

**PERCEPTIONS ON THE EFFECTIVENESS OF DIRECTLY OBSERVED  
TREATMENT SHORT COURSE (DOTS) STRATEGY FOR CONTROL  
OF TUBERCULOSIS IN THE OUTER WEST AREA OF THE DURBAN  
METRO-WESTERN SUBDISTRICT OF KWAZULU-NATAL PROVINCE**

**BY**

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**SUBMITTED TO THE FACULTY OF ARTS IN FULFILMENT OF THE  
REQUIRMENTS OF THE MASTER OF CURATIONIS DEGREE  
IN THE DEPARTMENT OF NURSING SCIENCE AT THE**

**UNIVERSITY OF ZULULAND  
DURBAN-UMLAZI CAMPUS**

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**DATE OF SUBMISSION : MARCH 2004**

## DECLARATION

I, OLGA TINNY KHANYILE declare that, "*Perceptions on the Effectiveness of Directly Observed Treatment Short Course (Dots) Strategy in the Outer West area of Durban Metro Western Sub district of Natal-Natal*", is my own work. All sources that I have used or quoted have been indicated by means of full references.

SIGNATURE :

---

O.T. KHANYILE

## **DEDICATION**

This work is dedicated to the following:-

- (i) My colleagues in the nursing profession who provide nursing care to patients / clients.
- (ii) SANTA staff and volunteers who dedicate their service in the fight against tuberculosis.
- (iii) My husband Fakazi Philemon Khanyile for his love, endless support and encouragement through all my studies.
- (iv) My late mother Lena Makhaye for instilling in me the love of education.
- (v) My daughter Amahle Sinethemba.
- (vi) My sisters Mary, Khwezi Nomkhosi and brother Sbusiso who always wish me the best.

## ACKNOWLEDGEMENTS

I wish to express my sincere gratitude and appreciation to people who gave their support and contributed directly or indirectly in making the completion of this study possible.

I am greatly indebted to my supervisor, Dr PJ Kunene for her guidance, patience, encouragement, support and academic assistance in the completion of this study.

I also wish express my sincere thank to:-

- (i) The health authorities who gave me permission to collect data in clinics under their jurisdiction.
- (ii) Management Committee of Don McKenzie Santa Centre for granting me permission for data collection.
- (iii) Nursing staff who gave consent for participation in the study.
- (iv) TB patients and DOTS supporters who participated in the study.
- (v) Mrs Nomvula Mazibuko (DOTS Co-ordinator) for her assistance during data collection.
- (vi) Mrs Zama Ncwane for the meticulous typing of this report.
- (vii) All authors whose works have been cited.

## ABSTRACT

The aim of this study was to assess the perceptions on the effectiveness of directly observed treatment short course (DOTS) strategy for control of tuberculosis implemented in the Outer West area of the Durban Metro-Western subdistrict of Natal-Natal province.

A descriptive survey design was undertaken. Three sets of questionnaires were designed for the different groups of participants, that are, DOTS supporters, TB patients and nursing personnel. An eclectic approach comprising systematic, purposive, stratified and random sampling respectively was used to select the participants from different study population groups. The total sample comprised of two hundred and fifty (250) TB patients, thirty (30) DOTS supporters and thirty two (32) nursing personnel involved in the implementation of DOTS programme.

The study revealed perceptions that DOTS programme in this district is not effective. The current cure rates of sputum smear positive patients, as indicated in the health facilities report 2002 are far too low to reach the global target of at least 85% cure rates of all smear positive patients, as indicated by WHO.

The level of public awareness and the financial commitment to DOTS is inadequate, as a result, the global epidemic continues to worsen, undermining the development of families communities and the national economy.

Based on the findings, recommendations were made developing and

implementing strategies for the development of sufficient, sustainable human and financial resources to meet the challenges of combating tuberculosis.

A model entitled "The Cross of Lorraine Model" for effective and sustainable DOTS Community Involvement was developed."

## OPSOMMING

Die doel van die studie was om die effektiwiteit van die DOTS strategie (Directly Observed Treatment Shortcourse) wat vir die beheer van tuberkulose (TB) in die Outer West gebied van die Durban Metro se sub-distrik in die provinsie van Natal-Natal uitgevoer is.

'n Beskrywende opname is gedoen. Drie stelsel vraelyste is gebruik naamlik vir TB pasiënte, DOTS Ondersteuners en Verpleegpersoneel.

'n Eklekiese benadering is gevolg vir die steekproef neming, bestaande uit sistematiese, doelgerigte, gestratif-seerde en ewelansig is onderskeidelik is om deelnemers uit die verskillende studie groepe te selekteer. Die totale steekproef het bestaan uit (250) tweehonderd en vyftig TB pasiënte wat ses maande van behandeling voltooi het, (30) dertig DOTS ondersteuners en (32) twee en dertig verpleegpersoneel betrokke by die implementering van die DOTS Program.

