National Guidelines and Operational Manual for Tuberculosis Control

Fourth Edition

National Tuberculosis Control Programme
Directorate General of Health Services
Dhaka, Bangladesh

World Health Organization
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Contents

Abbreviation

AFB	=	Acid-Fast Bacilli
AHI	=	Assistant Health Inspector
ACSM	=	Advocacy, Communication and Social Mobilization
BCC	=	Behavioral Change Communication
CDC	=	Chest Disease Clinic
CNS	=	Central Nervous System
CHW	=	Community Health Worker
DGHS	=	Directorate General of Health Services
DOT	=	Directly Observed Treatment
DOTS	=	Directly Observed Treatment Short Course
DPM	=	Deputy Program Manager
EPTB	=	Extra-Pulmonary Tuberculosis
ESP	=	Essential Services Package
FNAC	=	Fine Needle Aspiration Cytology
FDC	=	Fixed-Dose Combination
HA	=	Health Assistant
HRD	=	Human Resource Development
HI	=	Health Inspector
HE	=	Health Educator
HIV	=	Human Immuno-deficiency Virus
HPSP	=	Health and Population Sector Program
HNPSP	=	Health, Nutrition and Population Sector Program
HW	=	Health Worker
ICDDR,B	=	International Centre for Diarrhoeral Disease and Research, Bangladesh
IUATLD	=	International Union Against Tuberculosis and Lung Disease (The Union)
MA	=	Medical Assistant
MDR-TB	=	Multi Drug - ResistantTuberculosis
MoHFW	=	Ministry of Health and Family Welfare
NCHS	=	National Center for Health Statistics
MT	=	Mantoux test
NIDCH	=	National Institute of Diseases of Chest and Hospital
NGO	=	Nongovernmental Organization
NTP	=	National Tuberculosis Control Program
PM	=	Program Manager
PHC	=	Primary Health Care
PTB	=	Pulmonary Tuberculosis
PPM	=	Public Private Mix
PO	=	Program Organizer
TB	=	Tuberculosis
E	=	Ethambutol
H	=	Isoniazid
R	=	Rifampicin
S	=	Streptomycin
Z	=	Pyrazinamide
SCC	=	Short Course Chemotherapy
TBM	=	Tubercular Meningitis
TLCA	=	Tuberculosis and Leprosy Control Assistant
UHC	=	Upazila Health Complex
UH&FPO	=	Upazila Health and Family Planning Officer
VD	=	Village Doctor
WHO	=	World Health Organization

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Message

Tuberculosis is a major public health problem in Bangladesh. According to present estimation, over 300,000 people fall ill of tuberculosis each year and 65,000 die due to tuberculosis in Bangladesh.

The world Health Organizaiton (WHO) recommends the stop TB strategy to control TB and prevent MDR-TB (Multi-drug resistant TB). Currently the National TB Control Program in its "Strategy Plan for TB Control (2006-10)" recognizes the six components of this "Sop TB Strategy" and is committed to implement these for effective and successful control of tuberculosis to reach MDGs by the year 2015.

The technical aspects of TB control through DOTS concern case finding, diagnosis, treatment, recording & reporting. The operational aspect relate to supervision, supply of drugs and other materials, and monitoring. Diagnosis and treatment of children have been revised in this version of the manual. The revised treatment regimens have also been included in these guidelines and are expected to strengthen the collaboration between clinicians, the NTP and its partners.

Separate chapters are also included for MDR-TB, Infection Control, TB/HIV. PPM and ACSM.

I whole-heartedly recommend this NTP guideline for intensive use during day-to-day work, for training, health education and as a reference for medical officers, paramedical staff and managers working in public as well as private sectors.

19.03.09

(Shaikh Altaf Ali)
Secretary
Ministry of Health and Family Welfare
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Message

Tuberculosis is an ancient disease, which is still a major public health challenge in Bangladesh. The problem is aggravated by the increasing population density, rapid urbanization, poverty and illiteracy.

The National Tuberculosis Control Programme (NTP) has achieved 92% treatment success rate of the TB patients diagnosed during 2006, against the target of 85%, and the case detection rate of 72% in 2007 against the target of 70%.

The World Health Organization (WHO) recommends the Stop TB strategy which builds on the Directly Observed Treatment Short Course (DOTS) strategy, DOTS was adopted for field implementation at the end of 1993. It has proven to be very effective in curing patients through ensuring adherence to treatment.

The most cost-effective public health measure for the control of tuberculosis is effective identification and cure of infectious patients. The present treatment strategy is based on standardized short-course chemotherapy regimens and effective management to ensure completion of treatment and cure. Currently, the National TB Control Programme is also emphasizing the diagnosis and treatment of pulmonary smear negative, extra-pulmonary TB and childhood tuberculosis.

This National Guidelines for Control of Tuberculosis describes the technical aspect of case detection, treatment, supervision, supplies, recording, reporting, monitoring and evaluation for effective control of tuberculosis in Bangladesh.

I sincerely acknowledge and appreciate the efforts of the National Tuberculosis Control Program and its implementing partners in preparation of these guidelines. I would like to express my earnest thanks to WHO for technical support in preparation of this document.

Prof. Shah Monir Hossain
Director-General
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ACKNOWLEDGEMENT

Tuberculosis is a disease that had for centuries struck millions of men, women and children all over the world. It remains one of the most defiant public health problems of our times, killing more adults then any other infectious disease. Bangladesh ranks sixth in the global list of 22 countries with the highest burden of tuberculosis.

The WHO estimates for 2007 suggest that daily about 880 new TB cases and 176 TB deaths occur in Bangladesh. The estimated number of people suffering from active TB disease (all types) is about 391/100 000 population.

At present, the country's DOTS coverage is geo-administratively 100%. Free-of-charge diagnostic and treatment services for TB are now available in all upazila health complexes, chest disease clinics, urban clinics, chest disease hospitals, public and private medical colleges, sadar hospitals, defense hospitals, prisons and workplaces.

The program is maintaining treatment success rates of over 85% since 2003 and had detected over 72% of the estimated new smear posotive cases in 2007.

The Government of Bangladesh, together with its many and diverse partners from the public and private sectors, is committed to further intensify the DOTS programme in order to sustain the achieved success and to reach the TB control targets linked to the Millennium Development Goals (MDGs).
The overall goal of TB control is to reduce morbidity, mortality and transmission of TB until it is no longer a public health problem.

I expect that this fourth edition of the National Guidelines and Operational Manual for Tuberculosis Control will be instrumental for all professionals of the public and private health care providers involved in the National Tuberculosis Control Programme Bangladesh. This guideline provides valuable guidance for all the implementing partners for quality implementation of the NTP policies.

The NTP acknowledges the endeavors and contributions received from the Hon'ble Advisor, to the Ministry of Health and Family Welfare (MOH&FW); Secretary, MOH&FW; and Director-General of Health services for their guidance and support in implementing the TB Control Programme. NTP also recognize contribution of the Global fund to fight HIV/AIDS, Tuberculosis and Malaria (GFATM) for the control of Tuberculosis in Bangladesh.

I express my sincere thanks and gratefulness on behalf of the MBDC directorate for the working team of NTP and WHO and other experts of partners and stakeholders who contributed much for developing these guidelines.

(Prof. (Dr.) Pravat Chandra Barua)
Director MBDC and Line Director TB Control and
Leprosy Elimination Programme DGHS, Mohakhali, Dhaka.

ACKNOWLEDGEMENT

To combat tuberculosis that is recognized as a public health problem and one of the leading causes of death in Bangladesh, the National Tuberculosis Control Programme (NTP) adopted the internationally recommended DOTS strategy since 1993 as well the Stop TB Strategy in its " Strategic Plan for TB Control (2006-2010)".

The NTP aims to strengthen TB control efforts through effective partnerships, mobilization of resources and ensuring quality diagnostic and treatment services under defined DOTS strategy. The NTP strives to make services equally available to all people in Bangladesh irrespective of age, sex, religion, ethnicity, social status or race.

Since the introduction of DOTS in Bangladesh, remarkable progress in TB control has been made in terms of coverage, detection of TB cases and treatment success. The partnership between government and NGO's was instrumental for such achievement.

The NTP emphasizes on quality implementation of TB activities. I am sure that this fourth edition of the National Guidelines and Operational Manual for Turberculosis Control will help all professionals and health care providers at all levels to implement TB control activities from a common platfrom.

This document has developed through support from the Global fund to fight against AIDS, Tuberculosis and Malaria (GFATM), which will be used effectively to ensure high quality TB services.

I would like to express my sincere thanks and gratefulness on behalf of National Tuberculosis Control Programme for the TB team members and other experts who assisted in updating these guidelines. I acknowledege the technical support of WHO in the preparation of this guidelines.

I strongly recommend this document for intensive use during day-to-day practice, training, health education, supervision, monitoring and evaluation of TB control activities and as a reference for managers, administrators, medical and paramedical staff working in public and private sectors for implementation of TB control policy.

(Dr.'Md. Nazrul Islam)
Programme Manager
National Tuberculosis Control Programme

FOREWORD

World Health Organization
Country Office for Bangladesh

Tuberculosis (TB) is the leading cause of death among adults in developing countries due to a single infectious agent. Worldwide every year about eight million people develop TB disease. Almost two million people die annually of this disease, in spite of the avilability of highly effective treatment. Successful TB control measures are of extreme importance for the epidemic to be halted.

TB control largely depends on standardized procedures as well as adequate managerial capacity to implement these countrywide. The results of the DOTS strategy which has been implemented for more than a decade now in Bangladesh are very encouraging. The Stop TB Strategy builds on and expands the scope of the DOTS strategy. The National TB Control Programme rightfully emphasize on the management of drug-resistant tuberculosis, infection control, TB/HIV as well as public-private partnerships and advocacy, communication and social mobilization to reach the Millennium Development Goals by the year 2015.

WHO is committed to continue providing technical assistance to the National TB Control Programme.

I expect that these guidelines will be instrumental for all health care providers involved in the National Tuberculosis Control Programme of Bangladesh.

D. Sungkhobol

Dr Duangvadee Sungkhobol
WHO Representative

1 INTRODUCTION

1.1 Background

Tuberculosis (TB) is a major public health problem in Bangladesh since long. Estimates suggest that daily about 880 new TB cases and 176 TB deaths occur in the country.

Nearly one-third of the global population, i.e. two billion people, is infected with Mycobacterium tuberculosis and thus at risk of developing the disease. More than nine million people develop active TB every year and about two million die. More than 90% of global TB cases and deaths occur in the developing world, where 75% of cases are in the most economically productive age group (15-54 years) .

In 1993 the World Health Organization (WHO) declared TB as a global emergency and recommended a standard strategy for control of the disease known as "DOTS" or Directly Observed Treatment, Short course.

Under the Mycobacterial Disease Control (MBDC) Directorate of the Directorate-General of Health Services (DGHS), the National Tuberculosis Control Programme (NTP) adopted the DOTS strategy during the Fourth Health and Population Sector Programme (1992-98) under the project "Further Development of TB and Leprosy Control Services". The NTP started its field implementation in November 1993 in four thanas (upazilas) and progressively expanded to cover all upazilas by June 1998. NGO partners were involved from the inception of DOTS in the country. In July 1998, the NTP was integrated within the component of the Essential Services Package under Primary Health Care of Health and Population Sector Program (HPSP). In 2003, HPSP was renamed "Health, Nutrition and Population Sector Program" (HNPSP). Tuberculosis control and leprosy elimination started functioning again under MBDC.

NTP expanded its collaboration with other public and private health care providers. The DOTS strategy was rolled out to all metropolitan cities in collaboration with different NGOs. Administrative DOTS coverage is considered universal in the country.

The Government of Bangladesh, together with diverse partners from the public and private sectors, is committed to further strengthen the TB control programme. It has adopted the Stop TB strategy in 2006 aiming strengthening quality DOTS, addressing MDR-TB and TB-HIV, engaging all care providers, strengthening health systems, empowering people and the community and undertaking operational research. This was initiated with a view of sustaining the achievements of the past years and reaching the TB control targets linked to the Millennium Development Goals (MDGs).

1.2 Vision Statement of the National TB Control Programme

Tuberculosis is no more a public health problem in Bangladesh.

[1] Source: Global Tuberculosis Report (2008)

1.3 Mission Statement of the National TB Control Programme

The NTP aims to strengthen TB control efforts through establishing effective partnerships, mobilizing necessary resources and ensuring quality diagnostic and treatment services under DOTS strategy. It strives to make services equally available to all people in Bangladesh irrespective of age, sex, religion, ethnicity, social status or race.

1.4 Goal of Tuberculosis Control

The overall goal of TB control is to reduce morbidity, mortality and transmission of TB until it is no longer a public health problem.

1.5 Objectives of the National Tuberculosis Control Programme

The objectives of NTP are:

- To sustain the global targets of achieving at least 70% case detection and 85% treatment success among smear-positive TB cases under DOTS for the country as a whole;

  in order to then

- Reach the interim target of halving the TB death and TB prevalence rates by 2010 towards achieving a reduction of incidence of TB as stated under the MDGs by 2015.

1.6 Strategies for Control of Tuberculosis

DOTS an internationally recommended brand for TB control is the most effective strategy available for controlling TB epidemic. The NTP of Bangladesh follows this strategy to achieve its objectives and targets. DOTS have the following five components:

- Political commitment with increased and sustained financing;
- Case detection through quality-assured bacteriology;
- Standardized treatment with supervision and patient support ;
- An effective drug supply and management system;
- Monitoring and evaluation system and impact measurement.

In order to achieve the TB targets set under the Millennium Development Goals, Bangladesh is in the process of expanding the scope of services in line with the Stop TB strategy. The Stop TB strategy consists of six elements:

- Pursue high quality DOTS expansion and enhancement;
- Address TB/HIV, MDR/XDR-TB and other challenges;
- Contribute to health systems strengthening;
- Engage all care providers;
- Empower people with TB and communities;
- Enable and promote research.

1.7 Activities of NTP

To achieve the objectives, the main activities of the NTP are:

- Developing policies, strategies and guidelines for TB control
- Planning and budgeting for TB control activities
- Developing human resources for TB control including training
- Promoting early detection of smear-positive patients at all levels of the health services
- Implementing quality assurance system for smear microscopy
- Diagnosing smear-negative , extra-pulmonary and childhood TB
- Ensuring Directly Observed Treatment (DOT) through community participation and involvement of government and nongovernmental health care providers
- Ensuring uninterrupted supply of drugs, laboratory equipments and consumables and other logistics
- Implementing standardized recording and reporting systems
- Involving academic medical institutes and hospitals, private practitioners, special services like prisons, defense, industries and other corporate sectors in the NTP
- Strengthening cooperation and collaboration between the government of Bangladesh and nongovernmental organizations (NGOs) involved in control of tuberculosis
- Conducting regular supervisions, monitoring and evaluation of NTP thus measuring impact of interventions
- Ensuring programmatic management of drug-resistant TB
- Establishing linkage for management of TB-HIV co-infection
- Maintaining liaison with development partners and establishing intersectoral and interministerial collaboration
- Carrying out operational research related to TB control

2 GENERAL INFORMATI0N ABOUT TUBERCULOSIS

2.1 Definition of tuberculosis

Tuberculosis is an infectious disease, caused by the bacillus called Mycobacterium tuberculosis. The bacilli usually enter the body by inhalation through the lungs and spread to other parts of the body via the blood stream, the lymphatic system, or through direct extension to other organs.

Tuberculosis of the lungs or pulmonary tuberculosis is the most common form of TB and occurs in about 80% of cases. Extra-pulmonary tuberculosis can affect any part of the body other than lungs.

2.2 Difference between TB infection and TB disease

2.2.1 TB infection

TB spreads through droplet infection. TB bacilli stay suspended in the air as droplets. Healthy people become infected with TB through inhalation of the droplets containing TB bacilli. Around 90% of the infected people do not progress to TB disease because of their immunity.

People with TB infection usually (1) do not have symptoms;
(2) do not feel sick;
(3) cannot spread TB to others; but
(4) May have a positive skin test (Mantoux test).

2.2.2 TB disease

Around 10% of the people infected with TB bacilli may progress to TB disease in their lifetime. TB bacilli multiply in their lungs or other organs and produce the symptoms and signs. TB disease means TB infection plus presence of signs and symptoms of TB. (sec 2.4).

2.3 Spread of tuberculous bacilli

Patients with pulmonary tuberculosis who cough up TB bacill through coughing, sneezing and spitting are the main source of TB infection. Presence of TB bacilli in the sputum can be identified on microscopic examination of sputum specimens. Such patients whose sputum contains TB bacilli are known as ***smear- positive cases.***

If the bacilli cannot be identified on microscopy examination of sputum specimens of pulmonary cases, the patients are known as ***smear-negative cases.*** In contrast to smear-positive cases, smear-negative cases are less infectious and the disease is usually less severe. Extra-pulmonary cases are almost never infectious, unless they have pulmonary tuberculosis as well.

An infectious tuberculosis patient expels TB bacilli into the air through tiny droplets during coughing and sneezing. These droplets dry quickly, become droplet nuclei carrying the bacilli, and may remain suspended in the air for several hours. Infection occurs if the inhaled bacilli in these droplet nuclei enter and settle in the lungs of a healthy person and begin to multiply.

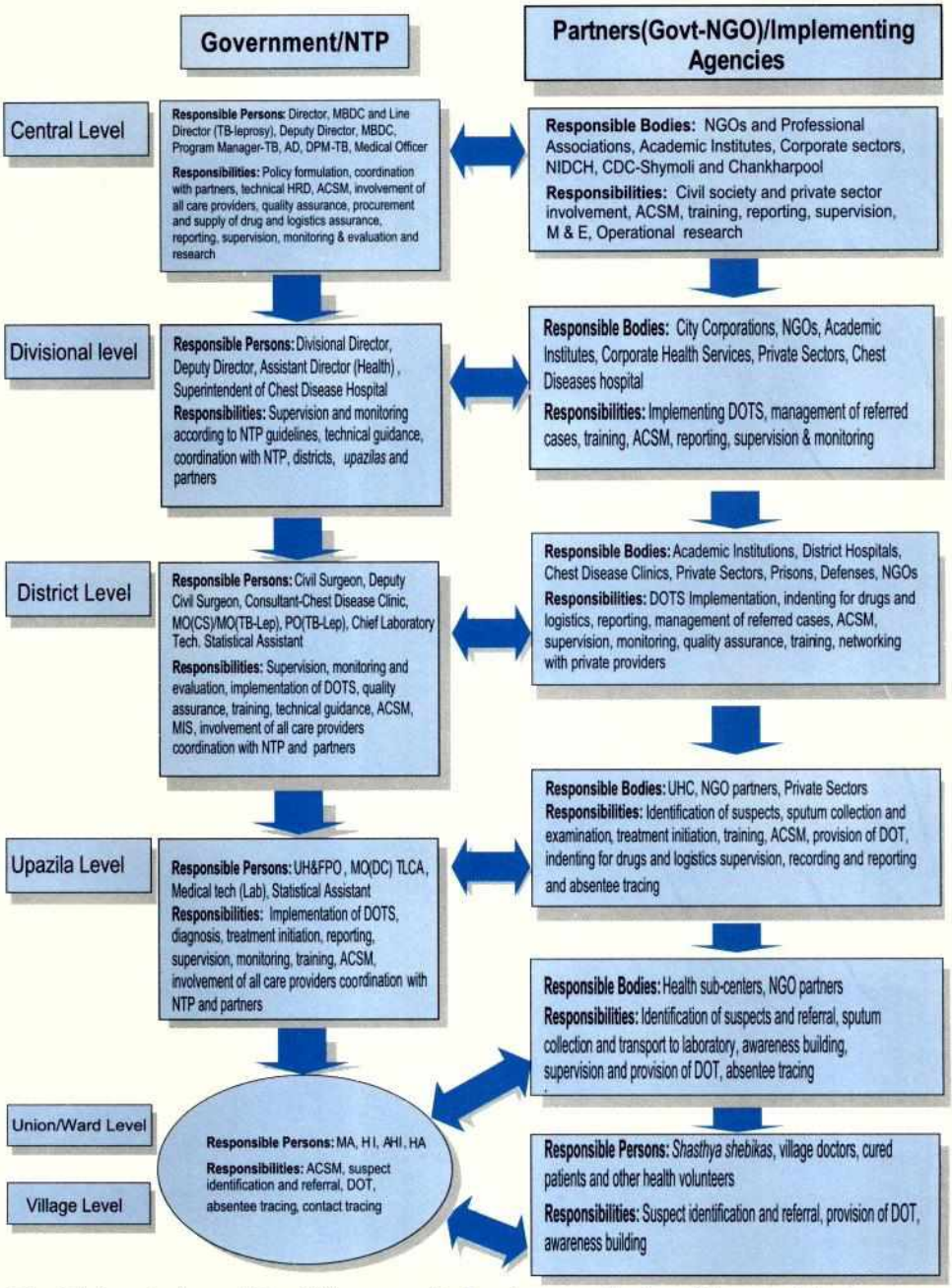
The degree of exposure is extensive for those who are in close and prolonged contact with an infectious case (i.e. persons who are living in the same household with infectious TB cases).

The bacilli are rapidly destroyed by exposure to sunlight and their concentration in the air is reduced by good ventilation.

2.4 Development of tuberculosis

If the body immune mechanism is not seriously compromised, approximately 90% of the infected cases will not develop tuberculosis disease; in this case the bacilli usually remain dormant within the body. The remaining 10% of infected individuals will subsequently develop disease, half of them shortly after infection, the other half later in their life.

3 STRUCTURE OF THE NATIONAL TUBERCULOSIS CONTROL PROGRAMME (NTP) OF BANGLADESH AND ITS PARTNERS



The job descriptions of the different medical and paramedical staff involved in the NTP are given in Annex 1 (A-H).

4 CASE FINDING AND DIAGNOSIS OF TUBERCULOSIS

4.1 Signs and symptoms of TB

The highest priority for TB control is identification and successful treatment of patients who are suffering from smear-positive pulmonary TB.

