Hirsch-Moverman et al., 2012; Horsburgh et al., 2010; Li et al., 2010). The completion rate of participants that accepted and initiated treatment in our cohort is 66%, which is slightly higher than the rates in larger studies with multi-ethnic groups enrolled. It is important to note that our rate could also be skewed because of our small sample and recruitment of a single ethnic group.

Predictors of treatment completion. Our study was not able to identify any predictors of treatment completion from our logistic regression model, which was likely due to the small sample size of the study. Although nine variables were correlated with treatment completion after increasing the p-value from 0.05 to 0.25 in the univariate analysis, care must be taken when interpreting these results as significant. Persons who were currently employed and those between the age group of 18-44 years of age had the strongest correlation among the nine variables. Our findings are not consistent with a majority of other studies found in the literature due to the difference of study groups, numbers enrolled, treatment regimen, and variables of interests such as socio-demographic data, health history. We believe the predictors in our findings are specific to the Vietnamese immigrant population.

Based on the variables found to be significant for completion in our study, we can infer that those who are younger would like to secure their future by treating their current latent infection so that it does not become a problem later in life. Most of the individuals in the younger group are either in college or employed. If they treat their infection now, they would have less to worry about in the future.
Three studies reported treatment regimen as a significant predictor of LTBI treatment completion, confirming the shorter 4-month treatment regimen with a single TB medication to have more success compared to the lengthier 9-12 months of isoniazid (Goswami et al., 2012; Horsburgh et al., 2010; Li et al., 2010). One study of recent refugees from the Middle East in San Diego had a 58.7% treatment completion rate and reported higher level of education completed as a significant factor to treatment completion. However, their study had 20% of participants drop out as a result of the refugees being relocated during their treatment (Bennett et al., 2014). Li et al. (2010) reported those who are close contacts of an infectious TB case and are 34 years of age and older as the greatest predictor of treatment completion in their cohort study that had only 45.2% treatment completion. At this time, no patterns or consistencies have been observed the literature on predictors of LTBI treatment completion.

Treatment non-completion rate: We observed a 34% rate of treatment non-completion in our cohort of Vietnamese participant. Primary reasons for early treatment termination identified by clinic staff were mild side effects (24%) followed by severe medication reactions (17%). Participants who were too busy (12%), changed their minds (17%) or failed to show for their follow up appointments (12%) made up the largest group of non-completers. Li et al., (2010) reported 54.8% non-completion treatment rate. The following reasons for early termination in their large cohort study (n=15,035) included: refusal to continue (40.5%), lost to follow-up (38.9%), moved away 3.8%, and side effects (2.4%). The greatest difference between the two studies is in the reporting of medication side effects, which was 41% in our study compared to 2.4% in the study by Li et al., 2010).

It is important to recognize that Li and Associates enrolled 15,035 participants that were mainly prescribed Isoniazid (93.3%) as the first line of chemoprophylaxis for LTBI treatment. In
addition, the inclusion criteria included almost all persons who were prescribed LTBI treatment regardless of their age, treatment regimen or ethnic background. Higher rates of medication side effects identified in our cohort could be skewed with a small sample size of 50 participants who initiated isoniazid and may have been at a higher rate of hepatitis B comorbidity as found among Vietnamese immigrants in the U.S. Late first month attendance in a large LTBI study across Canada, Brazil and Saudi Arabia was identified as the primary predictor of LTBI treatment non-completion (Trajman et al., 2010). Our study also noted late first follow-up appointments as a problem; however, it was not statistically found to be a significant factor.

In another study, Parysan et al. (2007) examined treatment non-completion rates among a large cohort study (n=1572) consisting of multi-ethnic subgroups, with Vietnamese representing 9% (n=143) of the total enrollment. Among the Vietnamese subgroup only, investigators identified 44.1% (n=63) treatment non-completion rate, which is slightly higher than our study rate, but well below the national recommendation for LTBI adherence. No factors were reported to be associated with the Vietnamese low treatment adherence rate; however, it was reported that 54% of those who initiated treatment dropped out before the end of the first month of treatment due to lost to follow-up (Parysan et al., 2007). More studies should focus on the identifying specific factors that influence treatment non-completion in specific ethnic groups, as adherence behaviors are likely to be influenced by cultural values and beliefs.

**Psychosocial Measurement of Correlations to LTBI Treatment Completion**

Medication non-adherence is one of the major contributors to poor patient health outcomes, increased health care costs and drug resistance in today’s healthcare system (Iuga & Mcguire, 2014). The WHO has identified factors leading to poor medication adherence that include: socioeconomic factors, therapy-related factors, patient-related-factors, condition-related
factors, and health system/health care team-related factors (Sabate, 2003). Phase 1 of this study aimed to examine multiple factors that were influential to patients’ adherence by collecting data on socio-demographics, health history, medication behaviors, including psychosocial measures, so as to gain a full understanding of all the factors leading to medication adherence or non-adherence.

Three psychosocial measurement tools, the Morisky Medication Adherence Scale (MMAS), Self-Efficacy for Appropriate Medication use (SEAM) and the Champion Health Belief Model Scale (CHBMS) were chosen to examine relationships with LTBI treatment completion. The purpose of administering these subjective measurements was to identify if the measures were predictive of overall medication completion.

The MMAS-8 was chosen because it is a widely accepted self-report measure for medication adherence most often used in the literature due to its focus on underuse and forgetfulness. Participants who score high on their MMAS surveys are reported to have high medication adherence behaviors which translates to better management of symptoms and in the case of LTBI, eradication of the bacteria without concerns of medication resistance. A recent study examined the adherence of patients with tinea pedis and to identify if the MMAS-8 scores correlated with effectiveness of oral and topical therapy (Tsunemi et al., 2016). Study findings indicated higher MMAS-8 scores was correlated with higher use of prescribed oral and topical medications, leading to overall improved symptoms. On the other hand, low MMAS-8 scores resulted in patient reports of poor medication effectiveness and extended doctors visits over six months for medication refills instead of a more regularly basis. The use of the MMAS-8 to measure medication adherence behaviors in this study was a significant predictor of medication use and treatment outcomes. Those with low MMAS-8 medication adherence scores should be
monitored more regularly and be re-educated on the importance of medication adherence to improve treatment outcomes.

In addition to the MMAS, it is important to gain a deeper understanding of participant’s health beliefs and self-efficacy as they may also contribute to overall adherence behaviors. Investigators who used the CHBM scale with 80 women to identify predictors of intentions of women to perform routine breast self-examination (BSE) and mammography (Fouladi et al. 2013). Findings indicated that high self-efficacy scores support performance of BSE while perceived barriers were related to women not performing BSE and mammography. The scale was useful in identifying women at risk so that more target education can be implemented. Having a good understanding of the study population’s health beliefs can help inform future education aimed at reducing barriers or erroneous beliefs to improving self-efficacy. Unfortunately there were no significant statistical findings, which indicated there were no correlations between the three predicting scales to LTBI treatment completion.

The lack of correlation could be due to the extremely small sample of participants enrolled in this study. Future studies would need a larger sample to test the associations between chosen psychosocial measurements and the outcome variable of treatment completion for a more robust analysis.

Since the psychosocial measurements utilized in this study did not show significance, a multi-measure approach was utilized to further understand medication adherence. Phase 2 of this research study interviewed a group of participants from phase 1 to further understand the decision-making process of treatment adherence. Vietnamese immigrants are currently experiencing a huge health disparity with high rates of active TB cases in Orange County. Therefore, further investigation must continue to assist this vulnerable population from an
infection that can be easily treated here in the U.S.

**Challenges to Recruiting Study Sample**

Vulnerable populations generally have low rates of participation in health research when compared to nonminority groups (NIH, 1993). Immigrants specifically from countries of political unrest or those seeking asylum are most vulnerable to exploitation; therefore researchers seeking to enroll such unique populations must take care in the process of recruitment and respect those who are not interested in participating. Some of the major barriers to recruiting vulnerable populations cited from the literature included distrust of research, lack of confidentiality, fear of safety, schedule conflicts, lack of knowledge, language barriers, and cultural differences (Levkoff & Sanchez, 2003; Corbie-Smith et al., 1999; Wendler et al., 2006).

Most of the immigrants enrolled in this study initially came to the U.S. in the 1970s to seek asylum after the Vietnam War; thus, they came as refugees from the late 1970s to the 1990s. More recently, within the last two decades, immigration by family sponsorship programs has been the primary route of immigration for this group.

Barriers to recruitment in the study were experienced from the beginning. Of the anticipated 160 participants planned for enrollment, only 51 were successfully enrolled. This is despite the fact that the recruiting strategy was carefully thought out in advance, as it was expected that recruitment would be difficult when working with vulnerable populations that have low literacy and a history of skepticism with research. The plan was to have the Principal Investigator (PI), who was a Vietnamese refugee to the U.S., and who spoke fluent Vietnamese, to reach out and enroll all participants, address any language barrier concerns, and to answer any questions that may arise during enrollment. Unfortunately, only one third of the expected enrollment number was achieved after almost 10 months of active recruitment at the local O.C.
Public Health TB Clinic.

The majority of patients who declined to participate were newer immigrants that informed either the clinic staff or the recruiter they were not interested and did not want to be bothered. The most common statement repeated among the Vietnamese immigrants was, “I don’t have time”. Approximately 28% of patients that were approached by the PI and were interested in the study passed the initial screening but did not move forward with enrollment.

Approximately 15% of the potential participants changed their minds because their family members swayed them from participating due to concerns related to confidentiality, stigma, and signing the consent form despite the PI’s reassurance. The remaining 10% decided to not move forward once they were told 30 minutes of their time was requested for consent and answering survey questionnaires. In addition, 3% of the immigrants expressed uneasiness talking about the topic of adherence and decided they did not want to participate once they were explained about the details of the study. These types of barriers were not anticipated hence it made recruiting a major challenge for this study.

Despite the challenges, 51 patients did agree to sign the consent form and enroll into this study. This group of participants had unique characteristics that were distinctly different from the comparison group that was added. Most of the enrolled participants have lived in the U.S. for over 10 years and were mostly employed with some English skills. It was likely that the enrolled group’s acculturation to the American lifestyle have put them more at ease for participating in this research study as compared to the newer immigrants who recently arrived to the U.S. with no English skills and a lack of understanding about research. Future studies seeking to enroll new immigrants in research should consider the above barriers and have plans to address those concerns. It is recommended for members of a research team to get to know the population first
and build a trusting relationship before starting recruitment.

Summary

Treatment acceptance for the combined group of patients in phase 1 was 51.5% with the following significant predictors of treatment acceptance in the univariate analysis to include immigrants who are single, employed, between the ages of 18-44 years, lived in the U.S. over ten years and spoke English. In addition individuals that with abnormal chest x-rays or a positive blood IGRA results and have been exposed to an active TB case were also more likely to accept treatment. Multivariate predictors that were significant for treatment acceptance included individuals who have a history of smoking and have been in contact with an infectious TB case. Our treatment completion rate for the enrolled group was 66%.

As for treatment completion, a large number of significant univariate predictors were noted. However, no significant multivariate predictors were found for treatment completion. Having a better understanding of factors that can affect LTBI acceptance and completion rates is crucial to the development of intervention programs aimed at improving Vietnamese adherence to LTBI treatment and reduce reactivation TB in this high risk population.

PHASE 2

Qualitative Discussion

Phase 2 of this study explored the experience of 17 Vietnamese immigrants that were diagnosed and offered latent tuberculosis infection (LTBI) treatment from the Orange County Public Health TB Clinic. This group of immigrants shared in detail their unique experiences related to treatment acceptance, initiation and completion, including barriers and problems they encountered during the entire process. A decision-making grounded theory model entitled “The Decision-Making Model for Latent TB Infection Treatment Acceptance and Completion” was
developed from their stories and testimonies (Appendix B). This chapter will present a
discussion of the study findings and its contribution to the decision-making model as it relates to
the current LTBI literature.

**Major Study Findings**

Three primary decision-making points were identified in this phase that was critical to the
development of the proposed model: treatment acceptance, treatment initiation and treatment
completion. Deciding to accept treatment for LTBI is the very first decision that all participants
are required to make once they receive a confirmed diagnosis of their infection. The decision to
take on six months of treatment for an infection that is asymptomatic can be quite confusing for
some immigrants at this phase. Three categories emerged from participants’ data that were
directly related to the decision to accept LTBI treatment, “beliefs”, “TB awareness” and “trust in
healthcare”.

Findings revealed that participants who trusted the U.S. health care system, who had a
firm understanding of LTBI, and personally believed that the prescribed medication was helpful
for treating their latent infection, were more inclined to accept treatment without hesitation.

Subsequent to that, the decision to return to clinic at a later time for treatment initiation became
the next hurdle for many as life goes on and scheduling becomes a problem. Findings revealed
that the only category identified to influence treatment initiation was “barriers” to scheduling.

