

**SOCIAL AND BEHAVIORAL SCIENCES EXERCISE 1:  
Explaining Health Behavior with the Health Belief Model-  
Screening for Latent Tuberculosis Infection  
STUDENT VERSION 1.0**

**SBS Exercise 1: Explaining Health Behavior with the Health Belief Model (HBM)  
Screening for Latent Tuberculosis Infection**

Estimated time to complete this exercise: 35 minutes

**LEARNING OBJECTIVES**

At the completion of this exercise, participants should be able to:

- Describe the 5 principal constructs of the HBM
- Describe a public health problem using HBM constructs
- Apply HBM constructs to a health promotion intervention
- Identify the main limitations of HBM and how they may limit the model's applicability to some health behaviors

**ASPH SOCIAL AND BEHAVIORAL SCIENCES COMPETENCIES ADDRESSED**

E.1. Identify basic theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice

**ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED**

F. 4. [Communication and Informatics] Apply theory and strategy-based communications principles across different settings and audiences

G.10. [Diversity and Culture] Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served

J.10. [Professionalism] Appreciate the importance of working collaboratively with diverse communities and constituencies (e.g., researchers, practitioners, agencies, and organizations)

K.1. [Program Planning] Describe how social, behavioral, environmental, and biological factors contribute to specific individual and community health outcomes

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*Students should complete the required reading and Introduction section before the class session and have these items available as references while they complete the exercise.*

**Required Reading: Champion VL and Skinner CS. “The Health Belief Model.” In: Glanz K, Rimer BK, Viswanath K, eds. Health Behavior and Health Education. Theory, Research, and Practice. 4th ed. San Francisco, CA: John Wiley and Sons, Inc.; 2008: 45-65.**

**Introduction**

Models of health behavior attempt to identify individual and social factors that influence health behaviors and to explain their interaction. Individual factors include beliefs, attitudes, motives, and expectations, as well as observable behaviors. Similarly, social factors include group values connected with and responses to particular behaviors, and material factors such as the availability of health care services.

One of the oldest and most widely applied models of individual health behavior is the Health Belief Model (HBM). The HBM emphasizes the normative, perceptual bases of behavior that are embedded in social relations and values, and which may influence individual health-related decisions as much or more than medical considerations. The model identifies perceptual dimensions related to judgments about personal health and health threats, and about the relative value and cost of contemplated health behaviors. Applied to health promotion and health education efforts, the HBM suggests that attempts to influence behavior will be successful to the degree that they effectively address the values and priorities of target populations, as well as providing information with sound scientific and clinical bases. As the required reading explains, the values and priorities are operationalized in the central HBM constructs: *perceived susceptibility*, *perceived severity*, *perceived benefits*, and *perceived barriers*.

**Key Concepts and Definitions of the Health belief Model<sup>1</sup>**

<b>Concept</b>	<b>Definition</b>	<b>Application</b>
Perceived Susceptibility	One’s opinion of chances of getting a condition.	Define population(s) at risk, risk levels.  Personalize risk based on a person’s characteristics or behavior.  Make perceived susceptibility more consistent with individual’s actual risk.

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Perceived Severity	One's opinion of how serious a condition and its sequelae are.	Specific consequences of the risk and the condition.
Perceived Benefits	One's opinion of the efficacy of the advised action to reduce risk or seriousness of impact.	Define action to take: how, where, when; clarify the positive effects to be expected.
Perceived Barriers	One's opinion of the tangible and psychological costs of the advised action.	Identify and reduce perceived barriers through reassurance, correction of misinformation, incentives, assistance.
Cues to Action	Strategies to activate one's "readiness."	Provide how-to information, promote awareness, employ reminder systems.

**The HBM and Tuberculosis (TB) Infection**

Inspiration for the HBM came from research conducted to explain the relatively low acceptance of free screening for TB in several large American cities in the early 1950s.<sup>2</sup> The US Public Health Service saw TB as an important target for its efforts to eradicate communicable diseases because it is both easily transmitted and curable with proper treatment. Therefore, it launched a campaign to identify individuals in the early stages of the disease before it became symptomatic and infectious. Detection and appropriate evaluation and treatment of individuals with this condition, known as latent TB infection (LTBI) are today cornerstones of US TB control strategy.

**TB and LTBI**

TB is among the oldest recorded diseases in human history. When TB bacteria are expelled with moisture from the respiratory system of a person with the disease while coughing, sneezing, speaking, or singing, they can be inhaled into another person's lungs and cause TB infection.