Pulmonary TB should be **suspected** in a person who presents with persistent cough for three weeks or more, with or without production of sputum despite the administration of a non-specific antibiotic.

Often a patient with pulmonary TB has one or more of the following symptoms in addition to cough:

- Respiratory symptoms: shortness of breath, chest pain, coughing up of blood
- General symptoms: loss of weight, loss of appetite, fever, night sweats

Sputum microscopy for AFB should always be requested for a patient, who has cough for three weeks or longer, even in the absence of any other symptoms.

Signs and symptoms of extra-pulmonary TB depend on the site involved. Most common examples are:

- TB lymph adenitis: swelling of lymph nodes
- Pleural effusion: fever, chest pain, shortness of breath
- TB arthritis: pain and swelling of joints
- TB of the spine: radiological findings with or without loss of function
- Meningitis: headache, fever, stiffness of neck and subsequent mental confusion

The diagnosis of extra-pulmonary TB should always be made by a graduate physician or specialist and often requires special examinations such as X-ray, biopsies, Fine Needle Aspiration Cytology (FNAC), etc.

4.2 Method of case finding

The most important method of case finding is identification of suspects at a health facility, on their own initiative or referred by another health facility, health worker, community volunteer, etc.

Patients diagnosed with any form of TB should always be asked whether there is anybody living in the same house that has chronic cough and be encouraged to bring or send that person to the health facility for sputum examination.

4.3 Organization of case finding by medical staff and non-medical individuals

4.3.1 By medical staff

Selection of people symptomatic for TB referred by different health providers and volunteers and arranging for examination of their sputum is the responsibility of medical doctors of governmental health facilities and NGO facilities involved in the NTP. In addition, treatment and registration is the responsibility of medical doctors of academic institutes, prisons, defense, corporate sectors and private practitioners directly collaborating with the NTP or through partner NGOs.

4.3.2 By non-medical persons

Community participation plays an important role in identification of TB suspects and motivating them to have their sputum examined or to visit a health facility for diagnosis.

Non-medical community members include the following persons:

- Village doctors
- Cured patients and patients under treatment
- Shasthya shebikas or volunteers
- Other important persons in the community such as religious and village leaders, political leaders, members of union councils, school teachers and persons who have close communication with women in the community.

4.4 Diagnosis

4.4.1 Tools for diagnosis of TB

Sputum smear examination

The most cost-effective tool for screening pulmonary TB suspects is microscopy examination of their sputum by the Ziehl-Neelsen method. Over 65% of pulmonary TB patients are smear-positive and will be detected by this method. In the remaining pulmonary TB patients, the number of bacilli in their sputum is too low to be detected through this method. Sputum examination is the most reliable procedure for diagnosis of TB.

Radiological (X-ray) examination of the lungs

Chest X-Ray findings do not specifically indicate pulmonary tuberculosis because there are other chest diseases which may show the same changes on X-ray. Chest X-ray findings suggestive of pulmonary tuberculosis in patients with smear-negative microscopy should always be supported by clinical findings. A qualified physician should decide on the diagnosis of TB.

Tuberculin skin test (Mantoux Test)

This test is only used for supporting TB diagnosis in young children. (see details in children tuberculosis section)

In populations with a high TB prevalence, the tuberculin skin test is of little value in the diagnosis of TB disease in adults. A positive tuberculin skin test does not by itself differentiate *M. tuberculosis* infection from TB disease. Previous exposure to environmental mycobacteria may also result in a false-positive test result. With increasing age an increasing percentage of the population will have infection with *M. tuberculosis* (almost 100% at the age of 40-50 years) and 90% of them would not develop TB disease. Hence, diagnosis of TB based on Mantoux test will lead to over-diagnosis of many patients. Conversely, the tuberculin skin test result may be negative, even when the patient has TB. Conditions often associated with a false-negative tuberculin skin test include severe malnutrition, miliary TB, HIV infection and other immuno-compromised condition.

Culture of TB bacilli

Culture is more sensitive than smear microscopy, detecting a higher proportion of patients among suspects. If resources permit and adequate, quality-assured laboratory facilities are available, culture should be included in the algorithm for evaluating patients with negative sputum smears. However, it takes about six weeks to provide a definite result, and is not accessible to most patients. Therefore, it is unsuitable as routine procedure. The probability of finding acid-fast bacilli in sputum smears by microscopy is directly related to the concentrations of bacilli in the sputum. Sputum microscopy is likely to be positive when there are at least 10,000 organisms per ml of sputum. At concentrations below 1000 organisms per ml of the sputum, the chance of observing acid-fast bacilli in a smear is less than 10%. In contrast, a properly performed culture can detect organism even concentrations below 100 organisms per ml.

FNAC and Biopsy

These are special tests performed to confirm extra pulmonary TB thus to be referred to concerned specialists.

4.4.2 Examination of sputum specimens

Microscopy should be performed on three sputum specimens, as follows:

- "On-the-spot" specimen: the first specimen is collected on the spot when a patient is identified as a pulmonary TB suspect (Spot-I specimen);
- Early morning specimen: the patient is given a sputum container to collect the second specimen at home on the following morning (Early Morning Specimen);
- A second "on-the-spot" specimen: the third specimen is collected when the patient returns to the health facility with the early morning specimen (Spot-II specimen);

The responsible medical officer or paramedic/laboratory technologist should provide clear instruction to the patient on how to collect the sputum: in the open air and as far as possible away

from other people. If the patient attends a centre where microscopy facilities are available, he/she should either be instructed to bring the specimens to the responsible medical officer or paramedic or directly to the laboratory. If the patient attends a centre without microscopy facility, the responsible staff should ensure that the three sputum specimens are brought within five days after collection to the microscopy centre.

To increase accessibility to diagnostic services, outreach sputum collection centres are organized by NGOs with support of government field staff at Union Health and Family Welfare Centres or other suitable places. If the patient attends an outreach center, he/she should be instructed one day earlier to bring the two sputum specimens (evening and early morning sputum samples) and produce another specimen on the spot.

4.5 Case definitions

Diagnosis of TB should be followed by specification of the type of TB or case definition.

Case definition takes the following into account:

- The anatomical site of disease (pulmonary or extra-pulmonary)
- The bacteriological results (smear-positive or smear-negative)
- The history of previous treatment (new or retreatment)

Case definition is necessary for:

- Correct choice of standard regimen
- Correct patient registration and reporting
- Cohort analysis
- Determining trends in the proportions of the different types of patients

4.5.1 Anatomical site of the disease

The categories by anatomical site are **pulmonary** and **extra-pulmonary TB.**

Pulmonary TB

Pulmonary TB refers to disease affecting the lung parenchyma.

Extra-pulmonary TB

Extra-pulmonary TB refers to tuberculosis of organs other than the lungs only. TB may affect any organ or tissue. Examples are: mediastinal and/or hilar lymph nodes, larynx, cervical lymph nodes, pleurae, meninges, central nervous system, spine, bones and joints, kidneys, pericardium, intestines, peritoneum and skin.

In miliary TB, there is acute haematogenous spread. Miliary tuberculosis is classified as pulmonary TB because there are lesions in the lungs.

Patients diagnosed with both pulmonary and extra-pulmonary TB should be classified as pulmonary TB

4.5.2 Bacteriological status

Pulmonary TB is divided into smear-positive and smear-negative pulmonary cases. Smear-positive cases represent 65-70% of all pulmonary cases and more than 50% of all TB cases. (see also 2.3)

Defining the smear status in pulmonary cases is important to:

- ✓ Identify smear-positive cases. These patients are the most infectious cases and usually have higher mortality;
- ✓ Record, report and evaluate programme performance (smear-positive cases are the cases for which bacteriological monitoring of treatment progress is most practicable).

4.5.3 Treatment history

The treatment history is very important for proper categorization of the patient subsequently choosing the correct regimen.

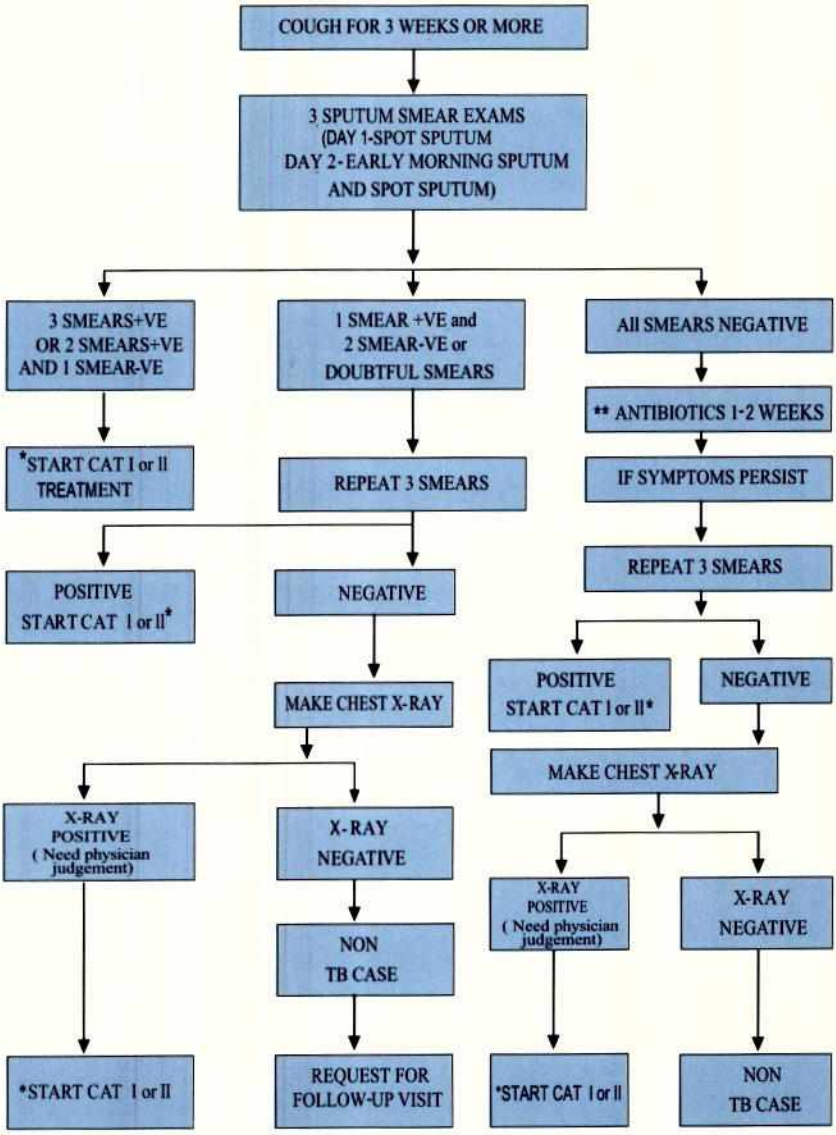
Table 1: Case definition by site and bacteriological status in adults

Case classification	Definition
Pulmonary smear-positive TB (PTB+)	• A patient with at least two sputum specimens positive for AFB; or • A patient with only one sputum specimen positive for AFB and chest radiologicalX-ray abnormalities consistent with active TB and diagnosis made by a graduate physician; or • A patient with only one sputum specimen positive for AFB and a culture positive for *M. tuberculosis*
Pulmonary smear-negative TB (PTB-)	• A patient with symptoms suggestive of TB with three sputum specimens negative for AFB; and • Persisting symptoms after a course of antibiotics; and • Again three negative sputum specimens for AFB during repeat sputum examination; and • Chest X-ray abnormalities consistent with active TB; and • Diagnosis made by a graduate physician
Extra-pulmonary TB (EPTB)	• A patient with TB of organs other than the lungs as confirmed by a graduate physician

Table 2: Case definition by treatment history

Case classification	Definition
New	• A patient who has never received anti-TB drugs; or • A patient who received anti -TB drugs for less than one month
Relapse	• A patient previously treated for TB who has been declared "cured" or "treatment completed" and is diagnosed with bacteriologically positive (smear or culture) tuberculosis
Treatment after failure	• A patient who, while on treatment, remained smear positive or became smear positive again at five months or more after the start of treatment or • A patient who was initially smear negative and was found smear positive at the end of the second month of treatment
Treatment after default	• A patient who returns to treatment after completion of at least one month of treatment and with a positive bacteriology, following interruption of treatment for two or more months
Transfer in	• A patient already registered for treatment in a DOTS centre and who is subsequently transferred to another registration unit
Chronic	• A patient who remained smear positive after completing a directly observed re-treatment regimen
Other (s)	• All cases that do not fit the above definitions

4.6 Flow chart for diagnosis and follow up of pulmonary TB



* Previous history of treatment > 1 month: CAT II

** Exclude Clarithromycin, Quinolones, Amoxyclavulanate

4.7 Diagnosis of extra-pulmonary TB in adults

Extra-pulmonary TB can occur at any age and can involve any organ. Many patients with EPTB may also suffer from pulmonary TB.

Definitive diagnosis of extra pulmonary TB is often difficult. Diagnosis may be presumptive, provided other conditions mimicking tuberculosis can be excluded. Patients usually present with constitutional features (fever, night sweats, weight loss) and local features related to the site of disease. The degree of certainty of diagnosis may depend on the availability of diagnostic tools, e.g. X-ray, ultrasound, FNAC, biopsy, etc.

Diagnose the case as EPTB using the following diagnostic tools

- ✓ Smear and/or culture for AFB of bodily fluids: pleural fluid, pericardial fluid, ascitic fluid (laparoscopic), cerebrospinal fluid (by lumbar puncture), urine, aspirate (FNAC) from any solid organ e.g. lymph node, spine, epididymis
- ✓ Histopathological examination (biopsy)– finding of caseating granuloma in the biopsy material obtained from body tissues such as lymph node, peritoneum (laparoscopic), synovium, spine, bone, liver, spleen, genital tract, etc.
- ✓ X-ray of involved structure, e.g. lung, spine, bone, joint, adrenal gland
- ✓ Biochemical test, e.g. exudate (low sugar and high protein)
- ✓ Cytological examination of effusions, ascites, CSF fluid, etc.
- ✓ Tuberculin test

4.7.1 Features and diagnostic approach of EPTB

Tuberculous lymphadenopathy

The lymph nodes most commonly involved are the cervical nodes. Other sites may also be involved including submandibular, supraclavicular, inguinal or axillary nodes. Involvement of lymph nodes may result from direct extension of infection or from haematogenous spread.

The usual course of lymph node disease is as follows. Initially they are firm and discrete, later become fluctuant and matted together followed by abscess formation. The skin may then breakdown leading to chronic sinus formation and ultimately healing with scarring.

Diagnosis is based on FNAC (smears for AFB, cultures for AFB, caseation); biopsy (caseating granuloma); AFB staining and AFB culture.

Miliary (disseminated) TB

Miliary TB results from widespread bloodborne dissemination of TB bacilli. Although in children

it is often the consequence of a recent (primary) infection, in adults it may be due to either recent infection or reactivation of old disseminated foci.

Patients present with constitutional features rather than respiratory symptoms. They may have hepatosplenomegaly and choroidal tubercles on fundoscopy. Often the presentation is associated with fever of unknown origin and wasting may be marked. A rare presentation seen in the elderly is cryptic miliary tuberculosis which has a chronic course and remains undiagnosed unless there is high degree of suspicion. An acute septicemic form, non-reactive miliary tuberculosis occurs very rarely and is due to massive hematogenous spread of tubercle bacilli.

Diagnosis is based on chest X-ray. It shows diffuse, uniformly distributed, small miliary shadows. "Miliary" means "like small millet seeds". Various hematological abnormalities may be seen including anemia, leucopenia, neutrophilic leukocytosis and leukemoid blood reactions. Liver function tests may be abnormal. Bacteriological confirmation (smear or culture) is sometimes possible from sputum, cerebrospinal fluid, bone marrow, liver or blood. Granulomas are evident in liver or bone marrow biopsy specimen from many patients. Bronchoalveolar lavage is more likely to permit bacteriological confirmation.

Tuberculous serous effusions (pleural, pericardial, ascites)

The presentation is usually with constitutional and local features.

Microscopy of the aspirate from tuberculous serous effusions rarely shows AFB because the fluid forms as an inflammatory reaction to TB lesions in the serous membrane. TB culture, even if available, is of no immediate help. The white cell content is variable, usually with predominant lymphocytes and monocytes. The aspirate is an exudate (i.e. protein content is more than 30 g/l; it is easily determined by leaving the aspirate standing and if "spider clots" develop in the specimen, it is an exudates). Interpret with caution the laboratory result of protein concentration in any aspirated fluid. If there has been a delay in laboratory analysis, a protein clot may have formed in the sample. The laboratory result may then be falsely low.

Tuberculous pleural effusion: The clinical and chest X-ray diagnosis of a pleural effusion is straightforward. Ultrasound can confirm the presence of fluid in the pleural space in case of doubt. Always perform diagnostic pleural aspiration if a patient has a pleural effusion. The fluid is usually straw-colored. The white cell count is usually high with predominant lymphocytes. Occasionally the fluid is blood-stained. The presence of pus on aspiration indicates an empyema (purulent effusion). If facilities are available, closed pleural biopsy using an Abrams needle is useful for histological diagnosis. Since the distribution of TB lesions in the pleura is patchy, the diagnostic yield of closed pleural biopsy is about 75%. Multiple biopsies increase the diagnostic yield. A small open pleural biopsy increases the yield even further.

Tuberculous pericardial effusion: The diagnosis usually rests on suggestive constitutional and cardiovascular features and investigation findings (ECG, chest X-ray and echocardiography).

Tuberculous ascites: Ascites results from peritoneal TB. Routes of spread of TB to the peritoneum include the following : a) from tuberculous mesenteric lymph nodes; b) from intestinal TB

(pulmonary TB patients may develop intestinal ulcers and fistulae as a result of swallowing infected sputum); c) blood-borne. Patients present with constitutional features and ascites. There may be palpable abdominal masses (mesenteric lymph nodes). Aspirated fluid is exudative with high protein content and leucocytosis with predominantly lymphocytes. The yield of direct smear and culture for AFB is relatively low; culture of a large volume ascitic fluid can increase the yield. Ultrasound may show features consistent with TB, including enlarged mesenteric or retroperitoneal lymph nodes. Definitive diagnosis rests on a peritoneal biopsy. Blind percutaneous needle biopsy of the peritoneum has a low pick-up rate and a high complication rate. In experienced hands, laparoscopy under local anesthetic has a high pick-up rate. Laparoscopy enables direct visualization and biopsy of peritoneal TB lesions. Laparotomy will confirm the diagnosis in nearly every case but is too invasive for routine use.

Gastro-intestinal TB

Any portion of the gastrointestinal tract may be affected by tuberculosis. The terminal ileum and caecum are the sites most commonly involved. Abdominal pain (at times similar to that of appendicitis), chronic diarrhea, subacute obstruction, hematochezia and a right iliac fossa mass are common findings at presentation. Fever, weight loss and night sweats are also frequent. A 'doughy abdomen' due to extensive intra-abdominal inflammation may also be detected. Diagnosis rests on barium examination of the small and large intestine or on colonoscopy.

Spinal TB (Pott's disease)

The sites most commonly involved are the lower thoracic vertebrae (with T-10 being the most common) and upper lumbar spine but the cervical spine can also be affected. TB starts in an intervertebral disc and spreads along the anterior and longitudinal ligaments, before involving the adjacent vertebral bodies. With advanced disease, collapse of vertebral bodies' results in kyphosis (gibbus). A para-vertebral cold abscess may also form. And this may track to sites such as the lower thoracic case or below the inguinal ligament (Psoas abscess).

Plain X-ray of the spine is usually diagnostic. The typical appearance is erosion of the anterior edges of the superior and inferior borders of adjacent vertebral bodies. The disc space is narrowed. CT scan or MRI reveals the lesions more correctly. Aspiration of the abscess or bone biopsy confirms the tuberculous etiology by histopathology and culture. The main differential diagnoses are malignancy and pyogenic spinal infections. Malignant deposits in the spine tend to erode the pedicles and spinal bodies, leaving the disc intact. Pyogenic infection tends to be more acute than TB, with more severe pain.

Joint TB

Weight bearing joints are mostly affected. Tuberculosis of the hip joints causes pain and limping. TB of the knee produces pain and swelling. A history of previous trauma is often elicited. Systemic symptoms are present in about half of the patients. Pulmonary TB is detected in approximately half of these patients. Radiological abnormalities include bone erosions, joint space narrowing, and ultimately joint destruction. Diagnosis requires synovial biopsy.

Genito-urinary TB

Tuberculosis can involve any part of genitor-urinary tract. It is usually due to hematogenous seedling following primary infection. Local symptoms predominate. Urinary frequency, dysuria, hematuria, and loin pain are common presentations. However patient may be asymptomatic and the disease discovered after severe destructive lesions of the kidneys have developed. Urinalysis gives abnormal result in 90% of cases, revealing pyuria and hematuria. Sterile pyuria first raises the suspicion of renal tuberculosis. An intravenous pyelography helps in the diagnosis. Calcification and ureteric stricture are suggestive findings. AFB from centrifuge urine specimen helps in diagnosis. Culture of three morning urine specimens yields a definitive diagnosis in nearly 90% cases. Severe ureteric strictures may lead to hydronephrosis and renal damage.

Genital tuberculosis is more common in female than in male patients. In female patients, it affects the fallopian tubes and endometrium and may cause infertility, pelvic pain and menstrual irregularities. Diagnosis requires biopsy and/or culture of specimens obtained by dilatation and curettage (D and C). In male patients, tuberculosis preferentially affects the epididymis (producing a slight tender mass), orchitis and prostatitis may also develop. In almost half of cases of genitourinary tuberculosis, urinary tract disease is also present.

Hepatic/Splenic TB

Disseminated TB may involve the liver or spleen and can cause diagnostic confusion. Solitary or multiple abscesses may develop. Ultrasound or CT scan and guided FNAC give diagnosis in most of the cases.

