

Combatting Tuberculosis and Homelessness:

Recommendations for Policy and Practice

May, 1994

CONTENTS

I. Introduction	6
A. History of TB	6
B. TB in the USA in 1994-Scope of the Problem	8
1. Current Tuberculosis Epidemiology	8
2. TB/HIV	10
3. Multidrug-Resistant Tuberculosis	11
C. TB Among Homeless People	12
1. Insufficient Access to Preventive Services and Health Care for Homeless Persons	12
2. Prevalence and Incidence of Tuberculosis Among Homeless Persons.....	12
3. Shelter Environments.....	13
4. Increased Prevalence of Other Health Conditions	14
5. Incomplete Drug Therapy.....	14
II. The Health Care Response to TB Among Homeless Persons	14
A. Screening	14
B. Diagnosis	15
C. Treatment of Tuberculosis.....	15
D. Surveillance and Data Reporting	16
E. Education of Health Care Providers.....	16
F. Education for Shelter Staff.....	16
G. Environmental Risk Reduction	17
III. Best Practices and Policy Recommendations for Combatting Tuberculosis Among Homeless People	18
A. Inadequate Access of Homeless Persons to Health Care	18
B. Prevalence and Incidence of Tuberculosis Among Homeless People	19
C. Shelter Environments.....	19
D. Increased Prevalence of Other Health Conditions.....	20
E. Incomplete Drug Therapy.....	20
IV. Conclusion	21
Appendices	
A. Essential Elements to Make Health Care Reform Effective for Homeless People	22
B. Tuberculosis 101	25
References	30

FOREWORD

The following discussion of tuberculosis among homeless persons is presented by the National Health Care for the Homeless Council, which encourages increased attention to the problem by health care providers, by shelter providers, and by those who make public policy. Tuberculosis remains a preventable and treatable disease, and its recent increase shames all of us who attempt to respond to homelessness.

The paper is structured to meet a variety of readers' needs, with each section highlighting a particular aspect of the issue of homelessness and TB. The first section provides a history of tuberculosis, its epidemiology in the United States and the experience of TB among homeless people. The second section discusses in more detail the provision of health care to homeless persons at risk for TB. The third section highlights best practices for responding to TB.

The policy recommendations in Section III are critical to the elimination of tuberculosis. These recommendations are highlighted here and fall into five major sections according to the problems they are intended to address.

Inadequate Access of Homeless Persons to Health Care

Homeless people are disenfranchised from the traditional medical system. In order to meet their needs for immediate medical attention and care for long-term conditions, and to address the major public health problems associated with homelessness, health care programs for homeless people should be maintained and strengthened. Homeless health care programs use shelter and street outreach, and case management services to meet the needs of the whole person. Outreach is a critical component to combatting the spread of tuberculosis among homeless people.

The High Prevalence and Incidence of TB among Homeless Persons

Federal funding is required for programs providing such services as TB screening at homeless shelters and Directly Observed Therapy, with particular attention to those areas hardest hit by TB among homeless people.

Incentives and support must be provided to encourage TB control programs of public health departments to partner with local agencies to provide screening services.

Funds for Directly Observed Therapy programs are critical everywhere, but especially for cities experiencing a rise in multi-drug resistant TB.

Characteristics of Shelter Environments Which Facilitate Transmission of TB

Respite care programs, designed for homeless persons suffering from TB should be considered as a short-term response. As long as emergency shelters remain a feature of our society's response to homelessness, funds must be provided to improve or retrofit shelters to minimize airborne disease transmission. Permanent, standard housing for all is the best possible guard against TB.

Access to HUD Section 8 vouchers and other permanent housing programs should be facilitated for those diagnosed with TB.

Increased Prevalence of Other Health Conditions (such as HIV, untreated diabetes, or pulmonary disease) Which May Increase the Risk of Homeless Persons for Developing Active TB.

Primary care programs serving homeless persons should be continued to provide vital, targeted services, and must be protected as national health care reform is implemented.

The state Medicaid option, providing reimbursement for TB-related services to low income persons, should be widely adopted by the states.

Social and Residential Instability of Homeless Persons and Difficulties in Completing TB Therapy.

Funds must be provided for Directly Observed Therapy Programs.

Centers for research and clinical specialty care should be developed in metropolitan areas hardest hit by TB.

FOREWORD

The following discussion of tuberculosis among homeless persons is presented by the National Health Care for the Homeless Council, which encourages increased attention to the problem by health care providers, by shelter providers, and by those who make public policy. Tuberculosis remains a preventable and treatable disease, and its recent increase shames all of us who attempt to respond to homelessness.

The paper is structured to meet a variety of readers' needs, with each section highlighting a particular aspect of the issue of homelessness and TB. The first section provides a history of tuberculosis, its epidemiology in the United States and the experience of TB among homeless people. The second section discusses in more detail the provision of health care to homeless persons at risk for TB. The third section highlights best practices for responding to TB.

The policy recommendations in Section III are critical to the elimination of tuberculosis. These recommendations are highlighted here and fall into five major sections according to the problems they are intended to address.

Inadequate Access of Homeless Persons to Health Care

Homeless people are disenfranchised from the traditional medical system. In order to meet their needs for immediate medical attention and care for long-term conditions, and to address the major public health problems associated with homelessness, health care programs for homeless people should be maintained and strengthened. Homeless health care programs use shelter and street outreach, and case management services to meet the needs of the whole person. Outreach is a critical component to combatting the spread of tuberculosis among homeless people.

The High Prevalence and Incidence of TB among Homeless Persons

Federal funding is required for programs providing such services as TB screening at homeless shelters and Directly Observed Therapy, with particular attention to those areas hardest hit by TB among homeless people.

Incentives and support must be provided to encourage TB control programs of public health departments to partner with local agencies to provide screening services.

Funds for Directly Observed Therapy programs are critical everywhere, but especially for cities experiencing a rise in multi-drug resistant TB.

Characteristics of Shelter Environments Which Facilitate Transmission of TB

Respite care programs, designed for homeless persons suffering from TB should be considered as a short-term response. As long as emergency shelters remain a feature of our society's response to homelessness, funds must be provided to improve or retrofit shelters to minimize airborne disease transmission. Permanent, standard housing for all is the best possible guard against TB.

Access to HUD Section 8 vouchers and other permanent housing programs should be facilitated for those diagnosed with TB.

Increased Prevalence of Other Health Conditions (such as HIV, untreated diabetes, or pulmonary disease) Which May Increase the Risk of Homeless Persons for Developing Active TB.

Primary care programs serving homeless persons should be continued to provide vital, targeted services, and must be protected as national health care reform is implemented.

The state Medicaid option, providing reimbursement for TB-related services to low income persons, should be widely adopted by the states.

Social and Residential Instability of Homeless Persons and Difficulties in Completing TB Therapy.

Funds must be provided for Directly Observed Therapy Programs.

Centers for research and clinical specialty care should be developed in metropolitan areas hardest hit by TB.

I. INTRODUCTION

A. History of TB

Although the name “tuberculosis” is relatively recent, the disease itself is believed to have afflicted mankind for many hundreds of centuries. Hippocrates, in about 400 B. C., gave a classic description of the disease which he called “phthisis” (from the Greek word meaning “to dry up” or “to waste”). Up until the 19th century, the disease was often referred to as “consumption” (from the Latin verb “consumare” meaning “to take/waste”).

Rene Dubois in his book, *Man Adapting*, observed the bearing of social conditions throughout history on man’s resistance to disease and theorized that health or disease are expressions of the success or failure of man to adapt to environmental challenges.