Transmission of TB through close human contact is common; about one-third of the world's population is infected with TB. A proportion of those who become infected will develop active TB disease, which can be deadly if untreated or improperly treated.

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Generally, people are most likely to progress from infection to active TB disease just after they are infected; the risk of developing the disease within 2 years of infection is from 5% to 10%. Thereafter, there is about a 10% lifetime risk of progression to disease if LTBI is not treated. Progression is significantly accelerated among certain groups, including young children and the immunocompromised, especially individuals infected with HIV.

One vaccine to prevent TB is currently available: the bacille Calmette-Guérin vaccine, or BCG. BCG is sometimes effective in preventing childhood TB and is given to very young children in many countries where TB is prevalent. It is not routinely given in the United States, because its effectiveness in adults is highly variable and because the vaccine may interfere with the reactivity of the most widely used test for TB infection, the tuberculin skin test (TST).

Given the difficulty in preventing transmission of TB, it is critically important that people who are infected with TB be identified early and when appropriate, be treated before the disease progresses to its symptomatic and usually infectious phase. TB-infected individuals for whom treatment is appropriate include: children under 5 years of age; close contacts of infectious TB cases; those who are at high risk for progression from infection to TB disease because of immuno-suppression due to disease, therapeutic drug regimen, or lifestyle considerations such as injection drug use and severe alcoholism; those in congregate settings, including prisons and jails, homeless shelters, and long-term care facilities; and recent immigrants from countries where TB prevalence is high. Effective treatment of LTBI can halt the development of TB disease in patients and may reduce the infections that would result from contact with an active disease case, infections that could become additional cases of TB disease.

The difficulties of identifying people with LTBI before they become symptomatic and infectious and seeing them successfully complete treatment have challenged health care providers and policy makers since effective treatment was made available. The preferred treatment for LTBI consists of 9 months of isoniazid (ī-sə-nī-ə-zəd; also referred to as INH) taken daily. INH is inexpensive and easily administered; however, it can produce toxic side effects, the most common of which is hepatitis. Alcohol use may increase the risk of hepatotoxic side effects from INH.

Recognizing the importance of LTBI treatment to TB control efforts in the United States, the US Department of Health and Human Services has established a target of an 85% completion rate among high-risk individuals prescribed LTBI treatment.<sup>3</sup> However, most reported completion rates fall well below that target.<sup>4</sup>

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**Case Study: Bringing LTBI Testing to Migrant Farm Workers**

Migrant workers make up most of the seasonal agricultural labor force in the United States. Many migrants enter the country with temporary work permits and move in regional patterns according to the demands of the agricultural cycle. Most come from countries where TB is prevalent, especially Mexico, and thus are at high risk of having LTBI. While in the United States, workers often live in crowded group settings, in which there is an elevated probability that anyone who does become sick with TB will infect others living and working in close proximity. Migrant workers are therefore good candidates to test for LTBI and to begin treatment to prevent those who are infected from becoming sick with TB disease.

A community-based organization (CBO) in the heart of a western agricultural region is planning an initiative to educate Mexican migrant workers about LTBI, perform testing for LTBI, and refer infected workers for appropriate treatment at the regional public health clinic, located in the largest urban center of their region. Anticipating that workers who begin LTBI treatment through the program may return home before completing treatment, the CBO has established relationships with several providers in the regions of northern Mexico that most workers come from. The Mexican providers have agreed to follow patients on treatment for LTBI who are referred to them from the CBO. The CBO hopes that this initiative will increase the number of migrant farm workers who receive appropriate treatment for LTBI, and thus contribute to a reduction in cases of TB disease in the region.

The CBO staff members believe they will be able to facilitate LTBI testing and treatment because most of the staff speak Spanish and they have been providing some services on location in migrant workers' residential camps for some years now. Resident workers regularly attend evening literacy classes that the CBO holds in the camps, and the staff has good rapport with many of the workers who return year after year.

In preparation for designing the CBO's TB educational sessions and testing initiative, staff members visited each camp and talked with as many workers as possible about their beliefs and experiences related to TB and LTBI.