Less common extra-pulmonary forms

Tuberculosis may cause chorioretinitis, uveitis, panopthalmitis, phlyctenular conjunctivitis. In the nasopharynx, tuberculosis may simulate Wegner's granulomatosis. Cutaneous manifestations of tuberculosis include primary infection due to direct inoculation, abscess and chronic ulcers, scrofuloderma, lupus vulgaris, miliary lesions, and erythema nodosum. Adrenal tuberculosis is a manifestation of advanced disease presenting as sign of adrenal insufficiency.

CNS tuberculosis

As described under children tuberculosis. (But it can also occur in adults)

5 TREATMENT OF TUBERCULOSIS

5.1 The role of treatment in the control of tuberculosis

Treatment and cure of infectious cases of tuberculosis will interrupt transmission of TB infection in the community. Therefore, successful completion of treatment is the most effective way of prevention of TB.

5.2 Aims of treatment

The aims of treating TB are:

- ✓ To cure the patient of TB
- ✓ To prevent death from active TB or its late effects
- ✓ To prevent relapse of TB
- ✓ To decrease transmission of TB to others
- ✓ To prevent the development of acquired drug resistance

5.3 Basic Principles of TB treatment

The basic principles of good TB treatment are:

a) Right combination of drugs to kill different bacterial populations

b) Drugs are given for the right duration (several months) to kill the bacilli

c) Drugs are given in the right dosage to achieve therapeutic but not toxic effect

5.4 Fixed-dose combinations (FDCs)

Tablets of fixed-dose drug combinations have several advantages over individual drugs:

a) Prescription errors are likely to occur less frequently because dosage recommendations are more straightforward and adjustment of dosage according to patient weight is easier

b) The number of tablets to ingest is smaller and may thus encourage patient's adherence. A new smear-positive patient of 38-54 kg body weight has to take three tablets of 4-FDC daily during the intensive phase of treatment. In case of loose drugs this would be nine tablets (three R150, one H300, three Z500 and two E400)

c) Drug resistance is less likely to occur; patients swallow all drugs and can not skip any particular drug

FDCs have the disadvantage that if severe side-effects occur, all drugs have to be stopped and the patient has to continue treatment with single drugs, excluding the drug(s) which might be responsible for the side-effect. In order to manage side effects, 5% of single drugs will be supplied together with FDCs.

5.5 Standardized Regimens

Standardized regimens have the following advantages over individualized prescription of drugs:

- ✓ Less risk for drug resistance development due to reduction in prescription errors
- ✓ Better estimates of drug needs, purchasing, distribution and monitoring
- ✓ Facilitate staff training
- ✓ Reduced costs
- ✓ Facilitates regular drug supply when patients move from one area to another

Bangladesh NTP has adopted standardized regimens for new and retreatment cases.

5.5.1 Treatment phases

Effective chemotherapy consists of two phases:

(a) The initial or intensive phase administered daily for two months in new cases and three months in re-treatment cases. The aim of this phase is to rapidly reduce and eliminate the multiplying bacilli without allowing the development of acquired resistance to the prescribed drugs. During the intensive phase, the tubercle bacilli are killed rapidly. The infectious patients quickly become non-infectious (within approximately two weeks).

(b) The continuation phase is essential to eliminate the remaining bacterial population. Drugs administered daily for the rest of the treatment duration according to category.

5.5.2 Standardized treatment regimen for each diagnostic category (Adults)

TB diagnostic category	Patient Category	Treatment regimen	
		Intensive phase (DAILY)	Continuation phase (DAILY)
I	• New smear (+) positive PTB patients • New smear (-) negative PTB patients • Extra-pulmonary TB patients • Concomitant/associated HIV/AIDS	2(HRZE)	4 (HR)
II	• Sputum smear (+) positive PTB with history of treatment of more than one month • Relapse • Treatment failure after Cat. I • Treatment after default • Others	2(HRZE)S / 1(HRZE)	5 (HR)E

5.6 Dosages of FDC tablets

FDC tablets are composed as follows:

✓ 4-FDC: isoniazid 75 mg + rifampicin 150 mg + pyrazinamide 400 mg + ethambutol 275 mg

✓ 2-FDC: isoniazid 75 mg + rifampicin 150 mg

The dosages of FDC tablets for adults are as follows:

Category I

Pre - treatment weight (kg)	Intensive Phase	Continuation Phase
	Daily (first 2 months)	Daily (Next 4 months)
	Number of 4FDC tablets	Number of 2 FDC tablets
30 – 37	2	2
38 – 54	3	3
55 – 70	4	4
> 70	5	5

Category II

Pre-treatment weight (kg)	Intensive Phase		Continuation Phase	
	Daily (first 3 months)	Daily (first 2 months)	Daily (next 5 months)	
	Number of 4 - FDC tablets	Injection Streptomycin	Number of 2 - FDC tablets	Ethambutol 400mg (Number of tablets)
30 – 37	2	500mg	2	2
38 – 54	3	750mg	3	3
55 – 70	4	1gm*	4	3
> 70	5	1gm*	5	4

* The dose of streptomycin should not exceed 750 mg daily after the age of 50 years

5.7 Start of treatment

Treatment should be started as soon as possible after the diagnosis is made. **TREATMENT SHOULD ONLY BE STARTED AFTER A CONFIRMED DIAGNOSIS HAS BEEN MADE.**

The responsible medical officer/graduate physician should categorize the patient. A paramedical staff may fill in the treatment card and register the patient in the TB register and maintain other documents related to diagnosis of the patients.

The first dose of drugs should be given at the respective health facility, where after the patient is referred to the DOT provider (see 5.11). At the time of start of treatment all drugs for the whole course of treatment (intensive and continuation phase) of the respective patient should be ensured. In case of transfer or death of a patient, the remaining drugs should be returned and added to the general stock.

The medical officer or TB manager/supervisor should weekly review and cross check the TB register with the laboratory register to ensure that all patients diagnosed in the laboratory are registered and enrolled for treatment.

Patients who are smear positive according to the laboratory register but did not begin treatment should be traced within two weeks after the laboratory result is available.

5.8 Adherence to treatment

Patient compliance is a key factor to treatment success. A proportion of patients stop treatment before completion, for various reasons so **strict adherence to treatment should be ensured to cure the patients and prevent the development of drug-resistant TB.**

Directly observed treatment (DOT) is a very important component in the internationally recommended policy package for TB control (DOTS strategy).

DOT means that an observer watches the patient swallowing their drugs, which is essential for completion of treatment and recovery from TB. This ensures that the patient takes the right anti-TB drugs, in the right doses, at the right intervals and for the right period. All patients, irrespective of the treatment category, should receive all doses of the anti-TB drugs under DOT.

5.9 Ambulatory versus hospital treatment

Over 95% of the patients can be treated as ambulatory TB cases. Hospitalization itself has little or no effect on the outcome of the treatment except in severe forms of tuberculosis. Hospitalization may be necessary if the patient cannot receive ambulatory treatment under direct observation. In-patient treatment may also be necessary (often only for a short period) for severely ill patients, e.g. tuberculosis with complications viz. severe hemoptysis (bloodstained sputum), spontaneous pneumothorax (air in the inter-pleural space resulting in collapse of the lung) or for those with other associated serious diseases.

5.10 DOT providers

To ensure adherence to treatment, DOT should be provided as conveniently as possible to the patient. This often means as close to the patient's home or workplace as possible. Patients may wish to attend any of the NTP recognized DOT centres according to patients convenience.

The DOT provider may be a facility or community-based health worker or a trained and supervised community member. These DOT providers include health assistants (HAs), assistant health inspectors (AHIs), community health workers (CHWs), shasthya shebikas, village doctors, community leaders, cured patients, etc. All non-medical personnel who deliver DOT should be supervised at least monthly.

Medical officers and paramedics in consultation with patients should identify the DOT provider, the name and address of whom should be recorded on the patient's treatment card. The medical officer or paramedic has to ensure that the DOT provider receives the filled-in copy of Treatment Card (TB 01), Identity Card (TB 02) and drugs at the specific intervals.

5.11 Methods of DOT

The following flow chart shows the decision tree for DOT:

Can the patient come to the treatment center everyday?

No

Yes

- Tell the patient to come daily
- Give 1 day supply of drug for weekends and other public holidays

Can the patient come to the Sub Centre (SC)/ Family Welfares Centre (FWC)/ Community Clinic (CC) every day?

No

Yes

- Communicate with the responsible person of the selected center and arrange for DOT
- Ensure a copy of TB 01 and regular drug supply to the center for that particular patient
- Confirm attendance on original treatment card (TB 01) kept at the initiating center by the responsible person
- Ensure attendance of the patient at microscopy center for follow up of sputum examination at specified intervals

Is there a reliable Health Worker (DOT provider/Village Doctor/Shastha Shebika)

No

Yes

- Communicate with the health worker/Village Doctor / Shastha Shebika and arrange for DOT
- Training should be ensured to non medical DOT provider before reffering the patient to that provider
- Ensure a copy of TB 01 and regular drug supply (2-4 wks) to the selected DOT provider for that particular patient
- Confirm attendance of the patient in original treatment card (TB 01) kept at the initiating center by the responsible person
- Ensure attendance of the patient at microscopy center for follow up of sputum examination at specified intervals
- Village Doctor / Shastha Shebika should be supervised at least monthly by the initiating centre

Can the patient be admitted to hospital for the intensive phase of Treatment?

No

Reinforce any available method

Yes

- Admit and give DOT

5.12 Drug supplies to DOT providers

If DOT is provided at the centre where the patient is registered, the drugs for that patient, for the whole course of the treatment, should be kept at the place which is secure and suitable for drugs in that centre. The paramedic responsible for DOT should be given the drugs for two weeks at a time.

If DOT is provided from a sub-center, where the patient is not registered for treatment or at community level by a health worker/village doctor/shastha shebika drugs needed for two to four weeks should be given at a time to the DOT provider until end of the treatment.

5.13 Regularity of treatment

DOT providers should ensure that the patients swallow the drugs according to prescription. They should organize tracing of absentees and prevent patients from becoming defaulters. Priority must be given to smear - positive pulmonary TB patients

If a patient misses consecutive three doses of the treatment he/she must be traced immediately to resume DOT without delay.

To ensure easy tracing of patients the detailed address should be filled in the Tuberculosis Treatment Card and TB Register. (Mobile number should be included if available with the patient).

5.14 Follow-up of treatment

In order to evaluate the result of treatment, sputum smear examinations should be performed at defined intervals.

5.14.1 New smear positive patients

One sputum specimen should be examined at the end of month 2, 5 and 6 after the start of treatment. The sputum at six months can also be collected during the last two weeks of treatment.

Patients whose sputum is positive at month 2 should continue the intensive phase for one more month. After one month of extended intensive phase, one specimen of sputum should be examined and the patients be put on the continuation phase, regardless of the smear result. In case of extension of the intensive phase based on positive smear results, the duration of the continuation phase will remain the same; hence the total treatment period will be extended by one month.

If the sputum is positive at month 5 or 6 the outcome will be recorded as treatment failure. The patient must be re-registered as "treatment after failure" and be treated with a course of Category II regimen.

5.14.2 Retreatment smear-positive patients

One specimen of sputum of patients treated with Category II regimen should be examined at the end of month 3, 5 and 8. The sputum at eighth month can also be collected during the last two weeks of treatment.

Patients whose smear is positive at month 3 should continue the intensive phase for one more month. After one month of extended intensive phase, one specimen of sputum should be examined and the patients be put on the continuation phase, regardless of the smear result at month 4. In case of extension of the intensive phase based on positive smear results, the duration of the continuation phase will remain the same; hence, the total treatment period will be extended by one month.

If the smear is still positive at month 5, patient should continue Category II treatment and meanwhile necessary steps should be taken for sputum culture and DST. If the patient remains smear positive after completion of the entire course of the treatment, the patient is no longer eligible for a new re-treatment regimen. In this case, the outcome will be recorded as "re-treatment failure" and the patient be considered as a "chronic case" and referred to a specialized hospital for further management.

5.14.3 Smear negative and extra-pulmonary patients

One specimen of sputum should be examined of smear-negative pulmonary TB at the end of month 2 to ensure that they remain negative. In case the smear is positive (a second smear should confirm the result), the patient should be put on Category II treatment and be re-registered as failure. If the sputum is negative the patients should continue the treatment and progress of the patient should be assessed clinically.

In case of extra-pulmonary TB, no smear examination is necessary and the patients should be assessed clinically.

Follow-up of patients after completion of treatment is not needed.

5.15 Actions in case of interruption of TB treatment

Table 3: Management of new smear-positive cases after interrupting treatment

Length of treatment	Length of interruption	Result of smear	Record Rx Outcome	Re-register	Treatment
Less than 1 month	Less than 1 month	Not required	No	No	Continue CAT 1 and prolong it to compensate for missed doses
	1-2 months	Positive	No	No	Continue CAT 1 compensate the doses for 1 extra month
		Negative	No	No	Continue CAT 1 and prolong it to compensate for missed doses
	More than 2 months	Positive	Yes, record as defaulter	Yes, register as new	Restart CAT-I
		Negative	Yes, record as defaulter	Go through flow chart	Depend on outcome of flow chart

Length of treatment	Length of interruption	Result of smear	Record Rx Outcome	Re-register	Treatment
1 - 2 months	Less than 2 months	Positive	No	No	Continue CAT 1 compensate the doses for 1 extra month
		Negative	No	No	Continue CAT 1 and prolong it to compensate for missed doses
	More than 2 months	Positive	Yes, record as defaulter	Yes, register as *RAD	Restart, now on CAT 2
		Negative	Yes, record as defaulter	Go through flow chart	Depend on outcome of flow chart
More than 2 months	Less than 2 months	Positive	No (if Rx < 5 months)	No	Restart, CAT 1
			Yes, Failure (if Rx ≥ 5 months)	Yes, register as Failure	Restart, now on CAT 2
		Negative	No	No	Continue CAT 1
	More than 2 months	Positive	Yes, record as defaulter	Yes, register as RAD	Restart, now on CAT 2
		Negative	Yes, record as defaulter	No	No

*RAD: Return After Default

Table 4: Management of re-treatment cases after interrupting treatment

Length of treatment	Length of interruption	Result of smear	Record Rx Outcome	Re-register	Treatment
Less than 2 months	Less than 1 month	Smear not required	No	No	Continue CAT 2, and prolong it to compensate for missed doses
	1-2 months	Positive	No	No	Continue CAT 2; 1 extra month
		Negative	No	No	Continue CAT 2, and prolong it to compensate for missed doses

Length of treatment	Length of interruption	Result of smear	Record Rx Outcome	Re-register	Treatment
	More than 2 months	Positive	Yes: record as defaulter	Yes: return after default	Restart CAT 2*
		Negative	Yes: record as defaulter	No	Refer if patient becomes smear positive again**
More than 2 months	Less than 2 months	Positive	No, (if treatment <5 months)	No	Restart Cat 2*
			Yes, record as "Failure" if Rx ≥ 5months	Yes, Failure	Refer to specialized ** centre to exclude/confirm MDR TB
	More than 2 months	Negative	No	No	Continue CAT 2
		Positive	Yes, Defaulter	Yes, Return after default	Restart CAT 2*
		Negative	Yes, Defaulter	No	Refer if patient becomes smear positive again**

* Restart only once

** Referral to any of the followings:

- National TB Reference Laboratory (NTRL) in National Institute of Disease of Chest Hospital, Mohakhali, Dhaka
- Regional TB Reference Laboratory (RTRL) in Rajshahi, Chittagong and Khulna
- Damien Foundation Hospitals in Netrokona, Mymensingh and Tangail (Jalchatra)

5.16 Drug reactions : Management of side effects or adverse reactions related to the use of anti-tuberculosis drugs

Most TB patients complete their treatment without any significant adverse effects of drugs. However, a few patients do experience adverse effects. Patients sometime discontinue the treatment due to major or even minor adverse effects. It is therefore important that patients be clinically monitored during treatment so that adverse effects can be detected promptly and managed properly. Routine laboratory monitoring is not necessary.

Health workers/ DOT providers can monitor side effects of drugs by teaching patients how to recognize symptoms of common side effects and to report if they develop such symptoms, and by asking about symptoms when the patients report to collect drugs.

Table 5: Symptom-based approach to side effects of anti-TB drugs and their management

Side-effect	Drug(s) probably responsible	Management
Minor		**Continue anti-TB drugs, check drug doses**
Anorexia, nausea, abdominal pain	Pyrazinamide, Rifampicin	Give drugs with or after meals
Joint pain	Pyrazinamide	Give non steroidal anti- inflammatory drug (NSAID)
Burning sensation in the feet	Isoniazid	Give pyridoxine 100 mg daily
Orange/red urine	Rifampicin	Reassurance; the patient should be informed at the beginning of the treatment that it happens commonly and is normal
Itchingwith minor or mild skin rash	All drugs	Exclude skin diseases Give antihistamines
Major		**Stop responsible drug(s)**
Itching with skin rash (moderate to severe)	All drugs	Stop anti-TB drugs Identify the offending drug **(need expert opinion)**
Deafness (no wax on auroscopy)	Streptomycin	Stop streptomycin and never use again
Dizziness (vertigo and nystagmus)	Streptomycin	Stop streptomycin and never use again
Jaundice (other causes excluded), hepatitis	Most anti-TB drugs (especiallyisoniazid pyrazinamide and rifampicin)	Stop all anti-TB drugs until jaundice resolves **(need expert opinion)**
Vomiting and Confusion (suspect drug induced acute liver failure if jaundice present)	Most anti -TB drugs	Stop all anti-TB drugs until jaundice resolves Urgent Liver function test and prothombin time test **(need expert opinion)**
Visual impairment (other causes excluded)	Ethambutol	Stop ethambutol and never use again
Shock syndrome, purpura, acute renal failure, acute hemolytic anemia	Rifampicin	Stop rifampicin and never use again

5.17 Treatment outcomes

At the end of the treatment course, one treatment outcome will be recorded for each TB patients. Table 6 shows the possible, mutually exlcusive treatment outcomes

Table 6: Treatment outcome description

Treatment Outcomes	Description
Cured	A smear-positive patient will be declared cured if the following conditions are fulfilled: • The entire course of 6(7) and 8(9) months of treatment has been completed AND • The sputum smears are negative on at least two occasions: (i) at the end or during the last month of the treatment and (ii) on at least one previous follow up occasion, at least one month apart
Treatment Completed	• If it is not possible to obtain sputum at the end of treatment from sputum positive patient, the patient has to be declared as "treatment completed" after completion of treatment (this should occur only in a minority of cases) • A smear-negative or extra-pulmonary TB should be declared "treatment completed" after completing a full treatment course
Treatment failure	• A patient who, while on treatment, remained smear-positive or became smear-positive again at 5 months or later after the start of treatment OR • A patient who was initially smear-negative and was found smear-positive at the end of the second month of treatment
Default	• A patient whose treatment was interrupted for two consecutive months or more after completion of treatment for 1 month or more
Transfer out	• A patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known
Died	• Patient who died for any reason during the course of treatment

5.18 Referral and transfer of patients

A patient during treatment may require referral or transfer to another designated DOTS centre for continuation of treatment. In these cases, the medical officer of the referring/transferring centre should fill the Tuberculosis Referral/Transfer Form (TB 07) in triplicate. One copy should be sent

to the referral/transfer center, one copy is given to the patient and one copy remains in the file of the treatment initiation center.

When treatment is continued in the receiving DOTS centre, the patient should be registered there as a "transfer in" case. The lower portion of the form (TB 07) should be returned to the centre from where the patient was referred.

If a patient was treated without being registered (e.g. in a hospital or by a private practitioner) and will continue treatment in the designated DOTS centre, this constitutes a referral and not a transfer. In this case, the receiving centre will register the patient as per treatment category (new, relapse, treatment after default, failure) and not as transfer in.

5.19 Treatment of tuberculosis in special situations

Drug-induced hepatitis

Most anti-TB drugs can damage the liver. Isoniazid, pyrazinamide and rifampicin are most commonly responsible, ethambutol rarely. When a patient develops hepatitis during TB treatment, the hepatitis may be due to the anti-TB drugs but may also have another cause. It is important to rule out other possible causes before deciding that the hepatitis is drug induced. If the diagnosis of drug-induced hepatitis is made, the anti-TB drugs should be stopped. The drugs must be withheld until the jaundice or hepatic symptoms have resolved and liver function tests have returned to normal. If liver function tests cannot be done, then it is advisable to wait two weeks after the jaundice has disappeared before recommencing anti-TB treatment. In most cases the patient can restart the same anti-TB drugs without return of hepatitis. This can be done either gradually (one by one) or all at once (if the hepatitis was mild). However if the hepatitis produced severe jaundice, it is advisable to avoid pyrazinamide. A suggested regimen in such patient is 2SHE/10HE. A severely ill TB patient with drug-induced hepatitis may die without ant-TB drugs. In this case the patient should be treated with two of the least hepatotoxic dugs, streptomycin and ethambutol. After the hepatitis has resolved, usual TB treatment should be restarted. In case of extensive TB, ofloxacin can be considered in conjunction with streptomycin and ethambutol as an interim non-hepatotoxic regimen.

Acute viral hepatitis

TB treatment should be deferred until the acute hepatitis has resolved. When it is necessary to treat during acute hepatitis, the combination of streptomycin and ethambutol for three months is the safest option. If the hepatitis has resolved, the patient can receive a continuation phase of six months isoniazid and rifampicin. If the hepatitis has not fully resolved, streptomycin and ethambutol should be continued for a total of 12 months.

Chronic liver disease

Patients with liver disease should not receive pyrazinamide. Isoniazid plus rifampicin plus one or two non-hepatotoxic drugs such as streptomycin and ethambutol can be used for total treatment duration of 8 months (2SHRE/6HR)

Renal failure

Isoniazid, rifampicin and pyrazinamide are either eliminated almost entirely by billiary excretion or metabolized into non-toxic compounds. These drugs can therefore be given in normal doses to patients with renal failure. Patients with severe renal failure should receive pyridoxine with isoniazid in order to prevent peripheral neuropathy.

Streptomycin and ethambutol are excreted by the kidney and can be given in reduced doses or intermittently where facilities for close monitoring of renal function are available. The safest regimen for patients with renal failure is 2HRZ/4HR.