The tuberculosis epidemic which prevailed throughout the industrialized countries of the Western world during the nineteenth century owed part at least of its severity to the long working hours, the poor nutrition, and the low living standards prevailing among the labor classes during the Industrial Revolution. As living standards improved, tuberculosis mortality began to decrease. The improvement was already noticeable at the end of the century, long before any specific measure of prophylaxis or therapy had been introduced (p. 169). It is most probable that no drugs, however potent, can control disease completely in populations with a low standard of living and poor nutrition. It is useful to mention them (these problems) because they illustrate so well that some very crucial questions of medical management cannot be answered by the traditional studies focused on the care of the individual patient, but rather must be approached as population problems.¹

At the beginning of this century, tuberculosis was so rampant that it was the leading cause of death in the United States, accounting for about 10 percent of all deaths. Since the cause of the disease was not known prior to 1882 and it was not known how the disease was spread, specific methods of treatment or prevention were not possible. Patients were placed in hospitals called sanatoria. (The word “sanatorium” comes from the Latin word “sanare” which means “to cure or heal.”) The sanatorium concept began in Scotland but quickly spread to the United States, where Edward Livingston Trudeau helped pioneer the “Sanatorium Movement” in 1885. At that time, anti-tuberculous treatment in the sanatorium primarily consisted of bed rest, good food, and fresh air. In addition, isolating the patient from the rest of the community served as a measure to control the spread of the disease. Many patients died, and many others stayed years or even decades in the sanatorium. Some fortunate individuals were cured by their natural body defenses and were able to return to their homes. The sanatorium remained the centerpiece of tuberculosis control efforts until the late 1960s and early 1970s. By that time, at least seven landmark events had occurred which enabled tuberculosis patients to be treated primarily in ambulatory settings.

First, in 1882, Robert Koch, a German scientist, after years of effort, discovered *Mycobacterium tuberculosis* or the “tubercle bacillus,” the bacterium that causes tuberculosis. Koch was also the first to prepare tuberculin, an extract prepared from killed tubercle bacilli (1890). This soon became the basis for the tuberculin skin test which remains, to this day, an important diagnostic tool.

¹ Dubois, *Man Adapting*. 1965:454

Second, in 1895, William Roentgen, a physicist, discovered a new type of radiation. He called this radiation the "X ray," because it was of an unknown type. This discovery led to the development of the chest radiograph. For the first time, disease process in the lungs could be visualized.

Third, in 1921, BCG (Bacille Calmette-Guerin), a live attenuated vaccine, developed from a closely related mycobacteria species *Mycobacterium bovis*, was first administered to humans. BCG has been administered worldwide, particularly to infants and children in developing countries. It has had limited application in the United States due to the limited efficacy of BCG in preventing tuberculosis. Since 1988, the Centers for Disease Control and Prevention have not recommended that health care workers or others at high risk of TB exposure be vaccinated with BCG, since those who receive the vaccine have a positive tuberculin skin test. This recommendation was reconfirmed in 1994.

Fourth, in 1934, PPD (purified protein derivative) was introduced by Florence Seibert and provided a more reliable tool for identifying persons with tuberculous infection.

Fifth, in the mid 1930s mass chest radiographic surveys were introduced to detect pulmonary tuberculosis among the adult population. They continued into the 1960s when they were discontinued because of the low yield.

Sixth, various surgical techniques, usually aimed at collapsing or removing portion of the lung (sometimes disfiguring), were common treatment modalities prior to the development of antituberculosis drugs.

Finally, a landmark occurred in 1944 with the discovery by Selman Waksman of streptomycin, the first drug effective against the tubercle bacillus. By the late 1940s, streptomycin was being used to treat patients with tuberculosis. However, many patients treated with streptomycin alone developed streptomycin-drug-resistant tuberculosis and experienced relapse of the disease. By the early 1950's, three other drugs, para-aminosalicylic acid, isoniazid, and pyrazinamide, had been introduced. *With the introduction of multiple drug therapy, tuberculosis had become a treatable and curable disease.* Two more drugs, ethambutol and rifampin, were introduced during the 1960s. Subsequent studies with isoniazid and rifampin, paved the way for short-course (less than 12 months) chemotherapy regimens.

Although some patients still require a short initial period of hospitalization, it is not required for most persons after the diagnosis is determined. In the early 1960s, the Madras Studies (conducted by the Indian Council of Medical Research, the Madras State Government, the World Health Organization, and the British Medical Research Council) demonstrated that home treatment of tuberculosis was as effective as treatment in a sanatorium and resulted in no additional transmission of infection to contacts. Today, most TB patients are treated on an outpatient basis and a successful cure is very likely, provided the patient takes the medication regularly.

In the late 1950s and 1960s, the U.S. Public Health Service demonstrated, in a series of trials involving nearly 70,000 persons, a substantial reduction in tuberculosis morbidity among infected persons taking daily isoniazid for one year.

Thus, tuberculous treatment and control are far different now than they were only a few decades ago. The causative agent has been identified, effective diagnostic tools are available, the mode of transmission of the disease is understood, and drugs have made it possible not only to treat

the disease but also to prevent it. Tuberculosis has largely lost its identity as a “specialty disease” and has become a matter of concern for private physicians, community hospitals, and health departments.

Despite all of these advances, tuberculosis remains a public health problem. In developing countries of the world, millions of individuals are affected. In the United States, the disease is far from uncommon; over 26,600 new cases were reported during 1992, a 20.1% increase over the number of cases reported during 1985.

Factors that have worked in concert to increase the number of cases in high-risk populations are HIV infection, immigration from high prevalence areas, homelessness and poverty, substance abuse, the unavailability of some anti-TB drugs, outbreaks of multidrug-resistant TB, the deterioration of the public health infrastructure, the transmission of TB within institutional settings (e.g. hospitals, correctional facilities, and shelters for homeless people), and the lack of funding of TB elimination programs at the federal, state, and local levels. *Tuberculosis in the United States is predominantly a disease of the socioeconomically disadvantaged, the elderly, and the foreign born. Among minorities, it is primarily a disease of young adults.*

Furthermore, there are about 10 million individuals in the country who have been infected with tubercle bacilli in the past. Most cases of tuberculosis develop from this “reservoir of infection,” thus making prevention of disease among high risk infected persons a high program priority.

In 1987, the Secretary, Department of Health and Human Services, established an Advisory Committee for Elimination of Tuberculosis (ACET) to provide recommendations for the elimination of tuberculosis as a public health problem. In response to this charge, the committee developed a three-step plan for the elimination of tuberculosis, urging the Nation to establish the goal of tuberculosis elimination (a case rate of less than 0.1/100,000 population) by the year 2010, with an interim target of a case rate of 3.5/100,000 population by the year 2000. The case rate for 1987 was 9.3/100,000. In 1989, the ACET published “The Strategic Plan for Elimination of Tuberculosis.” The three steps of the plan are:

Step 1. More effective use of existing prevention and control methods, especially in high risk populations;

Step 2. The development and evaluation of new technologies for diagnosis, treatment and prevention; and

Step 3. The rapid assessment and transfer of newly developed technologies into clinical and public health practice.

Since 1989, the Plan has not been fully implemented. The general approach to elimination outlined in the plan remains valid. Inadequate provision of resources at all levels is a major reason for the failure to implement the plan. In some states and cities, resources for TB control have actually been reduced. *This failure to provide adequate support has allowed the TB situation to deteriorate badly;* as a result, outbreaks of multidrug-resistant TB are now occurring in some parts of the United States. The ACET urges that aggressive and bold steps be taken immediately to control these outbreaks and to achieve the elimination of TB from the United States by implementing the recommendations of the Strategic Plan.

B. TB in the USA in 1994-Scope of the Problem

1. Current Tuberculosis Epidemiology

Tuberculosis is one of the most prevalent infections in the world. It is estimated that 30 to 60 percent of adults in developing countries are infected with *M. Tuberculosis*. Worldwide, approximately 8 million new cases and 3 million deaths are attributed to this disease each year.

From 1953, when nationwide reporting was first implemented, to 1984, the United States experienced an average decrease of 5 percent each year in the number of TB cases reported. In 1985, this decrease leveled off and in 1986 there was an actual increase, the first since 1953. From 1985 through 1992, reported TB cases increased 20.1%, from 22,201 to 26,673, respectively.

During the period 1985 through 1992, the largest increases occurred in New York (84.4%), California (54.2%) and Texas (32.7%). If the trend of decline observed from 1980 through 1984 had continued through 1992, approximately 51,700 fewer cases would have been expected during this period than were reported.

