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Advisory Council for the Elimination of Tuberculosis (ACET)

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EX OFFICIO MEMBERS

Amy S. Bloom, M.D.
U.S. Agency for International Development
Washington, DC

Michael J. Brennan, Ph.D.
U.S. Food and Drug Administration
Bethesda, Maryland

Georgia S. Buggs, M.P.H.
Public Health Service
Rockville, Maryland

James E. Cheek, M.D.
Indian Health Service
Albuquerque, New Mexico

Amanda L. Edens
U.S. Occupational Safety and Health Administration
Washington, DC

Ann M. Ginsberg, M.D., Ph.D.
National Institute of Health
Bethesda, Maryland

Warren W. Hewitt, Jr., M.S.
Substance Abuse and Mental Health Services Administration
Rockville, Maryland

Michael P. Johnson, M.D.
Health Resources and Services Administration
Rockville, Maryland

Gary A. Roselle, M.D.
U.S. Department of Veterans Affairs
Cincinnati, Ohio

LIAISON REPRESENTATIVES

John B. Bass, Jr., M.D.
American Thoracic Society
University of South Alabama
Mobile, Alabama

Fran DuMelle, M.S.
American Lung Association
Washington, DC

Nancy E. Dunlap, M.D.
American College of Chest Physicians
University of Alabama at Birmingham
Birmingham, Alabama

Susan W. Forlenza, M.D.
Hospital Infection Control Practices Advisory Committee
New York City Department of Health
New York, New York

Carol J. Pozsik, M.P.H.
National TB Controllers Association
South Carolina Department of Health
Columbia, South Carolina

Walter F. Schlech, M.D.
CDC Advisory Committee on HIV and STD Prevention
QE II Health Sciences Center
Halifax, Nova Scotia, Canada

Larry Schlesinger, M.D.
Infectious Disease Society of America
University of Iowa
Iowa City, Iowa

Michael L. Tapper, M.D.
Society for Healthcare Epidemiology of America
Lenox Hill Hospital
New York, New York

The following CDC staff members prepared this report:

Richard J. O'Brien, M.D.
Patricia M. Simone, M.D.
Division of Tuberculosis Elimination
National Center for HIV, STD, and TB Prevention

Tuberculosis Elimination Revisited: Obstacles, Opportunities, and a Renewed Commitment

Advisory Council for the Elimination of Tuberculosis (ACET)

Summary

In 1989, CDC and the Advisory Council for the Elimination of Tuberculosis (ACET) issued A Strategic Plan for the Elimination of Tuberculosis in the United States. *Since then, the United States has experienced a resurgence of tuberculosis (TB) followed by a successful mobilization against the epidemic. Because the nature of this disease has changed during the past decade, ACET has reassessed its 1989 plan. Recent progress against TB should reinforce the nation's confidence that the disease can be controlled and ultimately eliminated. However, existing TB-control efforts must be sustained and enhanced, and new and improved diagnostic, treatment, and prevention methods, including a new vaccine, must be developed and applied. Support for these efforts should be broad-based and include the establishment of new partnerships. Because eliminating TB in the United States will have widespread economic, public health, and social benefits, committing to this action will also fulfill an obligation to persons throughout the world who have this preventable and curable disease. With this reassessment, ACET reaffirms its call for the elimination of TB in the United States.*

INTRODUCTION

In 1989, CDC and the Advisory Council for the Elimination of Tuberculosis (ACET) issued *A Strategic Plan for the Elimination of Tuberculosis in the United States* (*1*). This plan established a national goal of tuberculosis (TB) elimination, defined as a case rate of less than 1/1,000,000 population by 2010, with an interim target of 3.5/100,000 population by the year 2000. The plan also described the following actions needed to achieve TB elimination: a) more effective use of existing prevention and control methods, especially among high-risk populations; b) development and evaluation of new technologies for TB diagnosis, treatment, and prevention; and c) rapid transfer of newly developed technologies into clinical and public health practice. For the past 10 years, this plan has provided the framework for the nation's TB-control efforts, including a successful mobilization against the resurgence of TB associated with a) deterioration of the public health infrastructure, b) increasing cases among foreign-born persons, c) human immunodeficiency virus (HIV) infection, and d) transmission of multidrug-resistant TB (MDR TB) in institutional settings (*2*).