Pregnancy

Most anti TB drugs are safe for use in pregnancy with the exception of streptomycin, which is ototoxic to the fetus.

Breast-feeding women

A woman with TB who is breast-feeding should receive a full course of anti-TB drugs. Regular and full course chemotherapy is the best way to prevent transmission of tubercle bacilli to her baby. The mother and baby should stay together and breast-feeding should be continued. Prophylactic treatment with isoniazid should be given for at least three months ahead of the time the mother is considered non-infectious. BCG vaccination of the newborn should be postponed until the end of the isoniazid prophylax.

Women taking oral contraceptive pills.

Rifampicin reduces the efficacy of estrogen thus increases the risk of pregnancy. A higher dose of estrogen (50 μ) can be used with rifampicin or another form of contraception may be used.

Diabetes mellitus.

During the course of anti-TB treatment a diabetes mellitus patient may require treatment with insulin.

6 TUBERCULOSIS IN CHILDREN

6.1 Background

Globally, of the 9.2 million new cases occurred in 2006, about 1 million (11%) were children (under 15 years of age). According to the Global WHO Report 2008, the National TB Control Program notified 3/100, 000 population new smear-positive cases between the ages 0-14 years in 2006. Adults with smear-positive TB usually infect children but not all children develop the disease once infected. The likelihood of developing disease is high shortly after infection. Infants and children under 5 years are at particular risk of developing disease. Immunosuppressive illnesses including measles, malnutrition, whooping cough, and HIV infection facilitate progression of TB infection to disease. Children during coughing can produce sputum and therefore can infect others.

6.2 Clinical spectrum of childhood TB

Pulmonary TB is the disease of the lung parenchyma and hilar lymph glands. Children with pulmonary TB have chest X-ray changes suggestive of TB. Typically there is persistent opacity in the lung together with enlarged hilar lymph glands. Progression of pulmonary TB occurs by 1) extension of the primary focus with or without cavitary lesions; 2) the pathological processes caused by the enlarging lymph nodes; or 3) by spreading through lymphatic and/or hematogenous route. Most of the children with TB suffer from pulmonary TB. Extrapulmonary TB (EPTB) refers to TB of organs other than the lungs. EPTB is also quite common among children and the most common forms include TB lymphadenitis, TB meningitis, TB effusions (pleural, pericardial and peritoneal) and spinal TB.

6.3 Diagnosis of tuberculosis in children

Diagnosis of TB in children is difficult as most children can not produce sputum for microscopic examination and the Mantoux test (MT) is often negative in children with severe malnutrition and/or HIV/AIDS. Symptoms of TB are not typical in children.

Key risk factors for TB in children

- Household contact with a known case of TB
- Age less than 5 years
- Severe malnutrition
- HIV infection

Infants (<1 year) with TB may present with acute severe pneumonia (fever, cough, breathing difficulty), and TB should be suspected when there is a poor response to antibiotics. In such situations, an identifiable source case is usually the mother.

Key features suggestive of TB in children

The presence of three or more of the following should strongly suggest a diagnosis of TB:

- Symptoms suggestive of TB
- Physical signs highly suggestive of TB
- A positive tuberculin skin test
- Chest X-ray suggestive of TB

6.3.1 Common symptoms of childhood TB are

- Chronic cough: an unremitting cough that is not improving with usual treatment has been present for more than 3 weeks;
- Fever: body temperature of >38°C (>100° F) for 2 weeks, after common causes such as typhoid, malaria or pneumonia have been excluded;
- Severe malnutrition or not gaining weight or losing weight.

6.3.2 Physical signs highly suggestive of pulmonary and extra pulmonary TB (EPTB)

- No specific signs are suggestive for pulmonary TB;
- A complete review of extra pulmonary tuberculosis in children is beyond the scope of monograph. For most forms of extra pulmonary tuberculosis, the clinical presentation is similar in children to that in adults. However the following signs are highly suggestive of extra pulmonary TB:
  - Painless enlarged cervical lymphadenopathy with or with out sinus formation;
  - Gibbus (an angulation of the vertebral column resulting from vertebral TB).

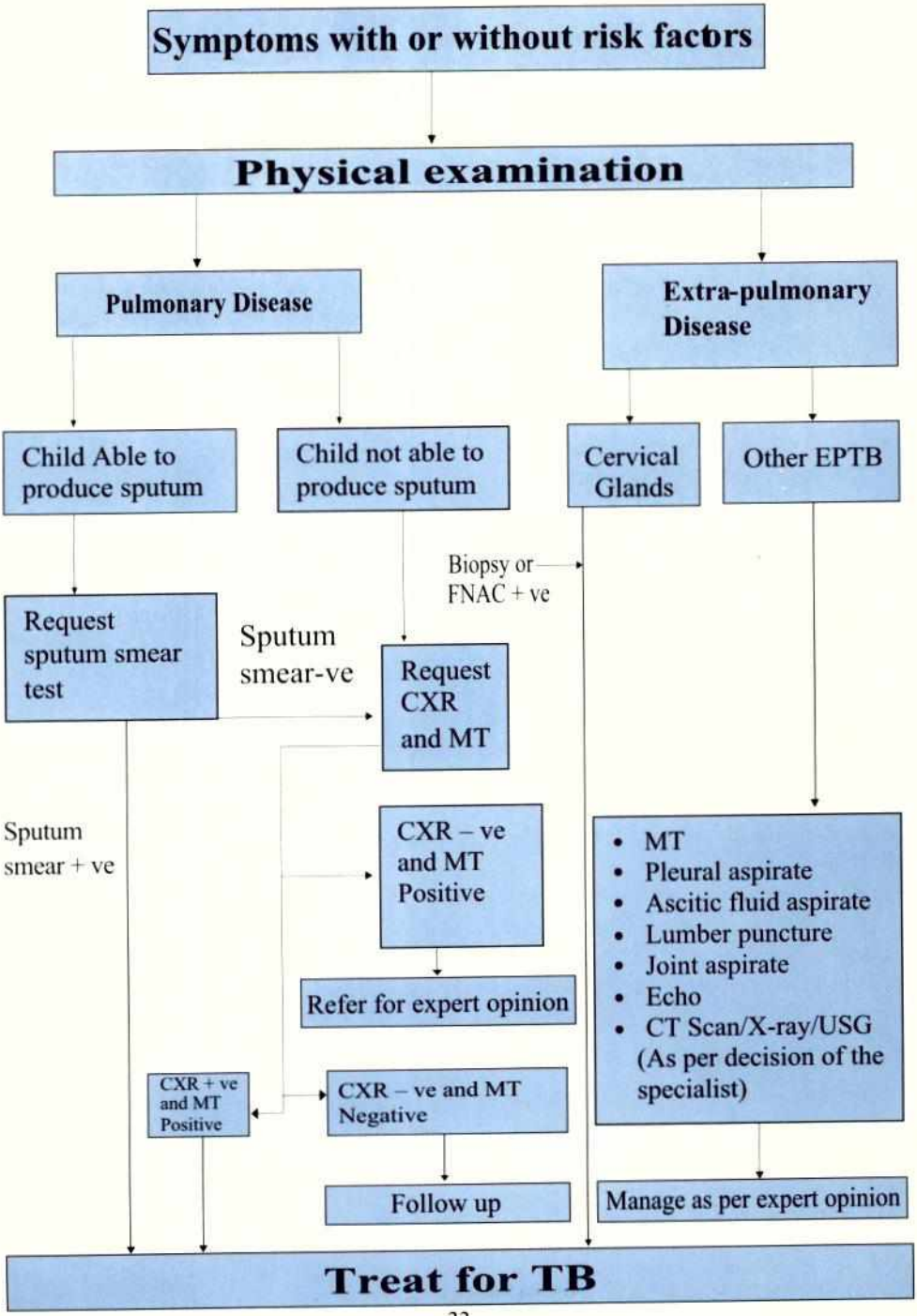
6.3.3 Physical signs requiring investigation to exclude extra pulmonary TB (EPTB)

- Meningitis not responding to antibiotic treatment, with a sub-acute onset or raised intracranial pressure;
- Pleural effusion;
- Pericardial effusion;
- Distended abdomen with ascites;
- Non-painful enlarged lymph nodes without fistula formation;
- Non-painful enlarged joint;
- Signs of tuberculin hypersensitivity (e.g. erythema nodosum, phlyctenular conjunctivitis)

Table 7: Diagnostic approach for Common forms of EPTB in children

Site	Practical approach to diagnosis
Peripheral lymph nodes (especially cervical)	Lymph node biopsy or fine needle aspiration cytology(FNAC)
Miliary TB (disseminated TB)	Chest X-ray
CNS TB • TB meningitis • Tuberculoma of the Brain	CSF study (very high protein, increased white blood cell count predominantly lymphocytes) CT / MRI
Pleural effusion (older children)	Chest X-ray, pleural fluid study for cells, protein, glucose, AFB (Z N staining and culture)
Abdominal TB (e.g. peritoneal)	Ascitic fluid study, abdominal ultrasound
TB Arthritis/Bone TB	X-ray, joint fluid study
Pericardial TB	CXR , Echocardiography

6.3.4 **General approach to diagnosis of TB in Children**



6.3.5 Tuberculin skin test- Mantaux Method

The Mantoux test is used as an adjunct in diagnosing TB in children with signs and symptoms of TB. The test is performed by injecting 0.1 ml reagent containing 5 tuberculin units of tuberculin purified protein derivative or 2 TU of tuberculin PPD RT23 into the anterior aspect of the forearm using a disposable tuberculin syringe with 10 mm long, 26-gauge needle. During injection, the skin is slightly stretched in the direction of the needle. The bevel of the needle should face up towards the injector; the needle is introduced into the superficial layer of the skin almost parallel to it. The volume is injected slowly to produce a pale wheal.

A health worker who has experience in administration and reading of MT reads the test after 72 hours. The reading is limited to measurement of the induration at the test site; the area of erythema or redness should not be measured. The site is gently palpated with the tip of the index finger, keeping the forearm of the child slightly flexed and if induration is present, its margins are determined and marked with a ballpoint pen. The widest transverse diameter (relative to the long axis of the forearm) of the induration is measured in millimeters using a 10 cm transparent ruler. If there is no palpable induration, "0" is recorded.

A Mantoux test should be regarded as positive in the following circumstances:

- In severely malnourished children (marasmus or kwashiorkor) or with HIV infection, ≥5 mm of induration. Marasmus is defined as weight-for-age less than - 3 standard deviations or <60% of NCHS median; kwashiorkor is weight-for-age more than -3 standard deviations or >60% of median plus pedal edema.
- In all other children (whether they have received BCG vaccine or not), a ≥10 mm of induration.

6.3.6 Radiological examination

In childhood pulmonary tuberculosis, the radiographic hallmark is the relatively large size of parahilar lymph nodes compared with the less significant size of the parenchymal focus. Lymphadenopathy is invariably present with childhood TB but may not be apparent on chest X-ray when other pulmonary findings are present. In most cases of pulmonary TB in children, the mild parenchymal infiltrate and lymphadenopathy resolve spontaneously, the chest radiograph remains normal, and the child is aymptomatic. In some children, the hilar and mediastinal lymph nodes continue to enlarge and are readily visible on chest radiograph. Occassionally, children have a picture of lobar pneumonia without impressive lymphadenopathy. If the infection is progressively destructive, liquefaction of the lung parenchyma leads to formation of a thin-walled primary tuberculous cavity. Other children and adolescents can develop the more typical adult type of reactivation TB.

6.3.7 Bacteriological confirmation

Bacteriological confirmation of TB should be done whenever possible. Sputum examination should be done for all children from 8 years or more and even in children aged less than that if they can produce sputum. Facilities for culture of Mycobacterium tuberculosis are available in the National Institute of Chest Diseases and Hospital (NIDCH) at Mohakhali, Dhaka, Chest Disease Hospital in Rajshahi, Chest Disease Clinic Shymoli, Dhaka and three clinics run by government accredited NGO the Damien Foundation in Netrokona, Mymensingh, Tangail.

6.4 Treatment of tuberculosis in children

Children usually have paucibacillary pulmonary disease with low number of bacteria, as cavitating disease is rare (less than 6% of cases). In contrast, extrapulmonary TB is more common than in adults. Severe and disseminated TB (e.g. TB meningitis and military TB) occur especially in children less than 3 years old. Treatment outcomes in children are generally good and the risk of adverse effects is low with use of the recommended treatment regimens.

Table 8: Recommended doses of first-line anti-TB drugs

Drug	Daily Dose and range (mg/kg body weight)
Isoniazid	5 (4-6)
Rifampicin	10 (8-12)
Pyrazinamide	25 (20-30)
Ethambutol[1]	20 (15-25)
Streptomycin[2]	15 (12-18)

[1] *Ethambutol is now considered to be safe in children at a dose of 20 mg/kg (range 15-25 mg/kg) daily.*

[2] *Streptomycin should be avoided when possible in children because the injections are painful and irreversible auditory damage may occur. It is mainly reserved for the first 2 months of treatment of TB meningitis.*

6.4.1 Recommended treatment regimens for children

The recommended treatment regimens for children for each TB diagnostic category are generally the same as for adults. New PTB cases as well as extrapulmonary TB cases fall in category I. Most children with TB have uncomplicated (smear-negative) pulmonary TB or extra pulmonary TB, and therefore fall under diagnostic category I. Children with TB meningitis and miliary TB deserve special mention.

Table 9: Recommended treatment regimens for children in each TB diagnostic category

TB diagnostic category	TB cases	Regimen	
		Intensive phase	Continuation phase
I	• New smear positive pulmonary TB • New smear negative pulmonary TB • Different forms of extrapulmonary TB (other than TB meningitis) • Severe concomitant HIVdisease	2(HRZ) E	4 (HR)
	• TB meningitis	2(HRZ)S	4(RH)
II	• Previously treated smear-positive pulmonary TB (relapse, treatment after interruption, treatment failure)	2(HRZ)ES/1(HR)	5(HR)E
*	• Chronic and MDR-TB	Specially designed standardized regimens	

E, ethambutol; H, isoniazid; R, rifampicin; S, streptomycin; Z, pyrazinamide

Dispersible, fixed-dose combination (FDC) tablets are now available with the National TB Control Programme. During the initial phase of 2 months, treatment is with 3FDC tablets each containing rifampicin 60 mg, isoniazid 30 mg, and pyrazinamide 150 mg. In addition ethambutol should be given according to body weight. During the continuation phase of four months, 2FDC tablets each containing rifampicin 60 mg and isoniazid 30 mg are given. This is written as 2(HRZ) E/4(HR).The table below shows the drugs and age-specific dosage for the initial phase and continuation phase of treatment.

Table 10: Drugs and age-specific doses for the initial and continuation phase of treatment for children

Body weight in kg	Initial Phase	Continuation phase
	No. of 3FDC(R/H/Z: 60/30/150mg)+ E(100 mg) Daily during first 2 months	No. of 2FDC(R/H: 60/30mg) Daily during next 4 months
2-3	0.5	0.5
4-7	1	1
8-14	2	2
15-19	3	3
20-29	4	4

6.4.2 Use of corticosteroids

Corticosteroids may be used for the management of complicated forms of TB, e.g. TB meningitis, airway obstruction by enlarged TB lymph glands, and pericardial TB. In cases of TB meningitis, steroids have been shown to improve survival and decrease morbidity and are therefore recommended in all cases of TB meningitis. Prednisone, 2 mg/kg daily, in very critically ill patients, with a maximum dose of 60 mg/day for 4 weeks. The dose should be gradually tapered over 1-2 weeks before stopping.

6.5 Miliary TB in children

There are no specific clinical features. Features commonly associated with miliary TB include fever, wasting, cough, lymphadenopathy and splenomegaly. The MT may be false negative and the diagnosis is based on typical chest x-ray findings of miliary mottlings.

6.6 Tuberculous meningitis in children

Tuberculous meningitis (TBM) is a disease with insidious onset and is fatal if left untreated. The course of illness is divided into three stages.

1. Stage of invasion or prodromal stage: Symptoms are non-specific and include apathy, irritability, headache, vomiting and mild fever.
2. Stage of meningitis: There are manifestations of meningism i.e. headache, vomiting, fever, convulsions, bulged anterior fontanellae in infants, altered mental status. Neck rigidity appears, Kernig's sign may be positive with a plantar extensor response. Ocular paralysis, strabismus and nystagmus may occur. Papilledema may be present.

3. Stage of coma or terminal stage: Case fatality is high in this stage. The incidence of hydrocephalus, blindness, deafness and mental retardation is high among survivors. At this stage, the child is comatose, may have convulsions, head retraction or decelerate rigidity.

Classically the cerebrospinal fluid shows lymphocytosis with high protein and low sugar levels. It forms a clot like a cobweb if left in a test tube placed in a refrigerator.

Children with tuberculous meningitis should be hospitalized and given streptomycin, 15 mg/kg per day, during the initial phase in addition to HRZ. Pyrazinamide is concentrated in the CSF and is, therefore, particularly useful in tuberculous meningitis. In order to reduce inflammation and prevent blockage of CSF flow, corticosteroids are given as mentioned above.

6.7 Chemoprophylaxis for children

Children aged less than 1 year, whose house hold contacts are under treatment for TB, should be given chemoprophylaxis with isoniazid 5 mg/kg per day for 6 months irrespective of BCG status and the child is free of active TB. Follow-up should be carried out at least every 2 months until completion of treatment. An infant born to a mother with infectious pulmonary TB can be safely breastfed if given isoniazid prophylaxis. If a child receiving isoniazid develops symptoms, assessment for TB should be done. If the child has not been BCG vaccinated, BCG should be given after completion of isoniazid treatment.

6.8 BCG vaccination

BCG vaccine is recommended as soon as possible after birth. The vaccine is known to prevent the more severe types of TB such as TB meningitis and military TB. However, the efficacy of the vaccine in general ranges from 0% to 80%. The reasons for this variability are: different types of BCG used in different countries, differences in the strains of M tuberculosis prevailing in different regions, different levels of exposure, etc. Revaccination offers no added protection, and is therefore not recommended.

A small number of children (1-2%) develop complications following BCG vaccination. These include local abscesses, secondary bacterial infections, suppurative adenitis, and local keloid formation. Most reactions resolve over a few months. Children who develop disseminated BCG disease should be treated for TB and investigated for immunodeficiencies.

The assessment should include inquiry about symptoms, treatment adherence, adverse events, and weight measurement. Doses of anti-TB medicines should be adjusted to account for any weight gain. Follow-up chest X-rays are not routinely required as many children will have a slow radiological improvement.

BCG acceleration is not recommended

7 RECORDING AND REPORTING

A standardized recording and reporting system is an important component of DOTS. It allows for assessment of case detection and treatment outcome against the targets set. It also allows for maintaining surveillance and monitoring with a regular two-way communication between central and peripheral levels.

The programmatic progress and achievements of NTP should be assessed at the different implementation levels: upazila, district, city and central levels.

The NTP recording and reporting system consists of standardized cards, registers and reports, the description of which are given below (Samples are also available in Annex 2).

7.1 Tuberculosis Treatment Card (TB - 01)

The medical officer or paramedic fills the Tuberculosis treatment card as soon as a patient is diagnosed with TB. The card is kept at the health facility where the patient is treated. In the front page during Intensive phase for the treatment of New cases the dose of 4FDC tablet and in case of Retreatment the dose of streptomycin in addition to 4FDC should be written in the box. If a patient is treated with single or multiple loose drugs the daily dosage should be filled in the boxes for H, R, Z, and E. On the back page similarly during Continuation phase the dose of 2FDC tablet for New cases should be filled in the box. In addition the dose of Ethambutol should be added for Retreatment cases. If the patient is treated with single or multiple loose drugs, the doses should be filled in the appropriate boxes. There is a special box for child TB. The doses of child TB should be filled in the box accordingly.

7.2 Tuberculosis Identity Card (TB - 02)

The medical officer or paramedic fills this card as soon as the diagnosis of tuberculosis is made and the patient keeps the card. The most important parts of this card are the date on which treatment was started, and categorization of the patient. The patient should be instructed to bring this card each time s/he attends for anti-TB treatment, but s/he should also bring and show it if s/he attends for any complaint at a health facility, as the complaint might be caused by the anti-TB drugs.

7.3 Tuberculosis Register (TB - 03)

This register is kept at the TB treatment facility. The Tuberculosis Register contains all the important general information of the patient, classification of the disease, type of patient, date of start of treatment, smear microscopy results and outcome of the treatment. The date of registration is the date the patient is registered in the Tuberculosis Register and may be different from the date the patient was diagnosed in the laboratory or started treatment. At the end of each quarter a line should be drawn beneath the last patient registered during that quarter to highlight the end of the quarterly cohort. This will facilitate preparation of the quarterly reports and cohort analysis of

treatment outcome. At the end of the quarter, a tally can be made per sex (males and female patients), disease classification, type of patient or treatment outcome. A new page should be used for starting a new quarter.

From this register the quarterly reports on case-detection and treatment outcome will be compiled. It is the responsibility of the staff that maintains the register to keep it up-to-date.

7.4 Tuberculosis Laboratory Register (TB - 04)

The tuberculosis laboratory register is kept at all laboratories performing sputum examination for AFB. The microscopist or technologist who examines the smears enters all information into the register. The register gives information on the number of suspects examined, the number of smear-positive cases detected and the number and results of smear examination for follow-up of treatment. The Laboratory serial number is the serial number and should be started with 1 at the beginning of each calendar year. At the end of each quarter a line should be drawn beneath the last patient entered in the register. After each quarter, the number of suspects and number of total smears of suspects examined, number of smear-positive patients, number of follow-up examinations and number of positive follow-up examinations should be entered. Source of referral can also be tallied. The next quarter can start on a new page but the serial number will continue throughout the year.