In 1992, 26,673 cases of TB (10.5 cases per 100,000) were reported to the Centers for Disease Control. The largest increases from 1991 to 1992 reported in cities were in Houston (25.7%), San Diego (19.3%), Chicago (5.9%), and New York City (3.5%). From 1985 through 1992, the TB case rate in nonurban areas of the United States decreased from 6.7 cases per 100,000 to 6.5 (3.0%). In comparison, the rate in urban areas increased from 17.1 cases per 100,000 to 22.0 (29.6%).

From 1985 through 1992, reported TB cases increased in every racial/ethnic group except Whites and American Indians. Reported cases increased among Hispanics by 74.5%, among Asians/Pacific Islanders by 46.2%, and among Blacks by 26.8%. Cases decreased by 9.9% among Whites.

From 1986 through 1992, reported cases among foreign-born persons increased 47.6%. As a proportion of total reported cases, reported cases among foreign-born persons increased from 21.6% in 1986 to 27.3% in 1992.

The increases among Hispanics, Blacks and Asians primarily reflect the greater occurrence of TB among (1) persons infected with HIV; (2) persons immigrating from countries with a high incidence of TB; and (3) primary transmission in these groups. Other contributing factors include socioeconomic factors such as substance abuse, limited access to health care, poverty, substandard housing and homelessness. The increase in the 25–44 year age group in urban areas is related, at least in part, to HIV infection. Results from CDC-funded unlinked surveys in TB clinics showed an HIV prevalence of 47% in 25 to 44 year–old US–born patients.

Elderly persons comprise another group that has substantial TB morbidity. During 1991, 23 percent of reported cases occurred in persons 65 years of age and older, although this age group made up only 13 percent of the population. In a 29 state survey conducted in 1984 and 1985, CDC found that elderly persons residing in nursing homes had a case rate nearly two-fold higher than those elderly persons not living in nursing homes. In two states not included in the survey, where case-finding appears to be more intensive, the case rates among the elderly in nursing homes were found to be four to six times higher. This is apparently not due solely to the fact that elderly persons at higher risk for TB are in nursing homes; transmission of TB in nursing homes has been well documented.

Poor people have always been disproportionately affected by TB. CDC examined TB case rates by zip code and median income. Persons living in zip code areas with the lowest median household income had an eight-times higher TB case rate than persons living in areas with the highest median household incomes. The association between TB and poverty has been dramatically demonstrated among homeless persons. Data from selected surveys have shown a TB prevalence of 1.6 to 6.8 percent and TB infection of 20 to 51 percent.²

TB is also a major problem in correctional facilities. A CDC study based on cases reported during 1984 and 1985 showed that the incidence of TB in correctional facilities was four-times greater than in the population 15 to 64 years of age outside correctional facilities. There are several reasons why TB rates are higher in correctional facilities than in the general population. First, populations with a high prevalence of latent TB infection, such as black and Hispanic men, are disproportionately represented in the prison population. Second, an increasing number of correctional facility inmates have HIV infection, and are at risk of developing clinical TB from an old or a new TB infection. Finally, there have been numerous outbreaks of TB in correctional facilities in the past several years, illustrating that these crowded prison environments are conducive to the spread of TB.

Another contributing factor for the recent increase in TB is immigration from areas with a high prevalence of TB. Among all cases of TB reported to CDC in 1991, over 26 percent were born in another country. The number of cases and the percentage of cases that occur in the foreign born have increased steadily since 1985 (from 20 percent in 1985 to 27 percent in 1991).

Migrant farm workers, many foreign born, are at increased risk for TB. In a recent survey conducted by CDC, the risk of TB among farm workers was estimated to be six-times greater than the general population of employed adults (CDC, unpublished data). Migrant farm workers also had high rates of asymptomatic TB infection (positive skin tests), ranging from 29 to 76 percent.

2. TB/HIV

A critical factor behind the recent resurgence in tuberculosis is co-occurrence in persons infected with the human immunodeficiency virus (HIV). There are two ways an HIV-infected person can get TB. First, a person with a latent pre-existing TB infection can become infected with HIV and develop active TB as the immune system is weakened. Second, a person with pre-existing HIV infection can be exposed to TB, become infected, and rapidly develop clinical TB.

Evidence of an association between TB and HIV infection comes from several sources. One indication of the association between tuberculosis and HIV was that areas with the largest number of AIDS cases were also reporting an increase in TB cases. Between 1985 and 1990, New York, California, Florida, Texas, and New Jersey ranked as the top 5 areas for both AIDS and TB cases. The most striking example has been in New York City.

² "Prevention and Control of Tuberculosis Among Homeless Persons: Recommendations of the Advisory Council for the Elimination of Tuberculosis." *Morbidity and Mortality Weekly Report* (Atlanta: Centers for Disease Control) April 17, 1992. Vol 41, No. RR-5.

Another piece of evidence demonstrating an association between the increases in TB and the HIV epidemic is data from HIV seroprevalence surveys. Among 20 clinics participating in CDC HIV serosurveys, the median clinic HIV seropositivity was 3 percent. In New York City, 46 percent of patients with suspected or confirmed TB were HIV seropositive, 34 percent in Newark, 27 percent in Boston, and 24 percent in Miami.

Additional evidence of an association between TB and HIV comes from a study among a group of methadone patients in New York City. This study looked at the risk of TB among persons with pre-existing TB infection. Among 49 patients who were skin test positive and HIV seropositive, about 14 percent developed clinical TB over a 2-year period. None of those who were skin test positive but HIV seronegative, developed clinical TB. This landmark study demonstrated that HIV infection is the strongest risk factor yet identified for developing TB disease. Data from this study further suggests that risk of active TB among persons with tuberculous infection who also have HIV infection may be about 8 percent per year, compared with a lifetime risk of 5 to 10 percent among persons with tuberculous infection without HIV infection.

In an outbreak reported from San Francisco, 40 percent of HIV-infected persons in a residential care facility developed clinical TB after exposure to a person with clinically active TB. An additional four residents developed tuberculous infection.

There are an estimated 10 to 15 million persons (4 to 6 percent of the population) with tuberculous infection in the United States. These persons harbor dormant, yet viable, tubercle bacilli capable of activating to disease. There are an estimated one million persons infected with HIV in the United States. The degree to which these populations overlap, that is, with co-infection, is an important research question and will determine the future incidence of HIV-related TB.

3. Multidrug-Resistant Tuberculosis

The most recent and most serious TB problem to emerge has been the occurrence of multidrug-resistant (MDR) TB outbreaks in hospitals and correctional facilities. In 1990 and 1991, CDC investigated five MDR TB outbreaks in hospitals in Miami and New York City. Virtually all of the cases in these outbreaks had organisms resistant to isoniazid (INH) and rifampin (RIF), the two best antituberculosis drugs; many cases had organisms that were also resistant to other drugs.

Most of the patients with TB in these outbreaks were HIV infected. Mortality among these patients was unusually high, ranging from 72 to 89 percent. The median interval between TB diagnosis and death was very short, from 4 to 16 weeks.

The investigations have also shown transmission of MDR TB to health care workers. In two of the hospitals following outbreak exposure, tuberculin skin test conversions were documented in 13 (33 percent) out of 39 health care workers in one hospital and in 6 (50 percent) out of 12 health care workers in the other. Skin test conversions, i.e. a change from a negative test result to a positive test result within a two-year period, indicate recent infection with tuberculosis. At least eight health care workers at these hospitals have developed clinically active TB with multidrug-resistant organisms. Four of the health care worker cases, all HIV seropositive, have died as the result of TB.

There are a variety of factors that have contributed to drug-resistant TB outbreaks. First and foremost, there is the problem of noncompliance with taking medication. Patients

who do not ingest medication as prescribed allow drug-resistant organisms to develop. The problem of patients not completing their medication regimens is not at all unique to homeless people, but the disorganized lives of many homeless people make adherence to medication regimes especially difficult. Directly Observed Therapy (DOT) --where the TB patient's ingestion of his or her medication is physically observed, each time, by a trained health care worker-- should be broadly implemented in order to assure effective treatment and to prevent the development of drug-resistant TB.

