



## THE MEANINGS OF TUBERCULOSIS FOR MEXICAN MIGRANT FARMWORKERS IN THE UNITED STATES

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**Abstract**—The timely diagnosis and treatment of tuberculosis is an important public health problem in both developed and developing nations. In the United States, migrant farmworkers are estimated to be about six times more likely than other employed adults to develop tuberculosis. The purpose of this study was to investigate explanatory models of tuberculosis among Mexican migrant farmworkers working in western New York state. In-depth interviews were conducted with 26 farmworkers using an open-ended question format. All interviews were conducted in migrant camps and were audio-taped, translated and transcribed by the researcher. Data analysis was performed using Glaser and Strauss' grounded theory method of analysis which involves continuous and simultaneous data collection, coding, and analysis. Study participants included 21 males and 5 females ranging in age from 18 to 65. Respondents had worked as migrant farmworkers an average of 10 years and had an average of five years of schooling. Two-thirds of the participants had previously attended a tuberculosis education program, and four had received treatment for tuberculosis infection in the past. Farmworkers' explanations of tuberculosis etiology, severity, symptoms, prevention, treatment, and social significance are described as well as their beliefs about tuberculosis skin testing and the bacillus Calmette-Guérin (BCG) vaccine. Migrant farmworkers' explanatory models were similar in many aspects to the medical model of tuberculosis, although farmworkers had numerous misconceptions about BCG vaccination. Health care workers should be aware that Mexican migrant farmworkers may have beliefs about tuberculosis that are very compatible with participation in testing and treatment programs if such programs are made accessible to them. © 1998 Elsevier Science Ltd. All rights reserved

**Key words**—explanatory models, migrant farmworkers, tuberculosis

### INTRODUCTION

The global prevalence of tuberculosis infection is estimated to be 1.7 billion persons or about one-third of the world's population, a number which is expected to grow steadily. Worldwide, tuberculosis is the leading cause of death by infectious disease (Bloom and Murray, 1992). Tuberculosis primarily affects adults between 15 and 64, and it is estimated that 26% of preventable deaths among adults in developing nations are caused by tuberculosis (Murray *et al.*, 1990).

The diagnosis and treatment of tuberculosis is accordingly an important public health problem in both developed and developing nations. In the United States, the number of reported cases of tuberculosis declined steadily between 1953 and 1985, but from 1985 to 1993, cases increased by 14% (Centers for Disease Control, 1993; Centers for Disease Control, 1994). Although there has been a decline in the total number of tuberculosis cases since 1993, this disease remains an important health concern among persons born outside of the United States. In 1995, about 35% of all reported cases of tuberculosis in the United States were among foreign-born persons (Centers for Disease Control, 1996a). The proportion of total reported tuberculosis cases among foreign-born persons has increased from about 22% in 1986 to 35% in 1995

(Centers for Disease Control, 1996b). Among Hispanics, reported cases of tuberculosis increased by 55% between 1985 and 1990 (Jereb *et al.*, 1991).

Health care providers often have understandings about tuberculosis that are very different from those of the people they treat. These different interpretations may result in misunderstandings or conflict between provider and client and lead to inadequate treatment of the illness. Other factors, however, also contribute to the failure of tuberculosis control efforts around the globe. Farmer (1997) argues that structural barriers, inadequate access to care, racism and environmental factors have played a primary role in the tuberculosis epidemic that disproportionately affects the world's poor.

In this paper, the literature about explanatory models of tuberculosis in a variety of cultures is reviewed. Explanatory models are notions about an illness that help patients make sense of the illness within a cultural context (Kleinman, 1980). The study of explanatory models focuses on the patient's explanation of the etiology, symptoms, severity, social significance, and treatment of the illness.

Following the discussion of explanatory models, the results of a qualitative study investigating the meanings of tuberculosis to a group of Mexican migrant farmworkers are presented. The purpose of

the study was to investigate farmworkers' explanatory models about tuberculosis in order to understand better how they view this disease and to improve an existing tuberculosis screening and treatment program targeted to them.

Farmworkers are estimated to be about six times more likely than other employed adults to develop tuberculosis (Centers for Disease Control, 1992a). Rates of tuberculosis infection and disease among Hispanic farmworkers, the vast majority of whom are Mexican, are much higher than those of the general United States population. Studies of farmworkers have documented positive tuberculosis skin tests rates of 23% in New York (Poss and Rangel, 1997), 37% on the peninsula shared by Delaware, Maryland, and Virginia (Jacobson *et al.*, 1987), 41% in North Carolina (Ciesielski *et al.*, 1991), 44% in Florida (Centers for Disease Control, 1992b) and 48% in Virginia (Centers for Disease Control, 1986).