7.5 Request form for AFB Microscopy examination (TB - 05)

The medical officer or paramedic who requests the smear examinations should fill in this form. If the smears are examined at the facility where the patient attends, the form should be brought to the laboratory with the first "on-the-spot" specimen. The patient should be given a sputum cup for the early morning specimen and a third cup for the second "on-the-spot" specimen when (s)he attends the next morning. If smears are examined at another facility, the three smears with the filled-in request form should be brought to the examining laboratory. It is essential to mention whether the sputum is sent for diagnosis or follow-up. A detailed address (including mobile phone number) of the patient should be recorded if sputum is sent for diagnosis. This is important to trace the patient if sputum is found positive and the patient does not return to the health facility. This form will be used for sample other than sputam also, for nature of sample is to be clearly mentioned.

7.6 Tuberculosis culture/DST request form (TB - 06)

Tuberculosis culture and drug-susceptibility testing will be carried out at the NIDCH, Laboratory of National TB Control Project Shyamoli, Dhaka and Regional Reference Lab at Rajshahi and Laboratory of Damien Foundation hospital in Netrakona for studies on surveillance of drug resistance and for selected patients as instructed by the NTP management (5.20).

7.7 Tuberculosis referral/transfer form (TB - 07)

This form is used for referring or transferring patients from one health facility to another. It should be filled in triplicate: one copy goes to the receiving center, one is given to the patient and one remains in the file. The receiving facility should fill the bottom part of the form and return it to the

sending institution as soon as the patient reports.

7.8 Reguistion Form for Drugs (TB - 08)

This form should be filled half yearly with a copy to District authority. For the drug calculation requirement of each item is calculated by multiplying the number of cases in the last quarter (category wise), the number of treatment doses and average units per dose by which working stock or running requirement will be obtained. This figure is multiplied by 3 to obtain stock of two quarter and 50% buffer stock (i.e., buffer stock of one quarter). By subtracting the in hand stock at the time of the indent from the above multiplication result, drug requirement for each item of drug for the bi-annum will be obtained.

7.9 Absentee tracing form (TB - 09)

This form should be used for retrieval of patients who do not turn up for their scheduled drug intake.

7.10 Quarterly report on case finding (TB - 10)

How to make the report?

- Identify all patients registered in the Tuberculosis Register during the quarter under report.
- Looking at the columns "Category" and "Pre-treatment smear examination", count the number of new male smear-positive cases, putting a mark with a pencil after a patient has been counted.
- Continue in the same way with the new female smear-positive cases.
- All new smear-positive cases have now been identified and they should be entered in the block-I (column-1),
- Divide the new smear-positive male and female patients according to the age groups and record the number in block-2. Verify that the number of males and the number of females for all age groups together should be the same as the numbers reported in block 1.
- Count (and mark) the smear-positive relapses, then new smear-negative cases and then new extra-pulmonary cases and other (previously treated & declared as treat. completed) in the same way.
- Enter these sums in the columns 2 to 5 of block 1. Add the totals of column 1-5 and enter in column 6.
- Verify that all patients registered during the quarter concerned have been included in the report.
- The reporting form should be filled in triplicate. One copy should be sent to the District Medical Officer, one to the NTP HQ in Dhaka and one should be kept in the records. The report should be sent promptly after the respective quarter is finished.

7.11 Quarterly Report on Treatment Results (TB 11)

This report is for cohort analysis of the treatment results. The different types of patients are evaluated separately. The evaluation is made quarterly of the cohort that started the treatment 12-15 months earlier. The information should be collected from the updated Tuberculosis Register.

Different categories of the treatment outcome

- For new smear-positive patients and retreatment patients
  - Cured (2 negative smears of which one at the end of treatment)
  - Treatment completed (no smear result at the end of treatment but clinicaly free of s/s)
  - Died (of any cause during treatment)
  - Failure (smear positive at 5 months or more after start of treatment)
  - Defaulted (absent for two or more consecutive months)
  - Transferred out (transferred to a facility outside the administrative recording/reporting area)
- For smear-negative patients
  - Treatment completed (finished the 6 months of treatment became free of s/s clinicaly)
  - Died (of any cause during treatment)
  - Failure (smear positive at 2 months after start of treatment)
  - Defaulted (absent for two or more consecutive months)
  - Transferred out (transferred to a facility outside the administrative recording/reporting area)

The report should be prepared in the same way as the case finding report.

7.12 Quarterly Report on Sputum conversion at 2/3 Months of Smear-positive Pulmonar TB Cases (TB 12)

This report provides information about the smear result at the end of the first two months (new smear-positive patients) or three months (retreatment patients) of treatment. In the best circumstances up to 10-15% of patients will remain positive at the end of the intensive phase. If the percentage is lower, this may indicate that scanty or low-positive smears are missed and thus provide an idea about the quality of microscopy.

The report should be prepared in the same way as the case finding report.

7.13 Quarterly Report on Laboratory Findings of Tuberculosis (TB-13)

This report provides information about the smear result during diagnosis and follow up examination of a patient. It will also provide information regarding total no of suspects examined & total no smear positive cases detected.

7.14 TB suspect Referral form (TB - 14)

Patients having cough for more than 3 weeks are the suspects of TB. They are referred to the nearest DOTS Center for further examination using this form.

7.15 Laboratory Logistic Request Form

This form should be filled in every quarter by the district staff responsible for supplies, with copy to the district authorities. The amounts required depend on the numbers of smear-positive patients diagnosed during the previous quarter and for some supplies on the number of diagnostic centres. This form is annexed in 5.

7.16 Preparation of reports

The following table helps to memorize when to send the reports to the district/national authorities. The reports should be sent within four weeks after the quarter is finished.

A **cohort** is a group of patients diagnosed and registered for treatment during a quarter.

A year is divided into 4(four) quarter so each quarter contain3 (three) months.

1stquarter (January, February, March), 2nd quarter (April, May, June),

3rd quarter (July, August, September), 4th quarter (October, November, December).

Reporting on	Case finding (form TB 10)	Smear conversion (form TB 12)	Treatment result (form TB 11)
01.01.08	4th Quarter 07	3rd Quarter 07	4th Quarter 06
01.04.08	1st Quarter 08	4th Quarter 07	1st Quarter 07
01.07.08	2nd Quarter 08	1st Quarter 08	2nd Quarter 07
01.10.08	3rd Quarter 08	2nd Quarter 08	3rd Quarter 07

8 SUPERVISION, MONITORING AND EVALUATION

8.1 Supervision

Supervision is the key element of TB control and is considered a cornerstone for sustainability of different NTP activities. It is the process of helping people to improve their own performance in order to meet objectives. Supervision is the part of monitoring that looks at the job performance of the people in the programme.

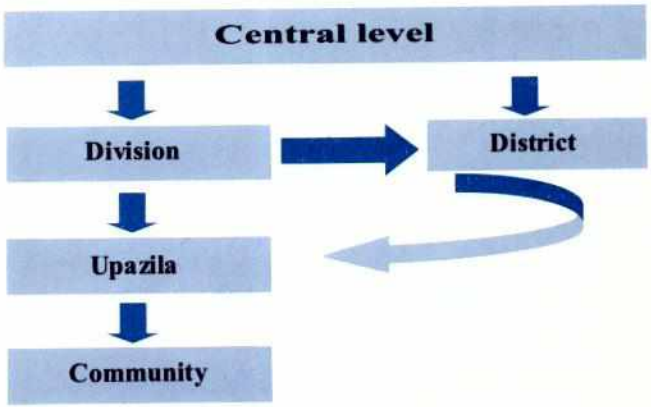
All health workers need help to solve problems and overcome difficulties. They need feedback on their performance and encouragement in their work.

Supervision should encourage, motivate, train, support, monitor, guide and boost staff morale. It is a set of activities to improve staff competence, effectiveness and efficiency of work through observation, discussion, technical support and reviewing records. The focus of supervisory visits is on education through on-the-job training, coordination, motivation, facilitation and guidance in implementation as per NTP guidelines with the overall objective to achieve national targets and goals.

Supervisory visits are planned with the following aims:

- To ensure effective implementation.
- To provide technical guidance and administrative support.
- To validate reported data.
- To effect corrective measures wherever required.
- To ensure patient and staff satisfaction
- To strengthen the relationship between the central, intermediate and peripheral levels and the implementing staff

8.1.2 NTP supervision policy



8.1.3 Process of supervision

Supervisory visits must be planed carefully. A schedule for supervisory visit should be prepared in advance. Before each visit, it is important to review the findings of the last supervisory visit, any notes of actions taken since the last visit, and any additional information about the health facility.

8.1.4 Tools for supervision

Supervisory checklist

Supervisory checklists are to be used to identify the administrative and technical problems systematically (Annex 3). They should be systematically filled in, calculating all indicators and answering all questions, together with the health worker. The checklist should be completed upon the end of the supervisory visit. The check list provides a guide but a supervisory visit may never be limited to completing the check list.

8.1.5 Points to be focused during supervision

General

- ✓ Availability of TB operational manual and other manuals including laboratory manual; also availability of health promotion materials for TB;
- ✓ Human resources: staff status (post sanctioned and vacant), availability of job description; training status of staff; knowledge, skills and attitude of relevant staff, job satisfaction.

Identification of suspects and laboratory diagnosis

- ✓ Trends in suspects: number of TB suspects per month; suspect notification rate (TB suspects detected in a defined period in a defined geographic area / total population of that area x 100,000) - inquire about any unexpected situation and provide feedback; quality of suspects; number of sputums examined per suspect (when there are several suspects for whom less than three sputum have been examined, may point out to poor counselling about the diagnostic procedure or wrong patients suspected for TB); source of referral of suspects;
- ✓ Triangulation: check that all patients diagnosed in the TB Laboratory Register have started treatment (treatment card available) and are registered in the TB register. Check for any inconsistency between the three forms.
- ✓ Check that smear-negative TB suspects are referred to a qualified physician for further investigations according to TB diagnostic algorithm.
- ✓ Calculate sputum positivity rate among TB suspects and during follow up. This amount should be around 10% for both suspects and follow up smears. Inquire in case of any very low or very high sputum positivity rate.
- ✓ Check the quality of smear (size, thickness, evenness, staining)
- ✓ Check maintenance of microscope and other equipments and logistics
- ✓ Check adequate supply of laboratory consumables

- ✓ Check Infection control measures taken (patients waiting area, sputum collected outside, availability and use of mask, etc.)

Verification of TB records

- ✓ **Trends in case notification:** number of TB cases per month (smear-positive cases, retreatment cases, all cases); notification rate (cases detected in a defined period in a defined geographic area / total population of that area x 100,000) - inquire about any unexpected situation and provide feedback;
- ✓ **Sputum conversion rate** (Total number new smear-positive cases becoming smear-negative after two months of treatment / total new smear-positive cases registered during the same quarter x 100 or total number of retreatment smear-positive cases becoming smear-negative after three months of treatment / total retreatment smear-positive cases registered during the same quarter x 100). This rate is expected to be around 85-90%. Inquire in case of any low conversion or very high conversion and provide feedback.
- ✓ **Treatment success rate:** Total number of new smear-positive cases who were declared "cured" or "Treatment Completed" / total number of new smear-positive cases registered in the same period x 100. This rate can be calculated in the same way for retreatment cases, smear-negative cases and extra-pulmonary cases. Inquire about any unexpected situation and provide feedback. The treatment completion rate for smear-positive cases should not exceed 5%.
- ✓ **Unsuccessful outcomes** (default rate, failure rate and transferred-out rate): Total number of new-smear positive cases who "defaulted", "failed" or were "transferred out" / total number of new smear-positive cases registered in the same period x 100. These rates can be calculated in the same way for retreatment cases, smear-negative cases and extra-pulmonary cases.

  Inquire about any unexpected situation and provide feedback.

Health education and counselling

- ✓ Check availability and use of health education materials
- ✓ Check counseling procedures
- ✓ Interview a selected number of patients to relate your findings with the information available
- ✓ On the patient cards, check knowledge about the diseases, duration of treatment and consequences of interruption of treatment

8.1.6 *Supervision Report*

Feedback is one of the most important parts of the supervision. It is encouraging to fill the checklist on the spot together with the related health personnel that will facilitate to strengthen a good relationship. Supervision reports should be submitted to relevant authorities and feedback must be provided to relevant field authorities.

8.2 Monitoring

Monitoring means to watch, keep track, or check usually for a special purpose. In our case it relates to maintaining and improving the health care for TB patient and suspects so that it meets our aspirations, to take appropriate action to improve performance. It is an ongoing process carried out by the programme implementers. Monitoring is the activity that ensures that measurable information of a programme is implemented, recorded and reported.

8.2.1 Methods of Monitoring

- Routine reporting
  - the core of a monitoring system
  - focus on data management, supply, finance, training, quality assurance, and drug use
- Supervisory visits
  - reinforce routine reporting requirements
    provide on-the-spot training, informal and direct monitoring
- Sentinel reporting
  - supplements routine reporting
  - most useful when a system is undergoing rapid or substantial change; can detect unexpected or unintended outcomes
- Special studies
  - when additional information and use of experts to design and conduct the study are required.

Both monitoring and supervision are ongoing processes. There should be a plan for regular supervision and monitoring at all levels.

8.3 Evaluation

Evaluation is the result of the programme that is measurable. It indicates whether the programme has achieved its targets and takes necessary steps for developing strategies and interventions for further improvement as per requirement of the programme.

The NTP advocates for continuous monitoring of the programme internally on periodic basis. The external joint evaluation is being conducted by both programme and external national and international experts at an interval of two to three years.

9 SUPPLY OF DRUGS, LABORATORY CONSUMABLES AND DOCUMENTATION MATERIALS

A regular, uninterrupted supply of quality drugs, laboratory consumables and documentation materials to all facilities where patients are diagnosed and treated should be ensured. Diagnosis of TB through smear microscopy and treatment of all registered TB patients are provided free of charge . The central level of NTP is responsible for planning, procurement and supply of anti-TB drugs, laboratory consumables and documentation materials to its implementing partners.

9.1 Requirement of drugs

Quantification at all level is based on the quantity drug needed for treatment of different categories of patient (annex 4). Quantification of anti-TB drugs is usually done annually by the central level of NTP with the technical assistance of WHO and the Global Drug Facility (GDF). This estimation of amounts of drugs required is based on the number of TB cases (category wise) treated during the previous year, annually adjusted; treatment regimen adopted, buffer stock (including amount of drugs required during lead time to supply) and stock-in-hand at the time of the drug order.

Quantification of anti-TB drugs at the upazila, CDC or city level is usually done quarterly according to the number of patients diagnosed during the previous quarter (TB-08). Local health authority in collaboration with NGOs will calculate the quantity of drugs required and fill in the requisition form for drugs (TB 08) at the end of every bi-annum. The form will be signed by the Upazila Health and Family Planning Officer (UH&FPO) or unit chief, countersigned by the Civil Surgeon (or supervisor for the unit) and forwarded to the central level preferably within the first week of the following month. The relevant NGOs will collect the drugs from central level and will deliver to respective indenting authority. Alternatively, the NTP may arrange for supply of the drugs to the indenting authority.

The NGOs will collect the required drugs from the UHC through indent to the UH&FPO and will report consumption and balance of drugs and other delivered logistics / laboratory consumables to the respective UH&FPO (or unit chief).

The information about drug consumption and stock at upazila level will be communicated to the central level quarterly together with case finding and treatment result reports. It is the responsibility of the UH&FPO (or unit chief) to ensure that this information is sent in time to avoid delays of supplies. The buffer stock of drugs and laboratory consumables for peripheral stores will be for one quarter.

9.2 Requirement of Laboratory Consumables

All health facilities require an adequate supply of sputum containers to collect and transport sputum specimens to microscopy centers. TB laboratories need a good quality binocular microscope, regular supply of slides and reagents. The "Laboratory Request Form" (Annex 5) gives information on how to calculate the required quantities of the ingredients for the stains and other supplies. Further details are given in the "Laboratory Manual on Smear Microscopy for Tuberculosis and its Quality Control in the NTP of Bangladesh".

9.3 Requirement of Documentation materials

Each registration unit needs a TB Register (one register will usually be sufficient for one year), TB treatment cards and patient identity cards based on the estimated number of patients. Sputumrequest forms should be available in the TB diagnostic facilities. One sputum request form

is sufficient for requesting diagnostic examination of three sputum specimens for a TB suspect and one for each follow-up examination during treatment. Each laboratory needs one or more TB laboratory registers per year depending on the number of suspects and follow-up cases examined. On an annual basis, all registration units (UHC, CDC, urban clinic, medical college hospital, etc.) need 25 copies of the quarterly report forms on case finding, smear conversion and treatment outcome. All districts need 15 copies of the "Requisition Form for Drugs" and the" Laboratory Request Form". NTP will ensure procurement of the documentation materials and its supply as per indent.

9.4 Inspection and Storage of Drugs and Supplies

Upon receipt, all drugs and supplies should be inspected by a 'Survey Committee' constituted for the store. The committee will tally the supplies with the 'Invoice' and will report for discrepancies or damages, if any.

Drugs and supplies should be stored in optimum conditions in a secured room. The drugs and laboratory reagents should be monitored regularly for expiry date. The drugs with shorter expiry dates should be placed in front and those with longer expiry dates behind (FEFO or first expiry-first out). A stock ledger must be maintained and updated whenever drugs and other materials are received or dispensed. In addition, a stock card (bin card) should be maintained for each drug. The bin card must be updated whenever drugs are received or dispensed, so that it always tallies the actual balance in stock as well as with the stock ledger.

The officer in charge of the store will ensure inspection of supplies, its optimum storage and proper recording as detailed in the "Standard Operating Procedures for Managing Drugs and Supplies".

9.5 Issuance of Drugs and Supplies

Considering the number of indenting centers and consequent workload, NTP will workout a 'schedule of distribution' mentioning the weeks, week days and districts for which the supplies will be issued. 'The distribution schedule', approved and signed by Director or his/her nominated person, should be available to the all concerned well ahead. The week of a quarter / bi-annum for a district should be similar for each quarter / bi-annum. The completed TB 08 form should be available to NTP well ahead of the schedule for distribution.

The NTP Medical Officer designated to supervise the Central Store should be responsible for following the distribution schedule as detailed in the "Standard Operating Procedures for Managing Drugs and Supplies".

9.6 Monitoring and Supervision of Stores

Monitoring and supervision of drugs/supplies management must be done at all levels. Reports of case finding and drug stock status from the upazila received through indent form as well as quarterly stock status from the Central Store should be the raw material for monitoring. Drug/supply management (especially GDF drugs) should be included in the agenda of monitoring meetings at all levels.

Supervisory visits including drug/supply management should be done by using a checklist as revised and included in the general supervisory checklist.

Reports of the supervisory visits should be analyzed for monitoring and feedback.

10 DRUG-RESISTANT TUBERCULOSIS

10.1 Definition and causes of multidrug-resistant tuberculosis

Multidrug-resistant tuberculosis (MDR-TB) is defined as TB resistant to at least isoniazid and rifampicin, the two most potent anti-TB drugs.

Although its causes are microbial, clinical and programmatic, MDR-TB is essentially a man-made phenomenon. From a microbiological perspective, resistance is caused by a genetic mutation that makes a drug ineffective. An inadequate or poorly administered treatment regimen allows drug-resistant mutants to become the dominant strain in a patient infected with TB. The table below summarizes the common causes of inadequate treatment. The most frequent mistakes include wrong classification of patients (Category 1 given to unrecognized retreatment cases) and the addition of a single drug to failing regimen.

Table 11: Factors of inadequate anti-TB treatment

Health-care providers: inadequate regimens	Drugs: inadequate supply/quality	Patients: inadequate drug intake
• Noncompliance with guidelines • Poor training No monitoring of treatment • Poorly organized or funded TB control programmes	• Poor quality • Unavailability of certain drugs (stock-outs or delivery disruptions) • Poor storage conditions • Wrong dose or combination	• Poor adherence • Lack of information • Lack of money • Lack of transportation • Adverse effects • Social barriers • Malabsorption • Substance dependency disorders

Treatment of MDR-TB with Category 1 or 2 may create even more resistance to the drugs used. This has been termed the "amplifier effect" of the short-course chemotherapy. Ongoing transmission of established MDR-TB strains in a population may also contribute to new drug-resistant cases.

10.2 Addressing the sources of drug-resistant TB

Any ongoing production of MDR-TB should be addressed urgently before embarking on any programme designed for MDR-TB control. Well-administered first-line treatment for susceptible cases is the best way to prevent acquisition of resistance. Timely identification of MDR-TB and adequate treatment regimens with second-line drugs administered early in the course of the disease are essential to stop primary transmission. Integration of DOTS with treatment of MDR-TB works synergistically to eliminate all the potential sources of TB transmission.

10.3 Types of drug resistance

Depending on the number of resistant drugs, we distinguish the following categories of resistance:

- Monoresistance: resistance to one type of drugs (e.g. isoniazid).

- Poly-resistance: resistance to more than one type of drug (e.g. streptomycin, isoniazid and ethambutol).
- MDR-TB: this is a subcategory of poly-resistance. TB resistant to at least isoniazid and rifampin.
- Extremely drug-resistant tuberculosis (XDR-TB): this is a subcategory of MDR-TB. XDR-TB is defined as MDR-TB plus resistance to a quinolone and an injectable second-line drug (kanamycin, capreomycin etc.)

Tuberculosis that is sensitive to all drugs is called pansusceptible TB.

Depending on the way resistance is required, two types are distinguished:

- Acquired or secondary resistance; this is defined as resistance to one or more anti-TB drugs, which arises during the course of treatment, usually due to non-adherence to the recommended regimen or due to incorrect drug prescription and intake.
- Primary resistance. This is defined as the presence of resistant strains of M. tuberculosis in patients, who have been infected with resistant bacilli by another patient and subsequently develop the disease.

Depending on the treatment history, two types of resistance are distinguished:

- Resistance among new patients, i.e. patients who were never treated before or were treated for maximum one month;
- Resistance among retreatment patients.

