



Field Guide to TB



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



FIELD GUIDE ON TUBERCULOSIS

1 Purpose of this Field Guide on Tuberculosis

The purpose of this Field Guide on Tuberculosis (TB) is to provide essential information about the disease and its control in Schools and amongst learners, Educators and School Support Staff. This Guide is presented in point form for ease of access and understanding. For further information the Department of Basic Education's Policy on HIV, STIs and TB should be consulted or a local health care worker consulted.

2 Tuberculosis (TB)

TB is an infectious disease that has been recorded for thousands of years. In 1882 the German Professor Robert Koch discovered the *Mycobacterium Tuberculosis* bacillus (bacteria) that causes tuberculosis. During the 19th century TB was widespread, especially in Europe, and was responsible for thousands of deaths. In South Africa in the 20th century TB infected ex-President Nelson Mandela in prison, as well as Archbishop Emeritus Desmond Tutu in his adolescence. Over the last century TB has decreased in Europe and North America but dramatically increased in Sub-Saharan Africa and South East Asia, which are now the global epicentres of the TB epidemic.

About 550,000 people, or around 1% of the country's population, develop TB in South Africa every year. South Africa and its neighbouring countries have the highest incidence of TB in the world. Twenty-two countries in Africa and Asia, including South Africa, have 90% of world's annual TB cases. There is no indication that the number of TB cases in South Africa is decreasing.

3 What is TB?

TB is caused by a Bacilli (bacteria) named *Mycobacterium Tuberculosis*, a very slow growing bacillus which is difficult to culture (grow). It causes a chronic infection of the lungs resulting in most cases in a chronic pneumonia. TB of the lungs is called pulmonary tuberculosis and is the commonest form of the disease. However, TB can cause a chronic infection of any of the body's organs, including the lymph glands, brain (TB meningitis), abdomen, bones and kidneys. These forms of TB are called extra-pulmonary tuberculosis.

4 How is TB spread?

TB is an airborne disease that spreads from one person to another in fine air droplets that contain the bacilli. When a person with infectious tuberculosis of the lungs coughs, they send a fine spray of droplets into the air. Any person in the same room can breathe in these droplets which contain the live bacilli. Droplets inhaled by other persons may settle in their lungs, causing tuberculosis infection. It is estimated that about 33% of the world's population is infected with TB.

5 Who spreads TB?

People with untreated pulmonary tuberculosis are mostly responsible for the spread of TB. If the symptoms of TB are ignored, cavities (holes) may develop in the lung. Persons with cavities cough up tens of millions of bacilli per day and are responsible for most infections. The more bacilli an infected person coughs up, the more infectious he or she is. The chances of becoming infected depend on how close the uninfected person is to an infectious person, the ventilation or air flow in the room, and the length of time spent together. For these reasons, most TB infections take place in the household.

6 Are all Adults and Adolescents infectious?

If TB does not involve the lungs the patient cannot cough up bacilli. If TB bacilli are not coughed up, the patient is not infectious. So a patient with TB of the brain, bones, joints, kidneys or lymph glands is not infectious, unless they also have pulmonary TB. Some patients have pulmonary tuberculosis without developing cavities. These patients cough up fewer bacilli and are therefore less infectious, and present a smaller risk of spreading TB to other people.

7 Who is most at risk of TB infection?

TB occurs in people of all ages but in South Africa the highest incidence occurs in children less than 2 years of age, adolescents and in adults 25-34 years of age. School-going children between 5 and 10 years of age have the lowest incidence of TB. TB is therefore less likely to occur amongst learners in Primary School than in learners at Secondary Schools.

8 Can children spread TB?

Most young children under the age of 10 years develop TB that involves the glands surrounding the lungs. These glands contain few bacilli which enter the airways and means that they cough up small numbers of bacilli. Due to this limited expulsion of

bacilli, young children are seldom infectious. A low percentage of children (less than 5%) cough up large numbers of bacilli and are infectious. And then??

9 Why is TB more common in some communities than others?

TB occurs in all communities and in any overcrowded space, especially if it is poorly ventilated. For this reason, classrooms are areas of increased risk, especially if the ventilation is poor due to closed windows. TB is often associated with poverty as poor people may have inadequate living conditions and may also suffer from malnutrition. TB can also infect people in public spaces, including churches, cinemas, shops, clubs and bars, especially if the ventilation is poor.

10 Why is TB an important disease in South Africa?

In 2013 TB was identified as the commonest cause of death in South Africa, but most TB deaths can be prevented by early diagnosis and treatment. More people in South Africa die annually from TB than in motor vehicle accidents.