Lastly, for those who accepted and initiated treatment, taking six months of daily Isoniazid was
challenging because many events can happen during that long stretch of time. Findings revealed
that the decision to maintain adherence during this period was strongly challenged by the
following categories: self-determination, side effects, and having family support. The following
sections will discuss current literature related to each finding during these major decision points
LTBI Treatment Acceptance

Although not heavily emphasized in the LTBI literature, treatment acceptance is a major contributor to the overall treatment adherence rate and should be accounted for in all LTBI adherence studies. Rates of acceptance from past studies that included foreign-born immigrants were reported in the higher ranges of 83% - 91% (Colson et al., 2013; Horsburgh et al., 2010; Parysan et al., 2007). Higher treatment acceptance rates are common in foreign-born populations but it does not always translate to treatment initiation. For the 17 participants that signed up for phase 2, 16 accepted treatment and 1 declined. No qualitative studies have been carried out to explore factors related to treatment acceptance among Vietnamese immigrants in the U.S. to date. The following is a discussion of the categories that were identified as influential to LTBI treatment acceptance in this study.

Trust in healthcare system. Trust in the U.S. healthcare system was repeatedly expressed from many participants’ interviews as one of the primary reasons for treatment acceptance. Major themes include the U.S. having better-trained physicians and technology for a more accurate diagnosis of latent TB infection compared to Vietnam. One study found Vietnamese refugees to be more receptive to biomedical health with 56.9% of their cohort admitted that modern medicine was superior over traditional medicine for curing TB disease (Carey et al., 1997). In addition, 98% of the same study cohort preferred a western-trained physician over traditional healers.

A recent study in Canada identified in their focus group sessions that Chinese immigrants with LTBI generally trusted western family doctors to treat their LTBI infection but were
dissatisfied with the language barriers they encountered in addition to the long waiting time for appointments (Gao et al., 2015). Participants from our study also expressed that they trusted their LTBI diagnosis from the county. To confirm LTBI in this cohort, county officials used either the TST or IGRA blood test depending on the individual’s risks. Many of the participants who were cleared for LTBI in Vietnam were in disbelief when they were told their LTBI results in the U.S. were positive. They started doubting if the money they spent in Vietnam was worth it. If performed correctly, both the TST and IGRA tests are adequate for confirming LTBI diagnosis, however many recent studies have now identified the IGRA blood test as superior over the TST because of its higher sensitivity and specificity (Diel et al., 2012; Ferreira et al. 2015). Due to the advancements of science and technology available in the U.S., 94% of the participants interviewed for this phase accepted the LTBI treatment offered by the county.

**TB awareness.** Having basic knowledge of the differences between LTBI and active TB in terms of transmission and possible reactivation later in life influenced many participants to accept LTBI treatment in this study. Those who knew of someone who either suffered or died from active TB felt more compelled to start. A large-scale study in Vietnam reported people from a local province who had low TB knowledge about the causes and transmission of TB delayed seeking care for their prolonged cough symptoms (Hoa et al., 2003). The study predicted those with more TB knowledge would be more likely to seek care earlier for their prolonged cough symptoms. In the case of LTBI, those with more TB knowledge would be more likely to accept treatment when offered.

In two separate studies, both Vietnamese and Chinese immigrants discussed hard manual labor, smoking, poor nutrition, and lack of sleep as major risk factors for advancing from LTBI to active TB disease (Carey et al., 1997; Gao et al., 2015). Those who do not exhibit those
symptoms had a misconception that they are at very low risk or were not susceptible to active infection if they maintained a healthy lifestyle (Gao et al., 2015). One participant that did decline to accept treatment in this study shared the same view and was insistent that her healthy lifestyle would protect her from reactivation TB later on. Although 16 out of 17 (94%) participants enrolled in phase 2 accepted treatment, phase 1 had 46 out of 97 (47%) that declined. TB knowledge and interpretation of illness and wellness were themes found in other qualitative studies that influenced TB treatment acceptance (Munro et al., 2007). Improving basic TB knowledge in Vietnamese immigrants through culturally-sensitive education could help improve overall LTBI acceptance rates.

Beliefs. Three specific sub-sets of beliefs were very influential to many participants in their decision to accept LTBI treatment. First, “securing one’s future” was a theme that was mainly recurrent in the younger participants who were either in college or employed. These participants wanted to prevent uncertainties about the possibility of reactivation TB in their future. Isoniazid has approximately 90% protective efficacy for adherent patients with LTBI (Blumberg, Leonard & Jasmer, 2005). Participants are given that information during their visits to help them stay adherent to their treatment regimen.

Newer immigrants sponsored to the U.S. by relatives with young children were more inclined to accept treatment for the primary reason of “protecting the safety of their family and children”. A systematic review of qualitative studies on TB identified family and the community influences as one of the eight primary themes for accepting TB treatment in different populations around the world (Munro et al., 2007). Participants in this study accepted treatment because they did not want their latent infection to become a burden to those around them in the future. One participant who was a mother of two toddlers made it clear that she accepted LTBI treatment to
protect her children from any future harm. This protective behavior was observed also in other Vietnamese women diagnosed with active TB in a qualitative study done in large province in southern Vietnam (Long et al., 2001).

Lastly, “personal beliefs” about the safety and efficacy of western medication was a strong factor in the decision to accept treatment despite the risk of side effects in the group of participants interviewed. Although Vietnamese immigrants have a higher isoniazid reaction rate compared to the general population due to the high prevalence of hepatitis B, participants interviewed in this study trusted their healthcare providers to monitor their symptoms and intervene if needed while under treatment (Patel & Voigt, 2002). Individuals who lack trust in the overall healthcare system and were fearful of medication side effects were the ones least likely to accept treatment. The fear of side effects preventing treatment acceptance is common.

This belief in the danger of side effects was also noted in other qualitative studies where patients rejected TB treatment because of a personal belief that it is more harmful to be on TB medication than without it (Munro et al, 2007). By understanding some of the common influencing factors that contribute to treatment acceptance among Vietnamese immigrants, providers can supplement their current LTBI education to address common concerns and misconceptions related to LTBI treatment in addition to providing reassurance about the safety and efficacy of the recommended treatment.

**LTBI Treatment Initiation**

Accepting treatment does not automatically translate to treatment initiation as that second step refers specifically to patients picking up their first month of medication at a follow-up visit. Some patients may think refusing LTBI treatment is offensive to their providers and feel obligated to accept treatment at the time of diagnosis but then decide not to return for their
follow up visit. The act of not initiating treatment is a non-adherent behavior and should be examined carefully as measures should be taken to identify barriers to initiation.

Studies in the literature reported LTBI initiation rates vary between 83% - 91% among large diverse populations across North America. Those that enrolled primarily foreign-born immigrants reported a much lower initiation rate of 26% and 66.4% (Goswami et al., 2012; Nuzzo et al., 2015). The primary difference between the two studies was the population enrolled. Based on those reports, foreign-born immigrants have a lower LTBI initiation rates compared to the general population. Phase 1 of this mixed method study recruited only foreign-born Vietnamese immigrants and had an initiation rate of 86%. The two primary reasons identified in these patients’ charts for not initiating were failed appointments and change of mind.

Not much discussion is available in the literature to explain what happens from the time of treatment acceptance to the first follow-up appointment because patients who do not return are mostly lost to follow up. One hypothesis could be that patients who accepted treatment in front of the provider when diagnosed never intended to initiate, but did not want to experience the shame or awkwardness of denying treatment in front of a health care professional.

The literature currently has various studies listing predictors of treatment initiation that range from being a contact to a TB case to having a primary care provider, but currently, no investigators have been able to provide perceptions of patients’ experiences about the barriers to initiation. A study by Menzies et al. (2005) identified the act of missing the first month follow up appointment as a strong indicator of treatment incompletion as many persons with LTBI may have doubts to starting medication. In our study, 1 (6%) participant out of the 16 enrolled accepted treatment but did not initiate treatment, and barriers to scheduling was the major contributing factor.
Our study is the first to examine the experience of a Vietnamese immigrant who struggled with LTBI treatment initiation. The participant did not initiate treatment because she missed her first appointment and could not reschedule for another time that would work best for her. In addition, this participant shared in her interview that she may not be able to stick to a daily medication regimen for six months even if she did initiate. In fact, scheduling issues were the primary barrier for her to not initiate treatment as our study findings from phase 1 identified those with a busy schedules were less likely to return for their follow up appointment. More emphasis should be placed on offering more flexible clinic hours to accommodate working people in order to limit the barriers to initiation.

**Treatment Completion**

Once all of the initial hurdles of starting treatment had been overcome, an established daily medication routine is usually developed and accommodations are made to return monthly for medication refills. However, maintaining adherence until completion for a minimum of 6 months can be daunting and many things can occur within that time frame that can lead to early termination by the patient or the provider. Participants in this phase are faced with daily decisions that challenge their ability to remain adherent. Significant categories that were crucial to LTBI medication adherence for this last phase included self-determination, medication side effects and family support. These categories influenced the remainder of participants left in the study to either finish or terminate treatment prematurely.

Treatment completion rates among those that initiated treatment remain dismal in the literature, ranging between 38% - 53% in large study cohorts (Goswami et al., 2012; Hirsch-Moverman et al., 2010; Horsburgh et al., 2010; Li et al., 2010; Parysan et al., 2007). If the rate included all individuals that accepted treatment in addition to those that did not return for
initiation, then the overall completion rate would be even lower. In phase 1 of our study, 50 participants accepted LTBI treatment, 7 (14%) did not initiate and 33 (66%) completed. The treatment completion rate from all those who accepted was 66% compared to the completion treatment for only those that initiated treatment, 77%.

For phase 2 of this study, the completion rate for the 15 participants who initiated treatment was 60%; however, it would only be 56.3% if we included all those that accepted treatment. Calculating treatment completion rates based only on persons who initiate treatment presents a skewed picture of an inflated adherence rate, leaving the non-initiators out of the overall picture. More attention needs to be dedicated to understanding why those participants did not want to or could not return to their initial follow-up appointment.

In our decision-making model, several major categories from the period of treatment initiation to treatment completion were identified as influential to maintaining overall adherence. First, the category of “self-determination” was identified from patient interviews as a key element to maintaining long-term adherence. Having “self-determination” means that the participants have decided for themselves that they will accomplish a specific task for whatever reason that motivated them to do so. Many participants agreed that their own future or the safety of their family and community was the primary motivation behind their determination to maintain strict adherence to the prescribed treatment. Even though challenges and barriers were encountered along the way, they were determined to get through it. Two participants who did not share this same motivation dropped out of treatment within the first few months by simply not returning to their follow-up appointments. No reasons were given but it appeared that both were not determined to complete their LTBI treatment at the time.

Side effects. Medication side effects were major contributors to treatment drop out in this
cohort of participants. Vietnam is the third leading country of birth for chronic hepatitis B among immigrants in the U.S. (Mitchell et al., 2011). In addition, Vietnamese are known to have higher liver cancer rates than any other racial/ethnic group in the U.S. due to an association with hepatitis B virus infection that is endemic in Southeast Asia (Taylor et al., 2000). A study by Patel et al. (2002) examined the rate of hepatitis toxicity of Vietnamese immigrants to TB medications, such as Isoniazid, and found an increased incidence of hepatitis B virus among Vietnamese immigrants. Many patients placed on TB chemoprophylaxis medication by providers in the community do not routinely get hepatitis panel screening, thus increasing the odds of side effects occurring in the Vietnamese population. Adverse reactions to isoniazid are reported in 10% to 20% of the general population, with more severe symptoms ranging from 3% to 5%. However, rates can vary depending on other factors, such as age and medical history (Saukkonen et al., 2006). Reactions that cause acute liver injury are fairly small ranging from 0.5% to 1%.

Among the 17 participants enrolled in phase 2, only 15 (88%) participants started isoniazid. Of these, 15, 8 (53%) reported side effects during their treatment. Early termination was recommended for three participants (20%) because of their elevated liver function enzymes and severe gastrointestinal concerns. One participant decided to stop treatment on her own because she was experiencing poor sleep, nightmares, dizziness and poor appetite. Although her blood work was all within normal limits, she did not feel safe to remain on isoniazid. The remainder 4 participants (27%) had milder symptoms that were either monitored by county officials or was self-managed by the participants themselves. Their symptoms included constipation, acne, mild rashes and dizziness.

A recent study reported adverse effects of isoniazid to include a wide variety of less-well documented symptoms that have received little attention in the literature (Denholm et al., 2014).
According to these investigators 56% of the enrolled patients suffered from at least one of the following subset of adverse effects: acneiform and other rashes, gastrointestinal adverse effects, drowsiness, alopecia, and peripheral neuropathy (Denholm et al., 2014). However, their completion rate was reported to be 85% despite the mild adverse reactions.

Of the 5 participants in our study that suffered from the milder subset of symptoms, 4 (80%) moved on to complete treatment. These four participants who remained on their treatment had self-determination to complete the regimen. From their experiences, the categories of “self-management” and “family support” emerged as it described how these participants dealt with the changes that were going on in their body and the family support they received that helped them get through the tough times. Self-management for those participants included taking over-the-counter medication for unwanted symptoms such as stool softeners or acne cream. For others, it meant changing their diet to include high fiber products and more water to decrease constipation. Most of these participants consulted with the clinic nurse or doctor for reassurance and they did not need to terminate their treatment. Those with family support stayed on their treatment and were successful because of the frequent reminders to take the medication and emotional support when times were bad. In the end, all 9 participants that successfully completed the prescribed LTBI treatment in this phase felt that “family support” was most influential to their success.