10.4 Magnitude of MDR-TB in Bangladesh

There are no national data on drug resistance in Bangladesh. However, in collaboration with Shyamoli CDC, the International Centre for Diarrheal Diseases and Research, Bangladesh has conducted drug-susceptibility testing in a sample of 657 patients showing 3% and 15% MDR-TB among new and previously treated TB patients, respectively. These data are not representative since Shyamoli CDC is a referral centre. Damien Foundation has also conducted two drug-resistance studies in 1995 and 2001 comprising 645 and 1041 patients. The 1995 study showed 0.7% and 6.8% MDR-TB among new and previously treated TB patients, respectively ; the 2001 study showed 0.4% and 3% MDR-TB among new and previously treated TB patients, respectively. A study conducted in 2005-2006 showed that of 96 Category II failures, 88% had MDR-TB.

Although the rates of MDR-TB in Bangladesh do not appear to be high, these low rates still translated into a high absolute number in view of the high burden. According to the WHO report 2008, the MDR-TB rate in Bangladesh is estimated at 3.6% and 19% among new and previously treated TB cases, respectively.

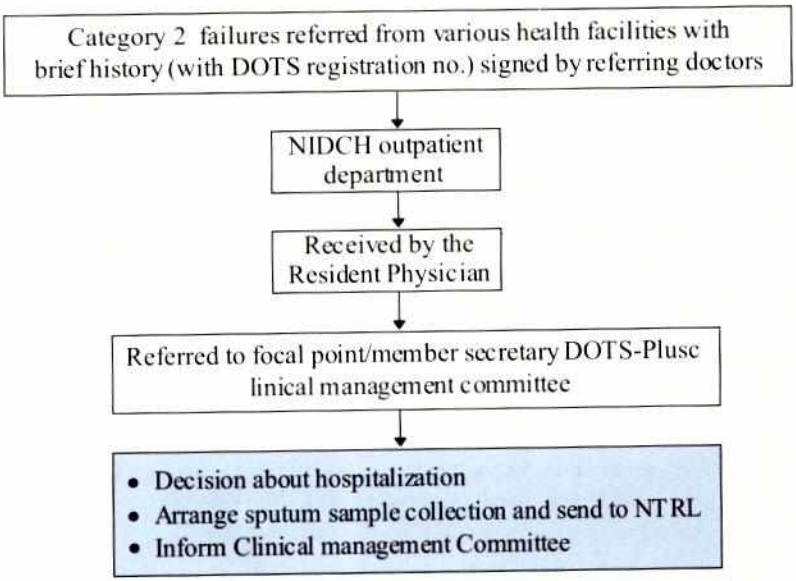
10.5 The operational manual

The NTP has published a separate manual for the management of drug-resistant tuberculosis. The guidelines expand upon the most recent WHO guidelines on TB , which included specific considerations for chronic and MDR-TB cases. The term DOTS-Plus has been currently used to refer to the management of drug-resistant TB building on basic DOTS programmes.

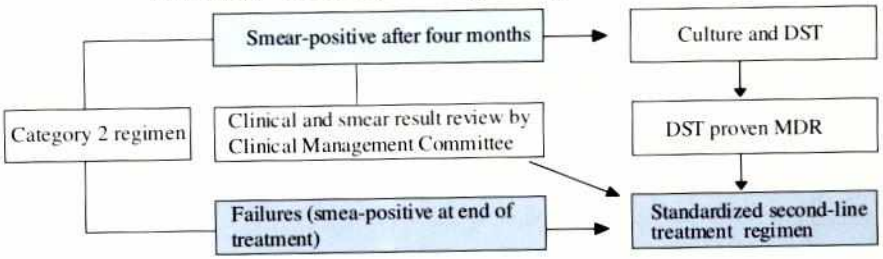
Category II failures will be referred by the medical officer of the Upazila Health Complex (and other health care facilities) to NIDCH. Patients residing in areas supported by Damien Foundation

will be referred to the Damien Foundation hospitals in Tangail (Jalchatra), Mymensingh, Netrakona or the Faridpur TB hospital. Patients from Rajshahi division will be referred to the Rajshahi Chest Diseases Hospital.

Referral flow chart



Inclusion criteria for case finding and treatment



The National TB Control Program has published detailed and separate MDR-TB guidelines.

[2] Zaman K, Rahim Z, Yunus Metal. Drug resistance of Mycobacterium tuberculosis in selected urban and rural areas in Bangladesh. Scandinavian Journal of Infectious Diseases, 2005; 37:21-26

[3] Van Deun A, Aung KJM, Chowdhury Setal. Drug susceptibility of Mycobacterium tuberculosis in a rural area of Bangladesh and its relevance to the national treatment regimens. IJTLD, 1999; 3 [4] (2):143–148

Van Deun A, Salim AH, Daru Petal. Drug resistance monitoring: combined rates may be the best [5] indicator of programme performance. IJTLD, 2004;8(1):23–30

NTP-NIDCH study (2005-06) to assess drug resistance pattern among category 2 failure patients. [6] Laboratory tests were done in Antwerp SRL.

For more information see the Green Light Committee web page at http://www.who.int/tb/dots/dotsplus/management/en/

11 INFECTION CONTROL

Transmission of TB is a recognized risk in health care facilities and communities, especially in resource-limited settings where transmission is facilitated by inadequate TB infection control measures. TB infection control has three components. By order of importance, they are as follows: administrative controls, environmental controls and personal respiratory protection.

11.1 Components of Infection Control

a. Administrative controls

The administrative controls include policies and procedures intended to promptly identify and treat infectious cases so that additional precautions can be taken. An important aspect of administrative control measures is the physical separation of patients known or suspected of having TB or MDR-TB (especially smear-positive cases) from other patients.

b. Environmental controls

In warm climates, infection control can be assured most effectively by strong natural ventilation (i.e. open windows in opposite walls).

c. Personal respiratory protection (special masks)

In addition, when administrative and environmental controls cannot provide complete protection, the third line of defense against nosocomial TB transmission is the use of masks. Because they are visible and relatively expensive, health workers assume that supplying personal masks alone will prevent TB transmission. However, they cannot be worn continuously and are likely not to be in use when unsuspected TB cases, or unsuspected MDR-TB, is encountered. Staff protection can be assured only by masks with a high-efficiency air-intake filter, and fitting tightly around the face so that no air can come in from besides the mask.

Patients will also wear personal masks to minimize dispersal of bacilli when they talk, cough, yawn or sneeze. These can be simple surgical masks; they will retain the droplets expelled by the patient effectively.

In addition to the above, basic infection control measures will be taught to patients such as covering the nose and mouth during coughing and sneezing and to discard used tissue into covered bins.

11.2 Essential Actions for Effective TB Infection Control Safety without stigma

11.2.1 Include Patients and Community in Advocacy Campaigns

The community should be well-educated about TB infection, prevention and control. Patients should understand that they should know their TB status and have a right to rapid TB diagnosis and treatment. They should know that TB can be spread by coughing and expect health care settings and community services to require persons coughing to cover their mouths when coughing. They should understand that health care workers (HCWs) may wear personal respiratory protection sometimes or that they may be asked to wear a mask to protect others. Safety without stigma should be the goal--a request to wear a mask or provide sputum outside, or in a well ventilated room should not be stigmatizing but is part of a safer clinic for everyone.

11.2.2 Develop an Infection Control Plan

All facilities should have an infection control (IC) plan and a facility person or team responsible for IC.

11.2.3 Ensure Safe Sputum Collection

Collecting and processing sputum are an essential part of the diagnosis of TB. Sputum collection can be potentially hazardous for health care workers and other patients-- HCWs should explain to patients that safety without stigma is the goal of good TB infection control and that sputum be collected outside.

11.2.4 Promote Cough Etiquette and Cough Hygiene

Every facility should have a poster on TB infection control and cough etiquette in at least the outpatient department waiting area, admissions area, and casualty department. Patients should be instructed to cover their mouths and nose when coughing, with hands, cloth such as handkerchief, clean rag, tissues, or paper masks.

11.2.5 Triage TB suspects for "fast-track" or separation

All patients should be screened upon arrival for chronic cough (i.e. >3 weeks), fever, weight loss, night sweats, haemoptysis, or contact with a person with TB. Persons suspected of having TB should be "fast-tracked" for rapid diagnosis and care services or should be asked to wait near an open window or in a comfortable area separate from the general waiting room (outside when possible). Community-based treatment models should be encouraged. Where there are in-patient settings, TB suspects should be placed in a room or area separate from general wards. Patients with known or suspected drug-resistant TB should be separated from general ward patients and from other TB suspects.

11.2.6 Assure Rapid Diagnosis and Initiation of Treatment

Patients suspected of having TB should move to the front of the queue for all services and should undergo prompt evaluation for TB. Sputum collection should be done away from other people. Sputum specimens are sent to a quality-assured laboratory for AFB smear. A patient-tracking system assures that TB suspects who are AFB smear-negative receive additional procedures (e.g. chest x-ray and referral visits) or treatment as quickly as possible. DOTS treatment for TB begins immediately when a diagnosis of TB is made.

11.2.7 Improve Room Air Ventilation

Patient waiting areas should be open and well-ventilated. Windows and doors should remain open when possible, to maximize cross ventilation. Appropriately placed simple fans can assist ventilation. Where weather permits, open-air shelters with a roof to protect patients from sun and rain are recommended. Patients should not wait for services in narrow, poorly ventilated corridors. Hospitals where patients with drug-resistant TB receive care should provide separate patient wards or rooms, preferably with good ventilation

11.2.8 Protect Health Care Workers

Health care workers should know the symptoms of TB.

11.2.9 Capacity Building

Training on TB infection control practices should be incorporated into the broader infection control trainings at hospitals and facilities (e.g. hand washing, other respiratory, and bloodborne infection control trainings).

11.2.10 Monitor infection control practices

Supervision of infection control practices should be a part of every supervisory visit. On-site measures include examining medical records of a sample of TB patients looking at the time interval from admission to suspicion of TB, suspicion of TB to ordering sputum for AFB, time from ordering to collection of sputum, collection of sputum to reporting of results, to initiation of TB treatment and interviewing patients to discuss understanding of infection control, safety and stigma.

(These ten essential actions are based on current WHO policy:
http://www.who.int/topics/hiv_aids/en/ or and http://www.stoptb.org/wg/tb_hiv/tbics.asp for more information).

12 TB-HIV CO-INFECTION

12.1 Definition: TB/HIV co infection denotes two diseases in one body.

There is a positive co-relation between TB incidence and HIV prevalence. Generally, the lifetime risk of developing active TB is around 10 percent while for TB/HIV co infection the risk is around 60 percent. HIV is the most powerful known risk factors for reactivation of latent tuberculosis to active disease, HIV infected people are most susceptible to be TB when they are exposed to Mycobacterium Tuberculosis, HIV increase the rate of recurrent TB, TB-HIV cases poses an increase risk of TB transmission to the general community, whether or not HIV infected. The estimated TB/HIV co-infection is 0.1% according to the study done on a sample of 1000 patients in Dhaka. Although the data show, by now, a low HIV prevalence in TB patients while the TB prevalence in PLHIV is high, the country situation with its 50% of population infected by TB called for a rationale for collaboration between TB and HIV activities.Considering the facts, functional collaboration has been established between NTP and NASP for implementing the collaborative TB/HIV programmes.

According with the WHO guidelines and the Bangladesh country profile, Bangladesh is classified in category 2 in TB/HIV collaboration model for two reasons: the national country adult HIV prevalence is below 1% & there is area with adult prevalence rate higher than 1%. According to this criteria TB/HIV activities need to be established as TB/HIV Co-infection burden in different administrative and geographic setting. In national context to identify the trend of TB/HIV co-infection burden and to design the activities National Survey for TB in HIV patient to be done 2-3 yearly. Considering all facts a country specific National Guideline on TB/HIV Programme Collaboration has been developed.

12.2 Goal of TB/HIV strategy

The goal of the TB/HIV strategy is to reduce TB/HIV associated morbidity and mortality through collaboration between National AIDS Programme and National TB programme.

12.3 Objectives of TB/HIV strategy

1. To establish the mechanism for collaboration between tuberculosis and HIV/AIDS programmes.
2. To decrease the burden of TB among People Living with HIV (PLHIV) and
3. To decrease the burden of HIV in TB patients.

12.4 Strategies to achieve the goal and objectives

1. Establish a joint surveillance mechanism to assess the annual status of TB/HIV
   - Assess annual status of HIV among TB patients by routine HIV screening among TB patients as set criteria;
   - National HIV sero prevalence in TB patients 2- 3 yearly;
   - Yearly TB screening for PLHIV (Sputum & CXR).

2. Strengthening health systems response to TB/HIV;
   - Building the capacity of service providers;
   - Strengthening of Counseling;
   - Ensure logistics.

12.5 Strategies for implementation

- Functional collaboration and not structural programme integration;
- Integration into ongoing programmes; and the need to generate evidence in order to effectively respond to TB/HIV in a comprehensive manner;
- This collaboration should be based on well-defined responsibilities and the complementary nature of each programme.

12.6 Criteria for TB/HIV Referral

1. From VCT to DOTS:
   1. All HIV positive patients;
   2. Suspected TB cases among the high risk group;
   3. Immediate family / partners contacts of HIV positive patients.
2. From DOTS to VCT:
   1. TB with history of high risk behavior (IDU, unsafe blood transfusion, SW, migrant workers , H/O STI, MSM, transgender/ Hijra);
   2. TB suspects with history of high risk behavior (IDU, unsafe blood transfusion, SW, migrant workers , H/O STI, MSM, transgender/Hijra);
   3. Complicated extra-pulmonary TB, Relapse and treatment failure Cases;
   4. MDR-TB;
   5. Clinical suspects of HIV infection;
   6. Children of mothers known to be HIV-positive;
   7. Others.

12.7 Mechanism for TB/HIV Referral

1. From VCT to DOTS:
   - Patient to go with existing referral card
   - Sputum collection if patient can not go with Sputum Request Form
2. From DOTS to VCT:
   - Patient to go with referral card
3. What to do when HIV patient is suspected as TB
   - Always refer TB suspects to nearest DOTS centre for diagnosis of TB.
4. What to do if HIV patients are diagnosed of having TB
   - VCT focal person should communicate with responsible person at TB-HIV partner organization or DOT centre for anti-TB drugs and arrange for collection anti-TB drugs.

- Ensure daily intake of anti-TB drugs (DOT) and recording in treatment card at VCT centre
- Enquire for any possible side effects of anti-TB drugs
- Encourage for regular treatment
- Refer the patient timely for follow- up to the DOT centre and whenever side effects of drugs is suspected
- Discharge patient from treatment at end of the course, refer to DOT centre for final examination and provide required information (copy of treatment card) to DOT centre

12.8 Diagnosis and Management of TB/HIV Co-infection: Described in National Guideline on TB/HIV Programme Collaboration.

12.9 Supervision, Monitoring and Reporting:

Exiting Programme will be responsible for TB and HIV supervision and monitoring according to their joint plan.

Patient after diagnosis as TB/HIV Co-infection will be managed and reported by VCT center but effective co-ordination between DOTS and VCT center to be maintained.

Joint M & E Plan will be done by NTP and NASP.

(Note : For detail understanding review "National Guidelines on TB/HIV Program Collaboration")

13 PUBLIC-PRIVATE MIX (PPM) FOR TB CONTROL

Public-Private Mix is a strategy, which aims to link the resources of public and private health care providers to achieve national TB Control targets.

Given the Bangladesh context, where private practitioners constitute a large proportion of the service delivery infrastructure and where almost half the people seek care for chest-related problems from the private sector, it is important that they are an integral component in the delivery of TB services under the umbrella of the NTP. It is widely recognized that the quality of and access to health care provision can be greatly enhanced by involvement of all health care providers through PPM. The combined efforts of the public and private sector are critical for Bangladesh in order to help halt the TB burden. The private sector resources can be best utilized to cover DOTS in these areas.

Many private providers in Bangladesh are already providing services to TB patients. However, the TB management practices in the private sector are not standardized and the precise number of TB cases detected and treated in the private sector is not known. This is due to the lack of sufficient interaction and formal linkages between NTP, private, NGO and public sector providers. Their involvement in the delivery of services will enable provision of high quality and effective TB services by all care providers.

13.1 The PPM approach for TB Control in Bangladesh are of various forms, such as:

1. Public with Private (for example: NTP collaborating with NGOs and private sector);
2. Public with Public, (for example: NTP collaborating with Defense, Police Health Services etc.); and
3. Private with Private health care providers (for example: NGOs working with Private Practitioners)

13.2 Current and Potential Providers for PPM:

Institutional Providers:

a. National TB Control Programme
b. City Corporation Health Services
c. NGO partners
d. Academic Medical Institutions e.g.: Medical Colleges, Specialized Institutions and Universities
e. Other Government Hospitals e.g.: District Hospitals, Upazila Health Complexes and Chest Hospitals etc.
f. Corporate Sectors/Work Places e.g.: Export Processing Zone (EPZ), Port, Railway, tea garden, garments, knitting and other companies etc.
g. Prison Health Services
h. Defense/ Police Medical Services
i. Private Hospitals and Clinics/ Private laboratories
j. Pharmacies/drug sellers
k. Refugee camp authorities

Individual Providers:

a. Specialist Physicians
b. Graduate Private Practitioners (PP's)
c. Non-graduate PPs e.g.: Sub-assistant Community Medical Officer (SACMO), Medical Assistant, Practitioners with LMF (Licentiate Medical Faculty) and MFPC (Member of the Faculty of Polli Chikitsok) etc.
d. Non-qualified PPs e.g.: Village Doctors
e. Community Health Volunteers e.g.: Shastho Shebika, Cured TB Patient, etc.

13.3 Roles of Diverse PPM Partners:

a. NTP:

- Central level planning for PPM for TB Control;
- Developing and distribution of PPM guidelines and training modules;
- Training of trainers;
- Developing and distribution of advocacy materials;
- Providing drugs and logistic supplies;
- Supervision and monitoring
- Recognition of high performing partners

b. Implementing Partners:

- Local level planning for PPM;
- Training;
- Establishing successful linkages among providers;
- Providing free sputum smear microscopy and drugs for TB patients;
- Organizing delivery of DOT;
- Recording and reporting;
- Supervision and monitoring

Contractual tools will be used such as a Memorandum of Understanding (MoU) to formalize partnership between Institutional providers and the NTP or a Letter of Agreement (LoA) to establish effective linkages with individual providers. These tools will be drafted through mutual consensus and are expected to clarify the expected roles and responsibilities of the collaborating partners.

The National TB control program has published PPM guidelines for TB Control and details of PPM TB Control are available in its guidelines.

14 ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION (ACSM)

Tuberculosis is social diseases with medical aspect. It is regarded as a barometer of social welfare. It is a public health problem worldwide. One third of the world population is infected with TB. Bangladesh ranks 6th among 22 high burden countries. ACSM activities are essential for the effective TB Control in Bangladesh.

Advocacy

The activities designed to place high in the political and developmental agenda. It will deal with political will and will increase the financial and other resources in a substantial basis. NTP is conducting the advocacy in the ministry, directorate and in the different policy level as routine activities. To cover TB related topics regularly and in a responsive manner for generating support from governments and donors advocacy is also conducted with the media people.

Communication

It is a theme expressing the process used by the people to exchange information's, views and opinions within each other. It is a two way process involving participation and dialogue as key element to change behavior of the specific group of people. In general people are not well informed regarding the symptom of TB, the mode of spread and personal hygiene. They do not know that the TB is curable, the treatment of TB is free of cost and the service providing all over the country by DOTS strategy. Maximum effort is going on in communicating the target group of people by NTP through arranging communication meeting and/or through with the help of NGO partners wherever feasible.

Social Mobilization

Social mobilization is the process of involving and motivating interested stakeholders (general population, health workers, policy makers etc.) to organize and take action for a common purpose to assist in the delivery of resources and services to strengthen community participation for sustainability and self-reliance. The aims of social mobilization are to bring about a social change within the country and to build up partnership. NTP is now working with more than thirty NGOs in the TB control activities to achieve the common goal.

ACSM helps in the TB control process by improving case detection and treatment adherence, combating stigma and discrimination, empowering people affected with TB and mobilizing political commitment and resource for TB.

NTP has developed for distribution of substantial amount of IEC material for enhancing ACSM activities to aware the high risk, marginalized and difficult to reach population.

Job Description (TB)

Annex 1-A

Area : DGHS

Sub area : Tuberculosis

Post : Civil Surgeon

Location : Civil Surgeon Office

Supervisor : Divisional Director/ Line Director/Program Manager

Responsibilities:

(1) Supervise the overall coordination procedure of NTP in the relevant geographic area;

(2) Supervise and provide technical support for quality assured laboratory networks and standard diagnostic facilities of NTP service delivery through government and partners and support NTP in sustaining and enhancing DOTS to reach all TB patients;

(3) Ensure that Government Medical Technologist performs AFB microscopy;

(4) Supervise and provide technical support to ensure anti-TB treatment according NTP guidelines including Directly Observed Treatment;

(5) Supervise and provide technical support for proper recording of patients and updating of TB registers to ensure improved case detection and treatment success;

(6) Supervise, coordinate and monitor management of MDR-TB with the National Institute of Diseases of Chest and Hospital and DOT provider center;

(7) Coordinate and supervise TB/HIV collaborative activities as when available in the district;

(8) Supervise and monitor public-private partnership by involvement of private, corporate, defense, prisons and other relevant sectors in TB control within the geographic locations;

(9) Conduct regular quarterly meetings on DOTS and expanded DOTS activities and monitor NTP performance and advise corrective measures for TB control;

(10) Supervise proper procurement, storage and distribution of anti-TB drugs;

(11) Supervise and provide technical support for in-service training to relevant staff providing NTP services;

(12) Supervise Advocacy, Communication and Social Mobilization activities for awareness building and to increase case detection and treatment success rate;

(13) Coordinate and Supervise the referral of Suspect and provision of DOT by Government field staff.