#### CROSS-CULTURAL PERSPECTIVES ON TUBERCULOSIS

Explanatory models about tuberculosis are different across cultures. Several studies describing the nature of explanatory models about tuberculosis are reviewed in this section. The ascribed etiology of tuberculosis varies by culture. In Honduras, Mata (1985) found that "aberrant" behaviors such as exposing oneself to the early morning dew, the night air, or bathing after a physical effort were considered causes of the illness. Methods of transmission cited by Honduran respondents included talking or sharing eating utensils with an infected person. In a study in Kenya, patients reported that tuberculosis can be caused by the desires of their ancestors, excessive physical exertion, and witchcraft (Ndeti, 1972). Barnhoorn and Adriaanse (1992) studied compliance with tuberculosis therapy among patients in India and found that noncompliant patients were more likely to believe that witchcraft or past sins were causes of tuberculosis. Sorcery was believed to play a role in the development of tuberculosis by a majority of patients in a study conducted in Haiti, although the authors stressed that patients' beliefs about etiology did not predict their compliance with medication regimens (Farmer *et al.*, 1991).

A study of tuberculosis patients in Pakistan revealed that most participants believed that tuberculosis was an infectious disease spread by sputum, but others thought it was caused by previous injury to the lungs, taking cold baths or prior sins (Liefoghe *et al.*, 1995). Nichter's (1994) study of illness semantics in the Philippines revealed that participants believed tuberculosis could result from germs, fatigue, poverty, exposure to cold or wind, or any factor that seriously weakened or shocked the body. Methods of transmission cited included spread "through the air" and inheritance through

the blood of the father or mother. In South Africa, factors named as causes of tuberculosis included cold weather, smoking, and malnutrition (Metcalf *et al.*, 1990). Eighty-five percent of South African respondents, however, believed that tuberculosis was infectious and could be spread through the air.

Symptoms of tuberculosis named by Hondurans included cough and expectoration, but Mata (1985) noted that a person with a cough often considered this symptom to be the disease itself and consequently did not seek treatment. In the Philippines, study participants most often named back and chest pain, weight loss, poor appetite, weakness, cough and fever as symptoms of tuberculosis (Nichter, 1994). In the South African study, over 90% of respondents listed cough, weight loss and night sweats as symptoms, but a smaller number thought that blindness, rash and hair loss were also indicative of tuberculosis (Metcalf *et al.*, 1990).

Most Honduran respondents believed that tuberculosis could be cured with medication but feared discovery of their condition by neighbors if they submitted to the lengthy treatment. Home remedies for suspected tuberculosis included skunk oil, boa constrictor oil, shark oil and mango. In Kenya, Ndeti (1972) found that tuberculosis patients supplemented the hospital drug treatment with traditional herbs or used herbs instead of medication. In addition, many believed in the ability of witchdoctors to cure tuberculosis. Nichter's study in the Philippines revealed that the vast majority of subjects felt that tuberculosis could be cured by a doctor using medication. Most participants did not know the length of treatment, however. All respondents in the South African study considered tuberculosis to be treatable with medications administered by physicians.

Studies in many cultures suggest that tuberculosis is a socially stigmatized illness. Hunter and Arbona (1985) report that infected persons in Puerto Rico often conceal their diagnosis or attribute symptoms to less-stigmatized pulmonary problems like pneumonia or asthma. In Honduras, Mata (1985) noted that tuberculosis is associated with extreme poverty, filth, and malnutrition. In his study, sixty percent of the population surveyed believe they would be rejected by their family if they contracted tuberculosis. Ndeti (1972) found that patients in Kenya rarely discussed their diagnosis with others. In Pakistan and India, tuberculosis patients reported that others feared and avoided them. A diagnosis of tuberculosis seriously diminished a single person's marriage prospects and sometimes resulted in divorce for married patients (Barnhoorn and Adriaanse, 1992; Liefoghe *et al.*, 1995). Research in the Philippines also revealed that persons affected with tuberculosis are stigmatized, although perhaps to a lesser extent than in other countries (Nichter, 1994). Respondents in Nichter's study reported that tuberculosis would not reduce chances of finding a

marriage partner or a job and that family members were not isolated or rejected by their kin.