**Application of The Decision-Making Model for LTBI Treatment and Completion**

The Decision-Making Model for Latent Tuberculosis Infection Treatment and Completion was generated from the personal experiences of a group of Vietnamese immigrants diagnosed with LTBI. The purpose of the proposed model is to provide practitioners with an overview of three major decision points that patients have to make once a diagnosis of LTBI has been confirmed: 1) treatment acceptance, 2) treatment initiation and 3) treatment completion.
Each point is influenced by its own set of internal and external factors that either supports a patient’s decision to continue on or to stop treatment. The model equips practitioners with a basic understanding of the anticipated barriers that Vietnamese patients may encounter at different points and times of their lengthy treatment plan. By utilizing this model, practitioners will be embracing the shared-decision-making approach that is recommended for all healthcare professionals to use when working with patients on making health related decisions.

The intention of the model is to encourage practitioners to communicate with their patients openly about the benefits and harms of all available options while taking in consideration each patient’s values and beliefs to help them make well informed decisions about their own health (Charles & Gafnin & Whelen, 1999). The proposed model will also help practitioners be prepared to respond to their patient concerns in addition to giving them cues on assessing factors for treatment completion such as the presence of family support. The goal of implementing this model in clinic practice is to help improve the overall rate of LTBI treatment acceptance, initiation and completion among the foreign-born Vietnamese population.

**Summary for Phase 2**

Phase two utilized a grounded theory approach to gather and interpret the data. A better understanding of the profile of treatment adherers will help identify those at risk for not accepting or completing treatment. “The Decision-Making Model for Latent TB Infection Treatment Acceptance and Completion” generated from phase 2 is an original model that describes major decision points and categories that are most influential in determining treatment completion among a group of Vietnamese immigrants.
Chapter 6: Conclusion

In this study of LTBI treatment adherence in Vietnamese immigrants, there were a lot of variables that correlatead with TLBI treatment acceptance and completion but only a few were significant predictors in the multivariate analysis. Individuals with a history of smoking, coupled with recent TB exposure were identified as significant predictors for treatment acceptance. As for treatment completion, no predictors from the multivariate analysis were identified as mentioned in the discussion section. Qualitative results found trust in the U.S. health care system, TB awareness and personal beliefs to be most influential when the decision of accepting treatment is made. Barriers to scheduling were the only category identified to be problematic for treatment initiation. As for treatment completion, self-determination, managing side effects and family support were all critical categories that influenced each individual immigrant’s LTBI treatment success. Results of this mixed method study will be used to develop culturally-specific interventions designed to target Vietnamese immigrants residing in the U.S. to help improve the overall rates of LTBI treatment acceptance, initiation and completion and reduce the number of reactivation TB.

Strengths and Limitations. Our study used a mixed method approach to capture both quantitative and qualitative data to assist in understanding LTBI medication adherence among Vietnamese immigrants. A single ethnic group’s perception was undertaken, which adds to the meaning of the findings for Vietnamese people and their community. In addition, this study is the first to examine the decision-making process of Vietnamese immigrants adherence behaviors to LTBI infection treatment using a grounded theory approach.

Several limitations were identified. First, focusing only on the Vietnamese population limited the ability of the findings to be generalized to a larger Asian population. Second, the
small number of participants enrolled in the study limited the power of statistical analysis in addition to the interpretation of the results, in particular confidence intervals and p-values. In addition, recruiting participants concurrently for both the quantitative and qualitative phases was a limitation to the study design because we were not able to use data from the quantitative phase to guide the qualitative phase. Lastly, we may not have captured all perspectives of LTBI adherence because we were unable to recruit potential participants who refused to participate due to their personal beliefs or lack of time in addition to those that experienced side effects during treatment.

*Implications for clinical practice.* Based on this study’s findings, target screening of Vietnamese immigrants at highest risk for latent TB reactivation should be done more frequently at both the county and private community clinics as the CDC recently published stricter guidelines to improve screening of foreign-born Asians in the U.S. Providers working with the Vietnamese population should focus heavily on improving LTBI treatment acceptance and completion rates to prevent the continued rise of active TB cases in the Vietnamese population at both the local and national level.

Since data from our studies suggest that family support is a critical component to treatment success, it would be beneficial to include immediate family members in the initial clinic visits when the LTBI diagnoses have been made and treatment is offered. Both the patient and their family members should be educated at the same time so that everyone understands the importance of adhering to the treatment recommended. Furthermore, latent TB nurses should follow strict protocols regarding the recommendations of accepting and completing LTBI treatment when educating patients with different risk factors and ethnic groups. Those with confirmed LTBI diagnosis must be treated to prevent reactivation down the road.
Targeting Vietnamese groups at highest risk for reactivation is a start, however screening must continue to include all foreign-born Vietnamese if TB elimination is desired in this population. Additional time should be spent on educating patients at the initial visits and subsequent medication refill visits in order to build repertoire and allow patients to open up about their fears or reservations of taking the medication prescribed. Nurses should discuss signs and symptoms of side effects including self-management for milder symptoms so patients could be prepared. Culturally-sensitive educational materials specific for the Vietnamese immigrants that discuss certain beliefs about western medication and side effects should be given to the immigrants instead of the translated generic LTBI handout. Since factors affecting treatment adherence is multi-factorial, it is critical for providers to understand that interventions implemented in ethnic populations need to be culturally specific if success is to be obtained.

*Recommendations for future studies.* To date, current literature lacks consistency in effective interventions to improve LTBI adherence rates because the interventions are too generalized and not specific enough for different ethnic populations (Hirsch-Moverman et al., 2008). Adherence behaviors are influenced by many socio-cultural factors such as a person’s upbringing, ethnic culture, personal experience and beliefs. Culturally-sensitive interventions should be developed specifically for one ethnic group in order to improve chances of success.

Vietnamese immigrants need improved LTBI education from providers that address misinformation and LTBI facts related to treatment side effects. In addition, future studies should aim at exploring the attitudes and decision-making process related to the current practices of general family physicians providing for Vietnamese immigrants in Orange County to better understand their LTBI screening and recommendations. Community-base-partnership research is highly recommended when working with vulnerable populations that have doubts about research.
Appendix A

The Health Belief Model (HBM) Framework

Health Belief Model Framework (HBM)

Cues to Action
- Raised awareness (e.g. media, news health professional)
- Illness of family member or friends

Perceived Susceptibility to Disease
Perceived Severity of Disease
Perceived Threat of the Disease
Perceived Self-Efficacy

Modifying Factors
- Demographics (age, sex, etc.)
- Structural variables (Knowledge about disease or prior experience to it)

Perceived Benefits of taking action, minus perceived Barriers to action

Likelihood of Taking Recommended Health Action

The variables in the Health Belief Model. Adapted from Rosenstock, Janz and others (Rosenstock, 1974; Janz, Champion & Strecher, 2002)
Appendix B

The Decision-Making Model for Latent Tuberculosis Infection

Treatment Acceptance and Completion

LTBI DIAGNOSIS

TREATMENT OFFERED

TREATMENT ACCEPTANCE

BELIEFS

TB AWARENESS

TRUST IN HEALTHCARE

NO

TREATMENT DECLINE

PERSONAL BARRIERS

YES

TREATMENT INITIATION

SELF DETERMINATION

YES

TREATMENT ACCEPTANCE

BARRIERS

DROP OUT

NO

SIDE EFFECTS

DROP OUT

FAMILY SUPPORT

NOT SEVERE

SELF MANAGE

FAMILY SUPPORT

DROP OUT

SEVERE

M.D. DECISION TO DROP

FEAR

TREATMENT COMPLETION

NO SHOW
Volunteers needed for research study on Latent TB

UCLA School of Nursing is collaborating with O.C. Health Care Agency TB clinics in a research study interested in learning how patients with latent TB infection make decisions about their treatment plans. This research is not a part of the routine latent TB treatment offered by the County. Your decision to participate will not affect any of your current county services. There are two phases in the research study. All qualified participants in phase 1 will receive a total of $20 in gift cards for answering the questionnaires provided. An additional compensation of $40 in gift card will be provided for volunteers that qualify to be interviewed in Phase 2.

You may qualify for the study if you...
1) are 18 years of age or older.
2) have been recently diagnosed with latent TB infection by O.C. TB clinic.
3) are a Vietnamese immigrant.

Please call
714-809-2803
if interested.
Cần Người Tinh Nguyên Cho Cuộc Nghiên Cứu Về Bệnh Ho Lao Ngâm

Đại Học UCLA hợp tác với các phòng khám bệnh ho lao cộng đồng ở Orange County để nghiên cứu việc sao bệnh nhân bị nhiễm bệnh ho lao ngâm để hỗ trợ quyết định cách trị liệu cho chính mình.

Cűc sự tìm này sẽ không ảnh hưởng đến bất kỳ dịch vụ nào mà quý vị hiện đang nhận được từ nơi (Quận/huyện) của quý vị đang ở.

Có 2 đợt chrons người trong cuộc nghiên cứu này. Tất cả những người được tham gia đợt 1 sẽ được nhận 2 thẻ tăng tổng cộng là $20 đô-la để trả lời những câu hỏi được đưa ra và được tăng thêm 1 thẻ $40 đô-la cho những người tinh nguyên được chọn để

Những người có đủ điều kiện để tham dự là:

1) Đã 18 tuổi hay lơn hơn.
2) Gần đây có đi khám bệnh và đã bị nhiễm bệnh ho lao ngâm bởi phòng khám ở Orange County.
3) Là người di dân gốc Việt.

Xin gọi để liên lạc:
714-809-2803
Appendix E: Pre-Eligibility Screening Questionnaire (English Version)

UNIVERSITY OF CALIFORNIA, LOS ANGELES
SCREENING CONSENT SCRIPT
Predictors of Medication Non-Adherence among Vietnamese Immigrants
With Latent Tuberculosis Infection

Thank you for calling/your interest about the Vietnamese immigrant research study. I would like to ask you a few questions to see if you can volunteer for the study. Before I begin the process, I would like to tell you a little bit about the research problem.

A recent rise in TB disease in Asian immigrants in the US is causing public health concerns. People who do not complete latent TB medication have a greater chance of getting TB disease later in life. The purpose of this research study is to better understand why Vietnamese immigrants are not accepting or finishing their medication. Information from this study will help make changes in the current latent TB program to improve completion rates. The goal is to have less TB disease in the Vietnamese communities.

Would you like to continue with the screening? (yes/no) The screening will take only a few minutes. You do not have to answer any questions you do not want to answer. You also don’t have to answer any question you are uncomfortable with. You may stop at any time. Your participation in this screening is voluntary. Your answers will be kept private. No one will know your answers except for the research team. Information from this screening will be used only to decide if you qualify for the study. All information will be thrown away afterwards.

This research study is strictly voluntary. It is NOT part of the current treatment you are getting from the county. Your decision to join or not join the study will not affect any current county services you are getting.

Would you like to continue with the screening? (yes/no)

I will begin asking you the screening questions:

1) Are you 18 years old or over?
   Yes/No

2) Are you a Vietnamese immigrant?
   Yes/No

3) Were you recently told by your doctor that you have latent tuberculosis infection?
   Yes/No
4) Have you taken medication for latent TB infection before?  
   Yes/No

5) Are you in the latent TB refugee program at the county?  
   Yes/No

Thank you for answering the screening questions. Based on your answers, you are **qualified/not qualified** for this research study.

(Eligibility is determined based on the participant’s answers. To be eligible, question 1-3 would have to be answered “yes” and question 4-5 would have to be answered “no”.)

**Option 1 (qualified):** Based on your answers to the above questions, you are pre-qualified to volunteer for this research study. If you decide to volunteer, you will need to schedule an appointment to learn about your rights. You will also be given more information about the research at that time. We can schedule that appointment at this time if you like.

Once you volunteer, you will be asked to sign two forms. The first form is to give your permission to join the study. The second form (county HIPAA) is to give the research team permission to look at your county records during your treatment and to check if you can join the study.

**Option 2 (not qualified):** Based on the answers you have given, you currently do not qualify for the study. I would like to thank you for your time and interest in this research.

Do you have any questions about the screening or the research at this time? I am going to give you a couple telephone numbers to call if you have any questions later. Do you have a pen? If you have questions about the research screening, you can call me, Fayette Nguyen Truax at 714-809-2803 or Dr. Adeline Nyamathi at 310-825-8405.

- **UCLA Office of the Human Research Protection Program (OHRPP):**
  Please call the OHRPP or write to them if you have questions about your rights as a volunteer or if you have any concerns about the study.