However, TB in the United States has changed during the past decade. Since 1993, TB morbidity has steadily declined, and the disease is more likely to occur in well-defined risk groups and geographic areas that can be targeted for control efforts. But new diagnostic and therapeutic tools are needed to continue the recent progress toward TB elimination (*3*). In addition, a growing awareness that the worldwide TB epidemic has implications for the United States has led to increased U.S. involvement in the global battle against TB and an initiative to develop an effective vaccine (*4,5*).

Finally, changes in the organization, delivery, and financing of health care have created new challenges for TB elimination (*6*).

Thus, ACET, which provides advice and recommendations regarding the elimination of TB to the U.S. Department of Health and Human Services and CDC, reassessed its 1989 plan and made updated recommendations for TB elimination. In its reassessment, ACET concluded that the past decade of progress against TB should reinforce the nation's confidence in the following concepts:

- TB can be controlled and ultimately eliminated with the development of new tools and expanded partnerships.
- TB elimination will have widespread economic, public health, and social benefits.
- Committing to decisive action against TB in the United States will fulfill an obligation to persons throughout the world who have this preventable and curable disease.

BACKGROUND

The Changing Epidemiology of TB

During 1953–1985, the number of TB cases reported annually in the United States dropped 74%, from 84,304 to 22,201. Subsequently, this trend stopped. In 1989, when CDC issued its TB elimination plan, reported TB cases had increased approximately 5% over the previous year; cases continued to rise, reaching a peak of 26,673 in 1992 (*7*). This resurgence was associated with a) the HIV epidemic, which substantially increased the risk for active TB among persons with latent TB infection; b) immigration from TB-endemic countries; c) TB transmission in congregate settings (e.g., hospitals and prisons); d) deterioration of the infrastructure for TB services; and e) development of difficult-to-treat cases of MDR TB (*8*).

Studies conducted during this period of TB resurgence indicated substantial, ongoing transmission of TB and development of active TB in many recently infected persons (*9,10*). This phenomenon appeared to primarily affect certain high-risk populations (e.g., persons who were HIV-infected, homeless, or incarcerated), suggesting the existence of several concurrent TB epidemics in the United States. The resurgence of TB during 1985–1992 was accompanied by an increase in the number of persons with MDR TB, largely because of MDR TB outbreaks among HIV-infected persons in institutional settings (*11*). The rise in total TB cases, coupled with increased drug resistance, has challenged state and local control efforts (*2*).

Since 1992, the number of reported TB cases in the United States has decreased each year, reaching a record low of 18,361 in 1998, with a case rate of 6.8/100,000 and an overall decline of 31% (CDC, unpublished data, 1998). This reduction is attributed to more effective TB-control programs that emphasize prompt identification of persons with TB, prompt initiation of appropriate therapy, and efforts to assure that therapy will be completed (*12*).

The recent success in TB control in the United States is tempered by the burden of TB among foreign-born persons residing in this country. An increasing percentage of U.S. cases are occurring among persons who were born in Asian, African, or Latin

American countries, where TB rates are 5–30 times higher than U.S. rates (*13*). During 1992–1997, the number of TB cases among U.S.-born persons declined 38%, whereas the number of TB cases among foreign-born persons in the United States increased 6%. The TB case rate for foreign-born persons has remained at least 4–5 times higher than that for U.S.-born persons, and the proportion of U.S. cases occurring in foreign-born persons has increased steadily since the mid-1980s, reaching 42% in 1998 (CDC, unpublished data, 1998).

Rebuilding the Public Health Infrastructure

Following the resurgence of TB and the emergence of MDR TB as a public health threat, federal resources were increased to a) strengthen TB surveillance, b) improve laboratory capacity for identifying mycobacterial species and conducting real-time drug susceptibility testing, c) expand the use of directly observed therapy (DOT), and d) expedite investigation of the close contacts of TB patients. The subsequent 31% decrease in annual TB cases during 1992–1998 is a notable public health achievement and a measurable return on the resources invested to strengthen TB-control programs nationwide. Increasing the number of patients who complete TB therapy, including those in hard-to-reach populations, has contributed to these reductions. In many areas, TB screening and preventive therapy services directed toward high-risk groups, especially persons at risk for HIV infection and persons in correctional facilities, have expanded substantially. Surveillance data and research on adherence to treatment have better characterized risk groups, leading to more effective, targeted interventions.

