

Introduction

CONTENTS

About the Ohio Tuberculosis Program Manual	1.2
Purpose.....	1.2
Audience	1.2
How to Use This Manual	1.3
Portable document format.....	1.3
Cross-references	1.3
Forms.....	1.3
Bookmarks	1.4
Printing.....	1.5
Icons	1.6
Abbreviations	1.7
Purpose of Tuberculosis Control.....	1.10
Ohio Laws and Rules on Tuberculosis Control	1.11
Objectives and Standards	1.12
Quality of care.....	1.12
National and state program objectives.....	1.13
Standards.....	1.17
Roles, Responsibilities, and Contact Information	1.18
State tuberculosis program staff	1.18
Tuberculosis consultants	1.18
Laboratories	1.19
Resources and References	1.20

About the Ohio Tuberculosis Program Manual

Purpose

This manual is designed to present the key steps and crucial information needed to perform tuberculosis (TB) control tasks in Ohio, which has a low incidence of TB—defined by the Centers for Disease Control and Prevention (CDC) as less than 3.5 cases/100,000 population/year.¹ Where additional or more detailed information is available, hyperlinks to CDC guidelines and other resources are provided.

The Ohio Tuberculosis Program Manual is based on a template created by an advisory group convened during CDC Task Order #6. The advisory group developed the template's format and created its content by reviewing other TB control manuals, current CDC guidelines, and needs in the four low-incidence states of Idaho, Montana, Utah, and Wyoming.

Audience

The audience for this manual includes city/county/regional public health nurses, outreach workers, physicians, and public health officers; Indian Health Services (IHS) staff; physician consultants; private sector physicians; infection control nurses in hospitals and other facilities; disease intervention specialists; state epidemiologists; and state TB program staff.

How to Use This Manual

Portable Document Format

This manual is available electronically as a portable document format (PDF) file. To view the PDF file, you will need the free Adobe Reader, available at: <http://www.adobe>

Cross-References

Throughout this document you will see this icon when other sections or topics in the manual are referenced.



Forms

Required and recommended forms are available on the Ohio Department of Health website at <http://www.odh.ohio.gov/pdf/IDCM/sect3forms.pdf>

This icon alerts you that forms are available:



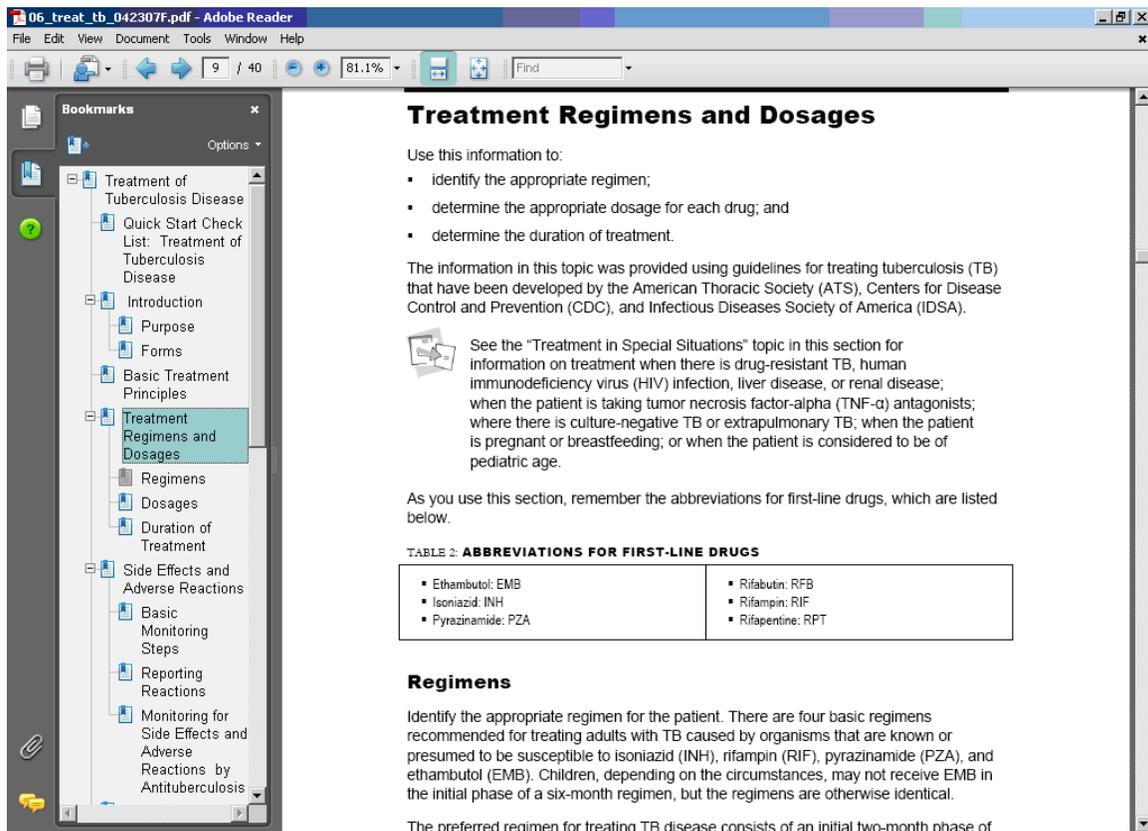
Bookmarks

In PDF files, you can use bookmarks to go quickly to a section or topic. If the bookmarks are not visible on the left, click the Bookmarks icon or tab on the left of the window.

To view sections and topics in the bookmarks list:

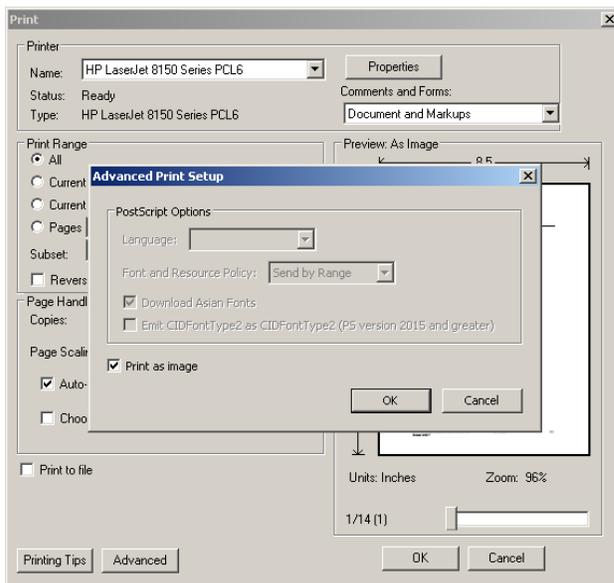
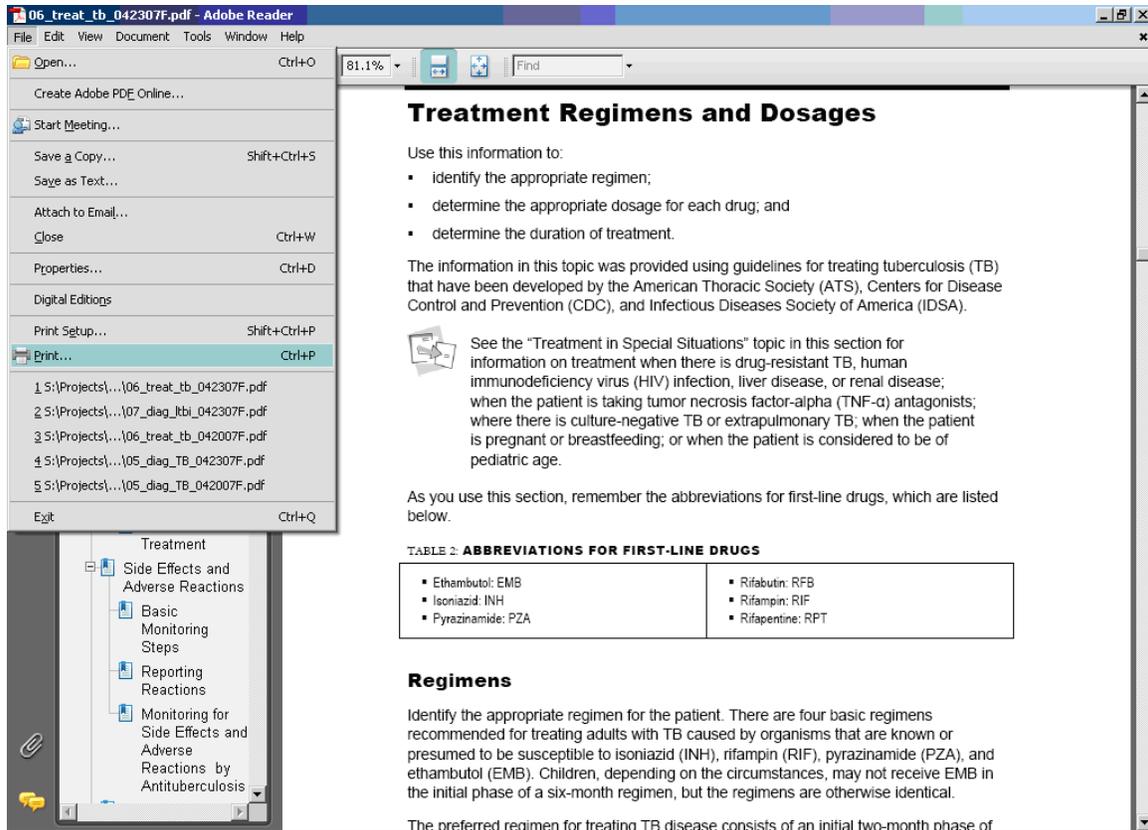
- Click + to see a more detailed list.
- Click – to hide the more detailed list.