Die studie openbaar persepsies dat die DOTS program in die Outer West gebied van die Durban Metro se sub-distrik nie effektief is nie. Effektiewe behandeling van pasiënte met 'n speeksel positiewe smeer, is nie aangedui in die gesondheids fasiliteite verslag (2002) nie en is gans te laag om die globale mikpunt van minstens 85% genesing van alle pasiënte met 'n positiewe smeer, soos aangedui deur die Wêreld Gesondheids organisasie, te bereik.

Die vlak van openbare bewustheid en die finansiële verbintenis tot DOTS, is onvoldoende, met die gevolg dat die globale epidemie steeds vererger en die ondermyning van die ontwikkeling van gesinne, gemeenskappe en nasionale ekonomieë tot gevolg het.

Gegronnd op die bevindings is aanbevelings gemaak vir strategieë wat sal lei tot die ontwikkeling en implementering van voldoende volhoubare menslike en finansiële bronne om die uitdagings van die bekamping van tuberkulose te oorkom.

Die " *Cross of Lorraine Model for effective and sustainable DOTS Community Involvement*" is ontwikkel.

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## CHAPTER 1

### PERCEPTIONS ON THE EFFECTIVENESS OF DIRECTLY OBSERVED TREATMENT SHORT COURSE (DOTS) STRATEGY FOR CONTROL OF TUBERCULOSIS IN THE OUTER WEST AREA OF DURBAN METRO WESTERN SUB-DISTRICT OF KWAZULU-NATAL PROVINCE

#### 1.1 INTRODUCTION

Effective Tuberculosis (TB) drugs have been available for decades and in nine out of ten cases, tuberculosis is curable, but in South Africa it is still a major problem.

The seriousness of the epidemic was confirmed in June 1993, when the World Health Organisation (WHO) declared tuberculosis a global emergency, and that South Africa has one of the worst recorded tuberculosis epidemics in the world. During 1996, 108 382 cases of TB were reported to the National Department of Health, a figure that translates into an estimated incidence of 251/100000 population (Dick, Mbewu and Matji (1999:1).

*This epidemic challenged WHO to promote a new approach to tuberculosis treatment, a global Tuberculosis Control programme. It urged all countries to adopt the Directly Observed Treatment Short Course (DOTS) strategy in which a health worker or a volunteer supervises a tuberculosis patient swallowing his medication everyday until he/she completes the six months course of treatment.*

In an attempt to reform the approach to TB Control in the country, the Department of Health in South Africa implemented a revised TB policy during 1996, based on the World Health Organization Strategy – DOTS. The WHO

target for this programme is to achieve an 85% cure rate of sputum-positive patients. The implementation of this policy requires both technical expertise and commitment from the health authorities at central, provincial and local levels (Dick, et al 1999:1).

The year 1996 saw a historic commitment of Dr. Nkosazana Zuma, former National Minister of Health, in declaring tuberculosis a "Top National Priority" for South Africa in her parliamentary speech on 7 November 1996 in Cape Town. This was the first time such an announcement had ever been made for any disease in South Africa (SANTA TB and health News 1996:1). Dr. Zuma called for a countrywide implementation of Directly Observed Treatment Short Course (Dots) strategy. To this end, the National Tuberculosis Control programme is implementing DOTS strategy country wide (Santa Annual Report 1996-1997:4).

To compound the problem, Human Immuno deficiency Virus (HIV) and Aids has also become a National priority in the late 1990's. Studies have shown that persons with HIV infections are at risk of developing tuberculosis. The increase in HIV seroprevalence in tuberculosis patients was first reported from Kinshasa, Zaire in 1986 (Porter & McAdam 1994:36). These authors report that numerous studies have been published from industrialised and developing countries documenting high rates of HIV infection in patients with tuberculosis than in healthy comparison groups (Porter & Mc Adam, 1994:36).

## **1.2 PROBLEM STATEMENT**

Despite the development of effective anti-tuberculosis drugs, and a national Directly Observed Treatment Shortcourse (DOTS) strategy, tuberculosis is still the cause of a high mortality rate in South Africa . It is estimated that in South Africa it kills almost 1 000 people every month. About two thirds of the population in this country are infected with TB bacilli, and the number of

people that are sick with pulmonary TB was 180 507 in 1998 (Matsha, 1998:1).

### **1.3 BACKGROUND TO THE PROBLEM**

The tuberculosis infection rate in South Africa has its roots in the structure of health services, where there was a fragmentation of health services due to the apartheid system. In the past, there was lack of co-ordination between provincial government, local governments, former homeland areas and non-governmental organizations. This rendered the tuberculosis control programme unfocussed and ineffective (African National Congress 1994:7).

The high incidence of Human Immunodeficiency Virus (HIV) infection, increased rural-urban migration, overpopulation, inadequate housing leading to overcrowding and poverty as well as the emergence of multidrug resistant (MDR) strains of tuberculosis further compound the problem. Many of these tuberculosis patients suffer from dual infections, TB and HIV, which results in many deaths.