Additionally, training and educational activities and products are increasingly available nationwide for health-care providers. New materials are developed as needed to address the changing TB epidemiology and scientific advances in diagnosis and treatment. ACET has issued several statements on TB-control practices, which are available on the Internet (*14*). Three model TB centers were established in 1994 as national educational resources to provide TB services, expert consultation, and training for health-care providers. In 1999, these centers worked with CDC to develop the *Strategic Plan for Tuberculosis Education and Training* to guide efforts in this area during the next 5 years (*15*).

Despite these efforts, DOT and other measures to improve timely completion of treatment are underused in many areas of the country (*16*). The investigation of contacts of infectious patients and the treatment of persons with latent TB infection are often inadequate. Although the numbers of cases have again started to decline in some areas, TB continues to be a serious public health threat requiring resources to maintain and enhance recent gains in prevention and control (*17*).

Changes in Health Care Organization and Delivery

The marked changes in providing and financing health care in the United States during the past decade present both challenges and opportunities for TB control. Approximately 80 million persons in the United States are enrolled in health maintenance organizations (*6*). Managed care programs serve one third of Medicaid beneficiaries, with enrollment in such programs growing 30%–40% annually (*18*). Opportunities exist for TB-control programs to work with health-care providers in

managed care programs to provide high-quality, preventive TB services to persons at high risk (*19*). Providing such services could be cost-saving (*20*). However, the extent to which managed care programs can provide optimal TB surveillance and reporting, as well as treatment and prevention services, is uncertain, especially in regard to the many previously uninsured persons now covered by managed care plans.

Recognition of the Interdependence of Global TB and TB in the United States

Worldwide, approximately 8 million cases and 2 million deaths were attributed to TB in 1998 (*21*). A close relationship exists between the global TB problem and the impact of the disease in the United States. TB cases among foreign-born persons residing in the United States could soon outnumber cases among U.S.-born persons. Thus, TB elimination in the United States will not be possible without a substantial reduction in the global TB burden. However, global TB-control efforts are hampered by several barriers, including the failure of some developing countries and donor countries to fund effective TB-control programs. The World Health Organization (WHO) estimates that, in 1997, only 32% of the world's population was living in areas where effective TB-control programs were fully implemented and operational (*22*). In many countries in sub-Saharan Africa, HIV infection has led to the doubling and tripling of TB cases, threatening to overwhelm TB-control programs in these countries (*23*). None of the strategies for TB control recommended for low-income countries appears to have decreased the number of HIV-associated TB cases. Moreover, MDR TB has emerged as a serious problem in many countries (*24*). Treatment of MDR TB is expensive and beyond the resources of most developing nations, and increases in MDR TB threaten global TB-control efforts and add urgency to the push for effective interventions worldwide.

WHO has developed a control strategy known as directly observed therapy, short-course (DOTS), which requires microscopy-based diagnosis, standardized treatment under direct supervision, a secure supply of quality drugs and equipment, careful monitoring and supervision, and political commitment to support these activities (*25*). WHO has advocated for increased assistance from wealthier countries to support DOTS programs that require outside assistance. Other international organizations have joined the call for increased U.S. support for global TB control; as a result, U.S. participation has increased, particularly through the U.S. Agency for International Development (USAID).

Scientific Advances

An important component of the 1989 TB elimination plan was the call for development of new tools for TB diagnosis, treatment, and prevention. In 1989, Public Health Service support for TB research totaled less than $5 million. With a renewed interest in TB, funding for research has increased. The National Institutes of Health (NIH) spends approximately $60 million/year, and CDC provides approximately $15 million/year. Although this expanded research has not had time to produce breakthroughs, progress has been made.