  UCLA Office of the Human Research Protection Program  
  11000 Kinross Avenue, Suite 211, Box 951694  
  Los Angeles, CA 90095-1694  
  (310) 825-7122

Thank you again for your time. If you would like a copy of your consent for this screening, please let me know at this time.
Appendix F: Pre-Eligibility Screening Questionnaire (Vietnamese Version)

ĐẠI HỌC UCLA
BÁN BẢNG LỌNG THỦ NGHIỆM
Những dự đoán không được thực hiện trong việc điều trị bệnh nhiễm hoa lao ngầm trong những người định cư Việt Nam

Cám ơn anh (chị) đã và có sự thíc híc h何必 sự coi công đồng người định cư Việt Nam. Tôi muốn hỏi anh (chị) một vài điều để thử xem anh (chị) có thể tự nguyện trong sự híc h何必 này hay không. Trước khi bắt đầu tiến hành, tôi muốn nói với anh (chị) một vài vấn đề trong sự híc h何必 này.

Có một sự gia tăng gánh nặng của bệnh hoa lao trong những người định cư Á- chau ở Mỹ đang gây nên những sự lo lắng về sức khỏe cho công đồng. Những người không được điều trị cho đến tận gốc bệnh hoa lao ngầm sẽ có một cơ hội lớn là mắc tro lạy bệnh hoa lao sau này trong đời sống của họ. Mục đích của sự học hỏi sự tầm này là làm cho hiểu rõ hơn tại sao những người định cư Việt Nam không chấp nhận hay là điều trị cho đến hết bệnh hoa lao của mình. Những tin tức từ sự học hỏi này sẽ giúp làm thay đổi trong chương trình trì liệu bệnh hoa lao ngầm hiện nay để có một sự cải tiến hoàn toàn về chất lượng. Tiêu chuẩn của mục đích này là để có ít người bị bệnh hoa lao hơn trong công đồng của người Việt Nam.


Sự sự tâm học hỏi này là hoàn toàn tự nguyện. Nº không là phần nào của sự tự liệu hiện giờ mà anh (chị) đang phần được của county. Sự quyết định của anh (chị) để tham gia hay không tham gia học hỏi này sẽ không ảnh hưởng bất kỳ những phúc vụ nào mà hiện nay anh (chị) đang nhận được của county.

Anh (chị) có muốn tiếp tục việc thử nghiệm này nữa không? (có/ không)
Tới sẽ bắt đầu hỏi anh (chị) các câu hỏi về thử nghiệm:

1) Có phải anh (chị) được 18 tuổi hay lên hơn rồi không? Có/ Khong

2) Có phải anh (chị) là người định cư Việt Nam không? Có/ Khong

3) Giàn đầy bác sĩ của anh (chị) đã nói rằng anh (chị) có nhiễm bệnh hoa lao ngầm phải không? Có/ Khong
4) Trước đây anh (chị) đã có triệt biên nghiêm ho lao ngầm lần nào không?  Có/ Không

5) Có phải anh (chị) ở trong chương trình người từ nạn bị biên ho lao ngầm của county không?  Có/ Không

Cám ơn anh (chị) đã trả lời những câu hỏi thượng nghiêm này. Dựa vào các câu trả lời của anh (chị) mà anh (chị) được chọn/ hay không được chọn cho sự học hỏi suy tầm này.

(Trình hợp lệ được chọn căn cứ trên các câu trả lời của người thăm dò. Để trình hợp lệ, câu hỏi 1-3 sẽ phải được trả lời “có” và câu hỏi 4-5 sẽ phải được trả lời “không”.)


Một khi anh (chị) tự nguyện, anh (chị) sẽ được hồi để ký 2 mẫu đơn. Mẫu thứ nhất là để cho phép anh (chị) được tham gia học hỏi. Mẫu thứ hai (county HIPAA) là để cho phép bạn sự tầm nhìn vào hồ sơ county của anh (chị) trong lúc đang triệt biên và để kiểm lại việc anh (chị) đã được chọn để tham gia trong sự học hỏi này.

2. Không chọn (không được chọn): Căn cứ trên các câu trả lời mà anh (chị) đã nói ra, hiện giờ anh (chị) không được chọn cho sự học hỏi này. Tôi muốn nói lên lời cảm ơn anh (chị) đã bỏ ra thời gian và có sự yêu thích trong sự tầm này.

Anh (chị) có bất kỳ những câu hỏi nào về sự nghiêm hay sự tầm trong lúc này không? Tôi sẽ cho anh (chị) một vài số điện thoại để gọi nếu anh (chị) có bất kỳ những câu hỏi nào sau đây. Anh (chị) có thấy việc mục không? Nếu anh (chị) có những câu hỏi về sự nghiêm sự tầm, anh (chị) có thể gọi tôi, Fayette Nguyen Truax ở số 714-809-2803 hay là Dr. Adeline Nyamathi ở số 310-825-8405.

UCLA Office of the Human Research Protection Program (OHRPP):
Xin gọi OHRPP hay viết thư cho họ nếu anh (chị) có những câu hỏi về quyền hạn của mình như là một người tự nguyện hay là nếu anh (chị) có bất kỳ những thắc mắc nào về sự học hỏi này.

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Los Angeles, CA 90095-1694
(310) 825-7122

Một lần nữa cảm ơn về thời gian của anh (chị). Nếu anh (chị) muốn có một bản sao về sự bằng lòng thử nghiệm này, hãy nói cho tôi biết ngay bây giờ.
Appendix G: Interview Guide

UNIVERSITY OF CALIFORNIA, LOS ANGELES
INTERVIEW GUIDE FOR PHASE 2
Predictors of Medication Non-adherence among Vietnamese Immigrants
With Latent Tuberculosis Infection

Introduction:

Good afternoon, Mr./Mrs. XXXX. Thank you for volunteering in phase two of this research study. Over the next 60 minutes, you will be asked a number of questions about your experience of getting diagnosed with tuberculosis treatment at the Orange County TB clinic. I will also be asking you to share what you think influenced your decision to take or not take latent TB medication. The following interview questions have been created as a guide for our interview. There are no right or wrong answers to the questions. You have the right to not answer any questions you feel uncomfortable with. You may stop the interview at any time without it affecting the care you are currently receiving. Do you have any questions before we begin? As a reminder, this interview will be audio recorded. You have the right to change or erase anything you do not want on the tape. Please try not to use your name or talk about any personal information that can identify you during our interview for your privacy.

1. Can you share with me your experience of immigrating to the U.S.?

   *Probing question:*
   - Do you live with immediate family?
   - Do you have a close network of relatives and friends living in your current community?
   - How do you get to and from places around the city?

2. What is your understanding of latent tuberculosis infection?

   *Probing question:*
   - How is the infection transferred?
   - How long does the infection last?
   - What can happen to your health if you have the infection?
   - What do you think your chance of getting active TB is in the future if you have latent TB infection?
   - Do you think taking latent TB medication is helpful or not helpful for your body?
   Please explain.
3. Can you talk about any personal/family/cultural beliefs that are related to TB or latent TB infection?

*Probing question:*

How do you feel about taking medication for latent TB infection when you don’t feel sick?
Do you feel taking medication in general is harmful for your body?
How do those beliefs affect your decision about accepting or not accepting latent TB treatment?

4. Describe your experience with any individual who had TB or latent TB infection in your past or present.

*Probing questions:*

How did that experience affect your view TB or latent TB disease now?
How did the above experience affect your decision to take/not take latent TB medication?

5. Discuss any barriers you may have encountered that affected your decision to not accept/begin/continue taking the latent TB medication recommended. (Barriers)

*Probing question:*

Did you suffer from any side effects of the medication? What were they? Did you seek medical help for relief? Why or why not?
How did the treatment affected your work or school schedule?
Do you have other chronic diseases that may have interfered with your latent TB medication plan?
Did you have transportation issues?
Did you have family or friends support to take the medication?
Do you feel stigmatized being on latent TB medication?

6. Describe why you chose to continue/not continue taking latent tuberculosis medication.

*Probing question:*

Do you worry about what your family and friends may think about you?
Did you want to reduce your chance of getting active TB later in life?
Does having a family or children affect your decision to complete the medication?
7. Can you talk about your trust the health care provider’s diagnosis and treatment of your latent TB infection?

Prompt questions:

Do you believe you have latent TB infection?
Does your history of a bacilli-calmette Guerin (BCG) vaccination in your home country affect your decision to take the latent TB medication? If so, please describe.
If you received the IGRA blood test recently by the county clinic, what is your understanding of that blood test? Did anyone explain the test results to you?

8. What do you think of your ability to successfully carry out anything you put your mind to do? (Self-efficacy)

Prompt question:

Did you have any support to complete your latent TB medication?
Can you carry out the task of remembering and taking the daily latent TB medication all by yourself?

9. What are some of the benefits of taking latent TB medication? (Benefits)

Prompt question:

Do you feel you have decreased your chances of contracting active TB later in life?

10. If you didn’t accept or complete your latent TB treatment this time, do you have plans on finishing it in the future?

Prompt question:

Would you contact your doctor or the county to restart your latent TB treatment?

11. How does the media/TV/radio affect your decision to take or not take latent TB medication?

Prompt question:

If the local newspaper indicated that there is a large breakout of active tuberculosis disease in your Vietnamese community, would that affect your decision to accept and start latent TB medication?
Appendix H: Consent for Phase 1 (English Version)

UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONSENT TO PARTICIPATE IN RESEARCH

“Predictors of Medication Non-adherence among Vietnamese Immigrants with Latent Tuberculosis Infection”
Phase I

Fayette Nguyen Truax, RN, MSN, CPNP and Dr. Adeline Nyamathi, ANP, PhD., FAAN, from UCLA School of Nursing are leading a research study. The researchers would like to learn more about latent tuberculosis (TB) infection in Vietnamese immigrants. They are interested in how this group of people makes decisions about taking their latent TB medication. You are asked to volunteer in this study because you are a Vietnamese immigrant getting care for latent TB infection through O.C. TB clinics. This study is strictly voluntary. It is NOT part of the current care you are getting from the county. Your decision to join or not join the study will not affect any current county services you are getting.

Background
A recent rise in TB disease in Asian immigrants in the US is causing public health concerns. People who do not complete latent TB medication have a greater chance of getting TB disease later in life. The purpose of phase 1 is to better understand reasons why immigrants do not accept or finish taking their medication. Information gathered from this study will help make changes in the current latent TB program to help more immigrants complete their medication. The goal is to reduce TB disease in Vietnamese communities.

What will happen if I join this research study?

Phase 1

• If you join this study, the researcher will ask you to do the following:
• Sign a form (County HIPAA authorization). This form will allow the research team permission to look at your medical records while you are under treatment and to make sure you can volunteer. Depending on the information in your charts, you may or may not be able to continue in the study. A study team member will notify you regardless.
• Fill out surveys at two separate time during the study.
  1) You will take the first 4 surveys once you enroll in the study. It will take about 30 minutes to complete. Some of the questions on the surveys will ask about your age, job, health beliefs, and behaviors related to taking medication.
  2) The 5th survey will be given one month after you started taking your medication. It will take less than 5 minutes to complete. The following are a few examples of what you will be asked on the survey: “Do you sometimes forget to take your medication?” and “Do you believe taking latent TB medication is harmful to your body?”
• After finishing the surveys, you will then be followed for the rest of your treatment by the research team through chart reviews only.

Phase 2:

• You may qualify to join phase 2 of the study if you: refuse to start your medication, decide to stop taking your medication, or if you finished the medication. About 25 people from phase 1 will be randomly chosen throughout the study to take part in the one-on-one 60-minute interview with the researcher.
• The 60-minute interview will talk about your experience of going through the treatment. You will be asked what affected your decision to stop or finish the medication. Examples of questions from the interview are: “Please tell me how your every day schedule have changed since being on medication?”, and “What are some of the problems you faced while taking the medication?”
• All study volunteers will be able to review, make changes or erase the recordings of their interview.

How long will I be in the research study?
Once in the study, you will be followed monthly through chart reviews for the duration of your treatment, which is between 6-12 months. You will not be asked to do anything more than what is mentioned above for the study.

Are there any risks or discomforts that I can expect from this study?

• There are no physical risks expected to you. However, there is a chance that your personal information can be accidently exposed to non-research people. However, everything will be done to make sure your privacy during the study is kept. Personal information such as names and medical record numbers on all forms and tapes will be removed.
• There is a chance you may feel uncomfortable during the interview. You can ask to have the interview be done in English or Vietnamese. You also have the right to not answer any questions you are uncomfortable with. All interviews will be done in a private closed room for privacy.

Are there any benefits if I join the study?
You will not get any direct benefits from volunteering in this study. However, the information you share can help create future latent TB programs that will reduce TB disease in Vietnamese immigrants.

Will I be paid for volunteering?

• In phase 1, you will receive a $15.00 Target gift card for completing the first 4 surveys the day you enroll into the study. You will then get another $5.00 Target gift card when you complete the last short survey at your second office visit with the latent TB nurse.
• If you qualify for phase 2 of the study, you will receive an additional $40 Target gift card for the 60-minute interview you will have with the researcher.

Will information about my participation be kept private?
Yes. All information collected in this study will be kept private. It will be given out only with your permission or as required by law. All recordings from the interviews will be transferred to paper without your personal information. The tapes will be destroyed once the study is done. Only the research team can look at your private information during the study.