Prior to the development of effective chemotherapy in the 1950's, a variety of remedies have been used to treat TB, but none showed significant efficacy. Dr. Robert Koch's (the manager of WHO Global TB Control programme) effort to develop an effective immunotherapy by injection of tuberculin was a failure, although it did lead to the development of the tuberculin skin test. This tuberculin intradermal skin test method is still a preferred method for identifying persons infected with mycobacterium tuberculosis (Porter, et al 1994:18).

KwaZulu-Natal is one of the worst affected of South Africa's nine provinces. In 1991 the number of TB notifications was 204 per 100 000 population. This

increased to 250 per 100 000 population in 1994 and 381 per 100 000 population in 1996 (TB Control Programme in KwaZulu-Natal 1996:1).

Some people who have been diagnosed with TB have been reluctant to openly come forward for treatment because of the stigma attached to the disease. Literature shows that even famous South African such as former Miss Universe Margaret Gardiner, Archbishop Desmond Tutu and former President Nelson Mandela were once afflicted with TB (Singer, 1997:1).

South Africa realised that efforts to fight tuberculosis have been ineffective, then joined its forces with its international counterparts by adopting Directly Observed Treatment Short Course Strategy (DOTS) to fight against the tuberculosis epidemic in 1996 (Matsha, 1999:1).

#### **1.4 MOTIVATION OF THIS STUDY**

The researcher was motivated by a number of factors to conduct this study. The Outer West Area of Durban Metro Western Sub-District of KwaZulu-Natal province where the researcher was working as a Nurse Manager in a TB hospital, was selected as one of the Training and Demonstration districts on Tuberculosis Control Programme by the Provincial Health Authorities. The researcher formed part of the Management Team for the implementation of Dots programme in this district. No systematic research had been conducted on Tuberculosis, yet the treatment of tuberculosis patients started 50 years ago at the Don McKenzie SANTA Centre.

Other factors which motivated the researcher to conduct this study were:

- The increasing number of patients suffering from TB, a preventable and curable disease, in the presence of TB drugs that are freely available.

- The high statistics of patients dying of TB in comparison to other infectious diseases in South Africa, particularly in KwaZulu-Natal. This results in many orphans and devastated families.
- The announcement by WHO in 1996 that tuberculosis is a global emergency and the introduction of a new strategy for control of tuberculosis that has been proven to be effective on other countries like Tanzania, New York City and China. This strategy is believed to provide such extra-ordinary benefits that no other TB Control strategy comes close to being as effective and affordable as DOTS since it cured over 95% TB cases in these countries. (Nursing update, 1997:10). In view of this recorded success rate of DOTS, the researcher intends to investigate effectiveness of this strategy of treatment in South Africa.

#### **1.5 DELIMITATION OF THE STUDY**

The focus of the study was on health institutions involved in the implementation of Directly Observed Treatment Short Course Strategy in the Outer West area of Durban Metro Western Subdistrict of KwaZulu-Natal. Only those institutions which keep Tuberculosis registers, that is Mpumalanga Clinic, Halley Stott Health Centre, Mzunduze Clinic and Don McKenzie TB Santa Centre were included in the study.

#### **1.6 SIGNIFICANCE OF THE STUDY**

It is hoped that this research will demonstrate the effectiveness of the DOTS programme as perceived by the relevant stakeholders and as reflected in the TB registers and other records. This will help the health authorities as well as those involved in the implementation of DOTS to improve in the fight against the tuberculosis epidemic.

## **1.7 ASSUMPTIONS**

The study is based on the assumption that this global tuberculosis epidemic can be eradicated if the public health services join forces with non-governmental organizations that are involved in the prevention and control of tuberculosis, like the South African National Tuberculosis Association (SANTA).

Local authorities may play a role in demonstrating the effectiveness of DOTS programme by improving housing and health as well as providing safe drinking water for all communities.

## **1.8 PURPOSE OF THE STUDY**

The purpose of the study is to investigate the treatment outcome of patients enrolled in DOTS programme and to evaluate the effectiveness of DOTS strategy from the perspectives of those involved in its implementation.

## **1.9 OBJECTIVES OF THE STUDY**

The study is intended to accomplish the following objectives which will be used to guide the study:

- To assess the effectiveness of DOTS strategy that has been implemented in the Outer West area of Durban Metro-Western Sub-district of KwaZulu-Natal in the fight against tuberculosis.
- To assess the perceptions about DOTS programme that are held by those involved in its implementation.

- To identify problem areas regarding the implementation of the Dots programme.
- To identify opportunities for improvement in the implementation and to make recommendations for Health Authorities regarding this programme – a bottom-up approach.

### **1.10 RESEARCH METHODOLOGY**

A descriptive survey design was used for this study. The study population comprised tuberculosis patients registered in the National TB registers of the Outer West area of Durban Metro Western Subdistrict of KwaZulu-Natal, who would have completed their six months course of treatment when the collection of data was carried out. It also included nursing staff involved in the implementation of DOTS programme and DOTS supporters.

