CHILDHOOD TB TRAINING

TOOLKIT

World Health Organization

International Union Against Tuberculosis and Lung Disease

Health solutions for the poor

CHILDHOOD TB TRAINING

TOOLKIT

World Health Organization

International Union Against Tuberculosis and Lung Disease

Health solutions for the poor

WHO Library Cataloguing-in-Publication Data

Childhood TB training toolkit.

1.Tuberculosis. 2.Child. 3.Training Materials. I.World Health Organization. II. International Union against Tuberculosis and Lung Disease.

ISBN 978 92 4 150778 3 (NLM Classification: WF 200)

WHO/HTM/TB/2014.14

ACKNOWLEDGEMENTS

These training materials were developed by WHO and The Union and are in line with the WHO Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children: second edition (2014). This product was funded by United States Agency for International Development (USAID) under the TB CARE I Collaborative Agreement No. AID-OAA-A-10-0020. The contents are the responsibility of TB CARE I and do not necessarily reflect the views of USAID or the United States Government.

CONTENTS

GLOSSARY

Before beginning this training toolkit, you should be familiar with the following terms, common definitions, distinctions and abbreviations.

Tuberculosis (TB) is caused by bacteria (*Mycobacterium tuberculosis*) that most often affect the lungs. Tuberculosis is curable and preventable.

TB is spread from person to person through the air. When people with pulmonary TB cough, sneeze or spit, they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected.

TB infection is when a person carries the *Mycobacterium tuberculosis* bacteria inside the body. Many people have TB infection and are well. A positive tuberculin skin test indicates infection - but a negative tuberculin skin test does not exclude the possibility of infection.

About one-third of the world's population has **latent TB infection**, which means people have been infected by TB bacteria but are not (yet) ill with disease and cannot transmit the disease.

TB disease occurs in someone with TB infection when the bacteria inside the body start to multiply and become numerous enough to damage one or more organs of the body. This damage causes clinical symptoms and signs and is referred to as “tuberculosis” which implies active disease. **Persons with TB disease are considered infectious and may spread TB bacteria to others**.

Pulmonary tuberculosis (PTB) refers to any bacteriologically confirmed or clinically diagnosed case of TB involving the lung parenchyma or the tracheobronchial tree.

Extrapulmonary tuberculosis (EPTB) refers to any bacteriologically confirmed or clinically diagnosed case of TB involving organs other than the lungs, e.g. pleura, abdomen, genitourinary tract, skin, joints and bones, meninges.

Close contact is defined as living in the same household as, or in frequent contact with (e.g. child minder, school staff), a source case with pulmonary TB.

Children refer to the 0 to 14 year age group.

Infant is a child of less than 1 year of age (0-12 month age group)

ABBREVIATIONS

ART	anti-retroviral therapy
CPT	cotrimoxazole preventive therapy
CXR	chest radiograph
DOT	directly observed therapy
EPTB	extra-pulmonary tuberculosis
HIV	human immunodeficiency virus
IPT	isoniazid preventive therapy
LIP	lymphoid interstitial pneumonitis
MDR	multi-drug resistant
NTP	National Tuberculosis control Programme
PcP	*Pneumocystis jirovecii* pneumonia
PTB	pulmonary tuberculosis
TB	tuberculosis
TST	tuberculin skin test

1 INTRODUCTION

1.1 WHY IS THIS TRAINING IMPORTANT?

It is estimated that there are more than half a million cases of tuberculosis (TB) in children occurring globally each year. In settings with a high overall incidence of TB, children can account for a large proportion (up to one-third) of all TB cases. As a consequence, TB is an important cause of morbidity and mortality in children in TB endemic countries.

World Health Organization (WHO) guidelines have recently been updated that relate to child TB including among others- Rapid Advice: Treatment of tuberculosis in children (2010); Treatment of tuberculosis: guidelines for national programmes 4th edition (2010); Guidelines for intensified case-finding for tuberculosis and isoniazid preventive therapy for people living with HIV in resource-constrained settings (2011); Guidelines for the programmatic management of drug-resistant tuberculosis -2011 update (2011); WHO policy on collaborative TB/HIV activities: guidelines for national programmes and other stakeholders (2012); Recommendations for investigating contacts of persons with infectious tuberculosis in low- and middle-income countries (2012); WHO consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach (2013); Definitions and reporting framework for tuberculosis -2013 revision; and Automated real-time nucleic acid amplification technology for rapid and simultaneous detection of tuberculosis and rifampicin resistance: Xpert MTB/RIF system for the diagnosis of pulmonary and extrapulmonary TB in adults and children (2013); and, the Second edition of the Guidance for national tuberculosis programmes on the management of tuberculosis in children (2014). This has resulted in revision or development of guidelines for child TB management by many NTPs in TB endemic countries.

The challenge remains to address the wide policy-practice gap that currently exists by greatly increasing the scope and effectiveness of implementation. Training is a critical tool to achieve this.

1.2 TRAINING OBJECTIVES

The **main objectives** of this training material are to:

1. Increase case-finding of child TB cases in the community;
2. Improve the management of children with TB;
3. Increase implementation of child contact screening and preventive therapy; and,
4. Provide accurate data of child TB for NTPs for purposes of monitoring and evaluation.

The **focus is on the common challenges** for diagnosis, treatment and prevention. It is often stated that the diagnosis of children is difficult. It is certainly difficult to confirm the diagnosis of TB in the majority of children with disease but the clinical diagnosis of TB in children can often be straightforward. It is often perceived that children with suspected TB disease or children in close contact with TB cases need referral to specialist paediatric services at central hospital level but this is not necessary for most cases. Therefore, the training material sets out to emphasize the management issues of the common cases in the usual scenario of presentation, not to replace the need for specialist referral and opinion.

The **responsibility** to improve child TB management and prevention is a shared responsibility that includes child health workers and NTP. Children with TB do not usually present to the NTP as a suspected case of TB but rather within the context of health services that provide care for all sick children.

Therefore, the **main focus of the training** is for three likely common scenarios:

- The child with suspected TB disease;
- The child treated for TB in the community;
- The child who is a close contact of a TB case.

It would be very informative and provide added value for the NTP if **monitoring and evaluation** of child TB activities was an integral part of training.

A further challenge to improving the prevention and management of TB cases, including child TB, is **integration**. The challenges of integration for TB/HIV care are well known, and these apply equally for children with TB/HIV. Additional challenges for integration within the health systems relate to management of maternal and child TB or TB/HIV and the management of the sick child with possible TB or TB/HIV within the context of the health services e.g. approach to evaluation of the sick child as Integrated Management of Childhood Illness (IMCI). Therefore, the training material aims to be **adaptable for use within a range of contexts**.

1.3 WHO IS THIS TRAINING FOR?

Who are the likely target audiences for training?

The main target audiences for training are the NTP and the health workers that manage sick children and/or TB cases of any age in the **community** or at the more peripheral level of health care – **primary health care facilities and district hospitals**. Target audiences for training of child TB might include:

- NTP staff that are not necessarily clinically trained in child health but need to manage or address child TB activities as part of their NTP duties, for example registration of cases, training, data management, drug procurement and distribution, monitoring and evaluation;
- Health workers at district hospital (secondary level of health care system) involved in the diagnosis and management of sick children;
- Health workers at community-based clinic (primary level of health care system) involved in the diagnosis and management of sick children;
- Health workers (clinical staff and volunteers) that are involved in the diagnosis and management of TB cases in the community;
- Health workers that are involved in the management of mothers and children with HIV.