What will happen to my information after the study?
Once the study is over, all of your personal information will be removed permanently from your data. There will be no link to you at all. Please mark below if you would like to allow or NOT allow your data to be kept for future use by the research team.

___________ I ALLOW my data to be kept for future use.

___________ I DO NOT ALLOW my data to be kept for future use.

What are my rights if I take part in this study?
• You have the right to leave the study at any time.
• Whatever decision you decide, there will be no cost to you, and no loss of benefits you were entitled to through the county.
• You have the right to refuse to answer any questions that you do not want to answer and still remain in the study.
• This study is NOT part of the current care you are getting from the county. Your decision to join or not join the study will not affect you receiving any county services.

Who can I contact if I have questions about this study?

The research team:
If you have any questions, comments or concerns about the research, please contact one of the researchers below:

Fayette Nguyen Truax, RN, MS, CPNP (Speaks Vietnamese)
714-809-2803 or ftruax@ucla.edu

Adeline Nyamathi, PhD, ANP, FAAN
310-825-8405

• UCLA Office of the Human Research Protection Program (OHRPP):
Please call the OHRPP or write to them if you have questions about your rights while volunteering in this study.
UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694, (310) 825-7122
You will be given a copy of this consent to keep for your records.

I have read the above information, or it has been read to me. I have had the opportunity to ask questions about it. Any questions I have asked have been answered to my satisfaction. I consent/agree to volunteer as a participant in phase 1 of this study.

Please check below to let the research team know if you would like to be considered as a volunteer for phase 2 of the study and be re-contacted at a later time.

_______ Yes, I would like to be contacted for Phase 2 of the study.

_______ No, I would NOT like to be contacted for Phase 2 of the study.

**SIGNATURE OF STUDY VOLUNTEER (PARTICIPANT)**

________________________________________
Name of Volunteer

________________________________________   ________________
Signature of Volunteer                       Date

**SIGNATURE OF PERSON OBTAINING CONSENT**

I have read out the information sheet to the volunteer. To the best of my ability, I made sure that the volunteer understands what will happen in the study. I confirm that the volunteer was given a chance to ask questions about the study. All the questions asked by the volunteer have been answered correctly and to the best of my ability. I confirm that the volunteer has not been forced into giving consent. The consent has been given freely and voluntarily.

________________________________________   ______________________
Name of Person Obtaining Consent            Contact Number

________________________________________   ________________
Signature of Person Obtaining Consent       Date
Appendix I: Consent for Phase 1 (Vietnamese Version)

ĐẠI HỌC UCLA
BÀNG LÔNG THAM GIA CUỘC NGHIỆN CƯ

“Những dự đoán không được thực hiện trong việc điều trị bệnh ho lao ngầm cho người di dân gốc Việt”

Giai đoạn I

Fayette Nguyen Truax, RN, MS, CPNP và Dr. Adeline Nyamathi, ANP, PhD., FAAN, của Đại Học UCLA đang hướng dẫn một cuộc nghiên cứu. Những nghiên cứu viên này muốn tìm hiểu nhiều hơn về sự nhiễm bệnh ho lao ngầm trong số các người Việt di cư. Họ rất muốn biết nhóm người Việt di cư này quyết định như thế nào về cách trị bệnh ho lao ngầm của họ. Anh (chị) được kêu gọi tình nguyện tham gia cuộc nghiên cứu này bởi vì anh (chị) là một người định cư gốc Việt được điều trị bệnh ho lao ngầm tại các phòng khám và điều trị bệnh lao của Orange County. Cuộc nghiên cứu này là hoàn toàn tự nguyện. Ít nhất những dịch vụ mà anh (chị) đang nhận được từ phòng khám bệnh lao. Sự quyết định của anh (chị) để tham gia hay là không tham gia sẽ không ảnh hưởng gì đến những dịch vụ y tế hiện tại của anh (chị) đang có.

Lịch sử cá nhân

Mục đích của giai đoạn I là tìm hiểu rõ hơn những lý do tại sao những người định cư không chấp nhận hay là không chịu điều trị cho đến đột nhiên ho lao của mình. Những thông tin đầu nhận được từ cuộc nghiên cứu này sẽ giúp làm thay đổi các chương trình điều trị bệnh ho lao ngầm hiện nay để giúp cho bệnh nhân hoàn thành việc điều trị cho chính mình. Tiêu chuẩn của cuộc nghiên cứu này là làm giảm bệnh ho lao trong cộng đồng người Việt.

Việc gì sẽ xảy ra nếu tôi tham gia vào cuộc nghiên cứu này?

Giai đoạn I

• Nếu anh (chị) tham gia cuộc nghiên cứu này, nghiên cứu viên sẽ hỏi anh (chị) làm mấy việc sau đây:
  • Các mô hình HIPAA (County HIPAA cho phép). Mẫu này sẽ cho phép ban nghiên cứu xem hồ sơ trị bệnh của anh (chị) trong khi anh (chị) đang được điều trị và để bảo đảm rằng anh (chị) có thể tự nguyện tham gia. Tuy thuộc vào hồ sơ bệnh án của anh (chị), anh (chị) có thể hay là không thể tiếp tục cuộc nghiên cứu này. Chắc chắn rằng một thành viên của ban tổ chức sẽ bảo cho anh (chị) biết kết quả.
  • Điền những cuộc khảo sát hài lòng khác nhau trong thời gian học hỏi.
    3) Anh(chị) sẽ nhận được một lần 4 cuộc khảo sát khi anh(chị) đăng ký tham gia. Nó sẽ mất khoảng 30 phút để điền xong các câu hỏi. Một số câu hỏi khảo sát sẽ hỏi anh (chị) về tuổi tác, công việc làm, sự hiểu biết về sức khỏe, và những quan điểm/hoạch định của mình liên quan đến việc điều trị.
    4) Khảo sát lần thứ năm bắt đầu một tháng sau khi anh (chị) đã bắt đầu trị bệnh. Nó chỉ cần ít hơn 5 phút là có thể điền xong. Sau đây là một vài thí dụ mà anh (chị) sẽ được hỏi ở cuộc khảo sát này: “Có khi nào anh (chị) quên uống thuốc không?” và “Anh
Tôi có tin rằng uống thuốc trị bệnh ho lao ngầm sẽ làm hại thân thể của mình không?"

Sau khi khám dứt những cuốn khảo sát, ban tổ chức sẽ theo dõi anh (chị) cho phân chốt của việc trị liệu bằng cách kiểm tra lại số độ trị bệnh mà thôi. Giai đoạn 2:

- Anh (chị) được coi là thích hợp để tham gia giai đoạn 2 này nếu anh (chị): từ chối để bắt đầu trị bệnh, quyết định ngừng uống thuốc, hay là nếu anh (chị) đã trị bệnh xong rồi. Có khoảng 25 người từ giai đoạn 1 của cuộc nghiên cứu sẽ tự nhân được chọn để tham gia giai đoạn 2 và sẽ được phong van tụng-người một trong vòng 60 phút với nhân viên của cuộc nghiên cứu.
- 60 phút phong van sẽ nói về kinh nghiệm của anh (chị) trong khi còn điều trị. Anh (chị) sẽ được hỏi điều gì đã khiến anh (chị) quyết định ngừng trị bệnh cho đến hết. Những thí dụ về những câu hỏi trong cuộc phỏng vấn như là: “Xin nói cho tôi biết lịch trình hàng ngày của anh (chị) đã thay đổi như thế nào trong lúc đang được trị bệnh?” và “Có những khó khăn nào mà anh (chị) gặp phải trong khi uống thuốc không?”
- Tất cả những người Tình nguyện tham gia sẽ có quyền xem lại, thay đổi hay là xóa đi những phần bằng thứ trong cuộc phỏng vấn của họ.

Cuộc nghiên cứu này sẽ kéo dài trong bao lâu?
Trong suốt thời gian tham gia, anh (chị) sẽ được theo dõi hằng tháng cho đến suốt thời gian trị bệnh từ 6-12 tháng. Anh (chị) sẽ không bị yêu cầu làm bất cứ điều gì hơn là các điều đã nói ở trên về cuộc nghiên cứu này.

Có những nguy hiểm nào hay bất tiện mà tôi có thể gặp trong cuộc nghiên cứu này không?

- Không có những nguy hiểm nào về thể xác mà anh (chị) sẽ gặp. Tuy nhiên, tin tức cả nhân của anh (chị) có thể nguy hại đến những người khác liên quan. Tuy vậy, mọi việc sẽ được giải quyết để đảm bảo sự bảo mật của anh (chị) được giữ kín trong thời gian của cuộc nghiên cứu. Những tin tức cả nhân như là tên và số hộ sở trị bệnh trên tất cả mọi và bằng thứ sẽ được xóa bỏ hết sau khi cuộc nghiên cứu được hoàn tất.
- Cũng có thể anh (chị) sẽ cảm thấy không được tự nhiên trong cuộc phỏng vấn này. Anh (chị) có thể yêu cầu để cuộc phỏng vấn được hoàn tất bằng tiếng Anh hay tiếng Việt. Anh (chị) cũng có quyền không trả lời những câu hỏi nào mà anh (chị) cảm thấy không được tự nhiên. Tất cả cuộc phỏng vấn sẽ được thực hiện trong một phòng riêng để tất cả những thông tin cá nhân của anh (chị) được giữ kín.

Có những lợi ích nào nếu tôi tham gia vào cuộc nghiên cứu này?
Anh(điều) sẽ không nhận được trực tiếp những lợi ích nào từ ban nghiên cứu. Tuy nhiên, những tin tức mà anh (chị) đưa ra có thể giúp tạo nên những chương trình trị bệnh ho lao ngầm trong tương lai, và chúng sẽ giúp làm giảm đi số lượng bệnh ho lao trong cộng đồng người Việt Nam.

Tôi sẽ được trả tiền cho sự tự nguyện này không?
- Trong giai đoạn 1, anh (chị) sẽ nhận một thẻ tặng $15.00 để điên xông 4 cuốn khảo sát lần đầu vào ngày anh (chị) ghi danh tham gia. Rồi anh (chị) sẽ nhận một thẻ tặng khác nữa
Nhìn vì sự tham gia của tôi sẽ được giữ kín không?

Việc gì sẽ xảy ra đối với những thông tin cá nhân của tôi sau khi cuộc nghiên cứu được kết thúc?
Một khi cuộc nghiên cứu được kết thúc, tất cả thông tin cá nhân của anh (chị) sẽ được xóa đi vĩnh viễn từ những dữ kiện (data) của anh (chị). Sẽ chẳng có liên hệ nguy hiểm nào đối với anh (chị) hết.

Xin dành đầu dưới đây nếu anh (chị) muốn cho phép hay KHÔNG cho phép ban tổ chức lưu giữ những dữ kiện (data) của anh (chị) để được sử dụng trong tương lai.

_________ TÔI CHO PHÉP những dữ kiện của tôi được giữ để dùng ở tương lai.

_________ TÔI KHÔNG CHO PHÉP những dữ kiện của tôi được giữ để dùng ở tương lai.

Những quyền hạn của tôi là gì nếu tôi nhận tham gia cuộc nghiên cứu này?
• Anh (chị) có quyền rỗi khỏi cuộc nghiên cứu bất cứ lúc nào.
• Đầu cho anh (chị) quyết định như thế nào, nó sẽ không tồn kẽm gì cho anh (chị), và nó cũng không mất những quyền lợi nào mà anh (chị) đã nhận được từ cuộc nghiên cứu.
• Anh (chị) có quyền từ chỗ trả lời những câu hỏi nào mà anh (chị) không muốn trả lời và vẫn có thể tiếp tục cuộc nghiên cứu.
• Cuộc nghiên cứu này KHÔNG đi kèm với những đích vụ mà anh (chị) đang nhận được từ phỏng vấn bính lao của cuộc nghiên cứu. Sự quyết định của anh (chị) để tham gia hay không tham gia sẽ không ảnh hưởng gì đến bất kỳ những đích vụ y tế nào mà anh (chị) đang nhận được từ cuộc nghiên cứu.

Ai là người mà tôi có thể liên lạc nếu tôi có những câu hỏi về cuộc nghiên cứu này?
• Ban tổ chức:
Nếu anh (chị) có những câu hỏi nào, những bình luận hay là những gì liên hệ đến cuộc nghiên cứu, xin hãy liên lạc với một trong những nghiên cứu viên dưới đây:

Fayette Nguyen Truax, MS, RN, CPNP (Nói tiếng Việt)
714-809-2803 hay là E-mail: ftruax@ucla.edu

Adeline Nyamath, PhD, ANP, FAAN
310-825-8405
• **UCLA Office of the Human Research Protection Program (OHRPP):**
  Xin hãy gọi OHRPP hay là viết thô cho họ nếu anh (chị) có những câu hỏi về quyền hạn trong khi tình nguyện tham gia cuộc nghiên cứu.

UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694
(310) 825-7122

Anh (chị) sẽ nhận được một bản sao của đơn đăng lòng tham gia để lưu lại trong hồ sơ của mình.