Since 1989, advances have been made in applied TB diagnostics, including new methods that reduce the time needed to detect growth of *Mycobacterium tuberculosis*

in diagnostic specimens (*26*). New rapid-detection methods using nucleic acid amplification techniques that provide results within hours have been licensed for use in the United States (*27*). Rapid methods to identify drug-resistant TB (*28*), a new blood test for latent TB infection based on the detection of gamma-interferon (*29*), and serodiagnosis based on a combination of purified mycobacterial antigens (*30,31*) are under investigation. DNA fingerprinting methods (e.g., restriction fragment length polymorphism [RFLP] analysis) have been used to identify *M. tuberculosis* strains implicated in outbreaks and laboratory contamination events, and the role of these methods in detecting ongoing community TB transmission is being assessed (*32*).

Slower progress is being made in TB drug development, although recent advances have been made in understanding the mechanisms of drug action and antibiotic resistance. These advances are contributing to the identification of novel drug targets and the development of new classes of therapeutic agents. NIH has increased support for TB drug discovery, providing for in vitro screening and animal testing of new compounds and evaluating promising therapeutic interventions in Phase I/II studies through the Tuberculosis Research Unit. In 1997, CDC established the TB Trials Consortium (TBTC) to undertake clinical trials of new drugs for treatment and prevention in the United States. TBTC provided data that helped the U.S. Food and Drug Administration (FDA) approve rifapentine in 1998, the first new TB drug approved in more than 25 years (*33*). Clinical trials of short-course treatment of latent TB infection supported by NIH and CDC led to CDC recommendations for the use of a 2-month regimen of rifampin and pyrazinamide as an alternative to longer courses of isoniazid (*34,35*). Despite the need for new drugs, few pharmaceutical companies are involved in TB drug development (*36*).

A major research effort is also directed toward developing new TB vaccines. In its recent statement calling for the development of a new TB vaccine, ACET reviewed research progress in this area (4). The successful cloning of the complete genome of *M. tuberculosis* should accelerate vaccine development (*37*), and several candidate vaccines should be available for human testing within the next few years. In 1998, NIH's National Institute for Allergy and Infectious Diseases (NIAID), CDC's National Vaccine Program Office (NVPO), and ACET issued the *Blueprint for Tuberculosis Vaccine Development* (*5*), which concluded that a safe and protective TB vaccine could be developed, but that the effort required a sustained commitment (i.e., 20 years and approximately $800 million) and international, as well as public- and private-sector collaboration.

TB ELIMINATION REVISITED AND REAFFIRMED

Since ACET's TB elimination plan was published in 1989, other groups of experts have analyzed the prospects for TB elimination and eventual eradication. The Office of Technology Assessment of the U.S. Congress studied TB in the United States in the early 1990s and concluded that "with an estimated one third of the world's population infected with TB and the relative mobility of people in and out of the United States through immigration and tourism, the complete eradication of tuberculosis from this country is unlikely in the foreseeable future" (*38*). The International Task Force for Disease Eradication conducted an evaluation of eradicable diseases and listed TB among those diseases that are not now eradicable, citing a need "for more accurate,

rapid diagnostic tests, shorter and less expensive therapies, better case findings in persons at risk, and a safer, more effective vaccine" (*39*).

Based on these observations, ACET reevaluated the feasibility of TB elimination in the United States and acknowledged that limitations in available tools for diagnosis, surveillance, and intervention are major barriers to disease elimination. In 1998, ACET called for a concerted and sustained national effort to develop an effective new TB vaccine, stating that "without a breakthrough in intervention strategy (i.e., a new TB vaccine), the global toll of TB will not be reduced substantially nor will the disease be eliminated in the United States" (*4*).

Approximately 18,000 new TB cases occur annually in the United States, and approximately 15 million persons have latent TB infection with the attendant risk for future disease. Costly TB outbreaks continue to occur, and MDR TB continues to spread. Despite recent progress, 43 states and the District of Columbia reported at least one MDR TB case during 1993–1997 (*40*). As a result, the annual cost of TB in the United States approaches $1 billion (*41*).

TB is a serious health problem that disproportionately affects disenfranchised persons. The existence of widespread racial and ethnic disparities in the incidence of TB in the United States demonstrates the need for more effective control, as well as for public policies that address the underlying causes of health disparities (*42*). An initiative to eliminate TB in the United States could help reduce the disease worldwide and serve as an example to other nations that recognize both the social and economic benefits of reducing the TB burden.