Rubel and Garro (1992) cite Rubel's unpublished study of Mexican immigrants in California that describes the social stigma attached to tuberculosis:

many patients had not mentioned to those with whom they lived the nature of their illness, others curtailed contacts with family and friends with whom they had enjoyed extensive relationships, and still others expressed fear that a spouse would discover their illness, refuse to eat or sleep with them, and even sever the relationship (p. 631).

Studies in several cultures suggest that tuberculosis may be confused with folk illnesses. In a study conducted in Cebu City, Philippines, Lieban (1976) found that the symptoms of various childhood respiratory illnesses including tuberculosis are attributed by parents to a folk illness known as *piang*. *Piang* is believed to result when a child falls, injures the bones of the rib cage and consequently sustains injury to the lungs. Parents whose children exhibit symptoms of *piang*, such as cough and fever, take them to traditional healers for treatment rather than to physicians. Nichter (1994) conducted a study in Oriental Mindoro, Philippines and found that tuberculosis may be confused with a condition known as *mahina ang baga* (weak lungs). Respondents in this study believed variously that weak lungs could develop into tuberculosis, that the two illnesses were the same, or that there was no connection between the two. Nichter noted that when physicians in the Philippines diagnose tuberculosis, they may use the term "weak lungs" because it carries less stigma for patients.

#### TUBERCULOSIS EXPLANATORY MODELS AMONG MEXICAN MIGRANT FARMWORKERS IN NEW YORK

There are no published studies about the meanings and social significance of tuberculosis for Mexican migrant farmworkers. In order to plan effective and appropriate education, screening and treatment programs for this population, it is important to understand the subjective meanings tuberculosis has for them. To this end, a qualitative study was conducted to investigate explanatory models of tuberculosis among Mexican migrant laborers working in Orleans and Monroe Counties in western New York. Crops grown in this region of the state include fruit, such as apples, peaches and cherries, as well as ground crops including strawberries, cucumbers, onions, and tomatoes. The study took place between July and September 1996 and was done in conjunction with a tuberculosis education and treatment program conducted by the Oak Orchard Community Health Center (OOCHC) in Brockport, NY.

Every summer, bilingual/bicultural health promoters from the Oochc, working with nurses and outreach staff from county health departments, conduct tuberculosis education and screening programs

in migrant camps in western New York. Since 1994, over 1050 migrant farmworkers have attended these educational programs and have been screened for tuberculosis. The education program is presented in the migrant camps by the health promoters using popular education methods, such as skits, demonstrations and audience participation. Farmworkers who wish to participate in screening receive tuberculosis skin tests, and, if indicated, chest radiographs and treatment. Participants in the program are not charged for any of these services.

#### Subjects

After obtaining the approval of the Human Subjects Review Committee at the State University of New York at Buffalo, School of Nursing, the researcher conducted in-depth interviews with 18 Mexican migrant farmworkers using an open-ended question format. In addition to the 18 persons who formally consented to participate in the study, 8 others participated informally. The latter group did not wish to sign the consent form, but expressed a desire to be present during interviews and contribute their opinions.

A convenience sample was chosen from farmworkers residing in ten different migrant camps in Monroe and Orleans counties in western New York. These camps ranged in size from six to over forty inhabitants. The researcher visited the camps in the evening after workers returned from the fields and approached Mexican farmworkers to ask if they would participate in the interview. No compensation was provided to any of the participants.

Because average educational attainment of the sample was fifth grade, all explanations about the study, including the statement of informed consent, were given orally in the subject's preferred language by the principal investigator, who is fluent in English and Spanish. Each subject was provided with a complete description of the study and its purpose. After participants signed the consent, they were given a copy written in their preferred language if so desired. The eight people who refused to sign the consent form were given the same information and gave verbal consent to participate in the study.

All farmworkers were interviewed in the migrant camps in the evenings after they returned from working in the fields. Interview sessions lasted between 35 and 65 minutes and were audio-taped, translated and transcribed by the researcher. In several instances, two or three farmworkers were interviewed together during the same session.

#### Interview schedule

All materials for the study, including the informed consent and the interview schedule, were developed in English and written at a fourth-grade reading level. The documents were then translated into Spanish by a bilingual Mexican-American out-

reach worker at the Oak Orchard Community Health Center (OOCHC) in Brockport, NY. The Spanish version was then independently translated back into English by a second Mexican-American bilingual outreach worker.