11 Why do people develop TB?

The risk of developing TB disease, or TB, is increased by any condition that attacks the immune system, like diabetes, malnourishment, cancer or – most importantly – HIV infection. A normal immune system can isolate TB bacilli and thereby prevents TB infection, but any condition which attacks the immune system increases the risk of developing TB. Once someone is infected there is a life-long risk of developing TB. In a School environment the chance of a young child developing TB is about 1% (1 in 100) if there is an infectious case of TB in the School, but the risk for adolescents is higher.

12 What are the links between TB and HIV?

The Human Immunodeficiency Virus (HIV) attacks the immune system that is vital in protecting someone against TB. Lowered immunity makes people living with HIV extremely vulnerable to developing TB and about 63% of people infected with TB are also infected with HIV. In people living with HIV who have contracted TB, Antiretroviral Therapy (ART) is essential as it reduces the risk of dying from TB by 50%. ART is available to all children and adults in South Africa who contract TB, and can be provided by local health professionals and clinics. However, TB in persons living with HIV is often more difficult to diagnose than in HIV-negative people and requires specialist medical intervention to minimise the chance of complications. People suffering from TB are treated with specific antibiotics whether or not they are also HIV-positive, but the

combination of TB drugs and HIV ART may have to be carefully monitored and adjusted during treatment. It is important for people to know their HIV status before starting TB treatment, as being on ART reduces the chances of developing TB by 33% in people living with HIV.

13 What are the Symptoms of TB in Children?

In children the commonest form of TB involves the lymph nodes in the chest and they develop symptoms of a chronic chest infection. The most common symptoms include:

- Chronic cough lasting more than 2-3 weeks
- Unexplained weight loss
- Unexplained fever
- Excessive sweating especially at night (night sweats)
- Child not as playful as normal (lethargy).

It should be noted that failure to gain weight in a child has the same significance as losing weight as an adult patient. Children also seldom cough up blood.

14 What are the Symptoms of TB in Adolescents and Adults?

The commonest form of TB in adolescents and adults is pulmonary TB. In a small proportion of people the inhaled bacilli (*Mycobacterium tuberculosis*) causes chronic pneumonia. If not diagnosed early, this can progress and form a cavity (hole in the lung). Symptoms of pulmonary TB are related to chronic pneumonia and commonly include:

- Chronic cough lasting more than 2-3 weeks
- Unexplained weight loss
- Unexplained fever
- Excessive sweating especially at night (night sweats)
- Haemoptysis (coughing up of blood)
- Lethargy

Anyone who has one or more of these symptoms should see a health professional to exclude the possibility of pulmonary TB infection. This is especially important if they have been in contact with someone recently diagnosed with TB.

15 Diagnosing TB in Children, Adolescents and Adults

15.1 Diagnosis of TB in Children

The diagnosis of TB in children is more difficult than diagnosis of adults. The main reason is that children have difficulty producing sputum and in those children where sputum samples are collected they have far fewer bacilli. Younger children are inclined to swallow their sputum and not cough it out. For this reason diagnosis of pulmonary TB in children is made using a combination of symptoms and special tests which include:

- Contact with an adult TB case
- Symptoms suggestive of TB
- Skin test (Mantoux skin test)
- Chest X-ray
- Sputum examination.

It is clear that the diagnosis of TB in children is less accurate than that of adults and many children are treated because the health professional involved decides, after taking all the factors into account, that TB is highly likely. A child with TB of the organs, other than the lungs, often has to undergo highly specialised investigations (for example, computer-tomography scans or even exploratory operations) to make an accurate diagnosis of TB.

15.2 Mantoux Skin Test

The commonest skin test used in South Africa is the Mantoux skin test which is useful in determining whether the children and adults concerned are at risk of developing TB. This test is performed by injecting a tiny amount of purified protein (extracted from *Mycobacterium tuberculosis*) into the skin. The response is measured in millimetres (mm) and if this is greater than 10mm it is regarded as positive. In people living with HIV, a response of more than 5mm is regarded as positive. A positive test means the child or adult has TB infection but does not indicate TB (disease). Young children under 5 years and people living with HIV who have TB infection are at risk, and require treatment to prevent TB (TB disease). This form of treatment is called preventative therapy.