1.4 HOW TO USE THIS TRAINING TOOLKIT

What will be addressed by each module?

The training focuses on being able to provide training in child TB to health workers working at the primary or secondary level. It is important that the training will achieve a high level of understanding and knowledge of just a few simple messages.

The training consist of the following ten modules:

1. **Epidemiology**
2. **Diagnosis**
3. **Treatment**
4. **Prevention**
5. **TB/HIV**
6. **MDR TB**
7. **Maternal and infant TB (and HIV)**
8. **Child TB and IMCI**
9. **Child TB within the NTP**
10. **Course evaluation**

Each module includes: objectives; teaching slides and clinical cases; learning points; revision and assessment tools; and a list of key resources. The final module (module 10) on evaluation provides information on possible methodological approaches and measurable indicators to evaluate the impact of training.

The information provided is consistent with recent WHO guidance for the management of child TB as revised in 2014. Teaching slides are available in the format of PowerPoint presentations. They can be adapted for local use and there is considerable repetition of information between modules. As a PowerPoint presentation this requires computer and projector, they could be adapted and printed for hard copy circulation.

How can the training modules be integrated into existing or ongoing training?

Each module covers a different topic and there is considerable overlap. The modules contain statements that are consistent with current guidelines and evidence-based resources. Some slides illustrate the evidence base with examples from published data. The most challenging and critical section is “Diagnosis” and this section provides guidance such as in the Union Deskguide aimed at the primary and secondary level of care. However, clearly this section would require adjustment to ensure that it is relevant to the local possibilities and the target audience.

Slides and assessment tools could be taken from the relevant training modules to build a teaching presentation and assessment for training purposes. The context and the time available would need to be considered. Some examples are provided:

- **NTP training**

It is important that regular and routine training or updates with NTP staff include attention to child TB. Issues relating to child TB, in particular those that are peculiar to child TB, should be integrated into ongoing training and updates, rather than being addressed in a separate training forum. Integration would be the more efficient and cost-effective way of including child TB in NTP activities, but importantly would also emphasize that child TB cases should be recorded and reported by the same disease categories, by age groups and by outcomes in the same way as TB cases in adults.

There is a lot of overlap from the NTP perspective as to how child TB and TB/HIV cases are managed by NTP staff. At the same time, the opportunity could be taken to emphasize issues that might differ, for example diagnosis, treatment dosages and regimens, or that require particular emphasis such as child contact screening and management. Module 9 focuses on issues of child TB and NTP.

- **IMCI**

Children with TB do not present to NTPs but to clinical services that provide care for children, as outpatients or inpatients. The first point of contact is usually at the level of primary or secondary care. The clinical presentation of most cases of TB in children is with symptoms that are very common in sick children in TB endemic countries, such as cough or fever or weight loss. It is therefore important that health workers who manage sick children at this level of care have some knowledge about when or in which children, the diagnosis of TB should be considered. The clinical approach to a suspected TB case should be included in training that addresses the management of the sick child, for example training for IMCI. Module 8 provides information relevant to the clinician managing children with suspected TB.

- **HIV**

HIV-infected children in TB endemic settings are at high risk of TB infection and disease. The clinical approach to TB diagnosis in an HIV-infected child, the use of anti-TB therapy and the recording of outcome are all similar to the management of the HIV-uninfected child with TB. The most important difference is the attention to additional HIV-related treatment issues such as ART and CPT. Module 5 contains information relevant to training for management of children with TB/HIV.

- **Maternal and Child Health**

The integration of maternal and child health services is an important challenge, as is the integration of TB/HIV services. Maternal TB is common in some settings and there are important management issues for the infant. Screening for TB in pregnancy is a useful intervention especially in HIV-endemic settings. If the mother with TB is also HIV-infected, there are many additional management issues for mother and baby, and this is added to other routine interventions in pregnancy (e.g. anaemia, malaria protection) and for the infant (e.g. EPI, malaria protection, feeding). The potential for integrated care and the priority management issues would vary greatly between settings. Module 7 highlights some of the challenges.

Who might provide the training?

It is important that training is consistent with national guidelines and prior to training it will be important to review (and even maybe revise) national guidelines for TB, HIV, child health and maternal health. This is best done by the child TB working group of the NTP (the designated NTP staff responsible for child TB PLUS a number of child TB experts in the country), and this same group would be ideal to conduct training and training of trainers within the country.

How might the training be evaluated?

It might be useful to evaluate the impact of training. Training may impact on the knowledge of the trainee which is one opportunity for evaluation. How this is done will depend upon the topic being addressed, the training audience and time allocated. This could be a classical examination of knowledge that might include a pre-training assessment as well as a post-training assessment, or it may be better to open group discussion with scenarios needing solutions. Some examples are given at the end of each presentation and these are further listed in Module 10.

The main aim of training is to improve actual practice or implementation, and for this to be sustained. Therefore evaluation of training as operational research that records measurable and relevant outputs is of greater value than simply assessing the knowledge of trained personnel. The main expected measurable outputs might be numbers of child TB cases, treatment outcomes, completion and accuracy of child TB data, and management of child contacts. Again, the outputs to be measured and when they should be measured would depend on the context of the activity being implemented or the training focus. These should be defined as much as possible with feedback from participants at the initial training. The NTP already have standard recording and reporting forms that can be used to provide data of disease burden and outcomes. Additional forms may need to be adapted and used for these purposes e.g. IPT register.

2 MODULES

MODULE 1: EPIDEMIOLOGY OF CHILD TB

1.1 Module goals

The primary goals of training are:

- To understand the importance of child TB as a public health problem in TB endemic communities;
- To understand the risk factors for infection and disease due to TB in children; and,
- To outline the impact of the HIV epidemic on the burden and management of child and maternal TB.

1.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of epidemiology of child TB. These slides could be adapted for local purposes, and the addition of "local" or national data to illustrate the main points would be beneficial. Explanations of the slides are provided when necessary in the text box below the slide.

Access teaching slides : Epidemiology of childhood TB

1.3 Key learning points

The main points of learning are that:

- ✓ child TB is common in settings where TB is common;
- ✓ TB is an important cause of child morbidity and mortality in TB endemic countries;
- ✓ young age is an important risk factor for TB disease and disseminated disease in children;
- ✓ risk factors for infection and for disease are well understood, and provide an important basis for approaches to clinical diagnosis and child contact management;
- ✓ neonatal BCG does have an important role, especially in reducing the risk of severe, disseminated disease in young children that are infected with TB;
- ✓ pulmonary and extrapulmonary TB disease are common in children;
- ✓ clinical presentation and disease type are affected by age and immune status;
- ✓ HIV has had a major impact on child TB burden, management and outcome;
- ✓ The challenges of TB/HIV include the mother-infant risks and the need for services that provide an integrated, family-based approach to TB care; and,
- ✓ Children with TB should be routinely registered and reported by NTP.