The results of the translated English version were compared with the original English version and decentered according to procedures described by Brislin *et al.* (1973) and Marin and Marin (1991). Decentering is a translation process in which both the source and the target language versions are considered to be equally important and subject to change during translation. Following the translation procedure, the consent form and the interview instrument were modified with the assistance of the translators to increase the clarity of the Spanish version.

The interview schedule consisted of 19 open-ended questions that were formulated to elicit farmworkers' beliefs and feelings about tuberculosis. The first item was framed broadly: "Please tell me what you know about tuberculosis". Subsequent questions were increasingly specific, requesting information about such topics as tuberculosis etiology, symptoms, treatment, severity, and significance.

#### *Data analysis*

Data analysis was performed using Glaser and Strauss' (1967) grounded theory method of analysis. The grounded theory methodology involves continuous and simultaneous data collection, coding, and analysis for the purpose of generating theory that is based in empirical data. Although the purpose of this particular study was not to develop theory, the researcher felt the grounded theory approach was the most effective method of analyzing the data.

Data analysis involved using open coding which is the process of breaking down, examining, comparing, conceptualizing and categorizing data (Strauss and Corbin, 1990). Open coding began after the first two interviews were completed. Categories that emerged from the open coding were compared with the explanatory model categories of Kleinman (1980) and reduced in number. Categories included the etiology, severity, susceptibility, prevention, symptoms, treatment, and social significance of tuberculosis as well as farmworkers' beliefs about skin testing, the bacille Calmette-Guérin (BCG) vaccine, and sources of information about tuberculosis.

As data collection proceeded and the categories were developed, several modifications and additions were made in the interview instrument to allow for theoretical sampling. Interviewing continued until all categories were well-defined and saturated, meaning that no new or relevant data emerged (Strauss and Corbin, 1990).

#### *Results*

Study participants included 21 males and 5 females. The ages of the respondents ranged from 18 to 65, with an average age of 27 for the males and 36 for the females. Twenty-five participants requested to be interviewed in Spanish, while one preferred English. Respondents had worked as migrant farmworkers an average of 10 years, with a range between 1 and 32 years. The place of birth for 25 participants was Mexico. One was born in the United States to Mexican-born parents. The average educational attainment was five years of schooling for the female and six years for the male participants, with a range between 3 and 12 years. Two-thirds of the study participants had previously attended the tuberculosis education program and four, all male, had received treatment for tuberculosis infection in the past.

*Tuberculosis etiology and transmission.* When asked about the etiology of tuberculosis, a number of farmworkers were aware that a tiny organism is the cause. One participant noted, "There are little animals (*animalitos*) that cause tuberculosis. They eat the flesh inside the body". Several other respondents reported that tuberculosis is variously caused by a germ, microbe (*microbio*), virus or bacteria. When questioned further, however, most admitted they did not know exactly what a virus or bacteria was, although one respondent noted that one can not see a virus — "It's invisible" — and another said that you can only see it with a microscope. One farmworker stated, "The bacteria get in your body and keep growing and growing and cause you to get sick".

Many respondents were aware that tuberculosis can be contracted by breathing in close proximity to a contagious source. One reported that he could catch tuberculosis by living, sleeping or breathing the same air with someone infected with the disease:

You get it through the breathing of any contagious person who passes the virus to you. The virus is called TB, and it goes from one person to another and carries the sickness. The virus is in the air and in the lungs of the contagious person.

Another subject expressed the opinion that tuberculosis was transmitted by "just being around someone who has it. Or drinking out of their glass. Or eating off of their plate. Or by having relations with a woman who has tuberculosis". Two respondents related that tuberculosis could also be contracted by drinking cow's milk. One farmworker stated that, if people with certain illnesses such as anemia were in a weakened state, they were more likely to get tuberculosis.

*Sources of information about tuberculosis.* About two-thirds of the respondents in the study had attended the tuberculosis education program presented by community outreach workers from the

Oak Orchard Community Health Center. A few of these had heard the presentation in previous years and several had heard it either days or weeks before they were interviewed.