The eclectic approach which utilizes a variety of sampling methods was used to select relevant participants from the different study population groups. Questionnaires, structured interviews and patients records including the National TB Control Register and Quarterly Report were used to collect data.

### **1.11 ETHICAL CONSIDERATIONS**

Permission from the institutions where data was collected, was obtained from the relevant authorities. Informed consent was obtained from the research participants and it was stressed that all participation would be voluntary.

### **1.12 THEORETICAL FRAMEWORK**

The theoretical framework on which the study was based is Orem's theory of self-care. This theory was chosen because it emphasises that man is

capable of caring for himself. It stresses the sense of responsibility and accountability, and that the individual is capable of learning. With the assistance of nurses, the TB patient can learn to take care of himself or herself at home.

### **1.13 PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA**

Data was analysed manually and findings are presented in the form of tables, graphs and pie charts. Recommendations for possible action and also for further research on this topic are made on the basis of the research findings.

### **1.14 DEFINITION OF TERMS**

#### **1.14.1 Directly observe treatment short-course (Dots)**

A patient-centred approach which provides support to TB patients by observing them as they swallow their TB drugs and ensuring that they complete their course of six months course of treatment (Matsha 1998:3).

#### **1.14.2 DOTS supporter**

Any responsible member of the community chosen by the tuberculosis patient to observe him or her as he or she swallows anti-tuberculosis drugs everyday (Matsha 1998:3).

#### **1.14.3 Tuberculosis**

A chronic, notifiable infectious bacterial disease caused mainly by mycobacterium tuberculosis and mycobacterium bovis (Avidi, 2002:10).

#### **1.14.4 Outer West area of Durban Metro Western Subdistrict**

The Outer West area of Durban Metro Western sub-district is located about 40 kilometers outside Durban, in a semi-rural area of KwaZulu-Natal. The district is served by the Valley Trust, a socio-economic medical project for the promotion of health that is a non profit-making and non-governmental organization, which focuses its efforts mainly on the five tribal areas of Embo, Molweni, Qadi, Nyuswa and Ngcolosi.

#### **1.14.5 Community Health Worker**

An adult person from the community who has been trained to function in the community in close relation with the health care system.

#### **1.14.6 Sputum smear positive patients**

Those patients who are the most potent source of transmission of TB bacilli in the community due to the presence of the Mycobacterium Tuberculosis in their sputum. This is detected by examining patients sputum stained by Ziehl – Neelsen method (Kironde, (undated):341).

#### **1.14.7 Sputum smear microscopy**

One of the most efficient tools of case finding in a national tuberculosis control programme because of its ability to identify and distinguish the cases with highest priority in tuberculosis control. (Rieder, Chonde, Mying, Urbanczik, Laszlo, Kim, Van Deun and Trebucq , 1998:16).

#### **1.14.8 Effectiveness**

In the context of this study, effectiveness means achieving goals of the National tuberculosis control programme (NTCP) which are smear-conversion rates of at least 85% of cure rates with the short course chemotherapy (Department of Health 2000:7).

#### **1.15 PLAN OF STUDY**

The research report will be arranged in chapters as follows:

##### CHAPTER 1

This chapter deals with the background of the problem, the problem statement, the motivation, delimitation of the study, significance of the study, assumptions, objectives and definition of terms.

##### CHAPTER 2

This chapter deals with literature review which focuses on tuberculosis control programme with specific reference to Directly Observed Treatment (DOTS) strategy. It also outlines the manner in which DOTS strategy was implemented in this province since the Minister of Health announced that "TB is a Top National priority" and urged the country to implement DOTS strategy in the fight against the tuberculosis epidemic.

##### CHAPTER 3

This chapter explains the theoretical framework on which the study was based, that is Orem's self care model.

#### CHAPTER 4

This chapter discusses the research methodology, including the research design, study population, sample and sampling method, research instruments, procedure for data collection, method of data analysis and presentation of findings.

#### CHAPTERS 5, 6 and 7

These chapters deal with the analysis and interpretation of data from the various samples of respondents namely patients, DOTS supporters and nursing personnel.

#### CHAPTER 8

A summary of the research will be provided in this chapter, as well as conclusions drawn and recommendations made.

References / Bibliography and Appendices will also be included.

#### **1.16 CONCLUSION**

*This chapter has outlined the orientation to the study, giving an indication of the problem under investigation and the objectives, to be achieved. The next chapter deals with the literature review.*

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Tuberculosis is a chronic, infectious, notifiable disease caused by a bacilli called *Mycobacterium tuberculosis*. It is spread by inhalation of droplets from people who cough up and spit sputum with active tuberculosis (SANTA, 2000:14).