1.4 WORKSHEET

Module 1: Epidemiology **___/ 10 marks**

1. List at least three important risk factors for TB exposure and infection (3 marks).

2. List at least three important risk factors for developing TB disease if infected (3 marks).

3. Answer True or False to these statements (4 marks):

1. The risk of TB infection for children is reduced in the HIV endemic setting ____
2. Extrapulmonary TB is usually more common than pulmonary TB in children ____
3. Contact history is an important diagnostic tool in children with suspected TB ____
4. Neonatal BCG vaccine has limited protective efficacy against TB in children ____

Use this space to make notes about anything you've learned during this module that you think might be useful.

1.5 Key resources

Combatting Tuberculosis in Children. Fact Sheet. World Health Organization, 2013. Factsheet

Dendup T. et al. Childhood tuberculosis in Bhutan: profile and treatment outcomes. *Public Health Action*, 2013, 3 (1): 11-14. Abstract

Donald PR. Childhood tuberculosis: the hidden epidemic. Editorial. *Int J Tuberc Lung Dis*, 2004, 8(5): 627-629. Abstract

Drobac PC et al. Risk factors for in-hospital mortality among children with tuberculosis: the 25-year experience in Peru. Pediatrics, 2012, 130(2): e373-e379. Abstract

Global Tuberculosis Report 2013. World Health Organization, 2013. Document

Harries AD et al. Childhood tuberculosis in Malawi: nationwide case-finding and treatment outcomes. International J Tuberc Lung Dis, 2002, 6(5):424-431. Abstract

Lestari T et al. High caseload of childhood tuberculosis in hospitals on Java Island, Indonesia: a cross sectional study. *BMC Public Health,* 2011, 11:784. Abstract

Marais BJ et al. The clinical epidemiology of childhood pulmonary tuberculosis: a critical review of literature from the pre-chemotherapy era. *Int J Tuberc Lung Dis*, 2004, 8(3): 278-285. Abstract

Marais BJ et al. The burden of childhood tuberculosis and the accuracy of community-based surveillance data. *Int J Tuberc Lung Dis*, 2006, 10(3):259-263. Abstract

Munoz-Sellart M et al. Treatment outcome in children with tuberculosis in southern Ethiopia. *Scand J Infect Dis*, 2009, 41(6-7):450-5. Abstract

Perez-Velez CM et al. Tuberculosis in children. Review article. *N Eng J Med 2012*, (367):348-61. Abstract

Swaminathan S et al. Pediatric Tuberculosis: Global overview and challenges. *Clinical Infectious Diseases*, 2010, 50 (S3):S184-S194. Abstract

Wu XR et al. Pediatric Tuberculosis at Beijing Children's Hospital: 2002–2010. *Pediatrics* 2012, 130(6):e1433-40. Abstract

PowerPoint presentation by Anneke C. Hesseling, Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, South Africa.

MODULE 2: DIAGNOSIS OF CHILDHOOD TB

2.1 Module goals

The primary goals of training are:

- To know the common clinical presentations of TB in children;
- To develop a structured approach to the diagnosis of TB in children; and,
- To know the main indications for referral and hospitalisation of children with suspected TB.

2.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of diagnosing childhood TB. These slides can be adapted for local purposes, to make it consistent with the availability of diagnostic tools and referral patterns. Explanations of the slides are provided when necessary in the text box below the slide. The training module on diagnosis has been developed for health workers who manages sick children at the district or peripheral health facility level. The focus is on the common clinical presentations of TB in children.

Access teaching slides : Diagnosis of childhood TB

2.3 Key learning points

The main points of learning are that:

- ✓ The diagnosis of TB in children usually relies on a combination of clinical and epidemiological features;
- ✓ A thorough and accurate contact history is a very important diagnostic tool;
- ✓ Sputum should be examined in all suspected cases whenever available;
- ✓ Other investigations will depend on site of disease; chest radiography is an important tool for the assessment of suspected intra-thoracic TB;
- ✓ HIV test should be routine in the assessment of children with TB;
- ✓ Clinical evaluation should also determine whether the child with suspected TB should be initially managed and evaluated as an inpatient or as an outpatient;
- ✓ There is no urgency to start treatment in most cases, and so follow-up with reassessment have a very useful role in diagnostic assessment;
- ✓ Accurate measure and plotting of weight is a very important tool in diagnosis and management;
- ✓ Cases that are difficult to diagnose, investigate or manage should be referred; and,
- ✓ All children diagnosed with TB should be registered with the NTP.

1.4 WORKSHEET

Module 2: Diagnosis **___/ 20 marks**

1. List 5 points (checklist) to consider in the assessment of a child with suspected TB (5 marks).
2. List three common clinical symptoms in a child presenting with TB (3 marks).
3. List three reasons why age is important in assessment of a child with suspected TB disease (3 marks).
4. List three aspects of contact history that are relevant (3 marks).
5. Discuss sputum for examination: indications and limitations (3 marks).
6. List clinical presentation of three common forms of EPTB in children (3 marks).

Use this space to make notes about anything you've learned during this module that you think might be useful.

2.5 Key resources

Cuevas LE et al. Evaluation of Tuberculosis Diagnostics in Children: 2. Methodological Issues for Conducting and Reporting Research evaluations of Tuberculosis Diagnostics for Intrathoracic Tuberculosis in children. Consensus from an Expert Panel. Supplement article. *J Infect Dis*, 2012, Suppl 2:S209-15. Abstract

Cuevas LE. The Urgent Need for New Diagnostics for Symptomatic Tuberculosis in Children. *Indian J Pediatr,* 2011 Apr;78(4):449-55. Abstract

Denkinger CM et al. Guidelines on interferon-c release assays for tuberculosis infection: concordance, discordance or confusion? *Clinical Microbiology and Infection*, 2011, CMI, 17: 806–814. Abstract

Desk guide for diagnosis and management of TB in children. The Union, 2010. Document

Gie R. Diagnostic atlas of intrathoracic tuberculosis in children. A guide for low income countries. The Union, Paris, 2003. Document

Graham SM et al. Evaluation of Tuberculosis Diagnostics in Children: 1. Proposed Clinical Case Definitions for Classification of Intrathoracic Tuberculosis Disease. Consensus From an Expert Panel *J Infect Dis*. 2012;205 Suppl 2:S199-208. Abstract

Graham SM. The Use of Diagnostic Systems for Tuberculosis in Children. *Indian J Pediatr*, 2011, 78:334–339. Abstract

Graham SM. Non-tuberculosis opportunistic infections and other lung diseases in HIV-infected infants and children. *Int J Tuberc Lung Dis*, 2005, 9(6):592–602. Abstract

Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children: second edition, World Health Organization, 2014. Document

Hatherill M et al. Structured approaches for the screening and diagnosis of childhood tuberculosis in a high prevalence region of South Africa. *Bull World Health Organ* 2010;88:312–320. Article

Hepple P et al. Microscopy compared to culture for the diagnosis of tuberculosis in induced sputum samples: a systematic review. Review Article. Int J Tuberc Lung Dis, 2012, 16(5):579-588. Abstract

IGRA TB Tests: Policy Statement 2011. The use of TB Interferon-Gamma Release Assays (IGRAs) in Low- and Middle-income countries. Fact sheet. World Health Organization, 2011. Factsheet