Job Description (TB)

Annex 1-B

Area : DGHS

Sub-area : Tuberculosis

Post : Junior Consultant Chest Clinic

Location : CDC

Supervisor : Civil Surgeon

Responsibilities:

1. Overall coordination of activities for NTP in the relevant geographic area;
2. Coordinate quality assured laboratory networks and standard diagnostic facilities of NTP service delivery through government and partners;
3. Support NTP in sustaining and enhancing DOTS to reach all TB patients;
4. Ensure identification of TB suspects and diagnosis of TB specially Smear Negative, Extra pulmonary and Child TB according to the NTP guidelines;
5. Ensure treatment according to the NTP guidelines, including directly observed treatment;
6. Coordinate, supervise and monitor management of MDR-TB, TB-HIV collaborative activities in line with National Guidelines;
7. Ensure proper records of the patients under treatment and assist in updating registers of the tuberculosis patients;
8. Assist and ensure tracing of defaulting TB patients and resumption of their treatment through government and partners;
9. Ensure clinical progress, identify and treat adverse reactions to drugs and manage complicated cases when and where necessary;
10. Ensure regular supply of Anti-TB Drugs and other logistics including ACSM material;
11. Assist and ensure accurate NTP quarterly reporting, quarterly monitoring of NTP performances and appropriate corrective action towards TB control;
12. Organize and facilitate in-service training to necessary staff, which addresses NTP services;
13. Ensure appropriate public-private partnership by involving corporate, defense, prisons and other relevant sectors for TB Control Programme;
14. Assist and ensure ACSM activities to individuals and community to promote self-reporting and treatment compliance of TB patients;
15. Ensure, Perform and monitor regular supervision of NTP activities at the relevant levels.

Job Description (TB)

Annex 1-C

Area: DGHS

Sub-area: Tuberculosis

Post: (1) Upazila Health & Family Planning Officer (UHFPO)
(3) Medical Officer TB/Leprosy (MO TB/LEP) Designated
(4) Medical Officer Chest Disease Clinic
(5) Medical Officer Disease Control (MO DC)
(6) Medical Officers, NGOs

Location: Civil Surgeon's Office/Chest Disease Clinic/Upazila Health Complex
Supervisor: Civil Surgeon

Responsibilities:

1. Overall coordination of activities for NTP in the relevant geographic area;
2. Coordinate and ensure quality assured AFB Microscopy by Government Medical Technologist and standard diagnostic facilities of NTP service delivery through government and partners and support NTP in sustaining and enhancing DOTS to reach all TB patients;
3. Assist and ensure treatment according to the NTP guidelines, including directly observed treatment;
4. Assist and ensure proper records of the patients under treatment and update registers of the tuberculosis patients by TLCA/ assigned TLCA to ensure improved case detection and treatment success;
5. Assist and ensure tracing of defaulting TB patients and resumption of their treatment involving Govt. field staff;
6. Ensure referral of suspect and provision of DOT by Government field staff
7. Ensure clinical progress, identify adverse reactions to drugs and refer the TB patient for proper management when necessary;
8. Coordinate, supervise and monitor management of MDR-TB, TB-HIV collaborative activities in line with National Guidelines
9. Ensure appropriate public-private partnership by involving corporate, defense, prisons and other relevant sectors for TB Control Programme;
10. Ensure accurate NTP quarterly reporting, quarterly monitoring of NTP performances and appropriate corrective action towards TB control;
11. Ensure in-service training to necessary staff, which addresses NTP services;
12. Assist and ensure ACSM to individuals and community to promote self-reporting and treatment compliance of TB patients;
13. Assist and ensure regular supervision of NTP at the relevant levels.

Job Description (TB)

Annex 1-D

Area: DGHS

Sub-area : Tuberculosis

Post : Programme Organizer

Location : Civil Surgeon Office

Supervisor : Civil Surgeon

Responsibilities:

1. Supervise NTP performance in the field level and assist in implementation of TB control measures;
2. Assist and ensure proper registration, recording and reporting of TB patients by LTCA and take appropriate measures to take corrective actions as when required;
3. Assist to conduct regular quarterly monitoring meetings on DOTS, prepare meeting minutes, submit to Civil Surgeon for distribution and assist to execute recommendation of QMM upto field level;
4. Assist and ensure regular supply of Anti-TB Drugs and other logistics including ACSM material;
5. Assist and ensure proper display of ACSM material to all DOT centres and update the TB related information in the display board;
6. Assist in coordination with NGOs and other private sectors for implementation of DOTS;
7. Assist and organize awareness building activity to the community to promote self-reporting and treatment compliance of TB patients.

Job Description

Annex 1-E

Area : DGHS
Sub-Area : Tuberculosis
Post : Medical Technologist (Laboratory)
Location : Upazila Health Complex, Hospitals, Clinics (GoB, NGOs)
Supervisor :
1. Jr. Consultant, Chest Disease Clinic
2. Upazila Health & Family Planning Officer (UH&FPO)
3. MO TB/Leprosy (Designated) of the District
4. Chief Medical Technologist (Laboratory), Civil Surgeon Office
5. Medical Technologist (Laboratory) Chest Disease Clinic (lab)
6. TB/Leprosy Programme Organizer, Tuberculosis & Leprosy Control Assistant

Responsibilities:

1. Maintain essential safety precautions during sputum collection, while working in the lab and concerning disposal of potentially infectious materials;
2. Collect sputum samples from suspects and patients on TB treatment:
   - 2.1 Explain the sampling procedure to the patient;
   - 2.2 Issue sputum containers and demonstrate how to use them;
   - 2.3 Give a unique identification number to each sample.
3. Prepare and examine a smear from each sputum sample submitted; prepare and examine smear from the types of a samples if requested by a medical officer:
   - 3.1 Properly identify a slide for each sample;
   - 3.2 Make a smear, fix and stain the smear;
   - 3.3 Examine the smear microscopically.
4. Record results of smear examinations and report them promptly to the requesting staff record results on sputum examination request form and TB laboratory register transmit positive results without delay;
5. Assure proper storage and regular supply of reagents and other materials :
   - 5.1 Store stains, sputum containers and slides protected from damage by light, dust or humidity;
   - 5.2 Timely request or collect appropriate quantities of supplies.
6. Monitor sputum smear results periodically for internal quality control; keep smears for re-checking:
   - 6.1 Periodically count numbers of results from the TB laboratory register;
   - 6.2 Note these counts in the register and calculate and plot positively rates;
   - 6.3 Preserve all slides after examination till a sample for re-checking is taken.
7. Keep the microscope as well as the laboratory in proper condition
   - 7.1 Clean the microscope regularly and take precautions against damage;
   - 7.2 Keep the laboratory neat and tidy;
   - 7.3 Transmit any problems with the microscope or other equipment to the appropriate authority.

Job Description (TB)

Annex 1-F

Area : DGHS

Sub-area : Tuberculosis

Post : 1. Health Inspector (HI)

2. Assistant Health Inspector (AHI)
3. Family Planning Inspector (FPI)
4. Health Assistant (HA)
5. Medical Assistant (MA)
6. NGO Community Health Workers

Location: UHC/ Union Health & Family Welfare Center (UHFWC)

Supervisor: UH&FPO/Medical Officer of UHFWC

Responsibilities:

1. Supervise the proper execution of all the tasks listed against each posts;
2. Assist and ensure the referral of symptomatic and TB patients;
3. Assist and ensure the directly observed treatment in the community and the tracing of TB treatment defaulters;
4. Assist and ensure proper registration, recording and reporting of TB patients;
5. Assist in collaborating public-private sectors;
6. Assist and ensure adequate and timely supply of anti-TB drugs and other items;
7. Assist and organize awareness building activity to the community to promote self-reporting and treatment compliance of TB patients.

Job Description (TB)

Annex 1-G

Area : DGHS

Sub-area : Tuberculosis

Post : Leprosy and TB Control Assistant (LTCA)

Location : Upazila Health Complex

Supervisor : UH&FPO

Responsibilities:

1. Perform the activities for NTP in the relevant geographic area;
2. Support standard diagnostic facilities of NTP service delivery through government and support NTP in sustaining and enhancing DOTS to reach all TB patients;
3. Assist treatment according to the NTP guidelines, including directly observed treatment;
4. Maintain proper records of the patients under treatment and update registers of the tuberculosis patients;
5. Assist tracing of defaulting TB patients and resumption of their treatment involving Govt. field staff;
6. Assist and ensure referral of suspect and provision of DOT;
7. Identify adverse reactions of drugs and refer the patient to UH&FPO/ MO DC for proper management;
8. Assist appropriate public-private partnership for TB Control Programme;
9. Prepare NTP quarterly reports including Lab performance and submit to UH&FPO timely;
10. Prepare reports of NTP performance for Upazila monthly meeting and District Quarterly meeting
11. Prepare indent for anti-TB drugs and other requirements with the help MODC and submit to UH&FPO;
12. Ensure display and proper use of available NTP ACSM material and collect the required material from NTP
13. Ensure display of update TB related information in the Upazila display board
14. Assist in implementing ACSM activities in the community to promote self-reporting and treatment compliance of TB patients;
15. Perform regular supervision of NTP activities at the field level.
16. Maintain liaison with NGOs and other partners in the field level.

Job Description (TB)

Annex 1-H

Area : DGHS

Sub area : Tuberculosis

Post : Statistical assistant

Location : Civil Surgeon Office.

Supervisor : Civil Surgeon

Responsibilities:

1. Collection of quarterly report (case finding, treatment outcome, sputum conversion& lab report) from Upazilla Health Complexes of the respective district.

2. Compilation of collected quarterly report.

3. Sending quarterly report to NTP Head quarter after getting signature from C/S.

4. Entering upazillawise TB related data at the district using TB Data management program.

5. Processing, Analysis & Interpretation of data at district level.

6. Preparation of quarterly report of respective district with chart and table.

7. Preparing and displaying graphical presentation of sharing time trends of some basic indicators(case finding, treatment outcome, No of TB suspect tested, No of positive case found, case positivity rate.)

Annex-02

TB 01

NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Directorate General of Health Services, Bangladesh

Tuberculosis Treatement Card (Front page)

Name : _____

Father's/Husband's name : _____

Address (in full) : _____

Name & Address of contact person: _____ Phone No. _____

Occupaton : _____

Sex: M ☐ F ☐ Age: ____ BCG: no scar ☐ scar seen ☐

Name and address of person providing DOT: _____

*Refd by :	PP	Gov Hospital	SS	GFS	TB Patient
	NON PP	Private Hospital	VD	CV	other specify

TB Registration No : _____ Date : _____

Name & Address of Health Institution / DOT Center : _____

Disease Classification			
Pulmonary		Extra pulmonary	☐
Smear positive	☐		
Smear negalive	☐	Site	_____

Type of Patient			
New	☐	Failure	☐
Transfer in	☐	Relapse	☐
Treatment after default	☐	Other (Specify)	☐

I. INTENSIVE PHASE- Prescribed regimen and dosages

Frequency : Daily

Tick category and indicate number of tablets per dose and doses of S(gms)

CAT 1 ☐ **CAT 2** ☐ Child ☐

4FDC ☐ 4FDC ☐ 3FDC ☐ ☐ E

R	H	Z	E	R	H	Z	E	S	R	H	Z	E	S

Month	Date	Results of sputum examination				Weight (kg)
		Smear 1	Smear 2	Smear 3	Lab No.	
0						
2/3						
3/4						
5						
6/8						

TB/HIV		
	Date	Result
HIV Test		
** CPT Start		
ART start		
Others		

** CPT= Co-trimoxazole preventive Therapy

Enter ☑ in the appropriate box to indicate the date when the drugs have been swallowed under direct observation

Month / year	Day																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

* PP= Private Graduate Practitioner, GFS= Government fielf staff, Non PP= Non Private Graduate Practitioner,
SS= Shastho Shebika, VD= Village Doctor, CV= Community volunteer

_____

Signature of medical officer

(6)

Tuberculosis Treatement Card (Back page)

Annex-02

TB 01

II. CONTINUATION PHASE - Prescribed regimen and drug dosages

Put tick ☑ mark in the appropriate box

CAT1 ☐ **CAT 2** ☐ Child ☐

2FDC ☐ R H

2FDC ☐ ☐ E R H E

2FDC ☐ R H

Enter a tick ☑ in the appropriate box to indicate the date when the drugs have been swallowed under direct obseration

Month / Year	Day																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Treatemt outcome

Date of decision ———

- ☐ Cured
- ☐ Treatment completed
- ☐ Died
- ☐ Treatment failure
- ☐ Default
- ☐ Transfer out

Remarks :- ———

Name & Address of contract person

Signture of Medical Officer

TB 02

Front

জাতীয় যক্ষ্মা নিয়ন্ত্রণ কর্মসূচি

টিবি-০২

স্বাস্থ্য অধিদপ্তর ঢাকা, বাংলাদেশ

পরিচয়পত্র

রোগীর নামঃ _____

পূর্ণ ঠিকানা ঃ

(ক) বর্তমানঃ _____

(খ) স্থায়ীঃ _____

লিঙ্গঃ পুরুষ ☐ মহিলা ☐ বয়সঃ _____

যক্ষা রেজিষ্ট্রেশন নং _____

চিকিৎসা শুরুর তারিখঃ _____

CAT I ☐ CAT 2 ☐ Child ☐

স্বাস্থ্য প্রতিষ্ঠানের নাম ঃ _____

রেফারকৃত ব্যক্তি/প্রতিষ্ঠানের নাম ঃ _____

ডট (DOTS) প্রদানকারীর নামঃ _____

ঠিকানাঃ _____

রোগের শ্রেণী	
ফুসফুস ☐	ফুসফুস বর্হিভূত ☐
জীবানুমুক্ত ☐	স্থানঃ _____
জীবানুযুক্ত ☐	

রোগের শ্রেণী	
নতুন (New) ☐	পূণঃআক্রান্ত (Relapse) ☐
অবস্থান হতে প্রেরিত (Transfer in) ☐	
ফেলাপী রোগী ঃ (Defaulter) ☐	অন্যান্য (Others) _____

Back

স্বাস্থ্য কেন্দ্রে উপস্থিতির তারিখঃ

_____

_____

_____

_____

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_____

_____

_____

(১) আপনার কার্ডের যত্ন নিন।
(২) নিয়মিতসঠিক মাত্রায় নির্দিষ্ট সময় পযর্ন্ত ঔষধ সেবন করুন।
(৩) অসম্পূর্ণ চিকিৎসা মারাত্মক যক্ষা রোগের সৃষ্টি করে যা সহজে আরোগ্য হয় না।
(৪) যেখানে সেখানে কফ ও থুথু ফেলবেন না।
(৫) হাঁচি বা কাশির সময় নাক-মুখ ঢেকে রাখুন।

বিঃ দ্রঃ ঔষধ সংগ্রহের সময় এই কার্ডটি অবশ্যই সঙ্গে আনতে হবে।

চিকিৎসা শেষের ফলাফলঃ _____

চিকিৎসা শেষের তারিখঃ _____

তিন সপ্তাহের বেশী কাশি যক্ষারোগের প্রধান লক্ষণ!

কফ পরীক্ষা ও চিকিৎসা সম্পূর্ণ ফ্রি

TB 03

NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Directorate General of Health Services, Bangladesh

Tuberculosis Register (Left side)

Date of Registration	TB Registration No	Name in full	Sex M/F	Age	Occupation	Address in full	Name of treatment unit	Date of start of treatment and regimen	Disease classification P/EP	Type of patient**						Refd by
										New (N)	Release (R)	Transfer in (T)	Treatment after default (D)	failure (F)	Other Specify (O)	

** Enter the appropriate code :

N: New case : a patient, who has never taken tuberculosis drugs or has taken drugs for less than a month

R: Relapse: a previously treated patient, who was declared cured, but is now smear-positive again

T: Transfer in: a patient, who has been transferred from one reporting unit to another. For transfer in patient name of the center from where patient was transferred out should be written in the remarks column.

D: Treatment aftet interruption: a patient who returns to treatment after having interrupted treatment for two consecutive months or more-having treatment for 1 months or more or A smear negative patient became smear positive at 2 months.

F: Treatment failure: a smear-positive patient who remained, or became again, smear positive at five months or later after commencing treatment

O: Other: patients, who cannot be classified to any previous category

NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Directorate General of Health Services, Bangladesh

Tuberculosis Register (Right side)

Sputum examination: Upper space result; Lower space Lab. senal number							Treatment outcome & date								TB/HIV activities			Remarks
Pretreatment				Follow-up smear			Date	Outcome							HIV Result Date	ART Y/N Start date	CPT Y/N Start date	
Smear 1	Smear 2	Smear 3	X-ray Result	2nd/3rd (new), 3rd/4th (Retreatment) month	5th month	6th/8th month		Cure	Treatment completed	Treatment Failure	Died	Default	Transfer out					

*** Enter date in the appropriate column.

1. Cured: Treatment completed and negative smear results on 2 or more consectultive occassions at 5 months and at the end of the treatment
2. Treatment completed; Full course of Rx completed but sputm result is not available for continuation phase
3. Died; Patient known to have died from any cause durint treatment
4. Failure: Smear-positive at 5 months or later for CAT 1 and at 2 month for CAT III
5. Treatment after interrruption (Defaulter): Patient who has not collected drugs for 2 months or more
6. Transferred out: Patient who has been transferred to another DOT Centre, Name of the Center from where the patient was transferred out should be written in the remarks column.

TB 04

NATIONAL TUBERCULOSIS CONTROL PROGRAMME-BANGLADESH

Tuberculosis Laboratory Register

Lab Serial No.	Date of specimen received	Name in full	Address in full (patients for diagnosis)	Occupation	Age	Sex (Tick)		Name of treatment/ referring facility	Reason for examination		Result of Smear Examination			TB register no. (after registration)	Referred by**	Signature	Remarks
						M	F		Diagnosis (Tick)	Follow-up*	1	2	3				

* Enter TB Register Number & month of follow-up

** PP= Private Graduate Practitioner, GFS= Government fielf staff, Non PP= Non Private Graduate Practitioner, SS= Shastho Shebika, VD= Village Doctor, CV= Community volunteer, Gov. Hospital, Private Hospital, TB Patient, Other (specify)

TB 05

NATIONAL TUBERCULOSIS CONTROL PROGRAMME (NTP)

Directorate General of Health Services, Bangladesh

Request Form for AFB Microscopy Examination

(The completed form with results should be sent promptly by the Laboratory to the referring facility)

Name of Referring Facility [1]/Providers: _____ **Date:** _____

Name of Patient: _____ **Age:** _____ **Sex:** ☐ **M** ☐ **F**

Occupation _____ **Name of Father / Husband** _____

Full Address of Patient: _____

_____ **Telephone no. (if any):** _____

OPD Reg. No. (if any); (For suspects only): _____

Reason for examination: ☐ Diagnosis ☐ Follow-up If follow-up, **No. of month of Treatment:** _____

Disease Classification: ☐ **Pulmonary** ☐ **Extra-pulmonary (EP)** If EP, Site: _____

Nature of Specimen: ☐ Sputum ☐ Urine ☐ Pus ☐ Other, specify: _____

Specimen identification no: _____ **Patient TB Registration No:** _____
(For follow-up patients)

Signature of person requesting examination: _____

Name & designation of person requesting examination: ----------

1. Including all public and private health facility/providers

---

RESULTS (To be completed in the Laboratory)

Lab Registration No: _____

Visual appearance of the specimen (if it is sputum): ☐ Muco-purulent ☐ Blood-stained ☐ Saliva

Microscopy results

Date of Collection*	Specimen	Result				
		Negative	Scanty (1-9)	1+	2+	3+
	1					
	2					
	3					

Sputum collected by:

Signature: _____

Name: _____

Examined by:

Signature of Medical Tech (Lab) _____

Name: _____

Date: _____

Name of Lab/Organization: _____

* To be completed by the person collecting the sputum

TB 06

NATIONAL TUBERCULOSIS CONTROL PROGRAM
Directorate General of Health Services, Bangladesh
Tuberculosis Culture/Sensitivity Test Request/Report Form

(1) Patient TB Registration No: _____ District: _____

Name of patient: _____ Hospital: _____

(2) Please (✓) mark in appropriate box

☐ Failure after CAT-II Regimen ☐ Relapse after CAT-II Regimen

Previous history of Treatment:
Chemotherapy given:

	From	To	From	To	From	To	From	To
Isoniazid								
Streptomycin								
Rifampicin								
Ethambutol								
Pyrazinamide								

Date: _____ Name of MO _____

Send results to (Address): _____

(3) Specimen (s) of Sputum at 0 Month ☐ Patient Starts/Started Treatment on Date: _____ Other Specimen Specify: Date: _____

(PLEASE TICK) 2 Months ☐

End of Treatment ☐

Date(s) of sputum collection: _____ _____

(4) FOR LAB USE ONLY

Lab. Serial No: _____

Direct Smear: _____

Specimen	Results*	Positive (grading)			
		3+	2+	1+	scanty (1-9)
1		☐	☐	☐	☐
2		☐	☐	☐	☐
3		☐	☐	☐	☐

*Write Neg. or pos.

Culture: _____ _____ _____

(5) **SENSITIVITY TESTS

DRUG	SENSITIVE	RESISTANT
Isoniazid		
Streptomycin		
Rifampicin		
Ethambutol		

COMMENTS: _____ _____ _____ _____ _____

**Not done at 2 months

Date: _____ Lab. Signature: _____

TB 07

NATIONAL TUBERCULOSIS CONTROL PROGRAM CENTRE

Directorate General of Health Services, Bangladesh

☐ **TB Referral form** ☐ **TB Transfer form**

(Put tick ☑ mark in the above appropriate box)

(fill out in triplicate with carbon paper between sheets)

Name of Referring/Transferring Unit ..... **Phone** .....

Name of Institution to where patient is referred (if known) : .....

Name of patient : ..... **Age :** ..... **Sex :** .....

Address (In full) : .....

TB Registration No : ..... **Date of Treatment started :** .....

Type of Treatment : ☐ CAT 1 ☐ CAT 2 ☐ Child

New smear positive

New Case (smear-negitive EP)

Others : _____

Date of treatment strated : .....

No. of days which patient received drugs at least attendence .....

Reasons for referral : .....

Remarks : .....