To go to a section or topic in the bookmarks list, point to its name and left-click.



Printing

To access the print dialog box, click the File drop-down menu, click Print, and then make your selections in the Print dialog box.



Some printers have older printer drivers that cause spaces to appear in the middle of words. To avoid this problem, select File/Print, click the Advanced button, check Print as Image, and then click OK. If you need further assistance with printing, call the Francis J. Curry National Tuberculosis Center's IT staff at 415-502-5810.

Icons

Throughout the manual, these icons quickly cue you into important information and other resources:



This warns about high-consequence information you must understand when performing the task.



This signals when you should call to report or to consult on the task.



This highlights special considerations for pediatric patients.



This suggests another relevant area in the manual or another resource that you may want to review.



This alerts you that a form is available for the task.

Abbreviations

Refer to the list below for abbreviations used in the manual.

ACET	Advisory Council for the Elimination of Tuberculosis
ACH	air changes per hour
AFB	acid-fast bacilli
AIDS	acquired immunodeficiency syndrome
All	airborne infection isolation
ALT	alanine aminotransferase
<i>ARPE</i>	<i>Aggregate Report for Program Evaluation</i>
ART	antiretroviral therapy
AST	aspartate aminotransferase
ATS	American Thoracic Society
BAMT	blood assay for <i>Mycobacterium tuberculosis</i>
BCG	bacille Calmette-Guérin
CDC	Centers for Disease Control and Prevention
CT	computed tomography
CXR	chest radiograph
DNA	deoxyribonucleic acid
DOT	directly observed therapy
DTBE	Division of Tuberculosis Elimination
DTH	delayed-type hypersensitivity
ED	emergency department
EMB	ethambutol
EMS	emergency medical service
ESRD	end-stage renal disease

FDA	U.S. Food and Drug Administration
HAART	highly active antiretroviral therapy
HCW	healthcare worker
HEPA	high-efficiency particulate air
HIPAA	Health Insurance Portability and Accountability Act
HIV	human immunodeficiency virus
IDSA	Infectious Diseases Society of America
IGRA	interferon gamma release assay
INH	isoniazid
<i>M. tuberculosis</i>	<i>Mycobacterium tuberculosis</i>
MDR-TB	multidrug-resistant tuberculosis
MIRU	mycobacterial interspersed repetitive units
MOTT	mycobacterium other than tuberculosis
NAA	nucleic acid amplification
NIOSH	National Institute for Occupational Safety and Health
NNRTI	nonnucleoside reverse transcriptase inhibitors
NTCA	National Tuberculosis Controllers Association
NTM	nontuberculous mycobacteria
NTNC	National Tuberculosis Nurse Coalition
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PCR	polymerase chain reaction
PI	protease inhibitor
PPD	purified protein derivative
PZA	pyrazinamide
QA	quality assurance
QFT	QuantiFERON [®] -TB test

