A world free of TB (Photo Credit: Sean Toney, CDC)

International Research and Programs Branch Annual Report

2010

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of Tuberculosis Elimination

At a Glance

The U.S. Centers for Disease Control and Prevention (CDC), Division of Tuberculosis Elimination (DTBE), International Research and Programs Branch (IRPB) has worked closely with Ministries of Health (MOH) for more than 30 years, strengthening capacity to prevent and control diseases and reducing health risk behaviors. IRPB's work globally focuses on infection control, multidrug-resistant (MDR) TB, general TB control program strengthening, and identifying, treating and preventing TB among people living with HIV (PLHIV). Together with partners, IRPB supports programs that develop and strengthen local skills and public health systems in areas including epidemiology, laboratory, and management science.

This report summarizes many of IRPB's accomplishments over the past year, highlighting both internal cross-program synergies and external partnerships. IRPB's Atlanta, Georgia, office has over 30 multidisciplinary staff. IRPB and locally employed staff work together in Botswana, Cambodia, China, India, Thailand, and Vietnam.

Let s eliminate TB. (Photo Credit: Brittany Moore, CDC)

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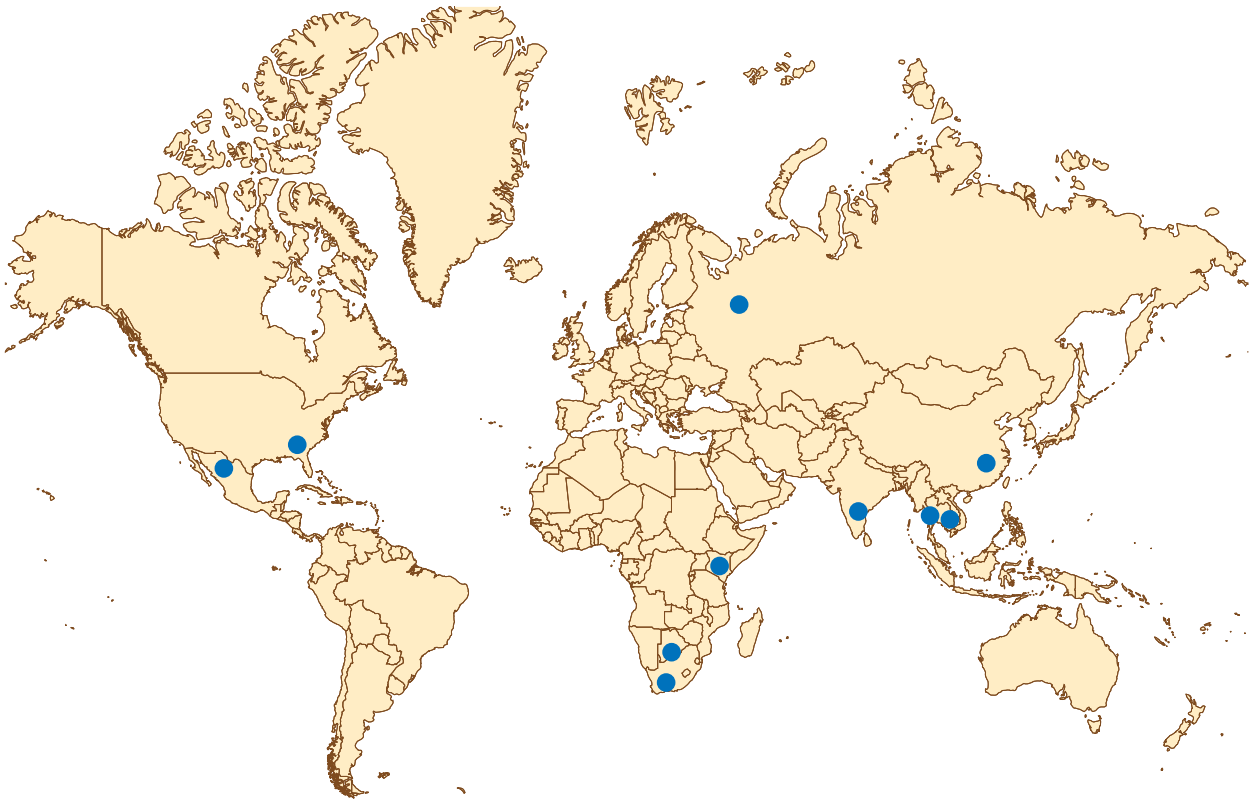
IRPB Overview

Tuberculosis (TB) is one of the world's deadliest diseases. Approximately one-third of the world's population is infected with *Mycobacterium tuberculosis*. Each year, globally, more than 9 million people become sick with TB disease and almost 2 million will die from TB. TB is also the leading cause of death among people living with HIV, undermining global progress against both diseases.

IRPB In-country Presence and Ongoing Extensive Collaborations



IRPB's mission is to reduce TB prevalence and mortality globally, as well as among foreign-born persons in the United States. Activities are carried out through collaborations within CDC, the U.S. Agency for International Development (USAID), other U.S. government (USG) agencies, the World Health Organization (WHO), Ministries of Health (MOH), and other international partners.

IRPB is comprised of more than 30 employees with diverse backgrounds in administration, architecture, behavioral science, clinical medicine, engineering, epidemiology, genetics, infection control, microbiology, pediatrics, research, and statistics. IRPB also has a significant and growing international presence, with field staff located in Botswana, China, India, and Thailand. IRPB has additional ongoing collaborations with governments and research institutions in Cambodia, Kenya, Mexico, Russia, South Africa, and Vietnam, as shown on the map.