In addition to this source of information, respondents named others from whom they had learned about tuberculosis including fellow migrant workers, friends, family members, nurses, and doctors. A number of participants knew someone who had tuberculosis, had been treated for it, or who had died from it:

In Mexico I knew someone with tuberculosis. It was very bad. His eyes turned yellow, he had pains in all parts of his body, he coughed up blood. He had very advanced tuberculosis. His name was Pedro. He was taking medicine and they were controlling the sickness. But the doctor told him they could not cure him, they could only control it.

*Seriousness.* Most farmworkers recognized the seriousness of tuberculosis. When asked about the nature of tuberculosis, one respondent said, "You can die from it [tuberculosis] if you don't get the right treatment. It's very serious". Several respondents knew someone who had died from tuberculosis, and one commented on its potentially fatal nature: "Tuberculosis is very serious. It can kill you". One participant commented that tuberculosis was especially serious "because it affects the lungs and the lungs are very important". Another noted the importance of timely treatment, and one stated, "You have to get attention as soon as you find out you have it [tuberculosis]. You have to get treatment, if not, you can die".

*Susceptibility.* "I believe that anyone can catch it", replied one farmworker when asked if he could get tuberculosis. He continued, "You are around lots of people every day and anyone can give it to you. You just don't know if you will catch it or not. It's always a possibility". Most felt even if they took good care of themselves, they could still contract tuberculosis. Only two respondents stated that they were "too healthy" to contract tuberculosis. One attributed his healthy state to not smoking; he noted that people who smoke become weak and, in their debilitated state, can develop tuberculosis.

*Prevention.* Farmworkers named measures they believed could help to prevent tuberculosis or reduce their susceptibility to this illness. Several thought the best method of prevention was to avoid getting too close to others with tuberculosis, but one respondent admitted this was difficult:

You don't always know who has it [tuberculosis], and they might not tell you. It would be good if doctors would put a mark on people who have it, but they don't do that. If someone has a cough and is very pale, then they might have tuberculosis. You can't be sure.

The following ways to avoid getting tuberculosis were provided by one subject:

By not smoking. By staying out of air conditioning. By not going between cold and hot weather. By being careful

of the climate you live in and work in. By not getting chilled. By not being around too much dust and smoke.

Other measures mentioned included taking good care of oneself, eating well, keeping a clean house, and being careful of the chemicals sprayed in the fields because these could weaken the lungs. One person stated that he tried to have a skin test every year so that he could find out right away if he had tuberculosis and take medication to prevent future problems. Several respondents felt there was nothing they could do to prevent getting tuberculosis.

*Symptoms.* Farmworkers reported that the symptoms of tuberculosis include dry cough, cough with bloody sputum, difficulty breathing, pain in the lungs, fatigue, sweating at night, weight loss, and pallor. Additional symptoms mentioned included fever, headache, dizziness, loss of desire to work, and loss of appetite. One participant related that tuberculosis principally affects the lungs, brain, spinal column and bones.

Five participants commented that tuberculosis is characterized by "spots on the lungs", that could be seen on a chest radiograph. One respondent noted these spots consisted of "bacteria growing inside the lungs", another stated the spots "show that the lungs are contaminated with the virus", a third said the spots "eat up your lungs and kill you", and a fourth said that "when you cough the saliva has spots on it too". In summing up the symptoms of tuberculosis, one farmworkers stated,

You lose weight and become very pale and tired. You can't work because you are too weak. You can die from tuberculosis because the body dries out. Because the lungs are the basis of the air that ones breathes and the lungs give out and the body gets reduced little by little until one loses all his energy. It's like a car that runs out of gasoline. I think.

*PPD significance.* Farmworkers had a variety of interpretations about the purpose and significance of the purified protein derivative tuberculin skin test or PPD. Most understood that having a PPD was the way to find out if they had been exposed to tuberculosis, and, if the PPD was negative, it meant that they had not.

Participants reported that if the PPD test developed into a swollen area ("*uma roncha*"), this indicated that the PPD was positive. One person whose PPD had been positive several years ago said this indicated that his blood "is a little infected". Another said his positive PPD indicated that he was prone ("*propenso*") to develop tuberculosis and that taking medicine would help him "to stop or to kill the virus in my body or something like that". A third said having a positive skin test meant that he was "on the brink of (*al punto de*) getting sick from tuberculosis". He went on to say that "If I hadn't taken the medicine, then further along I might have gotten sick".