Another factor in the emergence of drug-resistant TB is the prescription of inadequate regimens by physicians; that is regimens that do not contain at least two drugs to which the patient's organisms are susceptible. A third factor is the prolonged infectiousness of patients with MDR TB. This occurs because the technology for testing TB bacteria to determine drug resistance requires weeks to complete. In the meantime, patients may be treated with standard drug regimens which are ineffective against MDR TB; therefore the patients remain infectious. A fourth factor is the increased likelihood of HIV-infected persons to develop active disease extremely rapidly once infected with tuberculosis. A final important factor is the widespread absence or ineffectiveness of infection control measures in hospitals, other health care settings, prisons, jails, and homeless shelters.

C. TB Among Homeless People

At least five factors contribute to an increased risk for TB among homeless persons.

1. Insufficient Access to Preventive Services and Health Care for Homeless Persons

Whether or not they have health insurance, homeless persons generally lack access to health care. Primary care delivery systems are not designed to address the unique situations of homeless people, and many homeless people survive, poorly, without routine health care. Numerous barriers -financial, geographical, cultural- exclude homeless people from mainstream health care systems.

Underfunded, overburdened public health programs bear the responsibility of providing those at greatest risk with TB prevention, screening and treatment programs. Often, the design of these health programs lack outreach, case management or enabling services which improve the likelihood that homeless persons will receive effective care. Insufficient access to health care delays detection and deters effective treatment of TB.

2. Prevalence and Incidence of Tuberculosis Among Homeless Persons

Although from a national perspective, the overall incidence of active TB and the prevalence of latent tuberculous infection among homeless people are unknown, based on screening at selected clinics and shelters, the prevalence of clinically active disease ranges from 1.6% to 6.8%.^{3 4 5 6 7} Clinical data from the National Health Care for the

³ Sherman MN, Brickner PW, Schwartz MS, et al. "Tuberculosis in single-room-occupancy hotel residents: A persisting focus of disease." NY Med Quart 1980; 2:39-41.

⁴ CDC. Drug-resistant tuberculosis among the homeless-Boston. MMWR 1985;34: 429-31.

⁵ Barry MA, Wall C, Shirley I, et al. Tuberculosis screening in Boston's homeless shelters. Public Health Rep 1986;101 (5):487-98.

Homeless Program indicated a point prevalence of active TB of 968/100,000 homeless adults.⁸ These prevalence rates are 100 to 300 times higher than the nationwide prevalence rate. The prevalence of latent TB infection among homeless persons at selected clinics and shelters ranges from 18 to 51 percent^{3 4 5 6 7}, thus indicating that a large reservoir of infection may exist from which future cases will emerge unless large-scale preventive measures are undertaken. However, because of the selective nature of these screening activities, it is not appropriate to extrapolate these reported prevalence rates nationwide or to sub-populations of homeless people, such as single-parent families or runaway children.

3. Shelter Environments

Characteristics of shelter environments (e.g., crowding and insufficient ventilation) facilitate transmission of TB.^{9 10 11}

Of 49 shelter-related cases reported in Boston during 1984, 22 had cultures resistant to both isoniazid and streptomycin, and were of the same type of microorganism, indicating recent transmission originating with a single index patient.⁹

During 1990, 11 cases of active TB occurred among residents of a 200-bed shelter for homeless people in Cincinnati, Ohio. Genetic testing indicated that 9 of the 11 cases were infected with identical organisms. The large number of TB cases that occurred in one shelter, and the genetic testing results provide evidence that TB was transmitted within the shelter.¹⁰

The association between tuberculosis and inadequate housing for the poor is a problem that has been with us for decades. In 1914, S. Knopf described shelters in the United States in which thousands of Americans huddled without access to proper ventilation and sanitation:

All cheap lodging-houses in small or large cities are evidence of poverty, misery, and degradation. Those who have ever visited this class of habitation, in reality usually unfit to be inhabited by any human being, will realize that cheap lodging-houses are veritable breeding-places of tuberculosis. Many lack light, all of them lack air and proper ventilation, and not one of them is either sanitarily constructed or conducted. The tuberculous visitor to these lodging-houses will leave the traces of his tuberculosis . . . The underfed, badly clad, non-

⁶ Slutkin G. Management of tuberculosis in urban homeless indigents. *Public Health Rep* 1986;101 (5):481-5.

⁷ McAdam J, Brickner PW, Glicksman R, Edwards D, Fallon B, Yanowitch P. Tuberculosis in the SRO/homeless population. In: Brickner PW, Scharer LK, Conanan B, Elvy A, Savarese M, eds. *Health care of homeless people*. New York: Springer 1985:155-75.

⁸ Wright JD. Poor people, poor health: The health status of the homeless. *J Soc Issues* 1990;46 (4): 49-46.

⁹ Nardell E, McInnis B, Thomas B, Weidhass S, Exogenous, reinfection with tuberculosis in a shelter for the homeless. *N. Engl J Med* 1986; 315:1570-5.

¹⁰ CDC. Tuberculosis among residents of shelters for the homeless-Ohio, 1991. *MMWR* 1991;40: 869-71, 877.

¹¹ Nolan CM, Elarth AM, Barr H, Saeed AM, Risser DR. An outbreak of tuberculosis in a shelter for homeless men. *Am Rev Respir Dis* 1991;143:257-61.

tuberculosis lodger, who will next occupy this cubicle, the enclosed supposed to represent a room, is almost certain to contract the disease.¹²

4. Increased Prevalence of Other Health Conditions

Among homeless persons, the increased prevalence of conditions which can suppress the immune system (e.g., HIV infection, poor nutrition, untreated diabetes, chronic obstructive pulmonary disease, alcoholism, illicit drug use, and psychological stress) may increase the risk for active TB if infected.^{6 13 14 15 16 17}

5. Incomplete Drug Therapy

Because many shelter residents lack good access to health care and are highly mobile, they often do not complete TB therapy, and the likelihood of relapse, drug resistance, and further transmission of TB among shelter residents is increased.^{5 6 15 17}

II. THE HEALTH CARE RESPONSE TO TB AMONG HOMELESS PERSONS

A. Screening

The majority of cases (about 90%) of active tuberculosis come from reactivation of a latent infection which could have been contracted many months or years previously. Eradication of tuberculosis is only possible by removing those with active TB from the environment, treating them, and then treating those who are infected before they can become contagious.

While necessary, screening in homeless shelters for tuberculous infection and disease is both labor-intensive and is fraught with pitfalls unless clear, consistent guidelines are used. Health care staff need proper training and organization to manage such an undertaking. Staff who manage shelters must have a clear understanding of what screening involves, as well as why it is necessary. Total shelter population screening cannot succeed without the close cooperation of general shelter staff and the health care team.

Ideally, every client entering the shelter system should have a determination of his or her tuberculosis status. Such information is normally required for placement in most supportive residences. TB interviews can be the first step in securing housing as well as introducing clients

¹² Knopf, SA. Tuberculosis as a Cause and Result of Poverty. JAMA 1914;20:1720-24.

¹³ McAdam JM, Brickner PW, Scharer LK, et al. Tuberculosis in the homeless: A national perspective. In: Brickner PW, Scharer LK, Conanan BA, Savarese M, Scanlan BC, eds. Under the safety net. New York: WW Norton & Company, 1990;234-49.

¹⁴ Torres RA, Mani S, Altholz J, Brickner PW. Human immunodeficiency virus infection among homeless men in a New York City shelter: association with *Mycobacterium tuberculosis* infection. Arch Intern med 1990;150:2030-6.

¹⁵ Brudney K, Dobkin J. Resurgent tuberculosis in New York City: Human immunodeficiency virus, homelessness, and the decline of tuberculosis control programs. Am Rev Respir Dis 1991;144:745-

¹⁶ Reichman LB, Felton CP, Edsall JR. Drug dependence, a possible new risk factor for tuberculosis disease. Arch Intern Med 1990;90:351-5.

¹⁷ Pablos-Mendez A, Raviglione MC, Battan R, Ramos-Zuniga R. Drug-resistant tuberculosis among the homeless in New York City. New York State J Med 1990;90:351-5.

to the shelter health care team. The purpose of screening is to contain the disease by first finding those who have active and, therefore, contagious TB. All clients with active TB should be found upon entry into the system and receive the care needed immediately. These persons should be hospitalized and isolated from the rest of the shelter population before the infection can be spread further. The remainder of the population should be classified according to their risk of development of active tuberculosis. Those at higher risk should be offered preventive treatment to decrease the amount of active disease and further spread of the infection.