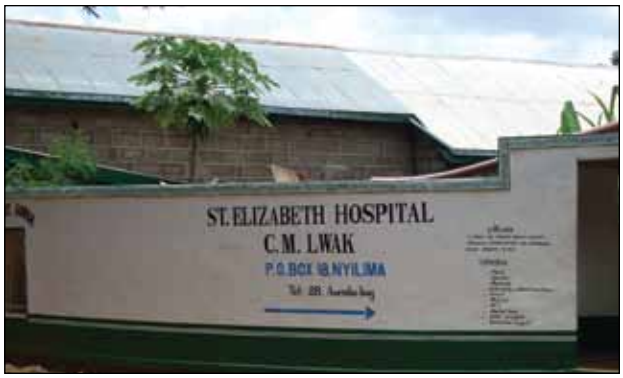
IRPB's priority areas include: supporting TB control efforts worldwide through program

strengthening and epidemiologic studies; improving infection control (IC) practices to prevent TB transmission and provide a safer environment in health facilities and other congregate settings; improving and expanding the diagnosis, treatment, and prevention of drug-resistant (DR) TB; and reducing TB/HIV prevalence and mortality through epidemiologic research and technical assistance.

Partners

IRPB collaborates with many external partners. USAID primarily funds the technical assistance IRPB provides internationally. Other partners include:

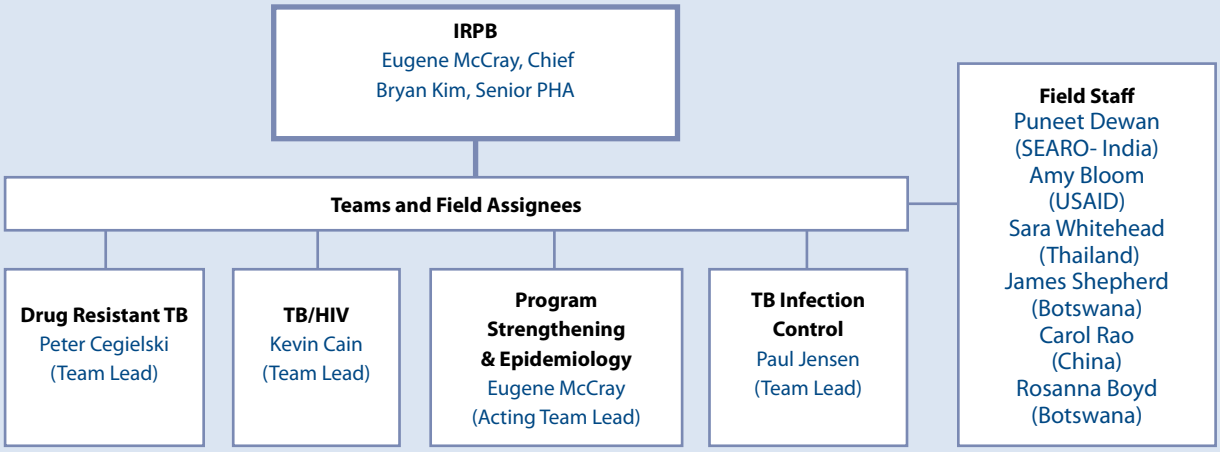
- USG agencies (e.g., Office of the U.S. Global AIDS Coordinator [OGAC], National Institute of Allergy and Infectious Diseases/ National Institutes of Health [NIAID/ NIH], Fogarty International Center/National Institutes of Health [FIC/NIH], and the Department of Defense [DoD]);
- country governments (e.g., Botswana MOH, Government of India, and the Royal Thai Government);
- multilateral organizations (e.g., WHO, Global Fund, World Bank);
- donors (e.g., KNCV Tuberculosis Foundation [KNCV], Research Institute Tuberculosis, Japan Anti-Tuberculosis Association [RIT, JATA], Bill and Melinda Gates Foundation);
- non-governmental organizations (e.g., International Union Against Tuberculosis and Lung Disease [IUATLD], Treatment Action Group, U.S. Civilian Research and Development Foundation, Project Hope);
- universities and schools of public health; and
- other key institutions.



Partner signage. (Photo credits: Gloria Oramasionwu, CDC and Alex Miranda, UNAIDS)

IRPB Organizational Structure and Highlights

DTBE- International Research and Programs Branch
Organizational Chart (2010)



IRPB is composed of four teams: TB Infection Control, Drug-Resistant (DR) TB, Program Strengthening and Epidemiology, and TB/HIV. The teams collaborate with other USG agencies and partners to address the needs of in-country USG offices and MOH. This work is accomplished by providing technical expertise, assisting in research design and oversight, developing and implementing trainings, and supporting programmatic implementation of innovative approaches to TB control. Additionally, IRPB has field staff in Botswana, China, India, Thailand, and Washington, DC.

Staff Transition

In 2010, IRPB welcomed Drs. Gloria Oramasionwu and Lindsay Kim, Epidemic Intelligence Service (EIS) Officers to support epidemiologic research and program evaluation of international TB programs. Garry Blackwelder, an architect, joined the TB Infection Control Team to lead TB IC trainings and provide technical assistance on optimal design and renovation of facilities for quality TB infection control. Rosanna Boyd joined CDC-Botswana to provide program, research, and technical assistance support to the Botswana MOH and other in-country partners.