Mandalakas AM et al. Interferon-gamma release assays and childhood tuberculosis: systematic review and meta-analysis. Review Article. *Int J Tuberc Lung Dis*, 201, 15(8):1018-1032. Abstract

Marais BJ et al. A Refined Symptom-Based Approach to Diagnose Pulmonary Tuberculosis in Children. *Pediatrics* 2006,118(5):e1350-9. Abstract

Marais BJ et al. The Bacteriologic Yield in Children with Intrathoracic Tuberculosis. *Clin Infect Dis*, 2006, 42:e69-71. Abstract

Marais BJ et al. The prevalence of symptoms associated with pulmonary tuberculosis in randomly selected children from a high burden community. *Arch Dis Child* 2005;90:1166–1170. Abstract

Marais S et al. Tuberculous meningitis: a uniform case definition for use in clinical research. Personal view. *The Lancet Infectious Diseases*, 2010, 10(11): 803-12. Abstract

Nhu et al. Evaluation of . Abstract

Nicol MP et al. New specimens and laboratory diagnostics for childhood pulmonary TB: progress and prospects. Mini-symposium: Childhood TB in 2010. *Paediatric Respiratory Reviews*, 2011, 12:16–21. Abstract

Nicol MP et al. Accuracy of the Expert MTB/RIF test for the diagnosis of pulmonary tuberculosis in children admitted to hospital in Cape Town, South Africa: a descriptive study. *Lancet Infect Dis,*.2011, 11(11):819-24. Abstract

Oberhelman RA et al. Diagnostic approaches for paediatric tuberculosis by use of different specimen types, culture methods, and PCR: a prospective case-control study. *Lancet Infect Dis.*, Sep 2010, 10(9): 612–620. Abstract

Perez-Velez CM et al. Tuberculosis in children. Review article. *N Eng J Med 2012*, (367):348-61. Abstract

Pillay T et al. Severe, rapidly progressive human immunodeficiency virus type 1 disease in newborns with coinfections. *Pediatr Infect Dis J*, 2001;20:404–10. Abstract

Rachow A et al. Increased and Expedited Case Detection by Xpert MTB/Rif Assay in Childhood Tuberculosis: A Prospective Cohort Study. *Clinical Infectious Diseases* 2012;54(10):1388–96. Abstract

Seddon J et al. Consensus Statement on Research Definitions for Drug-Resistant Tuberculosis in Children. *J Ped Infect Dis* , April 2013:1-10. Abstract

Stockdale AJ et al. Evidence behind WHO guidelines: Hospital Care for Children: What is the Diagnostic Accuracy of Gastric Aspiration for the Diagnosis of Tuberculosis in Children? Clinical Review. *J Trop Pediatr*, 2010, 56(5): 291-298. Abstract

Swingler GH et al. Diagnostic accuracy of chest radiography in detecting mediastinal lymphadenopathy in suspected pulmonary tuberculosis. *Arch. Dis. Child.,* 2005, 90:1153-1156. Abstract

TB Diagnostics. Fact sheet. World Health Organization, 2013. Factsheet

TB Xpert project. Fact sheet. World Health Organization, 2013. Factsheet

Xpert MTB/RIF Test. Fact sheet. World Health Organization, 2014. Factsheet

Zar HJ et al. Induced sputum versus gastric lavage for microbiological confirmation of pulmonary tuberculosis in infants and young children: a prospective study. *Lancet* 2005; 365: 130–34 Abstract

Zar HJ et al. Diagnosis of pulmonary tuberculosis in children: new advances. Expert Rev. *Anti Infect. Ther*., 2010, 8(3): 277-288. Abstract

Link to PowerPoint presentation on Interpretation of the Chest X-Ray in Children by Professor Robert Gie, Desmond Tutu Tuberculosis Centre, Department of Paediatrics and Child Health, Stellenbosch University, South Africa.

MODULE 3: TREATMENT OF CHILD TB

3.1 Module goals

The primary goals of training are:

- To recognize that the principles of treatment of TB in children are the same as for adults;
- To understand the importance of weight in monitoring treatment response and in prescribing appropriate dosages; and,
- To gain knowledge of reasons for and management of treatment failure in children.

3.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of treatment of child TB. These slides could be adapted for local purposes, so that the regimens and dosages are consistent with national guidelines. Explanations of the slides are provided when necessary in the text box below the slide. The training module on treatment has been developed for the health worker who manages sick children at the district or peripheral health facility level. The focus is on the treatment of the common types of TB in children, and the management of treatment failure.

Access teaching slides: Treatment of child TB

3.3 Key learning points

The main points of learning are that:

- ✓ Children should be treated with regimens and dosages according to national guidelines;
- ✓ All children started on TB treatment should be registered;
- ✓ Treatment outcomes for children with TB are usually good and should be recorded for NTP;
- ✓ Resolution of symptoms and weight gain are markers of a satisfactory treatment response in sputum smear-negative cases;
- ✓ Children tolerate first-line anti-TB treatment very well with low risk of toxicity;
- ✓ HIV-infected children with TB have poorer treatment outcomes than HIV-uninfected children with TB;
- ✓ Drug dosages are calculated according to weight (not age);
- ✓ Ethambutol at recommended dosages can be used safely in children of all ages;
- ✓ All children treated for TB should be registered with NTP; and,
- ✓ Treatment outcomes should be recorded and reported by NTP.

3.4 WORKSHEET

Module 3: Treatment of child TB

Checklist for child treated for TB:

1. Dosages and regimens for anti-TB treatment in children should follow NTP guidelines.
2. Weight is important for calculating dosages and for monitoring treatment response.
3. All children treated for TB should be registered with NTP and reported by disease type and within age bands (0-4 years and 5-14 years).
4. Follow-up is critical and treatment outcomes should be recorded as per NTP guidelines.
5. Adherence is a challenge especially during the continuation phase and counseling of child and family about importance of completion of full course of anti-TB treatment is important.

Use this space to make notes about anything you've learned during this module that you think might be useful.

3.5 Key resources

Donald PR. Antituberculosis drug-induced hepatotoxicity in children. *Pediatric Reports*, 2011, 3(2):e16. Abstract

Donald PR. The chemotherapy of tuberculous lymphadenopathy in children. *Tuberculosis (Edinb).* 2010, 90(4):213-24. Abstract

Dosing instructions for the use of currently available fixed-dose combination TB medicines for children. World Health Organization, 2009. Document

Ethambutol efficacy and toxicity: literature review and recommendations for daily and intermittent dosage in children. World Health Organization, 2006. Document

Frydenberg AR et al. Toxicity of first-line drugs for treatment of tuberculosis in children: review. *Tropical Medicine and International Health*, 2009, 14(11): 1329–1337. Abstract

Graham SM. Treatment of paediatric TB: revised WHO guidelines. *Paediatric Respiratory Reviews*, 2011 (12):22-26. Abstract

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Hesseling AC et al. Outcome of HIV infected children with culture confirmed tuberculosis. *Arch. Dis. Child*., 2005, 90(11): 1171–1174. Abstract

Puthanakit T et al. Immune Reconstitution Syndrome After Highly Active Antiretroviral Therapy in Human Immunodeficiency Virus-Infected Thai Children. *Pediatr Infect Dis J*, 2006, 25(1):53-58. Abstract