Tôi đã đọc kỹ những thông tin trên đây, hay những thông tin này đã được đọc cho tôi nghe. Tôi đã có cơ hội để nêu ra câu hỏi khi có thấy mắc. Tất cả các câu hỏi tôi đã đưa ra đều được trả lời thỏa đáng. Tôi bằng lòng/ đồng ý tự nguyện tham gia trong giai đoạn 1 của cuộc nghiên cứu này.

Xin đánh dấu dưới đây để ban nghiên cứu biết nếu anh (chị) có muốn suy nghĩ đến việc tự nguyện tham gia giai đoạn 2 và đề được liên lạc lại sau này.

[ ] Có, Tôi muốn được liên lạc cho giai đoạn 2.

[ ] Không, Tôi không muốn được liên lạc cho giai đoạn 2.

CHỦ KÝ CỦA NGƯỜI TỤ NGUYỄN THAM GIA

[ ] Tên của người tự nguyện

[ ] Chủ ký của người tự nguyện

[ ] Ngày

CHỦ KÝ CỦA NGƯỜI NHẬN SỰ ĐỒNG Ý


[ ] Tên của người nhận đơn đồng ý

[ ] Chủ ký của người nhận đơn đồng ý

[ ] Số điện thoại liên lạc

[ ] Ngày
Appendix J: Consent for Phase 2 (English Version)

UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONSENT TO PARTICIPATE IN RESEARCH
“Predictors of Medication Nonadherence among Vietnamese Immigrants with Latent Tuberculosis Infection”
Phase 2

Fayette Nguyen Truax, RN, MS, CPNP and Dr. Adeline Nyamathi, ANP, PhD., FAAN, from UCLA School of Nursing are leading a research study. The researchers would like to learn more about latent tuberculosis (TB) infection in Vietnamese immigrants. They are interested in how this group of people makes decisions about taking their latent TB medication.

Based on a review of your medical chart, you have been invited to participate in phase 2 of the above research study. Phase 2 is strictly voluntary. It is NOT part of the current care you are getting from the TB clinics. Your decision to join or not join the study will not affect any current county services you have. The researchers are interested in learning more about how you make your decision to finish or stop taking the prescribed medication. You will spend about 60 minute with the researcher talking about your experience.

At this time, feel free to ask questions about the study. Take time to decide if you would like to volunteer.

What will happen if I take part in phase 2 of the research study?

If you volunteer in this study, the researcher will ask you to do the following:

- Meet the researcher for a 60-minute interview.
- You can decide where you would like the interview. For example, in a private room at the county clinic, in your home, or at a public place of your choice.
- You will be ask to talk about your experience of taking latent TB medication.
- You do not have to answer any questions you do not want to.
- You have the choice to be interviewed in Vietnamese or English. The primary researcher speaks Vietnamese well.
- The interview will be tape recorded. Only the research team can listen and review your tapes.
- All study volunteers will be able to review, make changes or erase the recordings of their interview.

How long will phase 2 of this study last?

Participation in this phase will be a one-time interview lasting approximately 60-minutes.

Are there any potential risks or discomforts that I can expect from this study?
• There are no physical risks expected to you. However, there is a chance your personal information may be exposed to non-research people. Everything will be done to make sure your privacy during the study is kept. Researchers will remove all personal information such as names and private information from the tapes.

• There is a chance you may feel uncomfortable during the interview. You can ask to have the interview be done in English or Vietnamese. You do not have to answer any questions you are uncomfortable with. All interviews will be done in a private closed room for privacy.

**Are there any potential benefits if I participate?**
You will not get any direct benefits from volunteering in this study. The information you share can help create future county programs that can help reduce TB disease in Vietnamese immigrants.

**Will I be paid for participating?**

• You will receive a $40 Target gift card compensation for your time.

**Will information about my participation be kept private?**
Yes. All information collected in this study will be kept private. It will be given out only with your permission or as required by law. All recordings from the interviews will be transferred to paper without your personal information. The recordings will be destroyed once the study is done. Only the research team will have the right to your private information during the study.

**What are my rights if I take part in this study?**

• You have the right to leave the study at any time.
• Whatever decision you decide, there will be no cost to you, and no loss of benefits you were entitled to through the county.
• You have the right to refuse to answer any questions that you do not want to answer and still remain in the study.
• This study is NOT part of the current care you are getting from the county. Your decision to join or not join the study will not affect any current county services you are getting.
• All study volunteers will be able to review, make changes or erase the recordings of their interview

**Who can I contact if I have questions about this study?**

• **The research team:**
  If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact:
Fayette Nguyen Truax, MS, RN, CPNP (Speaks Vietnamese)
714-809-2803 or ftruax@ucla.edu

Adeline Nyamathi, PhD, ANP, FAAN
310-825-8405

- UCLA Office of the Human Research Protection Program (OHRPP):

Please call the OHRPP or write to them if you have questions about your rights while volunteering in this study.

UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694
(310) 825-712

You will be given a copy of this information to keep for your records.

I have read the above information, or it has been read to me. I have had the chance to ask questions about it and any questions I have asked have been answered to my satisfaction. I consent to voluntarily be a participant in phase 2 of this study.

SIGNATURE OF STUDY VOLUNTEER (PARTICIPANT)

Name of Participant

Signature of Participant Date

SIGNATURE OF PERSON OBTAINING CONSENT

I have read out the information sheet to the volunteer. To the best of my ability, I made sure that the volunteer understands what will happen in the study. I confirm that the volunteer was given a chance to ask questions about the study. All the questions asked by the volunteer have been answered correctly and to the best of my ability. I confirm that the volunteer has not been forced into giving consent. The consent has been given freely and voluntarily.

Name of Person Obtaining Consent Contact Number

Signature of Person Obtaining Consent Date
Appendix K: Consent for Phase 2 (Vietnamese Version)

ĐẠI HỌC UCLA
BẢNG LỒNG THAM GIA CUỘC NGHIỆN CỨU
“Những dự đoán không được thực hiện trong việc điều trị bình ho lao ngầm cho người di dân gốc Việt”
Giai đoạn II

Fayette Nguyen Truax, RN, MS, CPNP và Dr. Adeline Nyamathi, ANP, PhD., FAAN, của ĐẠI HỌC UCLA đang hướng dẫn một cuộc nghiên cứu. Những nghiên cứu viên này muốn tìm hiểu nhiều hơn về sự nhiễm bình ho lao ngầm trong số các người Việt di cư. Họ rất muốn biết nhóm người Việt di cư này quyết định như thế nào về cách trị bình ho lao ngầm của họ.

Cần cử trên việc xem lại số đồ trị bình của anh (chị), anh (chị) được mời để tham gia giai đoạn 2 của cuộc nghiên cứu nói trên. Giai đoạn 2 này là hoàn toàn tự nguyện. Nó KHÔNG định liều tới những dịch vụ mà anh (chị) đang nhận được từ phòng khám bình ho. Sự quyết định của anh (chị) để tham gia hay không tham gia sẽ không ảnh hưởng gì đến những dịch vụ y tế hiện tại của county mà anh (chị) đang sống. Chỉ yêu cầu nghiên cứu viên là để tìm hiểu thêm anh (chị) sẽ quyết định như thế nào cho việc chữa trị hay là ngừng uống thuốc mà đã được cho toa. Anh (chị) sẽ mất khoảng 60 phút với nghiên cứu viên để nói về kinh nghiệm của mình.

Ngay bây giờ, hãy tự nhiên hỏi những câu hỏi về việc nghiên cứu này. Anh (chị) nên suy nghĩ rồi hãy quyết định nếu anh (chị) cảm thấy muốn tham gia.

Việc gì sẽ xảy ra nếu tôi được nhận vào giai đoạn 2 của cuộc nghiên cứu?

Nếu anh (chị) tham gia, nghiên cứu viên sẽ yêu cầu anh (chị) làm một việc sau đây:
- Hãy gặp nghiên cứu viên để được phỏng vấn trong vòng 60 phút.
- Anh (chị) có thể quyết định chọn nơi mình thích cho cuộc phỏng vấn. Thí dụ, trong một phòng riêng ở phòng trị bình của county, ở nhà của anh (chị), hay là ở một chỗ công cộng mà anh (chị) tự chọn.
- Anh (chị) sẽ được hỏi để nói về kinh nghiệm của mình trong lúc trị bình ho lao ngầm.
- Anh (chị) không bắt buộc phải trả lời những câu hỏi nào mà mình không muốn trả lời.
- Cuộc phỏng vấn sẽ được thu băng. Chỉ có ban tổ chức cuộc nghiên cứu được phép nghe và xem lại bằng đầu của anh(čị).
- Tất cả những người tham gia sẽ được phép xem lại, thay đổi hay là xóa đi những phần thu băng trong cuộc phỏng vấn của họ.

Giai đoạn 2 của cuộc nghiên cứu kéo dài bao lâu?
Sự tham gia trong giai đoạn này sẽ là một lần phỏng vấn kéo dài gần 60 phút.

Sẽ có những nguy hiểm nào hay sự không được tự nhiên mà tôi có thể gặp trong cuộc nghiên cứu này không?
• Không có những nguy hiểm về thể xác. Tuy nhiên, tin tức cá nhân của anh (chị) có thể bị phổ biến đến những người khác liên quan. Mọi sự việc sẽ được giải quyết để đảm bảo sự bảo mật của anh (chị) được giữ kín trong suốt cuộc nghiên cứu. Những nghiên cứu viên sẽ xóa đi tất cả thông tin cá nhân bao gồm cả tên và những thông tin riêng trong những bảng thành.

• Sẽ có trường hợp anh (chị) cảm thấy không được tự nhiên trong khi phỏng vấn. Anh (chị) có thể yêu cầu trọn cuộc phỏng vấn bằng tiếng Anh hay là tiếng Việt. Anh (chị) không cần phải trả lời những câu hỏi nào mà mình cảm thấy không được tự nhiên. Tất cả cuộc phỏng vấn sẽ được làm xong trong phòng riêng dong kin để có sự riêng tư.

Có những ích lợi thiết thực nào nếu tôi tham gia?

Anh (chị) sẽ không nhận được trực tiếp những ích lợi nào trong việc tham gia này. Những tin tức mà anh (chị) chia sẻ có thể giúp tạo ra những chương trình cho county ở tương lai để giúp làm giảm đi bệnh ho lao cho những người dân góc Việt.

Có phải tôi sẽ được trả tiền cho sự tham gia này không?

• Anh (chị) sẽ nhận được một thể tạng $40.00 của Target để bù lại cho thời gian của anh (chị).

Có phải những thông tin về sự tham gia của tôi được giữ bí mật không?


Những quyền hạn của tôi là gì nếu tôi nhận tham gia cuộc nghiên cứu này?

• Anh (chị) có quyền chấm dứt và không tham gia cuộc nghiên cứu bất cứ lúc nào.
• Dấu cho anh (chị) quyết định như thế nào, nó sẽ không tồn kẹm gi cho anh (chị), và không mất mặc một lời ích nào mà anh (chị) đã nhận được của county.
• Anh (chị) có quyền tự chỉ ra lời những câu hỏi nào mà anh (chị) không muốn trả lời và vấn ở lại trong cuộc nghiên cứu này.
• Cuộc nghiên cứu này KHÔNG dinh li lên phân nào đối với việc chăm sóc sức khỏe hiện nay mà anh (chị) dang nhận được của county. Sự quyết định của anh(chi) để tham gia hay không tham gia sẽ không ảnh hưởng đến dịch vụ nào mà anh (chị) nhận được của county hiện nay.
• Tất cả những người tình nguyện sẽ có thể xem lại, thay đổi hay là xóa bỏ những đoạn bằng thu thập trong cuộc phỏng vấn của mình.

Ai là người mà tôi có thể liên lạc nếu tôi có những câu hỏi về cuộc nghiên cứu này?

• Ban nghiên cứu:
Nếu anh (chị) có những câu hỏi nào, những bình luận gì hay là những điều liên quan đến cuộc nghiên cứu, anh (chị) có thể nói với một trong những nghiên cứu viên. Xin hãy liên lạc với:

Fayette Nguyen Truax, MS, RN, CPNP (Nơi tiếng Việt)
714-809-2803 hay là E-mail: ftruax@ucla.edu

Adeline Nyamathi, PhD, ANP, FAAN
310-825-8405

• UCLA Office of the Human Research Protection Program (OHRPP):

Xin hãy gọi OHRPP hay là việt thồ cho họ tên anh (chị) có những câu hỏi về quyền hạn của mình trong khi tự nguyện tham gia cuộc nghiên cứu UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694
(310) 825-712

Anh (chị) sẽ được cho một bản sao của những thông tin này để giữ làm hồ sơ của mình.

Tôi đã đọc những thông tin ở trên, hay là những thông tin này đã được đọc cho tôi nghe. Tôi đã có cơ hội để hỏi những câu hỏi về chúng và những câu hỏi nào tôi đã hỏi đều được trả lời thích đáng với sự bằng lòng của tôi. Tôi bằng lòng tự nguyện là một người tham gia cho giai đoạn 2 của cuộc nghiên cứu này.