Despite obstacles, ACET reaffirms its commitment to eliminating TB in the United States. ACET encourages CDC to continue work initiated with the National Academy of Sciences' Institute of Medicine to review additional science and policy strategies that could aid this goal. Sustained commitment from the nation's scientific establishments is also required, and effective partnerships that extend beyond traditional TB-control alliances will be indispensable. ACET urges further strengthening of the TB-control infrastructure in the United States to apply the aggressive measures that proved effective in reducing TB cases in the 1990s. ACET also recommends the development of new diagnostic, therapeutic, and preventive tools, the most important of which is a new, effective vaccine.

RECOMMENDATIONS

To move from TB control to TB elimination in the United States, existing efforts must be sustained and enhanced, and new and improved diagnostic, treatment, and prevention methods, including a new vaccine, must be developed and applied. Support for these activities should be broad-based and include the establishment of new partnerships. TB elimination in the United States also will require recommitting to the global battle against the disease.

Tailor Prevention, Control, and Elimination Strategies Based on Local Epidemiology

The prevention, control, and elimination strategies of TB programs in the United States must be tailored to the local or regional epidemiology of TB. Several concurrent

epidemics are occurring across the United States and within individual states. Incidence rates vary, as does the quality of control programs. Some low- and medium-incidence states have high-incidence rates in certain local communities, and high-incidence states are likely to have some areas of low incidence. Identifying the spectrum of TB morbidity and the status of TB control within communities, as well as the changes in these over time, allows for variations in interventions (i.e., TB-control efforts in some areas and TB-elimination strategies in others), with resources reallocated as needed. ACET recommends the following steps to enhance local TB control:

- All TB programs should develop or update a strategic plan for elimination within their jurisdictions that is based on local surveillance and program evaluation data and targeted to local needs. Programs should include approaches for maintaining control efforts as prevention interventions are expanded.
- Programs should ensure the effective implementation of the highest priority activities. These are a) diagnosing all TB cases and ensuring that patients complete appropriate therapy, b) enhancing the effectiveness of contact investigation activities and ensuring the prompt identification and completion of treatment of contacts with latent TB infection, and c) expanding the testing and treatment of latent TB infection to persons in other high-risk populations (*43*).
- TB programs that successfully perform the highest-priority activities and have declining morbidity should begin developing and implementing plans for the next level of priority activities, based on local epidemiologic findings.
- TB programs in low-incidence areas that are successfully performing control and prevention activities and experiencing continued declines in morbidity should set goals for achieving TB elimination (e.g., no transmission of *M. tuberculosis* or no cases among the U.S.-born population in certain counties or regions of a state).
- State health departments should ensure timely responses to outbreaks or case clusters and make available adequate laboratory services and medical consultation for local areas with low or declining TB rates but inadequate expertise or infrastructure. Depending on local circumstances, these resources might be available only at the state, regional, or federal level.

Establish New Strategic Partnerships and Reach New Stakeholders

Enhancing prevention and control efforts and eliminating TB will require new strategic partnerships to more effectively reach persons at risk for infection and to broaden the base of support for elimination. ACET recommends the following steps to achieve this goal:

- TB programs should broaden collaborations with other public health programs, community-based organizations, and other groups that serve populations at risk for TB infection to more effectively reach these populations and expand services for targeted testing and treatment of latent TB infection.

- TB-control programs should work through state and local health departments to ensure participation in the development of contracts and agreements between managed care programs and large health-care purchasers (e.g., state health departments) to ensure provision of TB services to populations covered by these programs.
- TB education that targets private providers, managed care plans, and new partners must be intensified, as outlined in the *Strategic Plan for Tuberculosis Training and Education* (*15*).