B. Diagnosis

Any client strongly suspected of having pulmonary TB (i.e. complaining of fever, night sweats, productive cough and weight loss) should be fully evaluated immediately *outside* of the shelter setting, preferably in a properly constructed hospital. Because of the public health risk, this is not the type of evaluation that can be delayed or done over a period of several days.

The situation becomes more complicated when patients have symptoms less suggestive of pulmonary TB. For example, clients may have a single symptom of a chronic productive cough, or TB-like symptoms of very short duration. As with most diseases, "classic" symptoms of tuberculosis are usually present in a minority of patients. Atypical presentations are more likely in the early stages of active TB and in those with HIV infection.

Ideally, tuberculosis should be diagnosed with the patient already in respiratory isolation outside the shelter. If a patient is reluctant to spend hours waiting to be evaluated in an emergency room or other facility and the index of suspicion for active disease is lower, some cases may be diagnosed in a shelter clinic by history, physical exam, on-site sputum collection with a scheduled chest X ray. Individuals diagnosed in this way are still found earlier (and are probably less contagious) than if the health care provider waited until more "classic" symptoms developed.

C. Treatment of Tuberculosis

Armed with the information obtained from screening and diagnosis, the first job of the clinician is to treat those with active disease and then those with infection. Those with active disease need to be hospitalized, primarily to isolate them from other individuals in their environment, both clients and staff. Treatment must continue after discharge, and can be managed by Health Care for the Homeless providers, provided antibiotic sensitivities are known. The antibiotic sensitivities of the particular strain infecting the patient must be determined in order to properly guide the antibiotic therapy.

Multiple drug resistant strains of tuberculosis (MDR TB), while no more virulent or contagious than nonresistant TB, are much more difficult to treat. In the United States, active TB is nearly 100% curable if the patient is treated with two bactericidal drugs to which the organism is sensitive. The cure rate drops to 60% if the organism is resistant to both isoniazid (INH) and rifampin (RIF). Even with aggressive treatment including multiple drugs, and surgical resection of heavily diseased tissue, treatment for MDR TB can be unsuccessful.⁹

Compliance with TB regimens needs to be aggressively monitored. Lapses in therapy lead to recurrence of active disease and emergence of drug resistant strains. Directly Observed Therapy (DOT) can make the difference between success and failure in settings where compliance is a problem. In DOT, patients are reminded to take their TB medications and are observed swallowing their pills on a daily or bi-weekly basis by a DOT field worker. These field workers supplement routine clinic visits, which are still necessary. DOT workers reduce the cost of tuberculosis by preventing relapses and costly hospital admissions. This program also prevents adverse drug reactions by discovering them earlier through careful observation.¹³

In every case, providers of health care to homeless persons should collaborate closely with local public health authorities, who have the responsibility and (at least theoretically) the resources for combatting TB, but who need HCH providers' understanding of and access to the homeless population.

D. Surveillance and Data Reporting

Screening and treatment results from shelters and other locations where homeless persons are screened should be recorded systematically. Once the background levels of infection and disease are known, any increases can be aggressively investigated to control outbreaks sooner rather than later. Well organized data are a powerful advocacy tool, because they offer concrete evidence of the need for help from local health departments and the need for ongoing health care on site. A shelter reporting a number of cases of active TB per year is hard to ignore when the shelter requests health care services, decreased crowding, and improved ventilation.

E. Education of Health Care Providers

Tuberculous infection, as evidenced by a positive tuberculin skin test, is probably the most common medical problem of homeless people in some communities, but in general, health care workers are ill-equipped to deal with the current tuberculosis epidemic. Both clinical and basic science research fell off sharply when TB rates declined in the last few decades. Pharmaceutical companies have not pressed forward with development of new anti-tuberculous drugs for a shrinking market. In the recent past, physician training has largely neglected TB management.

Attempts are being made to reverse this decline both nationally and locally. The Centers for Disease Control and Prevention (CDC) has formed an Advisory Committee for the Elimination of Tuberculosis (ACET) and the National Coalition to Eliminate Tuberculosis (NCET). Health departments in some cities, such as New York, are issuing specific recommendations for treatment of TB, and are organizing training sessions for health care providers of all types. Those who provide health care to homeless persons are in a unique position to share their expertise with their colleagues in health care, including persons in professional associations and schools of medicine, nursing, social work and public health.

F. Education for Shelter Staff

As a response to TB among homeless people, emergency shelters that normally do not provide health care have of necessity expanded their services to include TB screening, referrals, health-oriented case management and health education to shelter guests. In light of the changing role of the shelter system and the high rates of TB in shelters, it is imperative that all staff of shelters receive in-service training on TB education and prevention methods. The high rate of staff turnover at many shelter sites further necessitates on-going TB in-service training at the shelter site. Such training complements and supports routine, periodic TB testing of shelter staff and volunteers. Furthermore, shelter staff are in an ideal position to provide primary prevention through education and distribution of prevention-oriented materials to shelter guests. Many staff are formerly homeless themselves, increasing their effectiveness as role models and trustworthy sources of information for shelter guests.

The goals of a TB training program for shelter staff are:

- *to increase knowledge about tuberculosis*, including transmission, disease progression, trends of infection, risk factors, prevention methods, TB testing treatment, the HIV/TB relationship, infection control guidelines, and roles within the health care system;

- *to challenge and change attitudes* that are based on misinformation and fear of working with homeless persons with, or at risk for, TB;
- *to improve staff skills* in the following areas: identifying and working with TB-infected clients, working with local health departments and other referral resources, reporting requirements, methods for developing agency based TB policies, and strategies for implementing on-site client and staff TB education and prevention programs; and
- *to institute policy changes within agency operations*, including adoption of written policies on staff, client, and volunteer testing, and implementation of guidelines for TB prevention, treatment and education.

G. Environmental Risk Reduction

TB is a disease of crowding, poverty, poor ventilation, and lack of access to medical care. We know this because TB began to decline in 1900, almost 50 years before streptomycin, the first antituberculous antibiotic was discovered. TB was controlled by early case finding and removal from households to sanatoria, decreased crowding in tenements, improved ventilation from architectural changes in residential buildings, and a general rise in the standard of living. When family incomes increased, more of the population had access to the health care system.

By putting individuals into medically unsupervised shelters with crowding and poor ventilation, and restricting access to health care, we are reconstructing the worst elements of 19th Century diseases. Regrettably, shelter buildings tend to be the least desirable buildings available, but they still need to meet modern health codes.

As an adjunct to screenings, treatment and surveillance, the health care response to tuberculosis should include decreased crowding, improved ventilation, and ultraviolet radiation in shelters to reduce transmission of *Mycobacterium tuberculosis* and other harmful organisms. Although no controlled clinical trials are yet available proving the efficacy of ultraviolet lights in reducing new infections, they have been shown to be effective in clearing the air of tubercle bacilli. If a single new case of TB is prevented, the cost savings (\$10,000 to \$20,000) would pay for the UV light installation. For every case of multi-drug resistant tuberculosis (MDR-TB) prevented, the cost savings to the health care system could be closer to \$180,000.¹⁸ Proper installation of UV light fixtures should work synergistically with improved ventilation to reduce airborne transmission of *Mycobacterium tuberculosis*. There is often resistance to exposure to any type of "radiation", but UV radiation at a wavelength of 254 nm is not associated with adverse long term effects,¹⁹ and germicidal UV light units can be designed in such a way as to prevent excessive exposure.

¹⁸ Riley RL. Transmission and environmental control of tuberculosis in : *Tuberculosis: A Comprehensive International Approach*. Reichman LB, Hershfield ES, eds. Marcel Dekker, Inc. New York, 1993, p. 129-33.