Graduating EIS Officer Dr. Sean Cavanaugh joined the Drug-Resistant (DR) TB Team as a Medical Officer. Graduating EIS Officer Dr. Philip Ricks left IRPB to join the Surveillance Branch in the Division of Healthcare Quality Promotion (DHQP), CDC as a Senior Service Fellow. Dr. Taraz Samandari, former Associate Director of TB/HIV Research Division in Botswana is now Chief of the Epidemiology Branch in the Division of HIV/AIDS Prevention (DHAP), CDC.

TB Infection (IC) Control Team

Team Overview

In resource-limited settings, the risk of TB transmission in health care and congregate facilities can be effectively reduced with practical precautions and administrative interventions. The TB IC Team develops, informs, and improves international guidance on TB IC practices to prevent TB transmission, trains TB IC specialists to oversee implementation, designs TB IC monitoring and evaluation metrics, and conducts scientific research to evaluate innovative approaches.

Health care workers receive training in testing respirators for proper fit and use. (Photo credit: Grigory V. Volchenkov, Vladimir Oblast TB Dispensary)

Select Accomplishments

- Developed TB training modules which are posted on the Stop TB Partnership Web site at www.stoptb.org/wg/tb_hiv/icshome.asp.
- In 2002, a comprehensive TB IC program was started at the Vladimir Oblast Tuberculosis Dispensary. Formal establishment of a center occurred in October 2008 with the opening of the Vladimir Center of Excellence (CoE) for Tuberculosis Infection Control. The Center is a partnership with the Vladimir Oblast Administration, USAID, CDC/DTBE, Central Tuberculosis Research Institute (CTRI –Moscow), and WHO –Moscow. The CoE serves as an IC training hub for Russia and other Commonwealth of Independent States (CIS). The TB IC Team provides instruction, monitoring, and implementation of administrative, environmental, and personal protective TB controls. As a result, there has been a remarkable reduction in occupationally-acquired TB in the Vladmir Oblast TB Dispensary; down from 1083 to 166 new cases per 100,000, with no new TB cases reported in 2010.

Future Projects

- Collaborate with Division of Global HIV/AIDS Program to develop a Biological Safety Cabinet (BSC) certification school in Africa to address a severe lack of qualified technicians who are trained in appropriate use of safety cabinets and ventilated work stations. This lack of trained personnel has resulted in a higher risk for contracting TB for local health care workers who are required to perform lab procedures that should be performed under a BSC or ventilated workstation.
- Develop guidelines for laboratory biosafety, and assist the Vladimir CoE for TB IC in establishing a TB laboratory biosafety training course in Russia.

Drug-Resistant (DR) TB Team

Team Overview

The pandemic of MDR TB has underscored the need for higher quality services in traditional TB control, as well as greater investments in rapid diagnosis and treatment of TB that does not respond to first-line TB drugs. The DR TB Team works with Ministries of Health (MOH), WHO, local and international NGOs, USG agencies, U.S. state health departments, and others to improve and expand diagnosis, proper treatment, and prevention of drug-resistant TB. These efforts are focused internationally, as well as domestically among foreign-born persons in the United States, through provision of technical assistance, trainings, and conducting research and demonstration projects of innovative approaches.

PETTS site: a laboratory in the Vladimir Oblast TB Dispensary in Russia. (Photo credit: Ekaterina Kurbatova, CDC)

Select Accomplishments

- In collaboration with the MOH and local partners in nine countries, the DR TB Team spearheaded the Preserving Effective TB Treatment Study (PETTS). PETTS has informed the new framework for WHO and international partners in providing universal access to diagnosis, treatment, and care of MDR TB. PETTS, a large multi-year, multi-country study compared programs approved by the Green Light Committee (GLC) to programs that were not GLC approved to determine the incidence and consequences of acquired resistance to second-line drugs (SLD) among MDR TB patients. GLC is a mechanism that enables access to affordable, high-quality, second-line anti-TB drugs for the treatment of MDR TB. Preliminary results suggest that acquired resistance to these drugs was lower in GLC approved programs. GLC approved programs also demonstrated higher cure rates, lower mortality, and lower treatment failure rates when compared with non-GLC approved programs.
- Evaluated optimal strategies for the microbiological monitoring of the effectiveness of MDR TB treatment. This was done using retrospective case-based data on cohorts of MDR TB patients treated with SLD at the first five Directly Observed Treatment/Therapy Short Course (DOTS)-Plus pilot projects approved by the GLC (Estonia, Latvia, Philippines, Russia, and Peru).

Future Projects

- Implement and evaluate novel technologies for rapid diagnosis of anti-TB drug resistance. Collect credible evidence to guide scale-up of strategies to optimize case detection and the diagnosis of drug resistance based on rapid molecular diagnostic technologies.
- Develop and test strategies to improve treatment of DR TB, and develop analytic methods to model the effectiveness of various therapeutic approaches to DR TB.

Program Strengthening and Epidemiology (PSE) Team

Team Overview

The Program Strengthening and Epidemiology (PSE) Team has a broad portfolio of projects aimed at supporting TB control efforts worldwide, as well as among foreign-born populations in the United States. The PSE team supports programs in resource-limited international settings by conducting research on the epidemiology of TB and by providing technical assistance in development, implementation, and assessment of surveillance and program evaluation policies. The team also designs and conducts demonstration projects of established TB control measures and rapid diagnostics in resource-limited settings to assess their impact and determine optimal approaches for implementation. In the United States, the team supports and provides assistance to programs aimed at reducing the incidence of TB among foreign-born persons prior to their arrival in the country.