Enhance the Use of Current Tools for TB Prevention and Control

Existing TB prevention and control tools have helped reduce morbidity in many parts of the United States. But closer examination of surveillance and program evaluation data reveals missed opportunities and areas for improvement. Although completion of therapy rates have improved, therapy is often prolonged, which is an inefficient use of staff time and resources. Substantial proportions of infected contacts do not start treatment or do not complete treatment, hindering efforts to prevent future TB cases. The large number of persons in the United States with latent TB infection and the high prevalence of TB infection among immigrants will continue to produce new cases of active TB unless effective strategies are better applied. Strategies that target groups at high risk for TB infection and treat those infected have often been poorly applied. Deficiencies in the quality and completeness of surveillance data also will hinder the ability of TB programs to develop effective elimination plans. Sharpening the effectiveness of existing tools can accelerate the recent progress in TB prevention and control. ACET recommends the following steps to achieve this goal:

- TB programs should develop plans to ensure the timely and complete reporting of TB cases and to improve the quality of surveillance data.
- TB programs should develop and implement systems to conduct active case finding among high-risk populations, when appropriate.
- DOT and other adherence-promoting measures should be expanded to improve and reduce delays in completion of therapy.
- Fixed-dose combinations of anti-TB medications should be used for all patients with active disease who are receiving self-administered, rifampin-containing therapy. Combination drugs are likely to facilitate adherence to treatment and reduce the risk for acquired drug resistance associated with erratic treatment.
- Operational research should be undertaken to develop strategies to ensure that contacts are identified for all TB patients and to increase a) the number of appropriate contacts identified for each patient, b) the proportion of infected contacts starting therapy, and c) the proportion of infected contacts completing therapy.
- TB-control staff members should be trained to use local epidemiologic data to identify high-risk groups appropriate for targeted testing and to ensure that a

greater proportion of infected persons begin and complete therapy (including short-course regimens for treatment of latent TB infection, when appropriate).

- TB programs should work closely with community organizations (e.g., managed care programs, community health clinics, immigrant groups) to expand testing and treatment of latent TB infection among targeted populations and to ensure that these activities are monitored and evaluated appropriately.
- National resources for TB education and training should be maintained as the *Strategic Plan for Tuberculosis Education and Training* is fully implemented (*15*). CDC should work with state and local programs to address training and education needs and gaps. Improved collaboration between agencies and training organizations is needed.
- TB programs should develop and implement systems for ongoing evaluation of TB prevention and control activities to maximize effectiveness.

Develop New Tools for Elimination

Although improving the application of current tools can enhance TB prevention and control efforts, new technologies must be developed, then quickly and appropriately implemented to accelerate the decline and elimination of TB. An effective vaccine would have the greatest impact on controlling and ultimately eliminating TB. Better diagnostic and treatment methods are needed to improve the accuracy, speed, and effectiveness of existing diagnostic and treatment measures. This country's research program must be expanded to capitalize on past investment and progress and to develop needed new tools. ACET recommends the following steps to achieve this goal:

- A concerted and sustained national effort to develop an effective new TB vaccine should be made. A new vaccine is an urgent public health priority, and long-term sources of private- and public-sector funds to support vaccine research should be identified (*4*). NIH, CDC, and FDA should work closely with other partners, especially those in the private sector, to implement the strategies outlined in the *Blueprint for Tuberculosis Vaccine Development* (*5*).
- Continued support should be provided for the development of specific skin-test antigens and other methods to improve the diagnosis of latent TB infection.
- Studies to determine the immunologic and genetic markers related to disease protection and progression from latent infection to active disease should be expanded.
- Molecular, biochemical, and immunologic methods for rapid, accurate, and cost-effective diagnosis of active TB and drug-resistant TB, including technologies that would be useful in low-income countries, should be further developed and refined.
- CDC should continue to support the TBTC, which, in turn, should seek expanded collaboration in clinical studies. Enhanced private-sector support and public- and private-sector collaboration are required for the development of new, effective

drugs and other therapeutic interventions to improve the treatment of both active and latent TB.

- Appropriate communication and behavior-change theories and models should be used to develop effective messages, materials, and programs for health-care providers on new developments in TB prevention and control. Successful implementation of new technologies requires education and training to effect changes in health-care practice.