Despite the availability of effective tools for its detection, treatment and prevention, the disease is still the major cause of death in the world. In 1993 the World Health Organization (WHO) declared TB a global epidemic. One of the possible reasons for this epidemic in South Africa is the persistence of transmission of TB in the community due to delayed diagnosis and treatment, and ineffective case holding. Case holding refers to ensuring that patients adhere to and complete treatment. TB treatment requires the patient to take multiple drugs for at least six months (Author unknown July 1997:47).

In the researcher's clinical experience, many patients find it difficult to adhere to the complete course after experiencing symptomatic improvement. Failure to adhere to and complete TB treatment has potentially disastrous consequences in the form of the emergence of multi-drug resistant (MDR) strain and an ongoing transmission of the TB bacillus. The TB defaulter is a health threat not only to him/herself but also to his/her contacts and the infection extends to the local and global community.

TB treatment is one of the most cost-effective health interventions and Directly Observed Treatment Short course (DOTS) is currently the best strategy used for treatment of tuberculosis. DOTS is the internationally

recommended approach to improving adherence and treatment outcome and is the basis of the South African National Tuberculosis Control Programme.

The National TB Control Programme aims to cure at least 85% of all TB patients in the country.

## **2.2 HISTORICAL BACKGROUND**

Tuberculosis is an ancient disease. It has afflicted man for centuries and today it is the leading infectious disease killer in the world. It was present in Egypt as early as 3700 BC and was well recognised by the times of Hippocrates. During this period a variety of remedies were used to treat TB, but none showed significant efficacy. TB patients were admitted in Sanatoria for a long period of time treated with nutritional therapies, sunlight and fresh air. *Exercise was encouraged and the physical well-being sustained with a good diet* (Porter and McAdam, 1994:12).

In 1882, Dr Robert Koch (the Manager of WHO Global TB Control Programme) discovered the tubercle bacillus by means of staining, using aniline dyes and an oil immersion microscope. He was able to culture the bacillus outside the body, and when he inoculated the bacillus into an experimental animal, it produced tuberculosis lesions. This method of searching for the bacillus in the sputum of suspected TB cases became the standard clinical practice that is used currently. He convinced the medical community and the world about the communicable nature of the disease and brought about the efforts to combat TB (Porter & McAdam 1994:14-15).

Koch considered initially that there was no difference between human and bovine tubercle bacilli, but in 1898, Theobald Smith in Harvard University showed that there were microscopic, morphological and toxic differences between the various bacilli. The human bacilli is now thought to account for

98% of cases of pulmonary tuberculosis spread by droplet infection by coughing and sneezing. Bovine infection was commonly acquired by drinking infected milk or rarely by eating infected beef. Bovine infection is related to the non-pulmonary forms of tuberculosis such as cervical, lymphadenopathy, intestinal and abdominal tuberculosis bone and joint disease, skin infections and tuberculosis meningitis seen mostly in children.

Dr Koch's effort to develop an effective immunotherapy by injection of tuberculin was a failure, although it did lead to the development of tuberculin skin test. This intradermal skin test method is still a preferred method today used to identify persons infected with mycobacterium tuberculosis.

In 1889, notification of positive TB patients was established by Dr Sir Robert W. Phillip of Edinburg and Dr Biggs in New York. They created an organised system for control of tuberculosis which involved case reporting to health authorities, inspection and disinfection of rooms which were occupied by TB patients. This laid a foundation for the system of notification of TB patients that is used currently (Porter and McAdam 1994:18-19).

### **2.2.1 Radiographic discovery**

In 1895 Roentgen announced the discovery of X-Ray as a technique for diagnosing pulmonary tuberculosis and other disorders of the chest. The chest X-Ray method is still currently in use to diagnose Tuberculosis if the patient has clinical signs of TB but is unable to cough up sputum for direct examination.

In 1898 the National Association for Prevention of Tuberculosis (NAPT) was formed. This Association was inspired by Sir William Broadbent who informed the Prince of Wales, and King Edward VIII together with Lord, Salisbury the Prime Minister as well as leading physicians that Tuberculosis is

preventable. The members of the National Association appreciated Dr Koch's scientific achievement of isolating the tubercle bacillus and they realised that the unforeseen killer was not directly inherited but was acquired by direct transmission of tubercle bacillus in sputum from the sick to the healthy person (Porter & McAdam 1994:14-16).

In 1920 the International Union Against Tuberculosis and Lung Disease (IUATLD) was reformed in Geneva. This organization was first founded in 1902 in Berlin and was closed down during the First World War. This is the oldest, largest international non-governmental organization that deals with health issues in the world. Its focus is on global lung health issues with particular concern to tuberculosis, asthma and tobacco smoking. The activities of IUATLD include education of health care providers and the public on matters related to the prevention and control of TB, other lung diseases and related health problems. This is done by dissemination of information through conferences, courses, publications, scientific statements issued by IUATLD, joint meeting reports and recommendations made by WHO and other international organizations.

The IUATLD is divided into regions and holds international conferences every two years. South Africa hosted the world conference in 2002. It was the first time that the conference of this nature was hosted by South African National Tuberculosis Association (SANTA), Dr Andrew Ratsela was elected the president of IUATLD Africa Region in July 2000 (SANTA June 2000:8).