**Migrant Workers' Perspectives on TB and LTBI**

The CBO staff found that the Mexican workers who they spoke to were familiar with TB disease, given that it is common in the rural communities the workers grew up in. They stated that treatment for TB was available in Mexico. Some migrants had lost family members to the disease. Almost all had heard stories about people stricken with TB who went to a distant public hospital for treatment and never returned or who were sent away

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from their families, even from their children, when they developed a persistent cough, became weak and lost weight, and otherwise showed signs of TB. They described the social and emotional effects of such social isolation as devastating, emphasizing that having TB could destroy a person's social and familial networks, the availability of treatment notwithstanding.

Despite its fearsome implications, the disease was not seen as a significant personal threat to the workers. Most had received the BCG vaccine when they were children and felt that it continued to protect them against TB.

The migrant workers were less familiar with the concept of TB infection in the absence of disease symptoms. Some who had heard about a test for TB had also heard that the BCG vaccine could cause a positive reaction to the TST, so they wondered if the test were appropriate for people who had been vaccinated. In general the workers seemed unaware of possibilities to treat LTBI, stating that, to their knowledge, LTBI treatment is not prescribed in their home regions in Mexico. Similarly, many did not know how TB is transmitted. Some expressed the belief that TB runs in families and that those with a family history of TB should take precautions if they believe that they are experiencing symptoms.

The workers were pleased to hear that the CBO staff planned to come to the camps to provide a service in the evening, since during the day they could not leave the fields for personal reasons. One migrant emphasized that they were only there while the harvest lasted and had to make as much money as possible while work was available. Several workers asked about the regional public health clinic that the CBO planned to partner with, and commented that they had no experience getting health care in the United States. They asked about the cost of treatment and seemed doubtful when the CBO staff explained that LTBI treatment would be provided at no cost. One worker said that he did not need to go to American doctors because he brought herbal teas from home to help him stay healthy. If he did fall ill, he said, he would think back to what the women in his family had done to treat illness at home and replicate their remedies when needed.

**Incorporating Patient Perspectives into Planning the Education and Testing Initiative**

The CBO staff members have gathered to discuss how to use the information collected from the migrant workers to design their education and testing efforts. To help analyze the information, they will use the HBM.

-----**End of Case Study**-----

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**Instructions: Based on the information gathered by the CBO that appears in the case study and using the table below, provide the CBO with your best advice about using the HBM to develop their initiative.**

- Identify the perceived susceptibility, severity, benefits, barriers, and cues to action as applied to LTBI testing.
- Provide examples of each HBM construct from the information that the CBO gathered.
- Describe how each HBM construct can be addressed in the CBO's initiative to bring LTBI education, testing, and referral for treatment to migrant farmer workers.

**The HBM: Migrant Workers and LTBI**

<b>HBM Construct</b>	<b>Construct Applied to LTB Testing</b>	<b>Examples of Construct from the Migrant Farm Workers Case Study</b>	<b>Construct Addressed in the CBO's LTBI Education, Testing, and Referral Initiative</b>
<b>Perceived Susceptibility</b>			
<b>Perceived Severity</b>			

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**The HBM: Migrant Workers and LTBI**

<b>HBM Construct</b>	<b>Construct Applied to LTB Testing</b>	<b>Examples of Construct from the Migrant Farm Workers Case Study</b>	<b>Construct Addressed in the CBO's LTBI Education, Testing, and Referral Initiative</b>
<b>Perceived Benefits</b>			
<b>Perceived Barriers</b>			
<b>Cues to Action</b>			



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**Questions for Further Discussion:**

**What important aspects of designing the initiative are not addressed by the Health Belief Model?**

**What weaknesses in the initiative might result if the CBO relies solely on the information they have gathered to design the initiative?**

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<sup>1</sup> Adapted with permission from Champion VL and Skinner CS. "The Health Belief Model." In: Glanz K, Rimer BK, Viswanath K, eds. Health Behavior and Health Education. Theory, Research, and Practice. 4th ed. San Francisco, CA: John Wiley and Sons, Inc.; 2008, 47.

<sup>2</sup> Hochbaum GM. Public participation in medical screening programs: a sociopsychological study. PHS Publication no. 571. Washington, DC: U.S. Government Printing Office. 1958.

<sup>3</sup> US Department of Health and Human Services. Healthy People 2010. 2nd ed. Washington DC, 2000.

<sup>4</sup> Hirsch-Moverman Y, Daftary A, Franks J, Colson PW. Adherence to treatment for latent tuberculosis infection: systematic review of studies in the US and Canada. Intl J Tuberc Lung Dis. 2008;12: 1235-1254.