¹⁹ See Philip W. Brickner, et al, eds., *Under the Safety Net: The Health and Social Welfare of the Homeless in the United States* (New York: W.W. Norton & Co., 1990) or David Wood, ed., *Delivering Health Care to Homeless Persons: The Diagnosis and Management of Medical and Mental Health Conditions* (New York: Springer Publishing, 1992) or James J. O'Connell and Janet Groth, eds., *The Manual of Common Communicable Diseases in Shelters* (Boston: Boston Health Care for the Homeless Program, 1991).

III. BEST PRACTICES AND POLICY RECOMMENDATIONS FOR COMBATting TUBERCULOSIS AMONG HOMELESS PEOPLE

This report has cited five major factors contributing to the increased risk for TB among homeless people:

- Insufficient access to health care for homeless people delays detection and deters effective treatment of TB;
- The high prevalence and incidence of TB among homeless persons increases the risk of transmitting TB to other homeless persons;
- Characteristics of shelter environments facilitate the transmission of TB;
- The increased prevalence of other health problems (such as HIV infection, poor nutrition, alcoholism, illicit drug use and psychological stress) may increase the risk of homeless persons developing active TB if they are infected; and
- The mobility of homeless persons increases the likelihood that they will not complete TB therapy.

The National Health Care for the Homeless Council has compiled the following “Best Practices” and “Policy Recommendations” through surveying and interviewing its member programs. It is critical that policy makers, state and local health departments, and providers of service to homeless persons use such information to establish policies and programs which will effectively eliminate the centuries-old problem of tuberculosis disease.

A. Inadequate Access of Homeless Persons to Health Care

Best Practices:

A substantial body of experience in the effective delivery of health care to homeless persons has developed in the last ten years.²⁰ Health care activities that target homeless persons concentrate on creating access to care through aggressive **outreach** activities and through the **elimination of geographical, financial, cultural and linguistic barriers to care**.¹²⁰ Health Care for the Homeless grantees of the Public Health Service embody these characteristics, but still reach only an estimated one-fifth to one-quarter of the nation's street and shelter dwellers in any year.

Policy Recommendations:

National health care reform that provides universal health insurance coverage, maintains and extends mechanisms for assuring access to care for vulnerable populations, and provides comprehensive health benefits is necessary to assure adequate access to care for homeless persons. A detailed statement on these issues is included as Appendix A. Fuller treatments of President Clinton's health reform proposal²¹ and of the Single Payer health reform legislation²² are available from the National Health Care for the Homeless Council.

²⁰ Dawn Sydney and John Lozier, “Life and Death on the Streets: Health Care Reform and Homelessness” (National Coalition for the Homeless and National Health Care for the Homeless Council, December, 1993).

²¹ Jeff Singer, “ ‘Tis a Gift to be Simple: Homelessness, Health Care Reform, and the Single Payer Solution” (National Coalition for the Homeless and National Health Care for the Homeless Council, May, 1994).

B. Prevalence and Incidence of Tuberculosis among Homeless Persons

Best practices:

Routine, consistent screening at homeless shelters and clinics which serve homeless people is essential. Communities should maximize the utility of screening results, and avoid duplication of effort, through a **master computer database**, maintained by the public health department or the health care provider, with easy access for providers and appropriate safeguards for confidentiality.

On-site X rays at the time of the skin test reading provide immediate follow-up to positive skin tests. Mobile X ray vans may increase the health system's capacity for this vital service, which - like other health services - must be readily accessible to homeless persons.

Providers of homeless health care and shelter services should have in place **linkages** with hospitals and specialty clinics that provide appropriate pulmonary care. **Special protocols** established with these hospitals and clinics should enhance access for homeless individuals, such as reduced waiting time for medical services.

Directly observed therapy (DOT) must be in place for all patients with active tuberculosis. **Directly observed preventive therapy** (DOPT) must be in place for those receiving prophylactic treatment. Provision of **incentives** for treatment is appropriate to encourage adherence to therapy.

Appropriate case management services should be provided to help infected individuals find housing and apply for benefits.

Education of shelter providers and homeless persons about proper infection control measures should promote appropriate concern without causing panic.

Policy Recommendations:

Federal funding of local programs and initiatives that provide all of the above, with particular attention to areas hardest hit by TB among the homeless population, should be provided through the Public Health Service and the Centers for Disease Control and Prevention.

Collaborative efforts involving local tuberculosis control programs and providers of service to homeless people are essential, and should be encouraged through special grants and through conditions attached to federal funding of various programs.

C. Shelter Environments

Best Practices:

Permanent, affordable, standard housing placements obviate the need for emergency shelter and eliminate the exposures inherent in the shelter setting. While homeless people continue to rely on emergency shelters, those facilities must be made as safe as possible, with particular attention to **ventilation and ultraviolet light installation** to minimize airborne transmission of tuberculosis and other infections.

Specialized respite care programs, with integrated social services, are appropriate as an alternative to emergency shelters for those discharged from a hospital after initial treatment for active tuberculosis.

Policy Recommendations:

Restoration of the major federal funding commitment to **affordable housing** is critical to overcoming tuberculosis. As an interim step, speeding access to the Section 8 housing voucher program and similar housing subsidies will help to slow the spread of TB.

Funding should be provided to **retrofit shelter facilities** to minimize airborne disease transmission. Funding for tuberculosis control should actively support **tuberculosis respite centers** or respite programs.

D. Increased Prevalence of Other Health Conditions

Best Practices:

Comprehensive risk screening tools should be used by Health Care for the Homeless programs in providing primary care to homeless persons, assessing risk for HIV infection, poor nutrition, alcoholism, illicit drug use, and psychological stress. **Routine medical evaluation** should be provided those at risk for these common illnesses.

Clearly defined assessment and treatment protocols for tuberculosis should be made available to service providers working with homeless persons. These should include **periodic TB screening** for clients, staff and volunteers in homeless shelter settings, community mental health programs, drug and alcohol treatment programs, social service programs, and programs working with HIV-impacted persons.

Respite centers or other housing options should be provided for persons with chronic, debilitating illnesses such as HIV disease or cancer, or who are in need of respite care after an acute illness or surgery.

Policy Recommendations:

Primary care programs serving homeless persons, including the McKinney Act Health Care for the Homeless and the Ryan White Title III programs, should continue to provide vital, targeted services, and must be protected and expanded as national health care reform is implemented.

State Medicaid options, providing coverage for TB-related services to low income persons, should be widely adopted by the States.

E. Incomplete Drug Therapy

Best Practices:

Directly observed therapy (DOT) must be in place for all patients with active tuberculosis. **Directly observed preventive therapy** (DOPT) must be in place for those receiving prophylactic treatment. Provision of **incentives** for treatment is appropriate to encourage adherence to therapy.

Policy Recommendations:

Federal funding should emphasize the necessity of DOT and DOPT programs.

Funding should be provided for **centers for research and clinical specialty care** in metropolitan areas hardest hit by tuberculosis.

IV. CONCLUSION

Tuberculosis is a life-threatening disease that is completely avoidable with safe and clean living conditions, and treatable with proper medical treatment. That any person in the United States should contract TB is a national tragedy; however, it is not surprising that persons who live on the streets and in the overcrowded shelters of our country, without access to health care, become infected every day.

Please advocate with us. Let us know if this paper has encouraged you to change practices in your community, and what your results have been. You can contact the National Health Care for the Homeless Council at P.O. Box 68019, Nashville, TN, 37306-8019, 615/226-2292.

Appendix A

NATIONAL HEALTH CARE FOR THE HOMELESS COUNCIL

Post Office Box 68019
Nashville TN 37206-8019
Phone (615) 226-2292
Fax (615) 226-1656

Essential Elements to Make Health Care Reform Effective for Homeless People

A significant measure of any reform of the health care system will be that reform's impact on the neediest Americans--those who lack the most basic necessities, such as housing and income. Their severely limited access to the current system results in untreated illnesses, prolonging their personal economic woes and ultimately driving up the overall costs of the health care system.

Effective reform of the health care system will address not only the financing of care, but also the delivery system to provide that care. Strong emphasis must be placed on health education, prevention and primary care in order to reduce the need for costly utilization of specialty and tertiary services and thus to achieve cost savings in the long run. Additional, comprehensive benefits are necessary to improve the health status of impoverished populations.