QFT-G	QuantiFERON®-TB Gold test
RFB	rifabutin
RFLP	restriction fragment length polymorphism
RIF	rifampin
RNA	ribonucleic acid
RPT	rifapentine
<i>RVCT</i>	<i>Report of Verified Case of Tuberculosis</i>
RZ	rifampin and pyrazinamide
TB	tuberculosis
TBI	tuberculosis infection
TIMS	Tuberculosis Information Management System
TNF- α	tumor necrosis factor-alpha
TST	tuberculin skin test
TU	tuberculin units
USCIS	U.S. Citizenship and Immigration Services
UVGI	ultraviolet germicidal irradiation
XDR-TB	extremely drug-resistant tuberculosis

Purpose of Tuberculosis Control

Tuberculosis (TB) is caused by a bacterial organism named *Mycobacterium tuberculosis*. (These organisms are sometimes called tubercle bacilli.) Mycobacteria can cause a variety of diseases. Some mycobacteria are called tuberculous mycobacteria because they cause TB or diseases similar to TB. These mycobacteria are *M. tuberculosis*, *M. bovis*, and *M. africanum*. Other mycobacteria are called nontuberculous mycobacteria (NTM) because they do not cause TB. One common type of nontuberculous mycobacteria is *M. avium* complex. Tuberculous mycobacteria readily spread from person to person; nontuberculous mycobacteria do not usually spread from person to person.

The goal of TB control in the United States is to reduce TB morbidity and mortality by doing the following:

- Preventing transmission of *M. tuberculosis* from persons with contagious forms of the disease to uninfected persons
- Preventing progression from TB infection (TBI) to active TB disease among persons who have contracted *M. tuberculosis* infection²



For information on the transmission of *M. tuberculosis* and on how LTBI progresses to TB disease, see the Centers for Disease Control and Prevention's (CDC's) online course, *Interactive Core Curriculum on Tuberculosis* (2011), at this link: .

<http://www.cdc.gov/tb/education/CE/corecurr.htm>

The four fundamental strategies to reduce TB morbidity and mortality include the following:

1. Early and accurate detection, diagnosis, and reporting of TB cases, leading to initiation and completion of treatment
2. Identification of contacts of patients with infectious TB and treatment of those at risk with an effective drug regimen
3. Identification of other persons with TB infection at risk for progression to TB disease and treatment of those persons with an effective drug regimen
4. Identification of settings in which a high risk exists for transmission of *M. tuberculosis* and application of effective infection control measures³



For more information on these strategies and the thinking behind them, see "Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America" (*MMWR* 2005;54[No. RR-12]) at this link:

<http://www.cdc.gov/MMWR/PDF/rr/rr5412.pdf> .

Ohio Laws and Rules on Tuberculosis Control

Ohio laws and rules on tuberculosis (TB) are located in the Ohio Revised Code 339.71 thru 339.89; 3707.04; 3701-13; 3701-34; 3701-56 and the Ohio Administrative Code, 3701-15-01 thru 03; 3701-13 thru 16 & 17; 3701-3-01 thru 13; 5122-33-14 & 18.

Section 2.5 of this manual will address specific areas in more detail.



Ohio Revised Code and Ohio Administrative Code can be accessed at the following web address: <http://codes.ohio.gov/>



Contact the Ohio Department of Health TB Program at (614) 466-2381 for assistance with interpreting laws and rules regarding TB control.

Objectives and Standards

Quality of Care

For tuberculosis (TB) programs, quality of care is measured by objectives and standards. Such objectives and standards are used as yardsticks to direct the program and measure its success.

Objectives reflect outcomes or results and program desires. Programs require objectives to define expected outcomes and results for case management activities.