Ramachandran G et al. Age, nutritional status and INH acetylator status affect pharmacokinetics of anti-tuberculosis drugs in children. *Int J Tuberc Lung Dis*, 2013, 17(6):800-806. Abstract

Ramachandran G et al. Pharmacokinetics of Anti-tuberculosis Drugs in Children. *Indian J Pediatr*, 2011, 78(4):435-442. Abstract

Rapid advice: treatment of tuberculosis in children. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.13). Document

Schaaf HS et al. Rifampin pharmacokinetics in children, with and without human immunodeficiency virus infection, hospitalized for the management of severe forms of tuberculosis. *BMC Medicine*, 2009 (7):19. Abstract

Schaaf HS et al. Isoniazid pharmacokinetics in children treated for respiratory tuberculosis. *Arch. Dis. Child*., 2005, 90: 614-618. Article

Thee S et al. Pharmacokinetics of Isoniazid, Rifampin, and Pyrazinamide in Children Younger than Two Years of Age with Tuberculosis: Evidence for Implementation of Revised World Health Organization Recommendations. *Antimicrob. Agents and Chemother*., 2011, 55(12):55605567. Abstract

MODULE 4: PREVENTION OF CHILD TB

4.1 Module goals

The primary goals of training are:

- To know the rationale for child contact screening and management;
- To understand the important role of BCG; and,
- To develop a structured approach to child contact management that is consistent with national guidelines.

4.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of prevention of child TB. These slides could be adapted for local purposes, so that it was consistent with national guidelines for child contact management and delivery of IPT. Explanations of the slides are provided when necessary in the text box below the slide. The training module on prevention has been developed for the health worker who manages cases of TB at the district or peripheral health facility level. The focus is on community-based management of children that are close/ household contacts of cases with sputum smear-positive TB.

Access teaching slides: Prevention of child TB

4.3 Key learning points

The main points of learning are that:

- ✓ The main consistent effectiveness of neonatal BCG is prevention of severe, disseminated disease in infants and young children;
- ✓ BCG protection against all forms of TB in children varies widely and depends on many factors including age of BCG immunisation, geographical location and BCG strain used;
- ✓ Child contact screening and management has enormous potential to reduce the burden of child TB;
- ✓ Child contact screening and management can be instituted at the peripheral facility level on the basis of symptom-based screening;
- ✓ Community-based child contact screening and management is a means of case-finding suspected TB cases of any age;
- ✓ IPT must be given for at least 6 months to be effective; and,
- ✓ A major challenge for effectiveness of IPT is adherence and follow-up is critical.

4.4 WORKSHEET

Module 4: Prevention **___/ 10 marks**

1. List three public health interventions that can reduce the burden of TB disease in children (3 marks).

2. What is the main role of BCG immunization in prevention of TB in children (1 mark).

3. Outline a symptom-based screening approach to children that are close contacts of a case with sputum-smear positive TB (3 marks).

4. Which child TB contacts are eligible for preventive therapy (IPT) (3 marks).

Use this space to make notes about anything you've learned during this module that you think might be useful.

4.5 Key resources

Bright-Thomas R et al. Effectiveness of 3 months of rifampicin and isoniazid chemoprophylaxis for the treatment of latent tuberculosis infection in children. *Arch Dis Child*. 2010, 95(8):600-2. Abstract

Donald PR. Edith Lincoln, an American Pioneer of Childhood Tuberculosis. *Pediatr Infect Dis J*, 2013, 32:241-245. Abstract

Essential actions for effective TB infection control: safety without stigma. WHO, 2008. Document

Favorov M et al. Comparative Tuberculosis (TB) Prevention Effectiveness in Children of Bacillus Calmette-Guérin (BCG) Vaccines from Different Sources, Kazakhstan. *PLoS ONE* 7(3): e32567. Article

Fox GJ et al. Contact investigation for tuberculosis: a systematic review and meta-analysis. *Eur Respir J*, 2013, 41(1):140-156. Abstract

Gomes VF et al. Impact of tuberculosis exposure at home on mortality among children less than 5 years old in Guinea-Bissau. *Thorax,* 2011, 66:163-167. Abstract

Graham SM et al. More Evidence to Support Screening of Child Contacts of Tuberculosis Cases: If Not Now, Then When? Editorial commentary. *Clin Infect Dis.*,2013 Dec;57(12):1693-4.Abstract

Graham SM. Missed opportunities for prevention of tuberculosis in children. *Annals of Tropical Paediatrics*, 2011, 31: 297-299. Abstract

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Hill PCH et al. Closing the Policy-Practice Gap in the Management of Child Contacts of Tuberculosis Cases in Developing Countries. *PLoS Medicine*, 2011, 8(10):1-5. Article

Jackson-Sillah D et al. Screening for tuberculosis among 2381 household contacts of sputum-smear-positive cases in The Gambia. *Trans R Soc Trop Med Hyg*., 2007, 101(6):594-601 Abstract

Jaganath D et al. Contact investigation for active tuberculosis among child contacts in Uganda. *Clin Infect Dis,* 2013, 57(12):1685-92. Abstract

Kruk A et al. Symptom-Based Screening of Child Tuberculosis Contacts: Improved Feasibility in Resource-Limited Settings. *Pediatrics*, 2008, 121:e1646-e1652. Abstract

Marais BJ et al. Screening and Preventive Therapy for Tuberculosis. *Clin Chest Med*, 2009, 30(4): 827-846. Abstract

Marais BJ et al. Radiographic Signs and Symptoms in Children Treated for Tuberculosis. Possible Implications for Symptom-Based Screening in Resource-Limited Settings. *Pedatr Infect Dis J*, 2006,25(3):237-240. Abstract

Marais BJ et al. Adherence to isoniazid preventive chemotherapy: a prospective community based study. *Arch. Dis. Child*, 2006, 91:762-765.Abstract

Morrison J et al. Tuberculosis and latent tuberculosis infection in close contacts of people with pulmonary tuberculosis in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis*, 2008, 8(6):359-68. Abstract

Nyirenda M et al. Poor attendance at a child TB contact clinic in Malawi. *Int J Tuberc Lung Dis*, 2006, 10(5): 585-587. Abstract

Recommendations for investigating contacts of persons with infectious tuberculosis in low- and middle income countries. World Health Organization, 2012. Document

Rutherford ME et al. Preventive therapy in children exposed to *Mycobacterium tuberculosis*: problems and solutions. T*rop Med Int Health*, 2012,17(10):1264-73. Abstract

Seddon JA et al. Preventive Therapy for Child Contacts of Multidrug-Resistant Tuberculosis: A Prospective Cohort Study. *Clin Infect Dis*. 2013 Dec;57(12):1676-84. Abstract

WHO Policy on TB infection control in health-care facilities, congregate settings and households. World Health Organization, 2009. Document

Zachariah R et al. Passive versus active tuberculosis case finding and isoniazid preventive therapy among household contacts in a rural district of Malawi. Int J Tuberc Lung Dis, 2003, 7/11):1033-1039. Abstract

MODULE 5: TB/HIV

5.1 Module goals

The primary goals of training are:

- To understand the impact of HIV on epidemiology, diagnosis, management and outcome for children with TB;
- To consider the other common causes of HIV-related lung disease; and,
- To develop a structured approach on the diagnosis and management of a child with TB/HIV.