### **2.2.2 BACILLE CALMETTE GUERIN**

Koch's discovery of the tubercle bacillus led to a search for a vaccine to prevent primary infection that carries the risk of reactivation of tuberculosis. Various experiments were conducted with dead and living organisms. In 1921 Calmette and Guërin produced attenuation of a virulent bovine strain

and this was regarded as a permanent avirulent modification. The vaccine was then named after Calmette and Guërin as *Bacille Calmette Guërin* (BCG). It was first administered to infants in a liquid form orally in 1922. In 1930 the Lubeck disaster occurred. About 240 children were given oral vaccine, nearly all of them developed severe forms of tuberculosis and died. This could have been a blow to BCG, but fortunately through investigations by the German authorities, the safety of the BCG vaccine was established. It was proved that the accidental contamination of the vaccine with a virulent strain had occurred. It has since been used on an increasing scale throughout the world, mainly by intradermal route and is now compulsory in some countries including South Africa.

The vaccination programme in South Africa has been disappointing, as the tuberculosis disease rate is increasing. Despite its widespread use, it has not stopped the epidemic (Porter & McAdam 1994, 20-21).

### **2.2.3 Surgical management of tuberculosis**

In the 1920's and 1930's, thoracic surgery, for example artificial pneumothorax, artificial pneumoperitoneum and crush of the phrenic nerve were practised as part of treatment for tuberculosis patients. During this period, surgical management of progressive disease was the only hope of cure or of slowing down its process until chemotherapy was developed in the late 1940's. Even during 1950's and 1960's surgery was often used as alternative to chemotherapy until the development of highly effective six to nine months short course chemotherapy regimen. The recent developments in thoracic surgery is done when the doctor is in doubt about the diagnosis of pulmonary tuberculosis, a lung tissue biopsy obtainable by surgery, that is thoracoscopy, can be done with less trauma to the patient.

## 2.3 DEVELOPMENTS IN TB CHEMOTHERAPY FROM 1940's TO 1980's

Due to continued research efforts, treatment of tuberculosis has undergone many changes through the years.

1944 – 1948 Waksman and co-workers in the United States of America (USA) discovered streptomycin as a bacteriostatic drug against TB. Its efficacy was confirmed by the British Medical Council, but the multi-drug resistance emerged as a serious drawback. To overcome this problem additional drug called Para-Aminosalicylic Acid (PAS) was added to be given with streptomycin as a combined therapy. Because of the serious side effects of the combination therapy, that is streptomycin and PAS, where patients experienced gastro intestinal problems, the Medical Research Council (MRC) recommended the use of streptomycin injection alone. Streptomycin injection is still currently in use to treat adult TB patients who are retreatment cases, who interrupted the previous treatment for any other reason. They are admitted in a TB institution and given Streptomycin injection for 2 months.

1952 In New York, Robitzek and Selikoff discovered the effectiveness of Isoniazid (INH) tablet. It was newly introduced as an important part of initial treatment and prophylaxis treatment. The drug was combined with streptomycin injection and this combination chemotherapy was proven to be the most effective remedy for treating tuberculosis. Patients were treated for two years admitted in Sanatoria (Health Systems Trust, 2000:4).

- 1953 The chemotherapeutic success of streptomycin and INH challenged the role of traditional management of tuberculosis which was two years admission in Sanatoria, bedrest, surgery and rehabilitation. All these methods became unnecessary with the combination therapy of streptomycin and INH. The number of trials conducted demonstrated that TB treatment could be effectively taken on an out-patient basis twice weekly under supervision.
- 1954 Pyrazinamide (PZA) tablets were introduced. Its action was found to be similar to that of INH and its contribution to the success of short course chemotherapy was recognised.
- 1962 Ethambutanol drug was discovered. It was considered to be bacteriostatic. The drug is currently used in cases of resistance to one of the major drugs as a substitute for streptomycin. It is administered orally in tablet form or as a syrup.
- 1969 Rifampicin drug was discovered. It was considered the "wonder drug in the treatment of tuberculosis since its advent made a short-course chemotherapy possible. Unfortunately, because of the complicated manufacturing process, rifampicin is an expensive drug. The pill showed successful cure rates and its use was justified because of its effectiveness in a short course chemotherapy when combined with INH and given to TB patients for 9 months.
- 1970-1985 With the introduction of the Rifampicin pill taken with INH and PZA the course of treatment was shortened to six months (Porter and McAdam 1994:19-20)

## **2.4 THE DEVELOPMENT OF EFFECTIVE STRATEGY FOR GLOBAL CONTROL OF TB**

The increase in the number of TB cases notified in 1995 was a challenge to the National Department of Health that necessitated the revision of National Guidelines for treatment and control of tuberculosis. These new guidelines were based on the international consensus on tuberculosis treatment coordinated by the Global TB programme of the World Health Organization. The overall objectives of the National Tuberculosis Control Programme are to reduce mortality and morbidity attributable to TB, to prevent the development of multi-drug resistant TB and ensure accurate measurement and evaluation of programme performance.