CHỦ KÝ CỦA TƯ NGUYỄN VIỆN

________________________________
Tên

________________________________
Chữ ký

Ngày

CHỦ KÝ CỦA NGƯỜI NHẬN SỰ ĐỒNG Y


________________________________
Tên của người nhận đơn đăng lòng tham gia

________________________________
Số điện thoại liên lạc

________________________________
Chữ ký của người nhận đơn đăng lòng tham gia

Ngày
Appendix L: Socio-Demographic (English Version)

LATENT TUBERCULOSIS INFECTION RESEARCH PROJECT
SOCIO-DEMOGRAPHIC INFORMATION

1. What year were you born?  
2. How old are you today?  
3. What is your race or ethnicity? (Circle one)
   Vietnamese ........................................... 1  
   Asian (Not Vietnamese) ....................... 2
   Specify please specify your ethnicity  
4. In what country were you born? (Circle one)
   Vietnam ............................................. 1  
   Other ................................................. 2
   Specify  
4a. If born outside of the U.S., how many years have you lived in the US?  
   Number of years  
5. What is your gender? (Circle one)
   Male .................................................. 1  
   Female .............................................. 2
6. What is the highest education you have completed? (Circle one)
   Some high school .................................... 1  
   High School ........................................... 2  
   Some college ........................................... 3  
   College degree ...................................... 4
7. Are you currently in a relationship? (Circle one)
   Yes ..................................................... 1  
   No ...................................................... 2
8. What is your current marital status? (Circle one)
   Never married ........................................... 1
   Married .................................................. 2
   Separated ................................................ 3
   Divorced ................................................ 4
   Widowed .................................................. 5
9. Do you have any children? (Circle one)
   Yes ....................................................... 1
   How many ?  
   No ...................................................... 2
10. What is your religion? (Circle one)
    Catholic ................................................ 1
    Christian ............................................. 2
    Buddhist ............................................. 3
    Other ..................................................... 4
    Specify  
11. What is your average annual income? (Circle one)
    $0 to $8,925 ........................................... 1
    $8,925 to $36,250 .................................... 2
    $36,250 to $87,890 .................................. 3
    $87,890 and up ...................................... 4
12. Are you currently: (Circle One)
    Working full-time ..................................... 1
    Working part-time ................................... 2
    Unemployed .......................................... 3
    Retired .................................................. 4
    In school .............................................. 5
    Other ..................................................... 6
    Specify  

1
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. What language do you primarily speak on a daily basis? (Circle One)</td>
<td>Vietnamese: 1  English: 2  Both: 3  Other: 4  Specify:</td>
</tr>
<tr>
<td>14. Do you know of anyone who has tuberculosis disease? (Circle One)</td>
<td>Yes: 1  No: 2</td>
</tr>
<tr>
<td>15. Do you know of anyone who has latent tuberculosis infection? (Circle One)</td>
<td>Yes: 1  No: 2</td>
</tr>
<tr>
<td>16. Do you have health insurance? (Circle One)</td>
<td>Yes: 1  No: 2</td>
</tr>
<tr>
<td>17. Do you have a car to drive around town? (Circle One)</td>
<td>Yes: 1  No: 2</td>
</tr>
<tr>
<td>18. Do you know how to use public transportation? (Circle One)</td>
<td>Yes: 1  No: 2</td>
</tr>
</tbody>
</table>
| 19. Have you traveled back to Vietnam since you arrived to the U.S.? (Circle One) | Yes: 1  How many times:  
How many days on average did you stay:  |
| 20. Do you currently smoke cigarettes? (Circle One)                     | Yes: 1  No: 2  Did you smoke in the past:  
When did you quit:  |
### Appendix M: Socio-Demographic (Vietnamese-Version)

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anh/chị sinh năm nào?</td>
<td>[Specify year]</td>
</tr>
<tr>
<td>2. Hôm nay anh/chị bao nhiêu tuổi?</td>
<td>[Specify age]</td>
</tr>
<tr>
<td>3. Anh/chị thuộc giống dân hay chủng tộc nào?</td>
<td></td>
</tr>
</tbody>
</table>
- Người Việt Nam 
- Người Âu-Âu (Không phải người Việt Nam) 
- Xin xác định chủng tộc của mình |
| 4. Anh/chị sinh ở nước nào? (Khoanh trên một số) | 
- Việt Nam 
- Khác |
| 4a. Nếu sinh ngoài nước Mỹ, anh/chị đã sống ở Mỹ bao nhiêu năm? | [Specify years] |
| 5. Anh/chị thuộc giống nào? (Khoanh trên một số) | 
- Nam 
- Nữ |
| 6. Học lực cao nhất nào mà anh/chị đã hoàn thành? (Khoanh trên một số) | 
- Sở trung học 
- Trung học 
- Sở đại học công đồng 
- Bằng đại học công đồng |
| 7. Hiện giờ anh/chị còn liên hệ không? (Khoanh trên một số) | 
- Có 
- Không |
| 8. Hiện giờ anh/chị có gia đình chưa? (Khoanh trên một số) | 
- Chưa 
- Có gia đình 
- Lý do 
- O khác |
| 9. Anh/chị có con không? (Khoanh trên một số) | 
- Có 
- Không |
| 10. Anh/chị theo đạo nào? (Khoanh trên một số) | 
- Thiền Chùa 
- Tinh Lành 
- Đạo Phật 
- Khác |
| 11. Lợi tức trung bình hàng năm của anh/chị bao nhiêu? (Khoanh trên một số) | 
- $0 to $8,925 
- $8,925 to $36,250 
- $36,250 to $87,850 
- $87,850 and up |
| 12. Hiện giờ anh/chị làm (Khoanh trên một số) | 
- Làm toàn thời gian 
- Làm bán thời gian 
- Thất nghiệp 
- H-Bar trẽ 
- ĐK học 
- Khác |
13. Hàng ngày anh/chị nói chuyện dùng ngôn ngữ chính nào? (Khoanh chân một số)
   Tiếng Việt ...........................................1
   Tiếng Anh ...........................................2
   Cả hai Việt và Anh đều dùng ..................3
   Khác ..................................................4
   Xác định ____________________________

   Có ........................................... 1
   Không ......................................... 2

15. Anh/chị có biết người nào bị nhiễm bệnh ho lao ngâm không? (Khoanh chân một số)
   Có ........................................... 1
   Không ......................................... 2

16. Anh/chị có bảo hiểm sức khỏe không? (Khoanh chân một số)
   Có ........................................... 1
   Không ......................................... 2

17. Anh/chị có xe để chạy trong thành phố không? (Khoanh chân một số)
   Có ........................................... 1
   Không ......................................... 2

18. Anh/chị có biết dùng giao thông công cộng không? (Khoanh chân một số)
   Có ........................................... 1
   Không ......................................... 2

19. Anh/chị có trở về du lịch Việt Nam từ khi đến Mỹ không? (Khoanh chân một số)
   Có ............................................... 1
   Máy lần? ____________________________
   Trung bình anh/chị ở lại bao nhiêu ngày?
   ________________
   Không ........................................... 2

20. Hiệu quả anh/chị có hút thuốc không? (Khoanh chân một số)
   Có ........................................... 1
   Không ......................................... 2
   Trong thời gian qua anh/chị có hút không? ________
   Khi nào anh/chị bỏ hút? ________
Introduction:

Please rate how much you agree or disagree with each item below. This group of questions has several different sections, but will all use the same answering scale.

This first section will ask how you feel about your chance of getting tuberculosis. Please tell me if you Strong Agree, Agree, are Neutral, Disagree, or Strongly Disagree with each statement below.

<table>
<thead>
<tr>
<th>SUSCEPTIBILITY (TB Disease)</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. You are likely to get tuberculosis.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. You are likely to get tuberculosis in the next few years.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. You will get tuberculosis sometime during your life.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. Your chances of getting tuberculosis are higher than most people your age.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Your chances of getting tuberculosis are lower than most people your age.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Ok, now I will ask your opinions about tuberculosis disease.

<table>
<thead>
<tr>
<th>SERIOUSNESS (TB Disease)</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>
6. The thought of tuberculosis scares me. & 5 & 4 & 3 & 2 & 1 \\
7. When I think about tuberculosis, my heart beats faster. & 5 & 4 & 3 & 2 & 1 \\
8. I am afraid to think about tuberculosis. & 5 & 4 & 3 & 2 & 1 \\
9. Problems I would experience with tuberculosis would last a long time. & 5 & 4 & 3 & 2 & 1 \\
10. Having tuberculosis would threaten the relationships I have with my family and friends. & 5 & 4 & 3 & 2 & 1 \\
11. If I have tuberculosis, my whole life would change. & 5 & 4 & 3 & 2 & 1 \\

Now I will ask your opinions about taking latent tuberculosis medication.

<table>
<thead>
<tr>
<th>BENEFITS (Taking Latent TB Medication)</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. If I take my latent TB medication even though I don’t have symptoms, I do not have to worry as much about tuberculosis.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. Taking latent TB medication will help prevent me from getting tuberculosis.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14. Completing latent TB medication will decrease my chances of dying from tuberculosis.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>15. Taking latent TB medication will set my mind at ease.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Thank you, now I will list some reasons that keep some men and women from taking latent TB medication. Tell me how strongly you agree or disagree with each statement below.

<table>
<thead>
<tr>
<th>BARRIERS (Taking Latent TB Medication)</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. I am too old to need latent TB medication.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>17. I can not remember to schedule my monthly latent TB appointments at the clinic.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>18. Taking latent TB medication is too embarrassing.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>19. Taking latent TB medication takes too much time.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>20. Taking latent TB medication is harmful to my body.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>21. I have other problems more important than taking latent TB medication.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>22. Taking latent TB medication exposes me to unnecessary medicine.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>23. I am afraid to start latent TB medication because I am afraid of the side effects it may cause my body.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

The next questions will use the same scale but ask about your ability to take the monthly latent TB medication.

<table>
<thead>
<tr>
<th>SELF-EFFICACY (Taking Latent TB Medication)</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. You can get transportation to your latent TB appointments.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>25. You can arrange other things in your life to take latent TB medication.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>26. You can talk to people at the TB clinic if you have a problem.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>27. You can take latent TB medication even if you are worried.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>28. You can take latent TB medication even if you don’t know what to expect.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>29. You can make your own monthly appointments to the clinic while under treatment.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix O: Champion Health Belief Model Scale (CHBMS-29) – Vietnamese Version

MẪU TIÊU CHUẨN SỨC KHỎE ĐÃNG TIN CHAMPION
(Bản tu chỉnh)
Xác định Mức độ Đãng Tin của Mẫu Tiêu chuẩn Sức khỏe
Đối với phép Trị liệu bình Ho lao

Mô đầu:
Anh/chị hãy đánh giá có bao nhiêu phần động ý hay không động ý với mỗi tiêu đề dưới đây. Nhóm câu hỏi này có vài đoạn khác nhau, nhưng tất cả chỉ dùng chung mẫu tiêu chuẩn để trả lời.

Đoạn thứ nhất sẽ hỏi anh/chị thấy như thế nào về cơ hội mắc bệnh ho lao. Xin nói cho tôi biết nếu anh/chị Rất Động ý, Động ý, Ở Giữa, Không Động ý, hay Rất Không Động ý với mỗi câu dưới đây.

<table>
<thead>
<tr>
<th>TỈNH TRẠNG NHIỄM BỊNH (Bình Ho lao)</th>
<th>Rất Động ý</th>
<th>Động ý</th>
<th>Ở Giữa</th>
<th>Không Động ý</th>
<th>Rất Không Động ý</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anh/chị như là mắc bệnh ho lao.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Anh/chị sẽ mắc bệnh ho lao trong vài năm tới.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. Anh/chị sẽ mắc bệnh ho lao lúc nào đó trong đời sống của mình.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. Những cơ hội mắc bệnh ho lao của anh/chị cao hơn hầu hết đối với những người cùng tuổi.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Những cơ hội mắc bệnh ho lao của anh/chị thấp hơn hầu hết đối với những người cùng tuổi.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Được rồi, bây giờ tôi sẽ hỏi ý kiến của anh/chị về bệnh ho lao.

<table>
<thead>
<tr>
<th>SỰ NGHIỆM TRỌNG (Bình Ho lao)</th>
<th>Rất Động ý</th>
<th>Động ý</th>
<th>Ở Giữa</th>
<th>Không Động ý</th>
<th>Rất Không Động ý</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cái suy nghĩ về bệnh ho lao làm tôi lo sợ.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
2. Khi tôi nghĩ đến bệnh ho lao, tin tôi đáp nhanh hơn.

3. Tôi lo sợ khi nghĩ đến bệnh ho lao.


5. Có bệnh ho lao sẽ đe dọa những liên hệ mà tôi có được với gia đình và bạn bè.


Bây giờ tôi sẽ hỏi ý kiến của anh/chị về việc trị liệu bệnh ho lao ngầm.