5.2 Teaching slides and materials

Access teaching slides : TB/HIV

5.3 Key learning points

The main points of learning are that:

- ✓ HIV testing should be routine in assessment of a child with suspected TB;
- ✓ HIV infected children in TB endemic setting at increased risk of exposure to TB and therefore TB infection, and at high risk of TB disease if infected;
- ✓ Clinical approach to TB diagnosis in HIV-infected children is similar as for HIV-uninfected children;
- ✓ Clinical diagnosis is more difficult especially for PTB as other HIV-related lung disease is common;
- ✓ Management of TB is more complicated in HIV-infected children with significantly poorer outcomes;
- ✓ CPT and ART have a role in reducing TB-related deaths which are especially common within the first months following TB treatment;
- ✓ HIV is a major risk factor for maternal TB;
- ✓ Mothers with TB/HIV are at risk of transmission of TB and HIV to their infant;
- ✓ BCG immunisation should not be given to an HIV-infected infant; and,
- ✓ Preventive therapy is indicated for an HIV-infected child of any age that is a TB contact and does not have active TB.

5.4 WORKSHEET

Module 5: TB/HIV **___/ 20 marks**

1. List 5 points to consider in the assessment of children that are contacts of an adult with TB/HIV (5 marks).
2. List three common clinical symptoms in an HIV-infected child presenting with TB (3 marks).
3. List three reasons why outcome is poorer for HIV-infected children treated for TB (3 marks).
4. List three causes of HIV-related lung disease in children (3 marks).
5. List other therapy that needs to be considered for an HIV-infected child with TB in addition to TB treatment (3 marks).
6. What are the risks for a baby born to a mother with TB/HIV (3 marks).

Use this space to make notes about anything you've learned during this module that you think might be useful.

5.5 Key resources

Abdool Karim SS et al. Timing of Initiation of Antiretroviral Drugs during Tuberculosis Therapy. *N Engl J Med*, 2010; 362:697-706. Abstract

Cain KP et al. An Algorithm for Tuberculosis Screening and Diagnosis in People with HIV. *N Engl J Med*, 2010, 362(8): 707-16. Abstract

Consensus IUATLD statement on the revised World Health Organization recommendations regarding BCG vaccination in HIV-infected infants. Proceedings from the IUATLD BCG Working Group, 38th Union World Lung Conference, Cape Town, 8-12 November 2007. Document

Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Recommendations for a public health approach. World Health Organization, 2013. Document

Graham SM. HIV-related pulmonary disorders: practice issues. *Ann Trop Pediatr*, 2007, 27:243-252. Abstract

Graham SM. Non-tuberculosis opportunistic infections and other lung diseases in HIV-infected infants and children. *Int J Tuberc Lung Dis*, 2005, 9(6):592-602.Abstract

Guidelines for intensified tuberculosis case-finding and isoniazid preventive therapy for people living with HIV in resource-constrained settings. World Health Organization, 2011. Document

Guidance for national tuberculosis and HIV programmes on the management of tuberculosis in HIV-infected children: recommendations for a public health approach. The Union, 2010.Document

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Hesseling AC et al. High Incidence of Tuberculosis among HIV-Infected Infants: Evidence from a South African Population-Based Study Highlights the Need for Improved Tuberculosis control Strategies. *Clin Infect Dis*, 2009, 48(1):108-14. Abstract

HIV-associated TB. Facts 2013. WHO Fact Sheet, 2013. Factsheet

Marais BJ et al. TB and HIV in children – advances in prevention and management. *Paediatr Respir Rev,* 2011, 12(1):39-45. Abstract

Marais BJ et al. Diagnostic and Management Challenges for Childhood Tuberculosis in the Era of HIV. *J Infect Dis*., 2007, 196, Suppl 1:S76-85. Abstract

Marais S et al. HIV-associated tuberculous meningitis – diagnostic and therapeutic challenges. *Tuberculosis (Edinb),* 2010, 90(6):367-74. Abstract

Palme IB et al. Impact of human immunodeficiency virus 1 infection on clinical presentation, treatment outcome and survival in a cohort of Ethiopian children with tuberculosis. *Pediatr Infect Dis J*, 2002, 21:1053-61. Abstract

Walters E. et al. Clinical presentation and outcome of Tuberculosis in Human Immunodeficiency Virus infected children on anti-retroviral therapy. *BMC Pediatrics*, 2008, 8(1). Abstract

WHO Policy on collaborative TB/HIV activities: guidelines for national programmes and other stakeholders. World Health Organization, 2012. Document

MODULE 6: MDR-TB

6.1 Module goals

The primary goals of training are:

- To recognise important steps in the approach to diagnosis and management of a child with suspected drug-resistant TB;
- To understand the guiding principles of treatment of drug resistant TB in children; and,
- To consider approaches to child contacts of drug resistant TB cases.

6.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of management of drug-resistant TB in children. These slides could be adapted for local purposes, for example depending on the possibility for referral and tertiary care management, availability of culture and susceptibility testing, and availability of second-line drugs for treatment. The training module on drug-resistant TB management has been developed primarily to inform the health worker who manages sick children at the district or peripheral health facility level.

Access teaching slides : MDR-TB in children

6.3 Key learning points

The main points of learning are that:

- ✓ Children usually develop drug-resistant TB following infection from a case with drug- resistant TB rather than from failure of previous TB treatment;
- ✓ Drug-resistant TB in children will be common in communities with a high prevalence of drug-resistant TB;
- ✓ Drug-resistant TB should be suspected in any child that is receiving TB treatment and not improving;
- ✓ Children with suspected drug-resistant TB should be referred if possible – for investigation and initial management;
- ✓ Known contact with a drug-resistant TB case and the drug susceptibility pattern of the index case are very important information to guide investigation and management of a child with suspected drug-resistant TB or of a child contact without TB that requires preventive therapy;
- ✓ Investigation of a suspected drug-resistant TB case in a child should always include an attempt to provide information on drug susceptibility;
- ✓ Treatment or preventive therapy will be guided by the results of drug susceptibility in isolates from the child or the contact index case (if results from child not possible);
- ✓ All children with suspected drug-resistant TB should be tested for HIV;
- ✓ Adverse events due to therapy for drug-resistant TB are common and require careful management; and,
- ✓ ART improves outcome for drug-resistant TB in HIV-infected children.

6.4 WORKSHEET

Module 6: MDR-TB in children

Checklist for drug-resistant TB in children:

1. Dosages and regimens for anti-TB treatment in children should follow NTP guidelines.
2. Weight is important for calculating dosages and for monitoring treatment response.
3. All children treated for TB should be registered with the NTP and reported by disease type and within age bands (0-4 years and 5-14 years).
4. Follow-up is critical and treatment outcomes should be recorded as per NTP guidelines.
5. Adherence is a challenge especially during the continuation phase and counseling of child and family about importance of completion of full course of anti-TB treatment is important.

Use this space to make notes about anything you've learned during this module that you think might be useful.