Copies of the national practical guidelines for control of tuberculosis in South Africa are presented as Annexure 5 in this report (Department of Health, 2000).

### **2.4.1 Principles of treatment**

The treatment regimens published in 2000 by the South Africa Tuberculosis Control Programme Practical Guidelines are in a form of combination tablet. A daily dose of a combination tablet is administered to a TB patient for five days a week. These combination drugs simplify treatment and ensure that all drugs necessary for the treatment of tuberculosis have been swallowed, therefore decrease the risk of drug resistance. The different regimens are summarized in the discussion that follows:

#### **Regimen I**

During the initial phase, a four combination drugs is given for two months, that is RHZE, which means a combination of R=Rifampicin; H=Isoniazid; Z=pyrazinamide and E=Ethambutol. Patients who are under 50 kg in body

weight are given four tablets per day and those who are over 50 kg in body weight are given five tablets per day.

During the continuation phase, a combination of two TB drugs is given for four months that is RH; R=Rifampicin and H=Isoniazid. Patients who are under 50 kg in body weight are given tablets of a lower dose and patients over 50 kg in body weight are given two tablets of a higher dose per day.

### Regimen 2

Patients who are treated with regimen 2 are re-treatment patients whose previous TB treatment failed or relapsed or they interrupted treatment. These patients are more likely to develop multi-drug resistance and therefore they are hospitalized for their initial two months treatment. The initial sputum for culture and sensitivity of the drugs is taken on admission and they are given streptomycin injection together with their combination tablets. These patients are treated for seven months. The initial phase is two months and the combination phase is five months.

### Regimen 3

This regimen is recommended for children with pulmonary tuberculosis. All children with severe forms of TB for example TB meningitis, miliary TB, TB bones and TB spine are referred to the hospital for management. They are not treated at the clinic as outpatients because the guidelines for treatment of such patients are different and the treatment takes longer than six months. Children under 5 years of age who are in close household contact with a smear positive pulmonary adult patient or who are tuberculin skin test positive, should be given prophylaxis treatment of Isoniazid 5 mg per kilogram body weight for six months.

#### **2.4.2 Precautionary measure to be taken before administration of TB drugs**

- Streptomycin should not be used in pregnancy or for patients over 65 years of age.
- Ethambutol should not be given to children under 8 years of age.
- Rifampicin reduces the efficacy of oral contraceptives therefore it is important when introducing new patients to treatment to ask about the method of contraception and explain the problem, or if necessary alter the oral and injectable contraceptive or suggest on Intra Uterine Contraceptive Device (IUCD)
- It is also important to ask the patient about the other drugs he may be taking and check if there is no cross reaction or incompatibility (Department of Health, 1998:50-52), for example, patient on epileptic drugs, INH tables inhibits the breakdown of phenytoin and carbamazepine. The dosage of these drugs may need to be reduced during TB treatment.

#### **2.4.3 Side effects of TB drugs and management**

The new anti TB drugs are in a combined form of 4 drugs for the first two months of intensive phase of treatment that is Rifampicin=R, Isoniazide=H, Parazinamide=Z, Ethambutol=E that is known as RHZE-4, and the combination of two drugs for the continuation phase of treatment which lasts for four months. That is Rifampicin=R and Isoniazide=H known as RH2.

These drugs have common and major side effects which must be recognised and reported by all those involved in the treatment of TB patients. Single

drugs are still available in case a patient has serious side effects cause by one drug.

**Table 2.1 : The minor side effects of TB drugs**

Side effects	Drug probable responsible	Management
Anorexia nausea and abdominal pain	Rifampicin	Give tablets last thing at night.
Joint pains	Pyrazinamide	Continue anti TB drugs and give aspirins for pains.
Orange/red urine	Rifampicin	Continue anti TB drugs, reassure patient, urine will be normal after completion of treatment.
Burning sensation in feet	Isoniazide	Give pyridoxine 25mg tablets daily

(Department of Health, 1998:52)

**Table 2.2 The major side effects and their management**

<b>Side effect</b>	<b>Drug(s) probably responsible</b>	<b>Management</b>
Skin tchiness/rash dizinnes, deafness	Streptomycin	For all major side effects stop anti TB drugs. Stop streptomycin.
Jaundice	Most anti TB drugs	Stop all anti TB drugs until jaundice resolves, then, introduce the single drugs one by one.
Vomiting and confusion (suspected drug induced pre-icteric hepatitis.	Most anti-TB drugs.	Stop anti TB drugs urgently and do liver functions test.
Visual imparement  Generalised reaction including shock.	Ethambrutol Rifampicin	Stop ethambrutol Stop rifampicin

(Department of Health 1998:52)

## **2.5 TUBERCULLOSS IN SOUTH AFRICA**

### **2.5.1 Incidence of tuberculosis in South Africa**

Tuberculosis is the leading infectious killer of the youth and adults in South Africa in spite of the effective drugs being available for decades. It is estimated that about two thirds of the population in this country are infected with TB bacilli. About 10 000 people die of TB every year. It is also estimated that 3.5 million new TB cases are expected by the year 2005 if current trends continue (Department of Health 1998:52). Experts estimate

that one positive TB patient infects about three others before he/she starts treatment. Those interrupting treatment before they are cured infect ten others before dying or presenting themselves for treatment (SANTA, 1999:9).