Standards are an accepted set of conditions or behaviors that define what is expected and acceptable regarding job duties, performance, and provision of services. The TB control program works to achieve objectives through a series of standards.

In Ohio, the TB program objectives and standards are established from the following:

TB Program Agreements, Plans, and Protocols

- Centers for Disease Control and Prevention (CDC) Cooperative Agreement

National TB Guidelines

- American Thoracic Society (ATS)
- Infectious Diseases Society of America (IDSA)
- CDC Division of Tuberculosis Elimination (DTBE) guidelines

National and State Program Objectives

Below are national and state TB program objectives. The CDC program objectives are current as of January 2010.⁴ Under each national objective, there is a state objective established by the Ohio TB Program, based on Ohio's TB epidemiology and recent state wide program performance.

PROGRAM OBJECTIVES AND PERFORMANCE TARGETS

1. COMPLETION of TREATMENT:

For patients with newly diagnosed TB for whom 12 months or less of treatment is indicated, increase the proportion of patients who complete treatment with 12 months to 93% by 2015

Year	2010	2011	2012	2013	2014
Goal	90%	91%	92%	92%	93%

2. TB CASE RATES (Number of Cases per 100,000 population)

a. U.S.-BORN

Decrease the TB case rate in U.S.-born persons to less than 0.7 cases per 100,000 by 2015.

Year	2010	2011	2012	2013	2014
Goal	1.0	0.90	0.80	0.75	0.70

b. FOREIGN-BORN

Decrease the TB case rate for foreign-born persons to less than 14 cases per 100,000 by 2015.

Year	2010	2011	2012	2013	2014
Goal	22	20	18	16	14

c. U.S.-BORN NON HISPANIC BLACKS

Decrease the TB rate in U.S.-born non-Hispanic blacks to less than 1.3 cases per 100,000 by 2015.

Year	2010	2011	2012	2013	2014
Goal	3.5	3.0	2.8	2.0	1.3

d. CHILDREN

Decrease the TB case rate in children younger than 5 years of age to less than 0.4 cases per 100,000 by 2015.

Year	2010	2011	2012	2013	2014
Goal	1.5	1.2	1.0	0.8	0.4

3. CONTACT INVESTIGATION

- a. Increase the proportion of TB patients with positive AFB sputum smear results who have contacts elicited to $\geq 95\%$ by 2015.

Year	2010	2011	2012	2013	2014
Goal	$\geq 95\%$				

- b. Increase the proportion of contacts to sputum smear positive cases who are evaluated to 93% by 2015.

Year	2010	2011	2012	2013	2014
Goal	93%	93%	93%	93%	93%

- c. Increase the proportion of contacts to sputum smear positive cases with newly diagnosed LTBI who start treatment to 88% by 2015.

Year	2010	2011	2012	2013	2014
Goal	80%	82%	84%	86%	88%

- d. For contacts to sputum smear positive cases who have started treatment for newly diagnosed LTBI, increase the proportion who complete treatment to 79% by 2015.

Year	2010	2011	2012	2013	2014
Goal	72%	74%	76%	78%	79%

4. DRUG-SUSCEPTIBILITY RESULTS

Increase the proportion of culture-positive TB cases with initial drug-susceptibility results reported to $\geq 95\%$ by 2015. Percent of culture-positive TB cases with initial drug-susceptibility results reported. "Initial drug-susceptibility results reported" is defined as initial drug susceptibility test results reported in the RVCT and the susceptibility results for Isoniazid and Rifampin reported as either resistant or susceptible.

Year	2010	2011	2012	2013	2014
Goal	$\geq 95\%$				

5. TREATMENT INITIATION

Increase the proportion of TB patients with positive AFB sputum-smear results who initiated treatment within 7 days of specimen collection.

6. SPUTUM CULTURE CONVERSION

Increase the proportion of TB patients with positive sputum culture results who have documented conversion to sputum culture negative within 60 days treatment initiation to 62% by 2015.

Year	2010	2011	2012	2013	2014
Goal	54%	56%	58%	60%	62%

7. DATA REPORTING

a. RVCT REPORTING

Increase the completeness of each core Report of Verified Case of Tuberculosis (RVCT) data item reported to CDC, as described in TB Cooperative Agreement announcement, to $\geq 95\%$ by 2015.