Signature :

Designation :

Date referred/transferred:

For use by the Institution where the patient is referred to send outcome report to the institution where patient was initially registered

Name of patient : **TB Registration No :**

Age : **Sex :** M ☐ F ☐

TB Registration no (of the organization from where the patient was referred) : ☐

Treatment result :

☐ *Cured* ☐ *Treatment completed* ☐ *Failure* ☐ *Defaulted* ☐ *Died*

Date :..... Date :..... *Date :..... Date :..... Date :.....*

Signature : **Name :**

Date : **Designation :**

Send this part back to the referring unit as soon as the treatment outcome report is available

---

For use by institution where patient has been referred

Name of patient : _____ **TB Registration No :**

Age : **Sex :** M ☐ F ☐

Date Referred/Transferred :

Date of Received at this institution on

Signature :

Designation :

Name of institution from where patient was referred :

District : **Date :**

Send this part to the Referring Unit as soon as patient has reported and registered and alsoSent the treatment outcome to the center from where the patient was referred after completion of treatment

TB 08

NATIONAL TUBERCULOSIS CONTROL PROGRAMME (NTP)
Directorate General of Health Services,Bangladesh
Requisition Form for Drugs

Year: _____ Bi-annum: Jan-Jun / July-Dec: _____

Name of Health Facility: _____

City/District/Upazila: _____

Name & Designation the person filling in the form: _____

Name & Contact no. of the UHFPO / Center chief: _____

Number of registered cases during the previous quarter		
Adults		Children ($\leq$ 15 years)
Category I = (n)	Category II = (n_1)	Category I =(c_1)

Drug requirements estimation

Drug	[1]Quantity required for one quarter			[2]Total for bi-annum (+Buffer) (b)=3x(a)	[3]Existing balance (c)	Amount to be supplied (b) - (c)	Actual amount supplied	[4]Remarks
	Cat I = (1)	Cat II = (2)	Total (a) = (1+2)					
4FDC	= n x 180	= n_1 x 270						
2FDC (R150/H75)	= n x 360	= n_1 x 450						
2FDC (R60/H30) (Dispersible)	= c_1 x 360							
(R60/H30)Z150mg (Dispersible)	= c_1 x 180							
H 100 mg								
R 150 mg								
H 300 mg								
R 450 mg								
Z 500 mg								
E 400 mg		= n_1 x 450						
S 1 g		= n_1 x 60						
Inj. Water, 5ml		= n_1 x 60						
D/ Syringe, 5cc		= n_1 x 60						

[1] Multiply the number of patients (n/n_1/c_1) in each treatment category with the number needed for treatment of one patient.
[2] Next bi-annum quantity + buffer stock (50% of bi-annum) is thrice the consumption of last quarter (300%).
[3] Indicate the remaining balance from the drug ledger at the end of the previous quarter.
[4] Use this column to mention drug (s) with expiry less than 6 months (give name, quantity & exact date of expiry).

Prepared by: _____ UH&FPO/Center chief: _____
(Signature with date)

Checked by: _____ Controlling authority (e.g. C S): _____
(Counter sign with Date)

টিবি -০৯

জাতীয় যক্ষ্মা নিয়ন্ত্রণ কর্মসূচি
স্বাস্থ্য অধিদপ্তর

গর-হাজিরা যক্ষ্মা রোগীর বাড়ী পরিদর্শন ফরম
(Absentee Tracing Form)

থানা স্বাস্থ্য কমপ্লেক্স/টিবি ক্লিনিক/লেপ্রোসী হাসপাতাল .....

প্রতি,

.....

স্বাস্থ্য সহকারী,

ওয়ার্ড নং .....

ইউনিয়ন .....

জনাব/জনাবা ..... পিতা/স্বামী .....

বয়স ..... রেজিঃ নং .....গ্রাম .....

ইউনিয়ন .....

একজন যক্ষ্মা/কুষ্ঠ রোগী। তিনি গত ..... তারিখ হইতে ঔষধ গ্রহণে রিবত থকায় অতি সত্ত্বর তাহার বাড়ী পরিদর্শন করিয়া মেডিকেল অফিসার (ডেজিগনেটেড) টিবি-লেপ্রোসী-এর নিকট রিপোর্ট প্রদানের জন্য আপনাকে নির্দেশ দেওয়া হইল।

আদেশক্রমে

বাড়ী পরিদর্শনের রিপোর্ট

থানা স্বাস্থ্য ও পরিবার পরিকল্পনা কর্মকর্তা

স্বাস্থ্য সহকারী

TB 10

NATIONAL TUBERCULOSIS CONTROL PROGRAM - BANGLADESH

Directorate General of Health Services, Bangladesh.

Quarterly report on case finding of tuberculosis

Name of District:	Name of Upazila/Address & Ward No:	Patients Registered During quarter 20.....	Date of Completion of this Form:
Name & Signature of UH&FPO/ In-charge of DOTS/ Health Unit:		Population of the area: Smear Positive Case Notification Rate:	Name, Signature & Contact no. of Person Completed the Form:

Block 1: All TB cases registered (Excluding "transfer in" and chronic)

Pulmonary sputum smear microscopy positive								Smear-Negative (5)		New Extra Pulmonary Tuberculosis (6)		Others previously treated* (7)		Total(8)		
New cases (1)		Previously treated														
		Relapses (2)		Failure(3)		Default(4)										
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total

Block 2: Smear Positive New Cases (From Column 1 above)

SMEAR POSITIVE NEW CASES: from column (1) above

Age-groups																TOTAL		
0-4		5-14		15-24		25-34		35-44		45-54		55-64		>= 65				
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total

Block 3: Smear Negative Cases (From column-5 above)

Age-groups																TOTAL		
0-4		5-14		15-24		25-34		35-44		45-54		55-64		>= 65				
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total

TB 10

Block 4: New EP Cases (From column 6 above)

Age-groups																TOTAL		
0-4		5-14		15-24		25-34		35-44		45-54		55-64		>= 65				
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total

Block-5 : No of Patients Reffered by:

PP	Non-PP	GFS	SS	VD	CV	Govt. Hospital	Private Hospital	TB Patient	Other (Specify)

Block 6: Laboratory Activity - Sputum smear microscopy

No. of TB suspects examined for diagnosis by sputum smear microscopy		No. of TB suspects with positive sputum smear microscopy result	
M	F	M	F

* This information to be included in the Lab report form

Block 7: TB/HIV activities

	No.of patients tested for HIV before or during TB treatment		No .of patients HIV positive	
	Male	Female	Male	Female
New Sputum smear				
Re teatment cases (specify)				
Smear negative				
Extra Pulmonary				
Others				

Suspect referral	No. of suspect reffered for sputum test			No. of positive among tested individuals		
	Male	Female	Total	Male	Female	Total

* Other previously treated cases include pulmonary cases with unknown history of previous treatment, previously treated sputum smear microscopy negative pulmonary cases and previously treated extrapulmonery cases. Transferred in and chronic cases are excluded.

NATIONAL TUBERCULOSIS CONTROL PROGRAM BANGLADESH

TB 11

Directorate General of Health Services, Bangladesh.

Quarterly Report onTreatmentResults of Pulmonary TB Patients Registered 12-15 months earlier

Name of District:	**Patients Registered During**	**Date of Completion of this Form:**
Name of Upazila/Address & Ward No:	quarter **20**	Name, signature & contact no. of person completed the form:
Name & Signature of UH&FPO/ In-charge of DOTS/ Health Unit:		

Total No of Patients reported during the above quarter			Patient type	(1) Cured		(2) Treatment Completed		(3) Died		(4) Failure		(5) Defaulted		(6) Transfarred out		Not Evaluated (7)		Grand Total (1 to 7)	
M	F	Total	1. New Cases	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. New Cases																			
			1.1 Smear Positive																
			1.2 Smear Negative																
			1.3 EP																
2. Retratment Cases																			
			2.1 Relapses																
			2.2 Failures																
			2.3 Treatment after default																
			2.4 Other																
			2.5 Total (2.1+ 2.2+2.3 +2.4)																

	No. of patient on CPT		No. of patient ART	
	M	F	M	F
All I TB Cases				

Treatment Success Rate:

1.1 sm +ve:..... 1.2 sm -ve:..... 2.5 result .....

* Includes TB Patients continuing on CPT started before TB diagnosis and those started during TB Treatment
* Includes TB Patients continuing on ART started before TB diagnosis and those started du ring TB Treatment

TB 12

NATIONAL TUBERCULOSIS CONTROL PROGRAM - BANGLADESH

Directorate General of Health Services, Bangladesh.

Quarterly Report on Sputum Conversion at 2/3 Months of Smear Positive

Pulmunary Tuberculosis patients registered 3-6 month earlier

Name of District:	**Patients Registered During**	**Date of Completion of this Form:**
Name of Upazila/Address & Ward No:	quarter 20	Name, signature & contact no. of person completed the form:
Name & Signature of UH&FPO/ In-charge of DOTS/ Health Unit:		

Total No of Pulmonary Patient reported during the above quater			Type of Patient	(1) Smear Negative		(2) Smear Positive		(3) Died		(4) Defulted		(5) Transferred out		(6) Not Evaluated		Grand Total (1 to 6)
M	F	T		M	F	M	F	M	F	M	F	M	F	M	F	Total
			1. New Cases													
			1.1 Smear Positive													
			1.2 Smear Negative													

Retreatment Cases			2 Retreatment Cases												
			2.1 Relapses												
			2.2 Failures												
			2.3 Default after Treatment												
			2.4 Others												

Sputum conversion rate

New ....., Retreatment .....

Annex-2
TB 13

NATIONAL TUBERCULOSIS PROGRAMME, BANGLADESH

Directorate General of Health Services, Bangladesh.

Quarterly Report On Laboratory Findings Of Tuberculosis

Centre: _____ **Upazilla:** _____ **District:** _____ **Division:** _____

Name of Lab technologist(s): _____ **Date of report preparation:** _____

Technologist trained by the NTP: **Yes (year:** **)/No** **No. of microscope in running condition:** _____

Quarter / Year	Diagnosis Examinations (Case Finding)					
	TB suspects tested (No. of people tested)	AFB positive cases (No. of positive tested)	Smears tested (No. of smears tested)	Positive Smears		Only sample tested
				(1+,2+ & 3+)	scanty (1-9AFB/100)	
	(a)	(b)	(c)	(d)	(e)	(f)

Follow-up Examinations		
Smears tested (No. of smears tested)	Positive Smears	
	(1+,2+ & 3+)	scanty (1-9AFB/100)
(g)	(h)	(i)

Total no.of smears tested (c+g)	*1	(W)
Total no.of (1+,2+ & 3+) smears (d+h)	*2	(X)
Total no.of Scanty Smears (e+i)	*2	(Y)
Total no.of Negative Smears (w-x-y)	*2	(Z)
Positive rate among TB suspects (%)	*3	(b)/(a) x100 %

***1** This data will be used for planning of supplies.

***2** This data will be used for quarterly report of re-checking in EQA centre.

***3** This could be used to monitor programme performance.

Problems identified and supports required by the Centre from NTP/EQA centre:

_____

_____

Copy to:
Respected EQA centre

Prepared by:
Lab Technologist

Approved by:
UHFOP / Jr. Consultant / NGO Clinic Manager

জাতীয় যক্ষ্মা নিয়ন্ত্রণ কর্মসূচি

সন্দেহজনক যক্ষ্মা রোগী প্রেরণের ফরম

সন্দেহজনক রোগীর নামঃ----------

বয়স ঃ----------

ঠিকানা ঃ----------

প্রেরনকারীর নামঃ----------পদবীঃ----------

ঠিকানাঃ----------

---------- স্বাক্ষরঃ----------

(৩ সপ্তাহের অধিক কাশি যক্ষ্মার প্রধান লক্ষন।)

জাতীয় যক্ষ্মা নিয়ন্ত্রণ কর্মসূচি

সন্দেহজনক যক্ষ্মা রোগী প্রেরণের ফরম

সন্দেহজনক রোগীর নামঃ----------

বয়স ঃ----------

ঠিকানা ঃ----------

প্রেরনকারীর নামঃ----------পদবীঃ----------

ঠিকানাঃ----------

---------- স্বাক্ষরঃ----------

(৩ সপ্তাহের অধিক কাশি যক্ষ্মার প্রধান লক্ষন।)

NATIONAL TUBERCULOSIS CONTROL PROGRAM-BANGLADESH **Annex 3**

Directorate General of Health Services

Mohakhali, Dhaka

Supervision Check List

Name of Centre: ---------- District ----------

Catchmen Population:----------

Estimated Number of TB patients:----------

Name of Supervisor:----------

Date of Visit:----------

Follow up of previous visit

Date of last visit: ……../ ……../ 200

Problems identified and recommendations of last visit:

Status of implementation according to recommendations:

Training status of health worker (s), including laboratory technologist, at the time of the visit:

1. Number of health worker(s) directly involved in TB Control programme

i) Health Center ☐

ii) Peripheral Health Workers ☐

2. Number of Health Worker(s) present on the day of visit ☐

3. Interview with health workers/DOTS providers (If available during visit):

* Knowledge of the disease	Satisfactory	☐	Unsatisfactory	☐
* Do they refer suspects	Yes	☐	No	☐
* Do they supervise treatment	Yes	☐	No	☐
* Do they follow-up drug reaction cases	Yes	☐	No	☐

4. Interview some patients to check their knowledge and satisfaction of services available (Answered satisfactorily)

- Name of the disease he/she is suffering from? Yes ☐ No ☐
- How can we suspect whether a person has TB or not? Yes ☐ No ☐
- Duration of treatment Yes ☐ No ☐
- Understanding of irregular treatment Yes ☐ No ☐
- Danger of irregular treatment Yes ☐ No ☐
- Availability of free treatment (who and where) Yes ☐ No ☐

5. Availability of NTP manual / Laboratory Manual (Available) Yes ☐ No ☐

6. Documentation:

6.1 Treatment Cards

Complete ☐ Incomplete ☐

6.2 Laboratory register (check last quarter)

a. Number of suspect with negative smear ☐ e. Number of cases registered in TB register ☐

b. Number of suspect with positive smear ☐ f. No. of +ve smear among follow-up exam ☐

c. No. of follow up examination ☐ g. Case/Smear positivity rate ☐

d. No. suspects with < 3 smear examination ☐ h. % of suspects with < 3 smear examination ☐

6.3 TB register:

6.3.1 Cross check whether all +ve from lab register are registered Yes ☐ No ☐

6.4 Patient Statistics (Available)

i) Case registered Yes ☐ No ☐

ii) Sputum conversion Yes ☐ No ☐

iii) Cure rate Yes ☐ No ☐

7. Laboratory services:

7.1 Microscope functioning

i) Presence of fungus Yes ☐ No ☐

ii) Preservation of Microscope Yes ☐ No ☐

7.2 Examining slides

7.2.1 Size of the smear appropriate ☐ Inappropriate ☐

7.2.2 Thickness of the smear appropriate ☐ Inappropriate ☐

7.2.3 Staining of slides appropriate ☐ Inappropriate ☐

7.3 Quality Assurance in place Yes ☐ No ☐

7.4 Regular Collection of slides for EQA Yes ☐ No ☐

7.5 Feed back of EQA available Yes ☐ No ☐

7.6 Action taken Yes ☐ No ☐

7.7 Disposal of lab. wastage (properly done) Yes ☐ No ☐

8. TB register Yes ☐ No ☐

8.1. Cross check whether all +ve from lab register are registered Yes ☐ No ☐

8.2 Information of patients Complete ☐ incomplete ☐

8.3. Case Detection:

8.3.1 Case registered in last quarter:

8.3.2 No. of new smear +ve cases registered: ☐

8.3.3 Case detection rate: (No. of cases in last 4 quarter × 100) ☐

No. of expected cases for a year

8.3.4 No. of patients referred by private practitioner: ☐ +ve ☐ -ve ☐ EP

8.3.5 Check for the correctness of the last quarter report Correct ☐ Incorrect ☐

8.4 Sputum conversion

8.4.1 No. of new smear +ve cases that became negative at the end of the intensive phase/No. of new smear positive cases registered (previous quarter) ☐

8.4.2 Check for the correctness of the last quarterly report Correct ☐ Incorrect ☐

8.4.3 Sputum conversion rate: ☐

8.5 Treatment outcome:

8.5.1 No. of new smear positive cured / No. of new smear positive cases registered (of 9-12 months ago) ☐

8.5.2 Check for the correctness of the quarterly report Correct ☐ Incorrect ☐

8.5.3 Treatment success rate: ☐

9. Management for Drugs and other logistics

9.1: Drugs:

9.1.1 Was the indent form filled in and calculated properly?

Yes ☐ No ☐ Others (Please specify) ☐

9.1.2 Was there any stock-out in the last quarter or now?

Yes ☐ No ☐ Others (Please specify) ☐

9.1.3 Are Anti-TB drugs stored properly on pallets/shelves?

Yes ☐ No ☐ Others (Please specify) ☐

9.1.4 Are Bin Cards maintained with Expiry Dates?

No ☐ Yes with Expiry date ☐ Yes without Expiry date ☐

9.1.5 Check whether FEFO and FIFO are applied during storage and distribution

Yes ☐ No ☐ Others (Please specify) ☐

9.1.6 Conformity amongst Stock Ledger, Bin Card and Random Physical Inventory:

Yes ☐ No ☐ Please specify, if no ☐

9.1.7 Is there any drug with shelf life less than 6 months?

Yes ☐ No ☐ Please specify with date, if yes ☐

9.2. Other logistics:

9.2.1 Reagents (carbol fuchsine, methyl blue, HCL etc):

Sufficient ☐ Insufficient ☐ Stock-out (Please specify) ☐

9.2.2 Are drugs and chemicals/reagents stored separately?

Yes ☐ No ☐ Please specify, if no ☐

9.2.3 Forms / cards / registers:

Sufficient ☐ Insufficient ☐ Stock-out (Please specify) ☐

9.2.4 Other logistics (Please specify)

Sufficient ☐ Insufficient ☐ Stock-out (Please specify) ☐

10. ACSM Activities:

i)	Presence of Posters / Sticker	Yes ☐	No ☐
ii)	Display of poster / sticker	Yes ☐	No ☐
iii)	Presence, distribution and use of educational materials (Leaflet, flip, char, flash chart, brochure)	Yes ☐	No ☐
iv)	Signboard with DOTS facilities in front of health center	Yes ☐	No ☐
v)	Health education on TB by health facility	Yes ☐	No ☐
vi)	DOTS committee meeting held regularly	Yes ☐	No ☐
vii)	DOTS committee meeting minutes available	Yes ☐	No ☐

11. Name and designation of key personnel's present during supervision:

1. ……
2. ……
3. ……

12. Recommendation / Comments of supervisor

_____

_____

_____

_____

_____

_____

_____

_____

_____

Quantities of Drug needed for the different categories of patients

Quantities needed for Cat I, adult patients (body weight 38-54 kg) 2(RHZE)/4(RH):

INTENSIVE PHASE: (DAILY)	DOSE	NO. OF TABLETS PER ADULT PATIENT
4 FDC tablet containing: R 150 mg/H75 mg/Z400 mg/ E275 mg	3 tablets daily for 60 doses	60 X 3 = 180

CONTINUATION PHASE (DAILY)	DOSE	NO. OF TABLETS PER ADULT PATIENT
2 FDC tablet containing: R 150 mg/H75 mg	3 tablets daily for 4 months = 120 doses	120 X 3 = 360

Quantities needed for Cat II, adult patients (body weight 38-54 kg): 2S(RHZE)/1(RHZE)/5(RH)E:

INTENSIVE PHASE: (DAILY)	DOSE	NO. OF TABLETS / INJECTION PER ADULT PATIENT
4 FDC tablet containing: R 150 mg/H75 mg/Z400 mg/ E275 mg	3 tablets daily for 90 doses 1 vials daily for 60 doses	90 X 3 = 270 60
Streptomycin vials 1 gm		
Water for injection vials use with Streptomycin	1 vials daily for 60 doses	60

CONTINUATION PHASE (DAILY)	DOSE	NO. OF TABLETS PER ADULT PATIENT
2 FDC tablet containing: R 150 mg/H75 mg	3 tablets daily for 5 months = 150 doses	150 X 3 = 450
Ethambutol 400 mg	3 tablets daily for 5 months = 150 doses	150 X 3 = 450

Quantities needed for all children: 2(RHZ)E/4(RH)

INTENSIVE PHASE: (DAILY)	DOSE	NO. OF TABLETS PER CHILD PATIENT
3FDC tablet containing: R 60 mg/H30 mg/Z150 mg	3 tablets daily for 60 doses	60 X 3 = 180
Ethambutol 100 mg	4 tablet daily for 60 doses	60 X 4 = 240
* Ethambutol 400 mg	1 tablets daily for 60 doses	60 X 1 = 60

CONTINUATION PHASE (DAILY)	DOSE	NO. OF TABLETS PER CHILD PATIENT
2FDC tablet containing: R 60 mg/H30 mg	3 tablets daily for 4 months = 120 doses	120 X 3 = 360

* for children weighing 20 kg or more

NATIONAL TUBERCULOSIS CONTROL PROGRAM

Directorate General of Health Services, Bangladesh

Lab orate Request Form

A. Smear-positive (sm+) detected last quater: .....

B. Number of lads to be supplied: .....

	Factor (C)	Calculation	Amount calculted (D)	Amount in stock (E)	Amount indented (F=2*D-E)	Amount received
Basic fuchsin	1 gram / sm+	A*C=				
Phenol crystals	5 gram / sm+	A*C=				
Methanol (or denatured ethanol)	10 ml / sm+	A*C=				
Methylene blue	0.1 gram / sm+	A*C=				
Sulphric Acid cone.	33 ml / sm+	A*C=				
Burning spirit	50 ml / sm+	A*C=				
slides	36 pc / sm+	A*C=				
Sputum Containers	36 pc / sm+	A*C=				
Bamboo sticks	36 pc / sm+	A*C=				
Immersion oil	2 ml / sm+	A*C=				
Xylene	25 ml / sm+	B*C=				
Toilet paper rolls	3 rolls / cilinic	B*C=				
Filter paper pcs	20 pcs / cilinic	B*C=				

National Tuberculosis Control Programme
Directorate General of Health Services
Leprosy Hospital Compound, Mohakhali
Dhaka, Bangladesh