Research nurse educating clients on TB in Botswana. (Photo credit: Joe Lockridge, Peace Corps)

Select Accomplishments

- Conducted operational research trainings in the Philippines and India, resulting in the design of 26 studies by training graduates.
- Collaborated with the Research Institute Tuberculosis, Japan Anti-Tuberculosis Association (RIT, JATA) to teach "Fundamentals of Epidemiology and TB Operations Research," as part of the 3-month International Stop TB Action Training. At the end of the project, each participant developed a protocol for an operational research project in his respective country.
- Collaborated with the WHO Global Task Force on TB Impact Measurement to publish the second edition of "Tuberculosis Prevalence Surveys: A Handbook."

Future Projects

- Implement and evaluate the integration of rapid diagnostics for TB and MDR TB into routine TB programs in resource-limited countries.
- Support the development of standards and benchmarks for TB surveillance in low and middle income countries in collaboration with the WHO Global Task Force on TB Impact Measurement.

TB/HIV Team

Team Overview

HIV/AIDS has led to increasing TB incidence and mortality, particularly in high HIV-burden countries. Globally, TB is the leading cause of death for people living with HIV (PLHIV). HIV-associated TB (TB/HIV) threatens to undermine progress made in TB and HIV control around the world. The TB/HIV Team aims to reduce TB/HIV prevalence and mortality in resource-limited settings by conducting high-impact research and demonstration projects to implement, evaluate, and validate innovative TB/HIV control approaches; providing technical assistance to resource-limited countries to guide design and implementation of TB/HIV programs; and by informing international policy. Research activities primarily focus on intensified TB case finding among PLHIV, isoniazid preventive therapy (IPT) among PLHIV, and pediatric TB/HIV.

Worldwide, TB is one of the leading causes of death among people living with HIV. (Photo credit: Alex Miranda, UNAIDS)

Select Accomplishments

- Led a cross-sectional study "Improving Diagnosis of TB in HIV-infected Persons: The ID-TB/HIV Study" enrolling more than 2,000 PLHIV from eight antiretroviral (ARV) clinics in Cambodia, Thailand, and Vietnam to determine the best method for screening and diagnosing TB in PLHIV. The study found that using previously recommended screening approaches failed to detect more than two-thirds of patients with TB disease. However, screening PLHIV for TB using a combination of three symptoms detected almost all cases among this population. (Of note, patients with a positive symptom screen need liquid culture to most accurately diagnose TB disease.) Further, this combination symptom screening method reliably ruled-out TB in those patients without TB disease, (97% without TB had no symptoms), allowing isoniazid preventive therapy (IPT) to be started more quickly. In follow up to this study, CDC and WHO collaborated on a meta-analysis which led to a change in WHO's international guidelines for screening for TB among PLHIV.

- Contributed to the development of the "U.S. Public Health Guidelines for the Prevention and Control of HIV/AIDS, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis among Persons who Use Illicit Drugs in the United States."

Future Projects

- Validate new intensified TB case finding approaches and evaluate the implementation of GeneXpert in HIV care settings.

- Develop evidence based approaches to pediatric TB screening; and improve diagnosis and management of TB in children, including evaluation of promising new diagnostics (e.g., GeneXpert MTB/RIF).

IRPB In-Country Presence

IRPB has in-country presence in Botswana, China, India, and Southeast Asia. IRPB provides technical assistance and resources for the prevention and treatment of TB. Five DTBE/IRPB direct hire employees and more than 40 locally employed staff and contractors are working in National TB Programs, carrying out programmatic TB activities, operational research, and capacity building. The information in this section highlights the contributions and planned projects in these select countries.

IRPB Presence in Botswana

Republic of Botswana

Capital City: Gaborone

Area: 582,000 sq. km. (224,710 sq. mi.)

Population (est.): 1.86 million (Source: www.state.gov)

Estimated TB Incidence/Prevalence, 2009: 694/100,000; 531/100,000
(Source: WHO Global TB Control Report 2010)

Number of people living with HIV at the end of 2009: 320,000
(Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

Estimated HIV Prevalence, (Age 15-49) 2009: 24.8%
(Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

HIV+ incident TB cases: (% of all TB cases): 66%
(Source: WHO Global TB Control Report 2010)

Estimated TB deaths in 2007: 194/100,000
(Source: WHO Global TB Control Report 2009)
PEPFAR/GAP Office

Overview

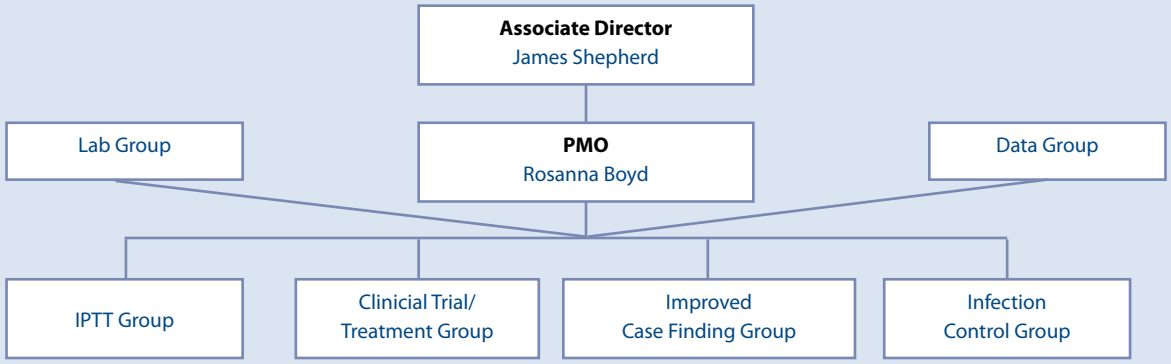
Since 1995, CDC Botswana has played an important role in extending the reach of Botswana's national TB response, with HIV/AIDS becoming a strong focus in 2000. CDC Botswana was initially established as a partnership with the Botswana MOH to strengthen TB control through public health research; it has evolved over the years to focus primarily on stopping the spread of TB and HIV/AIDS in southern Africa. CDC Botswana conducts training, technical assistance, and research; promotes innovation and evidence-based best practices; and supports the monitoring and evaluation of prevention, care, and treatment programs for HIV/AIDS and TB.