Several understood that if the PPD was positive, a chest X-ray was indicated to determine if active

tuberculosis was present. One farmworker stated that his positive skin test meant that either "I already have tuberculosis that has developed (*desarrollado*) or that I only have the bacteria". Another said:

I had the skin test and it was positive. I think it was 20 mm; it was very swollen and red. Then I went to the hospital for the chest X-ray. I am waiting to find out the results of the X-ray so I will know if I have it [tuberculosis] or not. I have to find out if it has developed or not. The doctor said I will have to wait about two weeks to find out. If I have tuberculosis, I will have to take medicine for 6 months. I am worried because I like to have a beer on the weekends, and, if I take the medicine, they say I can't have any alcohol to drink. But if I have tuberculosis, I will take the medicine.

Participants pointed out a number of benefits and barriers to having a skin test. Benefits included knowing their health status, getting early treatment, and protecting their family, while barriers included pain, fear, and having to miss work.

*Treatment.* Over two-thirds of the farmworkers interviewed agreed that if they learned they had tuberculosis, they would go to a doctor for treatment, either in the United States or in Mexico. Many understood the importance of taking medication as part of the treatment. One farmworker said, "If you don't take the medicine, the lungs finally will just give out. They turn black from so many spots and give out". The medication, according to several respondents, would "make the germs disappear", "make the spots get smaller", or "eliminate the bacteria from the body".

A few respondents distinguished between treatment for tuberculosis infection and for more advanced tuberculosis disease ("*tuberculosis desarrollada*"). When asked if there is a treatment for tuberculosis, one man replied:

For the person who just has the germ, sure there is. But for the person who has the advanced sickness, no. There is no treatment for the advanced tuberculosis, for the one who is dried out and coughing and very thin.

The duration of treatment for tuberculosis infection was variously given as "for about a month or two", "for six months or more", "for a long time", or "for the rest of your life". Several respondents were aware that it was necessary to stop or curtail drinking alcohol during treatment. Most thought that tuberculosis could be cured with medication. One man who had undergone six months of treatment for tuberculosis infection noted that he would not become ill in the future because "I have protectors ("*protectores*") in my body to keep me from getting sick with tuberculosis".

*Social significance of tuberculosis.* Respondents offered differing opinions about the social significance of tuberculosis. When asked if people like to talk about tuberculosis, one participant said:

I don't think they do. If someone has tuberculosis, they will feel bad and won't talk about it. It's just like if they have the virus for AIDS (*SIDA*). They might get thrown

out of the house. Or they might get taken to the hospital to get cured. It's different for everyone.

Another replied that "people don't want to talk about it because they don't want anyone to know they have it. It's a serious sickness". One woman stated that "most people are afraid to talk about it. If other people find out they have it, then they won't want to be around them any more".

Several other respondents, however, did not feel this way. One man who had been treated for tuberculosis infection was asked if he had told anyone. He replied:

I told people. I told my family, my friends. In fact it made me happy to talk about it because I knew it wasn't advanced and I was glad to tell them I was taking the medicine to cure myself.

Another said if his skin test was positive, he would not be afraid to tell people and felt that they could "give me advice and tell me what to do".

*BCG vaccination.* The majority of children in Mexico and most less developed countries receive BCG vaccine to help protect them from tuberculosis. In order to find out if farmworkers understood the rationale for administering BCG vaccine or if they felt less susceptible to tuberculosis because they had been vaccinated, respondents were asked (1) if they had received the BCG vaccine and (2) what it did for them.

Most participants knew that they had received the vaccination and showed the resulting scars to the interviewer. The vast majority knew that BCG is administered to all children in Mexico, but several did not know why. Only two participants believed that the vaccine is useful solely against tuberculosis. Many respondents reported that BCG offers protection against a wide-ranging variety of illnesses. One farmworker noted that BCG "protects you from all sicknesses". Another stated, "All I know is that since I had it [BCG], I haven't been sick at all". Several others expressed the opinion that BCG was variously effective against infantile paralysis, small pox ("*viruela*"), chicken pox, measles, whooping cough, stroke ("*embolio*"), bronchitis, and heart problems. While one respondent believed that BCG vaccination is also effective against tetanus, most in the sample stated that a separate vaccine was necessary to protect against this disease.

One man believed that BCG offered him life-long protection against tuberculosis. He persisted in this belief despite the fact that he previously had a positive PPD skin test which he stated meant he had tuberculosis infection.

Farmworkers were asked if they knew any other names for tuberculosis. Other than the abbreviation "TB", no respondent knew of another label for this illness.