15.3 Diagnosis in Adolescents and Adults

Pulmonary TB is the commonest form of tuberculosis for which a sputum sample is the most important test, confirming the presence of *Mycobacterium tuberculosis* bacilli in the sputum of someone suspected of having TB. Sputum samples are collected on consecutive days and sent to a laboratory for examination. There are three methods of examining sputum samples, including microscopic tests, sputum culturing in the laboratory and use of modern gene technology – which is available in most South Africa cities. Other tests include chest X-rays to confirm presence of pulmonary TB.

16 TB Treatment

TB is a curable disease if antibiotics are taken daily as prescribed. In adult patients who follow the treatment regime complete cure is achieved in approximately 95% of cases. On average in South Africa cure rates are 79% (2012), due to some patients not following instructions. The antibiotics and period of treatment is similar for both children and adults. TB is treated with four antibiotics for a period of six months and leads to a rapid decline in viable bacilli. After 14 days of treatment the patient is no longer infectious and can return to work or School without infecting other children or adults. However, in some exceptional cases this may not be true and it is therefore advisable to get a clearance report from a health worker. The four antibiotics are taken for two months and then reduced to two antibiotics for a further four months. In treatment of children, doses of antibiotics are adjusted to the weight of the child. Most children under treatment are not infectious and can return to School within 5 School days of starting treatment. Adolescent learners are treated like adult patients and should complete 14 days of treatment before returning to School. Patients who do not follow the treatment as prescribed are at risk of the TB recurring, and TB bacilli becoming resistant to the antibiotics.

17 What is Drug Resistant TB?

The bacilli in some patients may become resistant to one or more of the four antibiotics used in the treatment of TB. This is known as drug resistant TB (DR-TB). Less than 4.5% of all patients treated for TB develop multi drug resistant TB (MDR-TB). In some cases, patients may become resistant to even more antibiotics, a condition called extensively drug resistant TB (XDR-TB). Understanding the drug resistance of the bacilli determines which antibiotics are required to treat the patient. Patients with drug resistant TB (both MDR-TB and XDR-TB) require treatment for a much longer time and have less chance of being cured.

Drug resistant TB is as infectious as normal TB, which is called drug susceptible TB, and spreads in exactly the same manner (via airborne droplets) with the same chances of infection. Drug resistant TB is treated with at least five antibiotics, one of which requires daily injection. Normally children and adults treated for drug resistant TB are admitted to hospital for the first 4-6 months of treatment. Another important difference is that drug resistant TB remains infectious for months and not weeks. This means learners, Educators or School Support Staff diagnosed with drug resistant TB will be absent from School or the workplace for at least 4-6 months and even longer in some cases. Extensively drug resistant TB (XDR-TB) is even more resistant to antibiotics than MDR-TB and treatment is longer and requires hospitalisation. The cure rate for XDR-TB is very low and patients with XDR-TB can be infectious for many months. Return to work or School must be confirmed by a health professional or expert in this field.

18 Statutory Notification of Tuberculosis

Tuberculosis is a notifiable disease; this requires the health professional involved to notify the Department of Health (DOH) of TB cases identified. The DOH will then institute investigation to determine if TB has spread to other persons in the home, School or other environment. This is called a Contact Investigation or Contact Tracing and will require screening? for learners, Educators or School Support Staff who have TB symptoms. In Schools with learners younger than 5 years, contact tracing will also entail a Mantoux skin test. To prevent TB occurring preventative therapy will be given to children if they have a positive skin test. Screening for TB might take place in the School but diagnostic tests and treatment will most likely be done at the nearest health clinic/facility.

19 Preventing Tuberculosis

19.1 Cough Protocols

Everyone with a cold, lung infection or cough should be taught to cough into a tissue or handkerchief. This reduces the number of infected particles (bacilli) that spread TB. If a handkerchief is not available it is better to cough into a bent elbow than to put a hand in front of the mouth. This is because other airborne infections like the common cold and influenza are also spread by direct contact such as the hands.

19.2 Improved Ventilation

The tiny particles containing TB bacilli can circulate in a room for up to 60-minutes. Improving the air flow in a room will reduce this period significantly and simply opening windows on both sides of a classroom or office reduces the risk of transmitting all airborne diseases including TB. Activities held outdoors, including sports, have a minimal risk of spreading TB.

19.3 Early TB Identification and Treatment

The longer people suffer from undiagnosed TB, the greater the risk that it will spread. Early diagnosis and treatment of TB will considerably reduce this risk. It is essential that all learners, Educators or School Support Staff who have TB symptoms (chronic cough, weight loss, unexplained fever and lethargy) should be seen by a health worker as soon as possible.

20 Personal Protection Measures

20.1 Good Nutrition

Being healthy and following a good diet will reduce the risk of developing TB disease.