Recommit to the Global Battle Against TB

The interdependence of global TB and TB in the United States necessitates that the United States make a firm commitment to the global battle against TB. The United States has an important role in fostering international collaborations to address this problem, and TB elimination efforts in this country could yield tools to improve the effort worldwide. ACET recommends the following steps to achieve this goal:

- The United States should seek and promote a sustained commitment of the nation's scientific and political establishments to the global battle against TB.
- New diagnostic, treatment, and prevention tools developed as part of TB-elimination efforts in the United States should be evaluated for potential application in global settings. The United States also must commit to a concerted and sustained national effort to develop an effective, new TB vaccine.
- CDC should expand and strengthen collaborations with international partners, including USAID, WHO, the International Union Against Tuberculosis and Lung Disease, the World Bank, and countries whose citizens contribute substantially to the global TB burden and to TB morbidity in the United States.

Support Broad-Based Efforts for TB Prevention and Control at National, State, and Local Levels

The efforts of public health providers alone were unable to prevent "dwindling resources for TB prevention and control in the early 1970s [which] promoted the decay of local TB control programs and set the stage for the disease's subsequent resurgence" (*12*). Leaders from other public health fields (e.g., HIV and sexually transmitted disease [STD] prevention, cancer control, and violence prevention) have encouraged the development of coalitions to achieve health promotion and disease prevention objectives. In this context, a coalition consists of persons who represent diverse organizations and constituencies and who agree to work together to achieve a common goal (*44*). Coalitions offer several advantages, including diversity of expertise and perspective, a capacity to mobilize public support, and a potential to improve trust among groups that might otherwise be in competition. Similar mobilization of new and nontraditional partners (e.g., managed care organizations) into TB coalitions is needed to broaden the base of support for TB elimination.

Strong advocacy for sustaining TB control and proceeding with TB elimination at the local, state, and national levels is also necessary to ensure the commitment of public support. To prevent another resurgence and to continue the present trend of

decreasing TB morbidity, the support needed to effectively apply existing tools and strategies for prevention and control must be maintained. As morbidity declines, finding and treating cases of TB disease and latent infection could become less cost-effective and will rely more on health-care providers outside TB-control programs and health departments. Additional resources are needed for full implementation of effective elimination strategies, for biomedical research to develop the tools required for TB elimination, and for efforts to control global TB. Achieving TB elimination also will require the strategic use of mass media to promote TB elimination as an important public policy issue and advance it as a public policy initiative. ACET recommends the following steps to achieve this goal:

- CDC should continue providing technical assistance to the American Thoracic Society (ATS) and the American Lung Association (ALA) in their efforts to reinvigorate the National Coalition for the Elimination of Tuberculosis (NCET). NCET can play a key role nationally in encouraging support for TB elimination and in providing leadership to state and local coalitions.
- Health departments, local ATS and ALA representatives, and other state and local political partners should work with NCET to develop and strengthen local coalitions.
- CDC should work with state and local TB programs to develop partnerships with business organizations, foundations, philanthropic groups, and with the business, civic, and religious communities to mobilize support for TB elimination.
- CDC and state and local TB programs should work with health communications experts to gain access to the media and to promote TB elimination as an important public health concern for policymakers and opinion leaders, as well as for communities and the general public.

CONCLUSION

Since ACET issued its strategic plan for TB elimination in the United States in 1989, major changes have occurred in the epidemiology of TB and in the organization and delivery of medical and public health services in the United States. A TB resurgence was successfully curtailed, which demonstrated that investing in a strong public health infrastructure at the national, state, and local levels could have an impact on TB morbidity. The extent of the global TB epidemic and its increasing impact on TB morbidity in the United States also were recognized. Although TB in the United States can be contained by appropriate application of control methods, these events demonstrate that TB elimination will require substantial technological advancements in diagnosis, treatment, and prevention, including development of an effective vaccine. The dynamic global nature of TB also demands that control efforts abroad be enhanced to aid elimination in the United States.

Thus, ACET reaffirms its commitment to TB elimination in the United States. Many of the components needed to move from control to elimination are in place — a proven public health infrastructure, effective standards of clinical and public health practice, a coherent blueprint for TB education, and a framework for TB and vaccine research. ACET calls for the establishment of new partnerships and coalitions to

develop and support the resources and national consensus necessary to achieve TB elimination. An effective and sustained TB-elimination campaign in the United States could energize burgeoning international efforts to control TB worldwide and allow the United States to assume a leadership role in this global struggle.

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