Year	2010	2011	2012	2013	2014
Goal	$\geq 95\%$				

8. RECOMMENDED INITIAL THERAPY

Increase the proportion of patients who are started on the recommended initial 4-drug regimen when suspected of having TB disease to 94% by 2015.

Year	2010	2011	2012	2013	2014
Goal	86%	88%	90%	92%	94%

9. UNIVERSAL GENOTYPING

Increase the proportion of culture-confirmed TB cases with a genotyping result reported to 94% by 2015.

Year	2010	2011	2012	2013	2014
Goal	86%	88%	90%	92%	94%

10. KNOWN HIV STATUS

Increase the proportion of TB cases with positive or negative HIV test result reported to 88% by 2015.

Year	2010	2011	2012	2013	2014
Goal	80%	82%	84%	86%	88%

11. EVALUATION OF IMMIGRANTS AND REFUGEES

For immigrants and refugees entering the U.S. with a class A/B1/B2 condition

- a. For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, increase the proportion who initiate medical evaluation within 30 days of arrival

Year	2010	2011	2012	2013	2014
Goal	50%	55%	58%	62%	65%

- b. For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, increase the proportion who complete medical evaluation within 90 days of arrival

Year	2010	2011	2012	2013	2014
Goal	55%	60%	65%	70%	75%

- c. For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, and who are diagnosed with latent TB infection during evaluation in the U.S., increase the proportion who start treatment.

Year	2010	2011	2012	2013	2014
Goal	70%	75%	80%	85%	90%

- d. For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, and who are diagnosed with latent TB infection during evaluation in the U.S., and started on treatment, increase the proportion who complete LTBI treatment

Year	2010	2011	2012	2013	2014
Goal	50%	55%	60%	65%	70%

12. SPUTUM-CULTURE REPORTED

Increase the proportion of TB cases with a pleural or respiratory site of disease in patients ages 12 years or older that have a sputum-culture result reported to $\geq 95\%$ by 2015.

Year	2010	2011	2012	2013	2014
Goal	82%	86%	90%	93%	$\geq 95\%$

Standards

Program standards are what the stakeholders of the ODH TB program would consider to be "reasonable expectations" for state and local TB programs. For TB, standards have been established by nationally accepted authorities, such as the American Thoracic Society (ATS), the Infectious Diseases Society of America (IDSA), and the CDC, and generally recognized TB control experts, such as the National Tuberculosis Nurse Coalition (NTNC) and the National Tuberculosis Controllers Association (NTCA). The Ohio Department of Health Tuberculosis Program and some local TB control programs have established their own standards and objectives for case management.

The standards of care for the medical treatment and control of TB are published jointly by ATS, IDSA, and the CDC. These standards are available for reference at:

- ATS, CDC, IDSA. "Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America" (*MMWR* 2005;54[No. RR-12]). Available at: <http://www.cdc.gov/mmwr/PDF/rr/rr5412.pdf> .
- ATS, CDC, IDSA. "Diagnostic Standards and Classification of Tuberculosis in Adults and Children" (*Am J Respir Crit Care Med* 2000;161[4 Pt 1]). Available at: <http://www.cdc.gov/tb/publications/PDF/1376.pdf>.
- ATS, CDC, IDSA. "Treatment of Tuberculosis" (*MMWR* 2003;52[No. RR-11]). Available at: <http://www.cdc.gov/mmwr/PDF/rr/rr5211.pdf> .
- CDC, NTCA. "Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC" (*MMWR* 2005;54 [No. RR-15]). Available at: <http://www.cdc.gov/mmwr/pdf/rr/rr5415.pdf> .
- CDC. "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-care Settings, 2005" (*MMWR* 2005;54[No. RR-17]). Available at: <http://www.cdc.gov/mmwr/pdf/rr/rr5417.pdf> .
- CDC. "Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection" (*MMWR* 2000;49[No. RR-6]). Available at: <http://www.cdc.gov/mmwr/PDF/rr/rr4906.pdf> .