6.5 Key resources

Al-Dabbagh M. et al. Drug-resistant Tuberculosis. Pediatric Guidelines. *Ped Infect Dis J*, 2011, 30(6): 501-5. Abstract

Ettehad D et al. Treatment outcomes for children with multidrug-resistant tuberculosis: a systematic review and meta-analysis. *Lancet Infect Dis*, 2012, 12(6):449-456. Abstract

Fairlie L et al. High prevalence of childhood multi-drug resistant tuberculosis in Johannesburg, South Africa: a cross sectional study. *BMC Infectious Diseases*, 2011, 11:28. Abstract

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Hesseling AC et al. High prevalence of drug resistance amongst HIV-exposed and –infected children in a tuberculosis prevention trial. *Int J Tuberc Lung Dis*, 2012, 16(2):192-195. Abstract

Management of multi-drug resistant tuberculosis in children: a field guide. Boston, MA, Sentinel Project for Pediatric Drug-Resistant Tuberculosis, 2012. Document

Marais BJ et al. Management of Tuberculosis in Children and New Treatment Options. *Infect Disord Drug Targets*, 2011, 11(2):144-156. Abstract

Multidrug-resistant TB (MDR-TB): a 2013 update. Fact sheet. World Health Organization, 2013. Factsheet

Mukinda FK et al. Rise in rifampicin-monoresistant tuberculosis in Western Cape, South Africa. *Int J Tuberc Lung Dis*, 2012, 16(2):196-202. Abstract

Multidrug and extensively drug-resistant TB (M/XDR-TB). 2010 Global Report on Surveillance and Response. World Health Organization, Geneva, 2010. Document

Schaaf HS et al. Management of multidrug-resistant tuberculosis in children: a survival guide for paediatricians. *Paediatr Respir Rev*, 2011 Mar;12(1):31-8. Abstract

Seddon JA et al. Consensus Statement on Research Definitions for Drug-Resistant Tuberculosis in Children. *J Pediatric Infect Dis Soc*, 2013, 2(2):100-109. Abstract

Seddon JA et al. Peadiatric use of second-line anti-tuberculosis agents: A review. *Tuberculosis (Edinb)*,2012,92(1):9-17. Abstract

Seddon JA et al. Culture-Confirmed Multidrug-Resistant Tuberculosis in Children: Clinical Features, Treatment, and Outcome. *Clin Infect Dis* , 2012, 54(2):157-66. Abstract

Zignol M et al. Surveillance of anti-tuberculosis drug resistance in the world: an updated analysis, 2007-2010. *Bull World Health Organ*, 2012, 90:111-119D. Article

MODULE 7: MATERNAL AND INFANT TB (AND HIV)

7.1 Module goals

The primary goals of training are:

- To understand the importance of maternal TB on maternal and child health outcomes;
- To learn an approach to the management of an infant whose mother has TB; and,
- To recognise the rationale and challenges for integrated care.

7.2 Teaching slides and materials

Access teaching slides : Maternal and infant TB

7.3 Key learning points

The main points of learning are that:

✓ Infants born to mothers with TB require management for possible TB infection or disease;

✓ In the context of HIV or drug-resistant TB, there are many additional management issues to consider; and,

✓ Infection control measures are important to reduce transmission of TB in settings such as newborn care facilities and maternal and child health care settings.

7.4 WORKSHEET

Module 7: Maternal and infant TB and TB/HIV

Group exercise:

- List management issues to consider from ante-natal to one year post-natal for a pregnant mother that has TB.

- For each management issue, discuss how and where this service would be best provided in an integrated or family-based approach.

Use this space to make notes about anything you've learned during this module that you think might be useful.

7.5 Key resources

Adhikari M. Tuberculosis and tuberculosis/HIV co-infection in pregnancy. *Semin Fetal Neonatal Med*. ,2009 Aug;14(4):234-40. Abstract

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Guidelines for the management of a newborn infant in contact with a TB . Compiled by the Paediatric HIV/TB Policy Reference Group, Western Cape Department of Health, 2010 (Adapted from South African National Tuberculosis Management Guidelines, 2008.) Document

Gupta A et al. Maternal Tuberculosis: A Risk Factor for Mother-to-Child Transmission of Human Immunodeficiency Virus. *J Infect Dis,* 2011, 203(3):358-63. Abstract

Gupta A et al. Postpartum Tuberculosis Incidence and Mortality among HIV-Infected Women and Their Infants in Pune, India, 2002-2005. *Clin Infect Dis*, 2007, 45(2):241-9. Abstract

MODULE 8: CHILD TB AND THE INTEGRATED MANAGEMENT OF CHILDHOOD ILLNESS (IMCI)

8.1 Module goals

The primary goals of training are:

- To understand the common clinical presentations of TB in children;
- To develop a structured approach to the diagnosis and management of TB in a HIV-uninfected or HIV-infected child; and,
- To understand the principles and approaches to child contact management.

8.2 Teaching slides and materials

Access teaching slides : Childhood TB management and IMCI

8.3 Key learning points

The main points of learning are that:

- ✓ Tuberculosis in children is common wherever TB is common in adults;
- ✓ TB is an important cause of illness and death in children;
- ✓ History of possible contact with a TB case is an important step in assessment of a child with possible TB;
- ✓ TB in children presents in a wide variety of clinical syndromes - common forms include pulmonary TB and TB lymph nodes;
- ✓ Common clinical scenarios for the presentation of TB include persistent respiratory symptoms or weight loss;
- ✓ Many child TB cases can be successfully managed as an outpatient;
- ✓ HIV test should be routine in assessment of a child with suspected TB; and,
- ✓ All children treated for TB should be registered with NTP.

8.4 WORKSHEET

Module 8: Child TB and IMCI

1. List 3 common clinical presentations of pulmonary TB in a child.
2. List 3 common clinical presentations of extrapulmonary TB in a child.
3. What additional epidemiological information should always be sought when TB is suspected in a child?
4. TB can be present in a child who has presented with acute severe pneumonia or malnutrition. Describe your management approach and challenges if TB is suspected in these children.

Use this space to make notes about anything you've learned during this module that you think might be useful.

8.5 Key resources

Documents on the Integrated Management of Childhood Illness (IMCI). World Health Organization, 2014. Document

MODULE 9: CHILD TB MANAGEMENT AND THE NTP

9.1 Module goals

The primary goals of training are:

- To understand the importance of child TB as a public health problem;
- To recognise the main differences in management of child TB compared to adult TB; and,
- To understand the rationale for child TB prevention and management.

9.2 Teaching slides and materials

This module includes slides that illustrate the main aspects of the management of child TB that should be practiced by NTP staff. These slides could be adapted for local purposes, so that it was consistent with national TB programme guidelines, including for monitoring and evaluation purposes. Explanations of the slides are provided when necessary in the text box below the slide. The training module on diagnosis has been developed for the NTP staff that is responsible for NTP aspects of child TB management. The focus is on the management aspects of children that might differ or complement that of managing adults with TB.

Access teaching slides :

Module 9a: NTP and child TB
Module 9b: Community-based child TB management

9.3 Key learning points

The main points of learning are that:

- ✓ All children started on TB treatment should be registered;
- ✓ Child TB data are vitally important for monitoring and evaluation of child TB activities by NTP;
- ✓ NTP data should include children by age groups, disease types and outcomes;
- ✓ The main effectiveness of neonatal BCG is prevention of severe, disseminated disease in infants and young children;
- ✓ Child contact screening and management is a means of case-finding suspected TB cases of any age;
- ✓ Children should be treated with regimens and dosages according to national guidelines;
- ✓ Drug dosages are calculated according to weight (not age);
- ✓ Implementation of effective child TB activities by NTP requires clear, up-to-date and locally relevant guidelines;
- ✓ Child TB activities can be integrated into NTP activities facilitated by a designated child TB working group; and,
- ✓ Evaluation of child TB activities is an important potential area for operational research by NTP.