## DISCUSSION

The subjects in this study may not be representative of Mexican migrant farmworkers in general. Many of them had previously attended a tuberculosis education program taught by bilingual/bicultural health promoters and several had received prophylactic treatment with isoniazid (INH). Their knowledge level, therefore, may be different from workers who have not been exposed to such educational or treatment programs. The education program, however, was not their only source of information. Respondents reported that they had also acquired information about tuberculosis from family members, friends and coworkers. It also should be noted that several of the farmworkers interviewed for this study had little knowledge about tuberculosis.

The explanatory models of the migrant farmworkers in this study have similarities to the medical model of tuberculosis. Many subjects in the study articulated an infectious etiology for tuberculosis, variously described as a little animal, a germ, microbe, bacteria or virus and described methods of transmission such as breathing and coughing. They also believed that a person in a weakened state, whether from anemia, smoking, or pesticides, was more likely to develop tuberculosis.

Farmworkers in the study uniformly believed that tuberculosis is a serious illness and the majority felt that they personally could contract it. Many knew someone who had tuberculosis or who had died from it. Some expressed the feeling that there was nothing they could do to prevent getting tuberculosis. Others listed a variety of preventative measures, several of which may have roots in hot-cold etiologies of disease, including avoiding air conditioning, getting chilled and abrupt changes in climate. Study participants identified a number of symptoms of tuberculosis that are similar to the medical model of this disease, namely, cough, fatigue, fever, night sweats, and weight loss.

Farmworkers generally had accurate interpretations about the purpose and significance of the PPD skin test. They understood that a test with no reaction meant that they did not have tuberculosis and that a positive test indicated infection but not necessarily active disease. Several knew that a chest radiograph helped to determine if the lungs were affected.

Most farmworkers interviewed believed that medication was used to treat tuberculosis and reported they would seek care from a doctor if they were diagnosed with tuberculosis. The majority, however, did not know how long the medical therapy lasted, and at least one thought the medication would have to be taken for life. Several respondents believed there was no treatment for advanced stages of tuberculosis.

There were differing opinions about the social implications of tuberculosis. Some respondents

believed that there were severe social repercussions resulting from having a diagnosis of tuberculosis, and at least one said it was as bad as being diagnosed with AIDS. Other respondents, however, did not attribute such negative connotations to tuberculosis.

Farmworkers in this study had many misconceptions about BCG vaccination. Most participants knew their vaccination status, and they believed that the vaccine protected them against a wide array of diseases and, in some cases, against all disease. Only a few knew that BCG was given specifically to protect against tuberculosis.

This study has a number of implications for health care workers providing care for Mexican migrant farmworkers. First, it indicates that farmworkers may possess a basic level of knowledge about tuberculosis, although it cannot be determined from this study the extent to which attendance at the education program may have contributed to this knowledge. Second, the subjects in this study had misconceptions about the BCG vaccine. Health care workers should be aware of this issue and educate farmworkers that, while BCG is given to children to reduce their risk of tuberculosis, it is not effective against any other diseases. It is possible that farmworkers might not seek out, or might actually refuse, indicated vaccinations such as tetanus or influenza if they believe that the BCG vaccination confers protection against multiple diseases. Further research is needed to clarify this issue. Third, farmworkers in this study indicated varying opinions about the stigma conferred by a diagnosis of tuberculosis. Health care providers should be sensitive to the possibility that workers may refuse screening and treatment for tuberculosis because of fear of the social consequences.

In her review of adherence to tuberculosis treatment, Sumartojo (1993) recommends that tuberculosis services be tailored to the beliefs, attitudes and needs of culturally distinct groups of patients. The study reported in this article is an initial attempt at understanding Mexican migrant farmworkers' explanatory models of tuberculosis to help in the development of more relevant educational, screening and treatment programs.

Understanding farmworkers' explanatory models, however, does not help to explain why tuberculosis infection and disease are so prevalent in this population. As Farmer *et al.* (1991) have suggested, there may be a tenuous relationship between a person's beliefs about tuberculosis and compliance with medication regimens. To understand why tuberculosis is so prevalent among migrant workers and other impoverished groups, it is imperative to consider the larger social context in which they live and work. Macro-level factors such as extreme poverty, the need to travel great distances to find work, overcrowded living and working conditions, inadequate nutrition, racism and an unresponsive

health care system all contribute to the tuberculosis epidemic among migrant farmworkers in the United States.

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