<table>
<thead>
<tr>
<th>NHỮNG LỢI ÍCH (Trị liệu bệnh ho lao ngầm)</th>
<th>Rất Đồng ý</th>
<th>Đồng ý</th>
<th>Ở Giữa</th>
<th>Không Đồng ý</th>
<th>Rất Không Đồng ý</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nếu tôi dùng phép trị bệnh ho lao ngầm mắc đầu tôi không có triệu chứng, tôi không phải lo nhiều về bệnh ho lao.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Dùng phép điều trị bệnh ho lao ngầm sẽ giúp tôi chống lại việc mắc bệnh ho lao.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. Hoàn thành việc trị liệu bệnh ho lao ngầm sẽ giảm đi những cơ hội làm tôi phải chết vì bệnh ho lao.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. Dùng phép điều trị bệnh ho lao ngầm sẽ làm تمام tôi dế chịu.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Cám ơn, bây giờ tôi sẽ đưa ra một số lý do giúp cho một số ông/ bà nhận lấy điều trị bệnh ho lao ngầm. Hãy nói cho tôi biết anh/chị rất đồng ý hoặc là không đồng ý với mỗi câu dưới đây.
<table>
<thead>
<tr>
<th>NHỮNG TRỞ NGẢI (Trị liệu bình ho lao ngấm)</th>
<th>Rất Đống ý</th>
<th>Đống ý</th>
<th>Ở Giữa</th>
<th>Không Đống ý</th>
<th>Rất Không Đống ý</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tôi quá già rồi cần gì trị bệnh ho lao ngấm.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Tôi không thể nhờ để làm cái hễ hằng tháng về bệnh ho lao ngấm với phòng khám bệnh.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. Dùng phép trị liệu bình ho lao ngấm thì quá bổi rối.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. Dùng phép trị liệu bình ho lao ngấm mặt rất nhiều thời gian.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. Dùng phép trị liệu bình ho lao ngấm thì có hài cho thân thể tôi.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. Tôi có những vấn đề khác quan trọng hơn là dùng phép trị liệu bình ho lao ngấm.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7. Dùng phép trị liệu bình ho lao ngấm tôi ra tôi không cần đến y được nữa.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. Tôi lo để bắt đầu điều trị bình ho ngấm bởi vì tôi sợ các phân ứng có thể gây ra cho thân thể tôi.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Những câu hỏi sắp tới sẽ dùng chung mẫu tiêu chuẩn những hỏi về khả năng dùng thuốc trị liệu bình ho lao ngấm hàng tháng.

<table>
<thead>
<tr>
<th>TỤ KIỂM HIỆU QUẢ (Trị liệu bình ho lao ngấm )</th>
<th>Rất Đống ý</th>
<th>Đống ý</th>
<th>Ở Giữa</th>
<th>Không Đống ý</th>
<th>Rất Không Đống ý</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Anh/chị có được phương tiện đi đến cái hễ của bình ho lao ngấm.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Anh/chị có thể thễ thu xếp những việc khác trong đời sống của mình để nhận điều trị bệnh ho lao ngâm.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Anh/chị có thể nói với những người ở phòng khám bệnh lao nếu mình có một vấn đề.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. Anh/chị có thể nhận lấy điều trị bệnh ho lao ngâm ngay cả khi anh/chị đang bị lo lắng.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. Anh/chị có thể nhận lấy điều trị bệnh ho lao ngâm ngay cả khi anh/chị không biết mình muốn gì.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14. Anh/chị có thể làm cái henüz hàng tháng với phòng khám bệnh cho mình trong khi còn đang điều trị.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
## Appendix P: Morisky Medication Adherence Scale (MMAS-8) - English Version

**Latent Tuberculosis Infection**

**©Morisky Medication Adherence Scale (MMAS-8-Item)**

You indicated that you are taking medication for your (identify health concern, such as “high blood pressure”). Individuals have identified several issues regarding their medication-taking behavior and we are interested in your experiences. There is no right or wrong answer. Please answer each question based on your personal experience with your [health concern] medication.

(Please check your response below)

<table>
<thead>
<tr>
<th></th>
<th>No=1</th>
<th>Yes=0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you sometimes forget to take your [health concern] pills?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your [health concern] medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Have you ever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. When you travel or leave home, do you sometimes forget to bring along your [health concern] medication?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Did you take your [health concern] medicine yesterday?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. When you feel like your [health concern] is under control, do you sometimes stop taking your medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Taking medication everyday is a real inconvenience for some people. Do you ever feel hassled about sticking to your [health concern] treatment plan?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. How often do you have difficulty remembering to take all your medications?

(Please circle your response below)

- Never/Rarely………………………………………4
- Once in a while…………………………………3
- Sometimes………………………………………2
- Usually…………………………………………1
- All the time………………………………………0
### Mẫu Tiêu Kiểm Mức Độ Bình Ho-Lao Ngấm

**(LTBI Medication Adherence Scale)**

Anh/chị cho biết mình đang sử dụng thuốc ho落到 kiểm soát bệnh ho lão ngấm. Mỗi bệnh nhân đều gặp một vài trở ngại liên quan đến hành vi sử dụng thuốc và chúng tôi quan tâm đến những kinh nghiệm sử dụng thuốc của anh/chị. Sẽ không có câu trả lời đúng lạy sai cho những câu hỏi dưới đây. Xin anh/chị vui lòng trả lời các câu hỏi này dựa trên kinh nghiệm bản thân của mình khi sử dụng thuốc để điều trị bệnh ho lão ngấm.

(Xin vui lòng khoanh tròn số thích hợp)

<table>
<thead>
<tr>
<th>Hỏi</th>
<th>Không</th>
<th>Có</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thanh thạo anh/chị có quen dùng thuốc điều trị bệnh ho lão ngấm không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2. Có người đến khi không sử dụng thuốc không phải vì quen mà là vì một lý do khác. Hãy nhớ lại xem trong hai tuần vừa qua có ngày nào anh/chị đã không dùng thuốc điều trị bệnh ho lão ngấm không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3. Anh/chị có bảo giờ tự giảm liều thuốc hay ngừng thuốc mà không nói qua cho bác sĩ vì anh/chị đã cảm thấy tốt hơn khi không dùng thuốc không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. Khi đi du lịch hay ra khỏi nhà, anh/chị có đối khi quên mang theo thuốc điều trị bệnh ho lão ngấm không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5. Hôm qua anh/chị có sử dụng thuốc điều trị bệnh ho lão ngấm không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7. Phải dùng thuốc điều trị bệnh mới ngày thuốc thứ nhất tiên đối với một số người. Có bảo giờ anh/chị cảm thấy khó chịu vì cữ mà gần bối với kế hoạch điều trị bệnh ho lão ngấm không?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8. Anh/chị có thường cảm thấy khó mà nhớ việc sử dụng thuốc điều trị bệnh đầy đủ không?</td>
<td>(Xin vui lòng khoanh tròn số thích hợp)</td>
<td></td>
</tr>
</tbody>
</table>

Không bảo giờ/Hơi khi

Lâu lâu một lần

Đôi khi

Thương xuyên

Luôn luôn
Appendix R: Social Desirability Scale (SDS-13)- English Version

MARLOWE-CROWN SHORT FORM C- 13 ITEMS
SOCIAL DESIRABILITY SCALE

Instructions: Read each item and decide whether it is true (T) or false (F) for you. Try to work quickly and answer each question by circling true or false.

1. It is sometimes hard for me to go on with my work if I am not encouraged.
   
   True          False

2. I sometimes feel resentful when I don’t get my way.
   
   True          False

3. On a few occasions, I have given up doing something because I thought too little of my ability.
   
   True          False

4. There have been times when I felt like rebelling against people with authority even though I knew they were right.
   
   True          False

5. No matter who I’m talking to, I’m always a good listener.
   
   True          False

6. There have been occasions when I took advantage of someone.
   
   True          False

7. I’m always willing to admit it when I make a mistake.
   
   True          False

8. I sometimes try to get even rather than forgive and forget.
   
   True          False

9. I am always courteous, even to people who are disagreeable.
   
   True          False
10. I have never been bothered (irked) when people expressed ideas very different from my own.

   True    False

11. There have been times when I was quite jealous of the good fortune of others.

   True    False

12. I sometimes get irritated by people who ask favors of me.

   True    False

13. I have never deliberately said something that hurt someone’s feelings.

   True    False
Appendix S: Social Desirability Scale (SDS-13) - Vietnamese Version

MARLOWE-CROWN KHÔNG NGẪN C- 13 TIẾT MỤC MỨC ĐÔ HAM THÍCH Ở XÃ HỘI

Hướng dẫn: Đọc mỗi tiết mục và quyết định nó hoặc là thực (T) hay giả (G) đối với anh/chị. Hãy cố gắng làm nhanh và trả lời mọi câu hỏi bằng cách khoanh tròn thực hay giả.

1. Có lúc khó cho tôi tiếp tục với việc làm nếu tôi không được khuyên kích.
   Thực       Giả

2. Có lúc tôi cảm thấy không đúng khi tôi không đi con đường của tôi.
   Thực       Giả

3. Có một vài khi, tôi đã bỗ không làm bởi vì tôi nghĩ nó quá nhỏ đối với khả năng của tôi.
   Thực       Giả

4. Có nhiều lần khi tôi đã cảm thấy như người chúng lại những người có thể lực mặc đâu tôi biết họ đã đúng.
   Thực       Giả

5. Không cần biết nói chuyện với ai, tôi luôn luôn lắng tai nghe.
   Thực       Giả

6. Có nhiều khi tôi đã nhận lấy phán lì của người khác.
   Thực       Giả

7. Tôi luôn luôn sẵn sàng nhận lấy nó khi tôi phạm lỡ.
   Thực       Giả

8. Có lúc tôi cố gắng nhận lấy ngay hôm là tha thứ và quên.
   Thực       Giả
9. Tôi luôn luôn lịch sự, ngay cả những người không đồng ý với tôi.
   Thực    Giả

10. Tôi không bao giờ buồn phiền (nỗi giận) khi người ta bày tỏ ý kiến rất khác với tôi.
    Thực    Giả

11. Có nhiều lần khi tôi hoàn toàn gánh tội với cơ hội tốt của người khác.
    Thực    Giả

12. Có lúc tôi bịt bởi những người họ ăn lucr với tôi.
    Thực    Giả

13. Tôi chẳng bao giờ nói điều gì làm tổn thương đến cảm giác của người khác.
    Thực    Giả
Appendix T: Self-Efficacy for Appropriate Medication Use (SEAM-9)- English Version

**SELF-EFFICACY ASSESSMENT**

A lot of people have trouble taking their medicines like their doctor prescribes. I would like to ask you your opinion about taking your medicines. I want to learn what you think you can do under several different conditions, not actually what you do. For each situation, let me know whether you are "not at all confident," "somewhat confident," or "very confident."

<table>
<thead>
<tr>
<th>How confident are you that you can take your medicines correctly?</th>
<th>Not Confident</th>
<th>Somewhat Confident</th>
<th>Very Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you take several different medicines each day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. When you take medicines more than once a day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. When you are away from home.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. When you have a busy day planned.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. When they cause some side effects.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. When no one reminds you to take the medicine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. When the schedule to take the medicine is not convenient.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. When your normal routine gets messed up.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. When you are not sure how to take the medicine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. When you are not sure what time of the day to take your medicine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. When you are feeling sick (you know, like having a cold or the flu).</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. When you get a refill of your old medicines and some of the pills look different than usual.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. When a doctor changes your medicines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix U: Self-Efficacy for Appropriate Medication Use (SEAM-9)
Vietnamese Version

<table>
<thead>
<tr>
<th>Mã Tự Kiểm Kết Quả</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lần sao anh/chị tin rằng mình có thể dùng thuốc đúng ...</td>
</tr>
<tr>
<td>1. Khi anh/chị dùng với loại thuốc khác nhau mỗi ngày.</td>
</tr>
<tr>
<td>2. Khi anh/chị dùng thuốc nhiều lần một ngày.</td>
</tr>
<tr>
<td>3. Khi anh/chị đi xa nhà.</td>
</tr>
<tr>
<td>4. Khi anh/chị có một ngày bị rối loạn tiêu hóa.</td>
</tr>
<tr>
<td>5. Khi anh/chị bị đau hoặc ốm.</td>
</tr>
<tr>
<td>6. Khi không có ai để nhắc anh/chị dùng thuốc.</td>
</tr>
<tr>
<td>7. Khi lịch trình dùng thuốc không được thuận lợi.</td>
</tr>
<tr>
<td>8. Khi việc bệnh thuyên giảm gây rối loạnosaic.</td>
</tr>
<tr>
<td>9. Khi anh/chị không biết phải dùng thuốc như thế nào.</td>
</tr>
<tr>
<td>10. Khi anh/chị không biết nên quay ngược lại đây để dùng thuốc.</td>
</tr>
<tr>
<td>11. Khi anh/chị cảm thấy bị bệnh (như bị cảm hay tiêu hóa không tốt).</td>
</tr>
<tr>
<td>12. Khi anh/chị nhận thấy loại thuốc cũ và một loại thuốc trên nên có thể khác biệt hơn.</td>
</tr>
<tr>
<td>13. Khi biết rõ thì dễ dùng thuốc.</td>
</tr>
</tbody>
</table>
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