20.2 Stop Smoking

People who smoke have an increased risk of developing TB and dying from TB. Children exposed to adults who smoke also have an increased risk of developing TB. Anti-smoking programmes decrease the risk of developing TB and have other wellness implications.

20.3 Decreasing Exposure to Infectious Patients

If a family member has developed TB it is better not to expose a young child or persons at risk (e.g. persons living with HIV or older people) to these infectious persons before they have completed the first 14 days of their treatment.

20.4 Controlling other Chronic Diseases

Other common chronic diseases, including diabetes mellitus, increase the risk of developing TB. Improving one's lifestyle and controlling chronic disease will substantially decrease the risk of developing TB

20.5 Know Your HIV Status

People living with HIV have the greatest risk for developing TB. Testing for HIV and starting Antiretroviral Therapy (ART) or taking preventative treatment (Isoniazid Preventative Treatment or IPT) if a person is infected will significantly reduce the risk.

21 Administrative Measures

21.1 TB occurs in all Schools

The fact is that TB occurs in all schools and communities and not only in the poorest of schools or communities. It is essential that all schools manage their environments to reduce the TB risk to learners, educators or School Support Staff and the community.

21.2 Develop School Policy to Manage HIV, STIs and TB

Every school must develop a policy to manage HIV, STIs and TB based on the Department of Basic Education (DBE) Policy on HIV, STIs and TB. The DBE will provide every School with a template to guide the development of this Policy (see sections 3 and 4 of this School Policy Pack) which must be discussed with learners, educators and School Support Staff. The parents and the community must also be informed of the need for this Policy and what their role should be in preventing and managing HIV, STIs and TB.

21.3 Action if a Learner, Educator or Support Staff Member develops symptoms suggestive of TB:

If a learner, educator or support staff member develops symptoms that suggest TB (chronic cough, unexplained fever and weight loss) they should be referred by an educator or staff member to a health professional for further management. The health professional could include the school nurse, the school health team, the local clinic or a private practitioner.

21.4 Action if a Learner, Educator or Support Staff Member Develops TB

If a learner, educator or support staff member develops TB it is essential to do the following, while keeping the patient's medical information confidential:

- 21.3.1 Arrange a Contact Investigation by the nearest health clinic/facility to ensure there are no other cases of active TB in the School.
- 21.3.2 Advise all learners, educators and support staff to be vigilant regarding TB symptoms and seek medical advice if any are found.
- 21.3.3 In the event of a confirmed case of TB, advise the parents concerned to take their other children for a medical check-up if they develop TB symptoms, as they are at high risk of further infection.

- 21.3.4 Provide support for the TB-infected person as this may be a traumatic event in their lives.

21.5 Patient Age Differential

The key difference between a child 5 to 10 years of age, an adolescent or an adult patient with TB, is that the young child usually develops TB of the glands inside the chest and is unlikely to be infectious. As a result, these children can return to School within 4 to 5 days of starting their treatment. Young children develop TB after being in contact with a TB-infected adult and once the child is diagnosed, the adult source needs to be found. This is most likely to be someone in the child's house but could be an adolescent or adult at school with diagnosed or even undiagnosed TB.

21.6 Risk of having a Case of TB in a School

The incidence of TB in South Africa is approximately 1%. The risk is lower for children (5-10 years) in Primary School but higher in adolescents. Even in a School where there is a case of infectious TB, the risk for children in Primary School is also about 1%, but for adolescents this varies between 5% -10%. Adult Educators and School Support Staff have a life-long risk of about 10% of developing TB if in contact with an infectious case of TB.

The risk is higher for people living with HIV but can be reduced by starting preventative treatment (IPT) and ART. People living with HIV who have been exposed to TB should immediately seek medical advice.

21.7 Linking Education and Health

School Management Teams and School Based Support Teams must build strong relationships with the Integrated School Health Team, as well as the health centres serving the community. These are essential resources in the management of the challenges presented by HIV, STIs and TB. As and when there is a suspected case of TB in the School, the Integrated School Health Team and local health centre are allies in the management of the case, and the possible danger of infection this poses to Educators and the wider School community.

Any comments or suggestions are welcomed and should be addressed to the Director-General: Basic Education for the attention of the Health Promotion Directorate, Private Bag X895; Pretoria; 0001

Address:
Department of Basic Education
222 Struben Street
Pretoria
0001

Address:

Department of Basic Education
222 Struben Street
Pretoria

Tel: 012 357 3411

Fax: 012 328 8401

Website: www.education.gov.za