Health care reform should draw together the separate funding streams now supporting primary care, substance abuse and mental health services, eliminating bureaucratic obstacles to providing comprehensive services to people with multiple needs.

Providers of health and social services for homeless people have developed effective methods of extending care to marginalized populations, involving the use of interdisciplinary teams providing comprehensive services at sites frequented by homeless people and the careful elimination of barriers to care at more traditional service sites. Based on this experience, we have identified the following essential elements for a health care system that will be responsive to the serious health needs of the homeless poor.

The National Health Care for the Homeless Council believes that the single-payer approach to the financing of health care services most fully satisfies these concerns, that the approach proposed by President Clinton nearly satisfies the important criterion of universal coverage, and that other approaches currently under consideration utterly fail homeless people in that they do not provide universal coverage.

Universal coverage must apply to all people equally.

- Basic equity demands that poor people be able to present themselves to health care providers with the same assurance of adequate health insurance coverage as anyone else, lest they continue to be turned away by large numbers of providers.
- It is critical that all persons within the United States be involved in the health care system in order to achieve important public health goals. Truly universal involvement in primary and preventive care must complement a vigorous public health system, which must be strengthened in order to reverse the course of tuberculosis and HIV disease in particular.
- Likewise, truly universal coverage is necessary to hold down costs in a reformed system. Adequate primary care diminishes the need for more expensive emergency and tertiary care.
- Undocumented persons must be provided coverage in order to achieve these public health and cost containment goals.

- Prisoners must be guaranteed the same basic health benefits as other persons. Continuity of health care must not be interrupted by involvement with the criminal justice system. Jails, prisons and other public institutions should help to assure extension of coverage to all persons.

Access to care must be assured.

- Even with universal coverage, a reformed health care delivery system must eliminate barriers to care that are inherent in the current system, including those that relate to presenting problem(s), residency, economic status, location, language, culture, or provider attitude. For homeless people and other population groups, aggressive outreach and on-site health care delivery efforts are required.
- Out-of-pocket expenses must be eliminated. Persons needing health care should not be deterred by an expectation that they pay for services. Even when co-payments are routinely written off, they constitute a major barrier for very low income persons. Without elimination of out-of-pocket expenses, those who are unable to afford co-payments and deductibles will be restricted to seeking care from a separate class of providers who may or may not be accessible to them.
- System insufficiencies must be corrected. The current system of grant-funded community clinics, homeless and migrant health care projects, public health clinics and public hospitals must be preserved and expanded in order to provide primary care effectively to hard-to-reach populations. In this expansion, the Health Care for the Homeless Program should be specifically supported along with Community and Migrant Health Centers, which have similar funding, service patterns and target populations. Services must be geographically and physically accessible, linguistically appropriate and culturally acceptable to potential recipients of service.
- Outreach is critically important for engaging homeless people in health care services. The reformed system must provide not only outreach on the streets, but also the on-site delivery of comprehensive health care services in shelters, soup kitchens, and other locations where homeless people congregate.
- Enabling services such as translation and transportation should be guaranteed as a basic component of health care for anyone who needs such services in order to gain access. At the very least, enabling services must be funded for all providers of community-based primary care, rather than through competitive grant mechanisms or at state option.
- Portability of coverage is critical to effective access to care. Complex residency and registration requirements must not inhibit use of health care by persons whose lives are unstable or disorganized. Enrollment must be facilitated through point-of-service enrollment, immediate disenrollment or transfer to another plan (in a competitive system), and by the provision of impartial assistance with enrollment.
- In a competitive system, adverse selection which excludes certain populations must be prevented. Managed care providers may seek to avoid enrollment of homeless or poor persons because their complex medical problems are costly and because their presence in health care facilities might offend more 'desirable' patients. Alternatively, providers in a capitated system might seek large enrollments by aggressively marketing to homeless and poor people, while erecting subtle barriers to prevent utilization of services. Such practices have been observed in managed care experiments, and careful regulation and oversight are required to prevent marketing abuses.

Comprehensive benefits must be provided.

- Health problems are inter-related, and must be addressed comprehensively.

- There must be provision for social casework services to address social problems (such as lack of housing, food or income) that adversely affect physical health. Medical case management in a managed care system must be designed to assure easy access to all needed services, rather than acting as a gatekeeper whose role is to limit costs through limiting access. Effective health care for the most marginalized Americans requires the elimination of barriers, not the erection of barriers.
- Adequate treatment for substance abuse and mental illness, which lead to and exacerbate other health conditions is essential to health care reform. Mental health and substance abuse treatment should be treated as separate, comprehensive benefits, including residential treatment and after-care. Although the two benefits should be seen as separate, persons who are dually diagnosed must not be excluded from treatment. Expansion of the current substance abuse and mental health treatment systems will be required to adequately address the need.
- In addition to primary, specialty and tertiary medical care, any basic benefits package should provide dental and vision care, which contribute to homeless persons' employability and self-esteem.
- Building on the important, albeit underfunded, legacy of the McKinney Act, housing must be seen as an integral part of the continuum of health care, not only for homeless people but for the mentally disabled, those in recovery from substance abuse and people with HIV disease or tuberculosis.

January 14, 1994

Appendix B

NATIONAL HEALTH CARE FOR THE HOMELESS COUNCIL

Post Office Box 68019
Nashville TN 37206-8019
Phone (615) 226-2292
Fax (615) 226-1656

Tuberculosis 101

Tuberculosis (TB) is a disease caused by the organism *Mycobacterium tuberculosis* (MTB). In the world today, TB occurs in 10,000,000 persons annually and is responsible for 3,000,000 deaths a year. One-third of the world's population is infected with the organism. In the United States, anywhere from 5 to 15 % of the population is believed to be infected with MTB, and is therefore at risk for developing the active disease TB. In recent years there has been an increase in TB in the United States, and we now face over 25,000 new cases of active disease per year. The lung is the organ usually attacked by the bacteria, and the resulting disease is called pulmonary tuberculosis.

Infection vs. Disease

It is important to understand the difference between tuberculous infection, as demonstrated by a positive tuberculin skin test, and contagious, active TB disease. Tuberculous infection occurs when an individual inhales droplet nuclei containing MTB, produced by the cough of a person with active, contagious TB. The act of coughing produces many-sized droplets containing saliva, sputum and, in the case of someone with active TB, tubercle bacilli. These droplet nuclei, ranging from 5 to 15 microns in diameter, have a unique propensity for penetrating the human body's defenses through the respiratory system and lodging in the lungs.

From 2 to 10 weeks after this occurs the infection can be detected by a tuberculin skin test. In this test (called a PPD) a minute amount of purified protein derivative (PPD) is injected intradermally (i.e., within the first layer of skin). If a person has been infected in the past with MTB, "sensitized" lymphocyte cells react to fight the "new" infection (the PPD material). This results in swelling at the site of skin injection which can be measured. If a person has been infected in the past with MTB, an area of swelling or induration from 5 to 10 mm in diameter will appear at the site of the PPD injection within 2 to 3 days. This does not mean that the person has active TB. Those with tuberculous infection are not contagious. In fact, of all of those infected, only about 10% will go on to develop the active disease, tuberculosis, in their lifetimes. In New York, for example, there are believed to be 1,000,000 people infected with MTB, but in 1990 there were 3,520 new cases of active tuberculosis.

Active pulmonary TB disease is characterized by several weeks' gradual onset of fever, night sweats, productive cough and contagiousness. In a bacteriology laboratory, MTB can be isolated from the sputum of a person with active TB disease.

Risk of Infection

It is difficult to measure the risk of infection when one is exposed to an individual with active TB, since so many factors are involved. Ordinarily, exposure over a period of days to weeks is necessary in order for a person to acquire a tuberculous infection. In general in the United States, only about 25% of household contacts of active TB patients are found to be skin test positive (PPD+). In other words, 75% show no sign of infection.

One factor affecting the risk of infection is the extent of disease in the individual with active TB. If that person is coughing or has cavitary disease (revealed on a chest X ray) or has TB organisms in his or her sputum, the ease of spreading the infection to others is increased.