9.4 WORKSHEET

Module 1: Epidemiology **___/ 10 marks**

1. List at least 5 reasons why registration and reporting of all childhood TB cases including by age, type and outcome is important.

2. Identify common challenges and solutions to improve NTP data reporting child TB cases in your setting.

3. Exercise: provide a dosing chart of young children by weight band in your setting using currently available drugs.

4. List 3 current challenges or knowledge gaps that could benefit from operational research.

Use this space to make notes about anything you've learned during this module that you think might be useful.

9.5 Key resources

Combatting Tuberculosis in Children. Fact Sheet. World Health Organization, 2013. Factsheet

Desk guide for diagnosis and management of TB in children. The Union, 2010. Document

Early detection and prevention of TB in children. IEC materials for childhood TB. KNCV Tuberculosis Foundation, 2014. Document

Guidance for national tuberculosis programmes on the management of tuberculosis in children. Second edition. World Health Organization, 2014. Document

Guidance on Ethics of Tuberculosis Prevention, Care and Control. World Health Organization, 2010. Document

Implementing the Stop TB Strategy: A handbook for national tuberculosis control programmes. World Health Organization, 2008. Document

Marais BJ et al. The burden of childhood tuberculosis and the accuracy of community-based surveillance data. *Int J Tuberc Lung Dis*, 2006, 10(3):259-263. Abstract

Roadmap for Childhood TB: Towards Zero Deaths. World Health Organization, 2013. Document

The Global Plan to stop TB 2011-2015: transforming the fight towards elimination of tuberculosis. World Health Organization, Geneva, 2010. Document

MODULE 10:

EVALUATION OF CHILD TB MANAGEMENT

10.1 Module goals

The primary goals of training are:

- To identify priorities for implementation and set a research plan;
- To understand the principles of operational research; and,
- To understand the methodology of operational research.

1.2 Teaching slides and materials

Access teaching slides : Evaluation of child TB management

Course evaluation materials

10.3 Key learning points

The main points of learning are that:

- ✓ It is important to evaluate implementation of TB control activities in children;
- ✓ Operational research is a way to self-assess and optimize implementation of childhood TB activities; and,
- ✓ NTP data has a critical role in the evaluation process.

1.4 WORKSHEET

Use this space to make notes about anything you've learned during this module that you think might be useful.

10.5 Key resources

An International Roadmap for Tuberculosis Research. Towards a world free of tuberculosis. World Health Organization, 2011. Document

A research agenda for childhood tuberculosis. Improving the management of childhood tuberculosis within national tuberculosis programmes: research priorities based on a literature review. World Health Organization, 2007. Document

Asking the right questions: Advancing an HIV research agenda for Women and Children. Consensus Statement. International AIDS Society, 2010. Document

Addo KK et al. Situation analysis of TB microscopy centres in Ghana. *Int J Tuberc Lung Dis*, 2006, 10(8):870-875. Abstract

Compendium of Indicators for Monitoring and Evaluating National Tuberculosis Programs. World Health Organization, 2004. Document

Corbett EL et al. Comparison of two active case-finding strategies for community-based diagnosis of symptomatic smear-positive tuberculosis and control of infectious tuberculosis in Harare, Zimbabwe (DETECTB): a cluster-randomised trial. *Lancet*, 2010, 376(9748):1244-53. Abstract

Desk guide for diagnosis and management of TB in children. The Union, 2010. Document

Early detection and prevention of TB in children. IEC materials for childhood TB as developed by NTP Viet Nam in collaboration with the KNCV Tuberculosis Foundation, 2014. Document

Framework for Operations and Implementation Research in Health and Disease Control Programs. The Global Fund to fight AIDS, TB and Malaria, 2008. Document

*Global Tuberculosis Report 2013.*World Health Organization, 2013. Document

Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children: second edition. World Health Organization, 2014. Document

Guidance on ethics of tuberculosis prevention, care and control. World Health Organization, 2010. Document

Guide de diagnostic et de prise en charge de la tuberculose chez l'enfant. Union Internationale Contre la Tuberculose et les Maladies respiratoires, 2010. Document

Hane F et al. Identifying barriers to effective tuberculosis control in Senegal: an anthropological approach. *Int J Tuberc Lung Dis*, 2007, 11(5):539-543. Abstract

Harries AD et al. The Union and Médecins Sans Frontières approach to operational research. *Int J Tuberc Lung Dis*, 2011, 15(2):144-154. Abstract

Harries AD et all. Childhood tuberculosis in Malawi: nationwide case-finding and treatment outcomes. *Int J Tuberc Lung Dis*, 2002, 6(5):424-431. Abstract

Hill PC et al. Risk factors for defaulting from tuberculosis treatment: a prospective cohort study of 301 cases in The Gambia. *Int J Tuberc Lung Dis*, 2005, 9(12):1349-1354. Abstract

Implementing Operational Research in Global Fund-supported disease control programmes: Strategic and managerial guide for applicants. The Global Fund, 2007. Document

Implementing the Stop TB Strategy: A handbook for national tuberculosis control programmes. World Health Organization, 2008. Document

Mann GH et al. The role of health economics research in implementation research for health systems strengthening. *Int J Tuberc Lung Dis*, 2011, 15(6):715-721. Abstract

Marais BJ et al. The burden of childhood tuberculosis and the accuracy of community-based surveillance data. *Int J Tuberc Lung Dis*, 2006, 10(3):259-263. Abstract

Monitoring and evaluation toolkit. HIV, Tuberculosis and Malaria and Health Systems Strengthening. Part 3: Tuberculosis. Fourth Edition. The Global Fund to fight AIDS, Tuberculosis and Malaria, 2011. Document

Looking beyond 2015. Proposed Global Strategy and targets for tuberculosis prevention, care and control after 2015. World Health Organization, 2014. Document

Priorities in operational research to improve tuberculosis care and control. World Health Organization, Geneva, 2011. Document

Rocha C et al. The Innovative Socio-economic Interventions Against Tuberculosis (ISIAT) project: an operational assessment. *Int J Tuberc Lung Dis*, 2011, 15(5):S50-S57. Abstract

Squire SB et al. Making innovations accessible to the poor through implementation research. *Int J Tuberc Lung Dis, 2011*, 15(7):862-870. Abstract

The Global Plan to stop TB 2011-2015: transforming the fight towards elimination of tuberculosis. World Health Organization, Geneva, 2010. Document

The Stop TB Strategy. Building on and enhancing DOTS to meeting the TB-related Millennium Development Goals. World Health Organization, 2006. Document

Tuberculosis: A comprehensive clinical reference. Schaaf HS, Zumla A (Eds). Elsevier, 2009. Hyperlink

Ukwaja KN et al. The economic burden of tuberculosis care for patients and households in Africa: a systematic review. *Int J Tuberc Lung Dis*, 2012, 16(6):733-9. Abstract

ISBN 978 92 4 150778 3