Select Accomplishments

- *Isoniazid Prevention Therapy Trial (IPTT):* The IPTT, conducted from 2004 to 2011, was designed to determine whether 36 months of isoniazid treatment was more effective in preventing TB disease among PLHIV than the routinely prescribed six month treatment. The main finding was that while IPT was highly effective (>90% reduction) in reducing TB in people with a positive tuberculin skin test, 36 months of IPT was much more effective than the current standard of providing six months of IPT for these persons. CDC Botswana has worked closely with the Botswana National TB and HIV Programs, including providing cost effectiveness analysis to modify the

Structure of TB/HIV Research Division in Botswana

[2 DTBE/IRPB CDC Direct Hire employees (named below), 28 Locally Employed Staff]



National IPT Program based on the IPTT findings. The trial continues to monitor incident TB in those who received IPT. WHO used these study findings to update its policy. This study informed a change in WHO recommendations, now suggesting that PLHIV with a positive TB skin test should receive 36 months of IPT.

- *Clinical trial/treatment:* CDC Botswana is conducting the first clinical trial of TB treatment in Botswana. The RIFAQUIN Trial is a multi-country clinical trial, coordinated by St. George's Hospital and the Medical Research Council of the United Kingdom, examining the efficacy of high-dose short-course rifapentine coupled with moxifloxacin for the treatment of drug-sensitive TB. A study team in Francistown, Botswana began enrolling patients in October 2010. As a part of this study, CDC Botswana will increase the capacity of the National Tuberculosis Reference Laboratory by enhancing their capabilities to support second-line drug susceptibility testing. As a result of preparation for this trial, a new facility in Francistown is now fully equipped for future clinical trials.

Future Plans

- Enhance clinical trial capability for Botswana by strengthening the National TB Reference Laboratory's capacity to perform culture, line-probe assays, and second-line drug sensitivity testing.
- Strengthen country capacity to detect new TB cases in PLHIV through infrastructure developed for implementation of the Early Mortality Reduction Group (EMRG) Study. EMERG evaluates the extent of lives saved due to enhanced TB case finding at ART clinics.

Lab technician at CDC Botswana performing IGRA assay. (Photo credit: Sean Toney, CDC)

IRPB Presence in China

The People's Republic of China

Capital City: Beijing

Area: 9,600,000 sq. km. (3,706,580 sq. mi.)

Population (est.): 1,353,311,000
(Source: www.state.gov)

Estimated TB Incidence/Prevalence, 2009: 96/100,000; 138/100,000
(Source: WHO Global TB Control Report 2010)

Number of people living with HIV at the end of 2009: 740,000
(Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

Estimated HIV Prevalence (Age 15-49), 2009: 0.1% (Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

HIV+ incident TB cases (% of all TB cases): 4%
(Source: WHO Global TB Control Report 2010

Estimated TB deaths in 2009: 15/100,000
(Source: WHO Global TB Control Report 2010)

Overview

U.S. CDC has provided technical assistance to China's TB control efforts through the Division of Global HIV/AIDS Program and DTBE for the past 10 years. In 2008, U.S. CDC's newly created Global Disease Detection (GDD) Program in China began focusing on TB. In 2009, DTBE/IRPB began providing 50% support for an epidemiologist within GDD. DTBE/IRPB's activities, conducted through GDD, are centered on technical support and training to advance control of drug-resistant tuberculosis.

Select Accomplishments

- *IC Policy and training to reduce transmission of TB and MDR TB:* During large, acute outbreaks of respiratory infections such as SARS and pandemic H1N1 influenza, China demonstrated a tremendous ability to strengthen IC in health care facilities. In routine practice, however, China has no national policy for how to reduce transmission of TB in health care facilities. Generally, practices do not adhere to international recommendations for TB IC. In 2010, CDC assisted the National TB Program in developing the first national government publication about TB IC in health care facilities. The "China TB Infection Control Handbook" was written by Chinese experts in consultation with CDC and WHO. The handbook is now being distributed throughout the country. With sponsorship by WHO, China's National TB program also held a large training course on TB IC in August 2010. DTBE/IRPB staff served as trainers for respiratory infection control and assessments of health care facility ventilation.