Environmental factors are also important. Poor air circulation, crowding and the presence of a susceptible population increase the risk of acquiring a tuberculous infection. Studies of shelter residents have demonstrated PPD+ rates of 25 to 60% (remember, these are rates of infection, not of active disease). Several studies have strongly suggested or proven transmission of tuberculous infection in shelters. This makes sense in light of the history of TB control. The sanatorium movement of the early 20th Century removed contagious TB patients from their households. Improved housing (better ventilation, less crowding), combined with a general increase in the standard of living, brought levels of active disease to historic lows even before antibiotics were available. Today, some shelters recreate the worst living conditions of Nineteenth Century slums with crowding, poor ventilation and lack of access to medical care.

Improved environments, improved health status generally, and the prompt recognition of active TB cases with removal of the contagious person from the environment are the keys to preventing transmission of tuberculous infection.

Risk of Progression to Active TB

Several factors are known to increase the likelihood that an individual who has TB infection (a positive PPD) will develop active disease:

- 1) Recent infection: Those who develop a positive tuberculin skin test and who were known to be PPD-negative within the last two years are at increased risk for developing active TB.
- 2) Household contact: Those in close, prolonged contact with an active, and therefore contagious, TB case are known to be at increased risk for development of active TB.
- 3) Immune suppression: Those with depressed immunity because of medications (steroids, cancer chemotherapy, etc.) or illness (human immunodeficiency virus [HIV] infection, leukemia, lymphoma, etc.) are at greatly increased risk for developing active TB from an initial MTB infection (i.e., a positive PPD).
- 4) Other medical illnesses affecting immunity: Illnesses such as diabetes mellitus, chronic renal failure, silicosis and others can increase the risk of developing active disease.
- 5) Chest X ray consistent with old (dormant) TB and a positive PPD: These persons are also at increased risk for development of active disease.

In most instances, these individuals are offered preventative therapy with the antibiotic isoniazid (INH). This prophylactic treatment is from 70 to 90% effective in preventing progression to active disease.

Treatment

Therapy of tuberculous infection or disease consists of a prolonged course of antibiotics, from 6 to 24 months. Most common nontuberculous bacterial infections require only 7 to 10 days treatment or less. TB organisms (MTB) grow so slowly (dividing once every 24 hours) that much longer courses of antibiotics are necessary. Treatment is different in the two groups: those infected and those with active disease. A history and physical examination, chest X ray and sputum specimen for microscopic examination and culture, determine if a patient is merely infected or has active tuberculosis.

1. Infected persons are treated with one drug, isoniazid, for 6 to 12 months. If a person completes the course of treatment, it is 70 to 90% effective in preventing the development of active disease.
2. Those with active disease require treatment with 2 or more antituberculous drugs for 6 to 24 months. Treatment is therefore chronic and also cumulative. Lapses of more than a week can result in reactivation of the active disease and treatment may have to begin all over again.

Those with active pulmonary tuberculosis have varying degrees of contagiousness and it is usually best to place these individuals in respiratory isolation in a hospital until it has been determined they are no longer contagious. In the past it was assumed that a patient with a susceptible organism was no longer contagious after about 10 to 14 days treatment. Because of the recent problems of drug resistance and immune deficiency, most clinicians are more cautious before declaring a patient ready for discontinuation of isolation and /or hospital discharge. The usual practice now is to watch for a good clinical response to treatment and check daily sputum smears for TB organisms before a patient is considered ready for discharge. A good clinical response includes decrease in fever, decrease in cough, and improvement in night sweats and appetite. If a patient is responding well to antibiotics, then sputum smears should become negative for TB organisms. An individualized decision is then made regarding discontinuing respiratory isolation and/or discharging the patient.

Treatment is continued in the outpatient setting. The usual practice is for a physician to see the patient every month or more often if the patient's course has been complicated. When compliance may be difficult for a patient or client, directly observed therapy (DOT) may mean the difference between success or failure. In DOT field workers observe patients taking their medications on a daily, bi-weekly or other regimen. DOT workers do not dispense medication and therefore are not MDs, RNs or LPNs. This makes these programs economical as well as successful. DOT workers are trained to look for any signs of toxicity from TB medication and immediately contact the prescribing physician if there is any question of drug toxicity.

The most common side effects of antituberculous medications are liver disorders. It is unusual to have to discontinue a medication because of side effects. Side effects are both uncommon and completely reversible by discontinuing the medication. There are two chemicals or drugs which can harmfully interact with TB drugs - alcohol and methadone.

Alcohol in itself can cause a variety of health problems including hepatitis and cirrhosis. Daily consumption of alcohol increases the risk of drug toxicity, and these patients must be watched very closely. The main symptoms of liver toxicity are: loss of appetite, jaundice (a yellowing of the skin or the eyes), weight loss, darkening of the urine, or abdominal pain. Luckily, antituberculous medications are well tolerated with antihypertensives, psychotropics, and other commonly prescribed drugs.

Methodone is used to block the symptoms of withdrawal from heroin and other opiates. Rifampin causes the liver to metabolize methadone more quickly and the patient may experience withdrawal symptoms. This can be alleviated by increasing the dose of methadone.

Drug Resistance

In nature, one in a million MTB organisms is resistant to a single antituberculous drug. Since a billion or more organisms exist in a typical tuberculous pulmonary cavity, two or more drugs are needed to cure TB. Repeated lapses of more than one week in TB therapy will promote the growth of organisms resistant to one or both drugs. Even in the best of circumstances, compliance rates in the general population seldom exceed 75%. In other words 25% of persons with active TB fail to complete therapy within the prescribed time, unless they are in a supervised or directly observed program. Homelessness only makes compliance more difficult. Drug resistance is a man-made problem. Meticulous compliance is required of the patient, but also of the physician and other members of the health care team. Various methods must be used to ensure compliance, such as on site care in shelters and positive incentives. These methods are well known and have been proven effective in the US as well as around the world.

HIV and Tuberculosis

Persons with HIV infection are uniquely at risk for development of active TB from a tuberculous infection. HIV, the virus that causes AIDS, attacks the type of white blood cell (CD4 lymphocyte) which is responsible for the initial containment of many types of infection, including TB. The CD4 lymphocyte also helps produce the characteristic "positive" PPD in those who are infected. As CD4 counts drop, the ability to give an appropriate response to a tuberculin skin test can be lost. These individuals are also at risk to develop active TB from a recent or remote tuberculous infection. In fact, studies indicate that HIV+, PPD+ persons may develop active TB at a rate of 10% per year. This is in comparison to the overall rate of 10% over a lifetime used to describe the risk of active disease among all PPD+ patients. Further, it appears that drug resistance may develop sooner in non-compliant HIV patients than with other non-compliant patients. It is as if the organism is more virulent in the immune compromised patient. Drug resistant organisms can infect others, regardless of immune status.

Summary

Tuberculosis is a contagious disease, transmitted by the inhalation of droplet nuclei. These are produced when a person with the active form of the disease coughs. Exposure on the order of days to weeks is necessary to acquire a tuberculous infection. Only about 10% of those who acquire this infection will go on to develop the active disease, tuberculosis, although some groups such as

those with later stages of HIV infection, appear to be at greater risk. Crowding, poor ventilation and certain characteristics of the contagious individual increase the likelihood of becoming infected with MTB.

Preventative treatment of infected individuals (as defined by a positive tuberculin skin test) with isoniazid can be 70 to 90% effective in preventing these individuals from developing active disease.

Early detection and isolation of contagious persons with active TB is the key to disease control. A constant state of alertness is necessary to find such individuals sooner rather than later.

With appropriate treatment, active tuberculosis is 98% curable, except in the case of multiply-drug resistant (MDR) TB, where the effective cure rate is as low as 60%, approximately the cure rate of the pre-antibiotic era.

Most of the tools for controlling TB, sound public health measures, were known a hundred years ago. In addition, we now have a variety of antibiotics at our disposal. A combined effort will be needed to control this ancient disease once again.

John M. McAdam, M.D.
Attending Physician
St. Vincent's Hospital and
Medical Center of New York
Department of Community Medicine

April, 1992

REFERENCES