For additional guidelines, see the Division of Tuberculosis Elimination's "TB Guidelines" Web page (Division of Tuberculosis Elimination Web site; accessed October 1, 2013). Available at: <http://www.cdc.gov/tb/publications/guidelines/default.htm>

State Tuberculosis Program Staff

Table 2: STATE TUBERCULOSIS PROGRAM STAFF ROLES, RESPONSIBILITIES, AND CONTACT INFORMATION

Roles and Responsibilities	Contact Information
<p>Maureen Murphy-Weiss, BSN, RN, CPM TB Controller/Program Manager</p>	<p>Ohio Department of Health 35 East Chestnut Street, 6th Floor Columbus, Ohio 43215 Tel: (614) 387-0652 Fax: (614) 387-2132 E-mail: <i>maureen.murphy-weiss@odh.ohio.gov</i></p>
<p>Teri Rossman, BSN, RN Infectious Disease Control Consultant</p>	<p>Ohio Department of Health 35 East Chestnut Street, 6th Floor Columbus, Ohio 43215 Tel: (614) 728-7406 Fax: (614) 387-2132 E-mail: <i>teri.rossman@odh.ohio.gov</i></p>
<p>VACANT</p>	<p>Ohio Department of Health 35 East Chestnut Street, 6th Floor Columbus, Ohio 43215 Tel: (614) 644-8150 Fax: (614) 387-2132 E-mail:</p>
<p>Angela Allen, MPH, PhD Epidemiologist 3</p>	<p>Ohio Department of Health 35 East Chestnut Street, 6th Floor Columbus, Ohio 43215 Tel: (614) 752-8838 Fax: (614) 387-2132 E-mail: <i>angela.allen@odh.ohio.gov</i></p>
<p>Anita Adkins, BS Epidemiologist 2</p>	<p>Ohio Department of Health 35 East Chestnut Street, 6th Floor Columbus, Ohio 43215 Tel: (614) 752-8838 Fax: (614) 387-2132 E-mail: <i>anita.adkins@odh.ohio.gov</i></p>

Laboratories

Table 3: ROLES, RESPONSIBILITIES, AND CONTACT INFORMATION OF LABORATORIES

Role and Responsibilities	Contact Information
Ohio Department of Health Laboratories	8995 East Main Street, Building 22 Reynoldsburg, Ohio 43068 1-888-ODH-LABS (1-888-634-5227)
Kevin Sohner, BS Microbiology Supervisor	Ohio Department of Health Laboratory 8995 East Main Street, Building 22 Reynoldsburg, Ohio 43068 Tel: (614) 644-4668

Resources and References

Resources

- CDC. "Framework for Program Evaluation in Public Health" (*MMWR* 1999;48[No. RR-11]). Available at: <ftp://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4811.pdf> .
- Division of Tuberculosis Elimination. *A Guide to Developing a TB Program Evaluation Plan* (Division of Tuberculosis Elimination Web site; accessed November 1, 2006). Available at: http://www.cdc.gov/tb/programs/Evaluation/Guide/PDF/Complete_guide_Developing_eval_plan.pdf .
- Division of Tuberculosis Elimination. *Understanding the TB Cohort Review Process: Instruction Guide* (Division of Tuberculosis Elimination Web site; accessed November 1, 2006). Available at: <http://www.cdc.gov/tb/publications/guidestoolkits/cohort/Cohort.pdf>.
- New Jersey Medical School National Tuberculosis Center. *Planning & Implementing the TB Case Management Conference: A Unique Opportunity for Networking, Peer Support and Ongoing Training* (Newark, NJ; 2004). Available at: <http://www.umdnj.edu/globaltb/products/planning&implementing.htm> .

References

- ¹ CDC. Progressing toward tuberculosis elimination in low-incidence areas of the United States: recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR* 2005;51(No. RR-5):1.
- ² ATS, CDC, IDSA. Controlling tuberculosis in the United States: recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005;54(No. RR-12):14.
- ³ ATS, CDC, IDSA. Controlling tuberculosis in the United States: recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005;54(No. RR-12):15.