- *Assessments of TB transmission in health care facilities:* Although transmission of TB and MDR TB in health care facilities is an important global public health problem, few studies in China have systematically evaluated the prevalence of TB infection and disease in health care workers, identified risk factors for infection, or studied health care worker knowledge, attitudes, and practices. In 2010, DTBE/IRPB collaborated with the National TB Program to complete a survey of

4,200 healthcare workers in Inner Mongolia province. To reliably measure TB infection rates, CDC microbiologists installed equipment, provided supplies, and conducted training for performing the QuantiFERON-TB Gold In-Tube test (QFT) at two hospitals in Inner Mongolia. Preliminary findings from this survey include: (a) the prevalence of TB infection in health care workers, as assessed by QFT, was over 60%; (b) increased risk of TB infection was associated with hospital exposures, not community exposures; and (c) baseline TB infection control knowledge levels were generally high, but some false beliefs existed about ways to reduce transmission.

Future Plans

- Continue to work with CDC China and the MOH to advance TB IC in health care facilities. Activities will include assistance with development, implementation, and monitoring of standard operating procedures for health care facilities; epidemiologic studies to evaluate the risk of health care worker TB infection and strategies to reduce risk; and technical support to partners (e.g., WHO, Gates Foundation, Global Fund) to support training of health care workers and assessment of health care facility practices.
- Work with China CDC to implement a multi-country study evaluating the rate of TB infection in households with MDR TB patients.

Nurses in Hohhot, China, evaluating blood volume in tubes. The blood will be analyzed using QuantiFERON-TB Gold In-Tube for a study of TB Infection among Chinese healthcare workers (Photo credit: Carol Rao, CDC)

IRPB Presence in India

Republic of India

Capital City: New Delhi

Area: 3.29 million sq. km. (1.27 million sq. mi.)

Population (est.): 1.17 billion; urban 29%
(Source: www.state.gov)

Estimated TB Incidence/Prevalence, 2009: 168/100,000; 249/100,000
(Source: WHO Global TB Control Report 2010; incidence and prevalence provisional WHO estimates and not agreed to by GoI, and expected to be revised in 2011 following WHO-GoI consultation)

Number of people living with HIV at the end of 2009: 2,400,000
(Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

Estimated HIV Prevalence (Age 15-49), 2009: 0.3%
(Source: UNAIDS, Report on the Global AIDS Epidemic, 2010)

HIV+ Incident TB cases, 2009: 12%

Estimated TB deaths in 2009: 28/100,000
(Source: WHO Global Report, 2010)

Overview

DTBE/IRPB has provided technical assistance for TB control efforts in India in collaboration with USAID, the Southeast Asia Regional Office (SEARO) of the World Health Organization (WHO), and the Government of India, Revised National Tuberculosis Control Program (RNTCP). Since 1997, DTBE/IRPB has maintained an assigned medical officer position in India. The DTBE/IRPB assignee is detailed to WHO/SEARO and provides technical support to the RNTCP. DTBE/IRPB is focused on providing comprehensive technical support for strengthening TB control, with emphasis on:

1. development and expansion of TB/HIV services and TB infection control activities in India;
2. expansion of the programmatic management of MDR TB activities within RNTCP; and
3. support for operational research and surveillance.

Full DOTS expansion efforts began in 1998, with full nationwide coverage achieved in 2006. Since 2006, national efforts have been directed to strengthen implementation of DOTS, along with all aspects of the Stop TB Partnership's comprehensive Global Strategy.

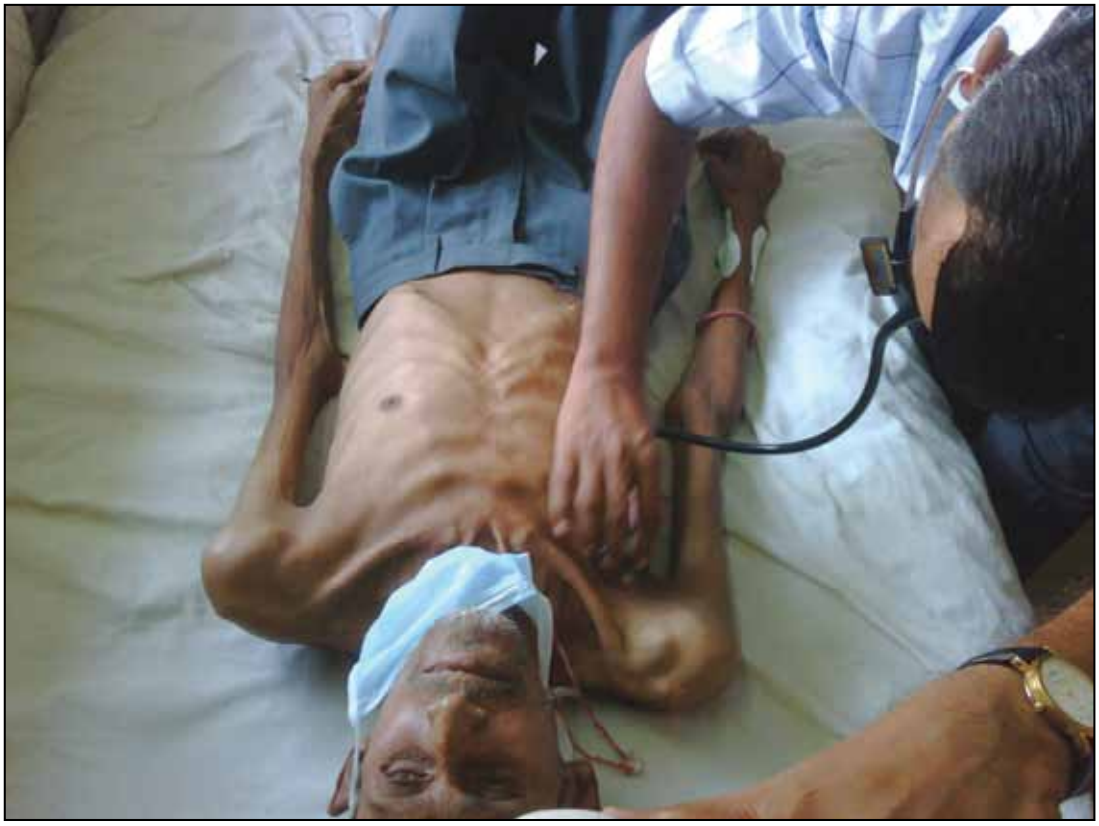
Select Accomplishments:

- *MDR TB and TB laboratory scale-up:* DTBE/IRPB and partners developed national scale up plans, and facilitated the adoption by RNTCP of a new diagnostic algorithm for MDR TB. The new algorithm is based on rapid diagnosis using molecular rapid diagnostics. DTBE/IRPB and partners secured, committed third party financing for accelerated laboratory and treatment service expansion.

- *TB IC:* DTBE/IRPB and partners organized a national steering body for IC, developed the first national guidelines on airborne infection control, created a standard training and education curriculum, and developed capacity at national and state levels for pilot testing the national guidelines. Data from the pilot test will be used for policy revision.

Future Plans

- Contribute to the process of developing the next National Strategic Plan to Control TB 2012 – 2017. Upon implementation, this plan is expected to dramatically expand government expenditure on TB control and support with implementation.
- Support large scale pilot testing of new diagnostics, including GeneXpert MTB/RIF, in public and private settings.



MDR TB patient in Ahmedabad, shortly after hospitalization and shortly before death. In Gujarat, 40% of MDR TB patients have fluoroquinolone resistance (also known as pre-XDR TB). (Photo credit: Puneet Dewan, CDC, detailed to WHO/SEARO)

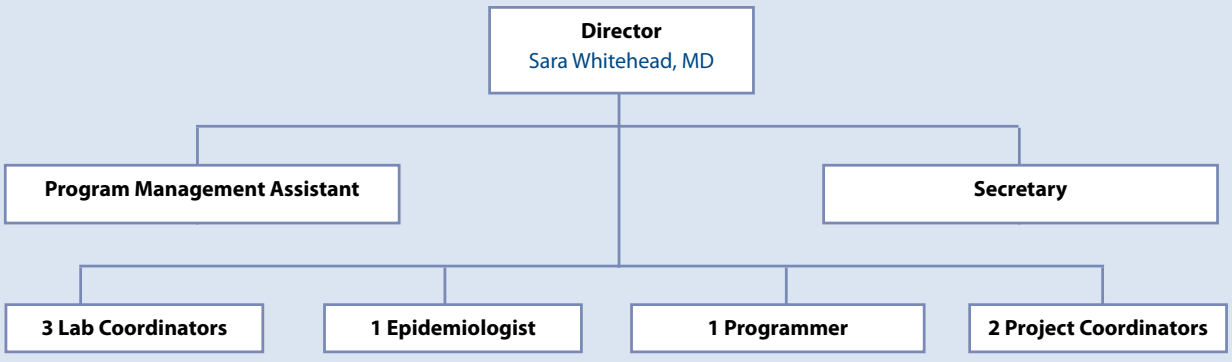
IRPB Presence in Southeast Asia

Background

DTBE/IRPB has worked with the Thai Ministry of Public Health (MOPH) and the CDC Southeast Asia Regional Office since 2003 to develop initiatives and research that lead to effective TB control policies. DTBE/IRPB has a Regional TB Technical Advisor (Medical Officer) stationed in Bangkok. Program staff also provides technical assistance to other countries in the region, including Cambodia, Laos, and Vietnam, and to the WHO regional offices in New Delhi and Manila. Strategies used to reduce the burden of TB in Thailand and Southeast Asia include developing epidemiologic models, measuring incidence and mortality, and promoting best practices. The program collaborates closely with the Royal Thai Government, other USG partners, and multilateral, national, and NGO partners to conduct research, inform policy, support program implementation, and build program capacity.

Structure of TB Program in Thailand

[1 CDC Direct Hire employee (named below), 9 Locally Employed Staff]



Selected Accomplishments:

- *Intensified TB case finding for people with HIV:* DTBE, with USAID support, completed a large multi-country study in Thailand, Cambodia, and Vietnam called "Improving Diagnosis of TB in HIV-Infected Persons: The ID-TB/HIV Study." This multi-center, cross-sectional study enrolled over 2,000 HIV-infected patients to determine the optimal algorithm to screen and diagnose TB in PLHIV. The study found that a combination of three symptoms is an effective tool for screening PLHIV for TB, sufficient to reliably rule out TB in most patients who have none of these symptoms (screen negative). Most of the remaining patients who have any of these symptoms need liquid culture to reliably diagnose TB. In follow up to this study, DTBE and WHO collaborated on a meta-analysis which led to a change in WHO's international guidelines for screening for TB among persons with HIV. CDC also worked with partners at the Thai Healthcare Intervention and Technology Assessment Program (HITAP) to determine the cost-effectiveness of the newly defined TB screening algorithm for people with HIV.

- *TB screening in people with acute pneumonia:* The regional TB program collaborated with DTBE and IEIP/GDD colleagues to conduct enhanced surveillance for TB among people with acute pneumonia in two sites for population-based surveillance of respiratory disease. DTBE initiated the project, developed lab procedures, and analyzed and interpreted the data. This work helps identify people with TB who would otherwise be missed, thus preventing treatment delays and further transmission of TB within health care facilities. Further investigation is underway to determine which patients with TB are being missed, with an aim to develop guidance on how to improve TB case finding in this population.

Future Plans

- Pilot and evaluate programmatic implementation of new evidence-based approaches to TB screening and isoniazid preventive therapy in Cambodia, Thailand, and Vietnam. The findings on barriers and feasibility will be used to assist countries with scale up planning.

- TB IC is a new area of focus in Southeast Asia. Although the need to prevent TB transmission in health care facilities is widely recognized, the efficacy of IC interventions is not well documented; policy makers have little information available to make decisions about where to target resources. Projects in Thailand and Vietnam have assessed the current status of infection control practices in health care facilities and LTBI rates among health care staff. Planning is underway for a large trial, including 16 hospitals in Thailand and Vietnam, to evaluate the impact of a package of IC support measures on both LTBI in health care staff, and on staff carrying out recommended infection control procedures.

- Support and evaluate the implementation of new rapid diagnostic tests such as the GeneXpert MTB/RIF test in a variety of settings.

Hmong Refugees providing sputum samples in Thailand (Photo credit: Sean Toney, CDC)

2010 Articles Published in Peer-Reviewed Journals

In addition to conducting epidemiologic research, providing technical assistance, and supporting program implementation, translating research into practice is a major priority for IRPB. Disseminating findings to local and international partners, as well as the broader TB and TB/HIV communities, is a critical component of the majority of IRPB projects. In collaboration with USG and CDC partners, MOH, and partner NGOs, IRPB staff has made significant contributions to the literature. Below is a list of IRPB publications for 2010, listed alphabetically by first author.

Agizew TB, Arwady MA, Yoon JC, Nyirenda S, Mosimaneotsile B, Tedla Z, Motsamai O, Kilmarx PH, Wells CD, Samandari T. Tuberculosis in asymptomatic HIV-infected adults with abnormal chest radiographs screened for tuberculosis prevention. *Int J Tuberc Lung Dis* 2010 Jan; 14 (1): 45-51.

Agizew T, Bachhuber MA, Nyirenda S, Makwaruzi VZ, Tedla Z, Tallaksen RJ, Parker JE, Mboya JJ, Samandari T. Association of chest radiographic abnormalities with tuberculosis disease in asymptomatic HIV-infected adults. Int *J Tuberc Lung Dis* 2010 March; 14(3): 324-331.

Anek-vorapong R, Sinthuwattanawibool C, Podewils L, McCarthy K, Ngamlert K, Promsarin B, Varma JK. Validation of the GenoType MTBDRplus assay for detection of MDR TB in a public health laboratory in Thailand. *BMC Infectious Diseases* 2010:123.

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Acronyms and Abbreviations

ART	Antiretroviral Therapy/Treatment
ARV	Antiretroviral
BSC	Biological Safety Cabinet
CoE	Center of Excellence
CIS	Commonwealth of Independent States
DOTS	Directly Observed Treatment/ Therapy Short Course
DGHA	Division of Global HIV/AIDS Program, CDC
DGMQ	Division of Global Migration and Quarantine, CDC
DHQP	Division of Healthcare Quality Promotion, CDC
DHAP	Division of HIV/AIDS Prevention, CDC
DTBE	Division of Tuberculosis Elimination, CDC
DRS	Drug Resistance Survey
DR TB	Drug Resistant TB
DST	Drug Sensitivity Testing
EMERG	Early Mortality Reduction Group
EIS	Epidemic Intelligence Service
EMB, E	Ethambutol
GDD	Global Disease Detection
GLC	Green Light Committee
HITAP	Healthcare Intervention and Technology Assessment Program
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
IC	Infection Control
ICF	Intensified Case Finding
IEIP	International Emerging Infections Program
IRPB	International Research and Programs Branch, DTBE, CDC
IUATLD	International Union Against TB and Lung Disease (The "Union")
H	Isoniazid
IPT	Isoniazid Preventive Therapy
IPTT	Isoniazid Preventive Therapy Trial
KNCV	KNCV Tuberculosis Foundation
M & E	Monitoring and Evaluation
MDR TB	Multidrug-Resistant TB
MOH	Ministry of Health
MSF	Medicines Sans Frontiers (Doctors without Borders)
MSH	Management Sciences for Health
NRL	National Reference Laboratory
NGO	Non-governmental organization
OD	Office of the Director
OGAC	Office of Global AIDS Coordination
OI	Opportunistic Infection
OR	Operations Research
PHA	Public Health Advisor
PLHIV	People Living with HIV
PEPFAR	President's Emergency Plan for AIDS Relief
PETTS	Preserving Effective TB Treatment Study (multinational)
PMTCT	Preventive Maternal to Child Transmission (HIV)
PSE	Program Strengthening and Epidemiology
PZA	Pyrazinamide
QFT GIT	QuantiFERON-TB Gold In-Tube
RIF, R	Rifampin
RIT, JATA	The Research Institute Tuberculosis, Japan Anti-Tuberculosis Association
SEARO	South East Asia Regional Office
SLD	Second-Line Drugs
S, SM, STM	Streptomycin
TA	Technical Assistance
TB	Tuberculosis
TB/HIV	Tuberculosis/ Human Immunodeficiency Virus
TST	Tuberculin Skin Test
USAID	U.S. Agency for International Development
USG	United States Government
WHO	World Health Organization
XDR TB	Extensively Drug Resistant TB

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