The seriousness of the epidemic was confirmed in June 1993 when the World Health Organization (WHO) declared that South Africa has one of the worst recorded tuberculosis epidemics in the world. During 1996, 158 689 cases of TB were reported to the Department of Health, a figure that translates into an estimated 362 per 100 000 population (Singer 1997:5).

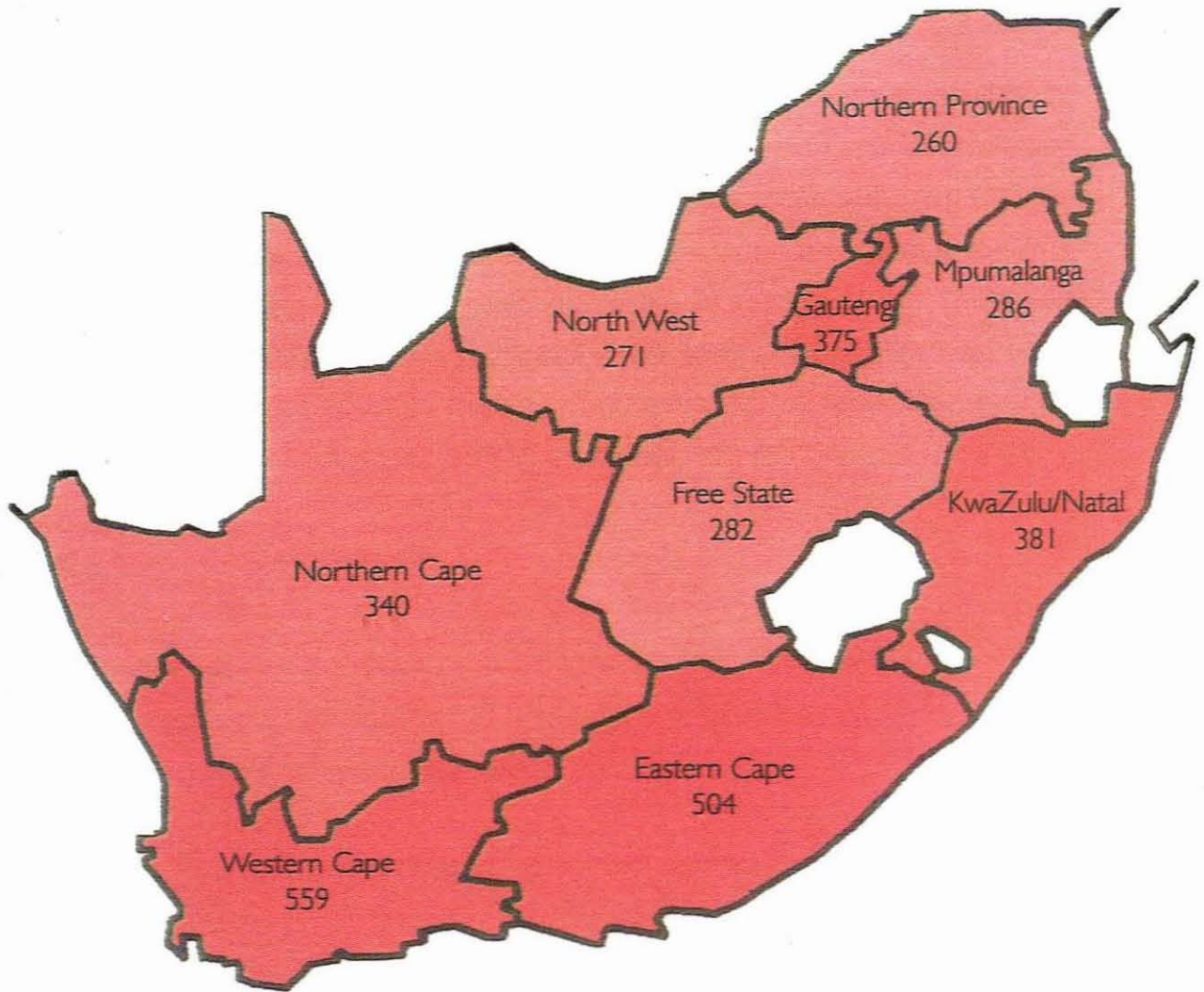
According to Singer (1997:7) certain areas or provinces in South Africa can be singled out as "TB hotspots", indicating places where the incidences of TB are highest in the country as illustrated in figures 2.1.

#### **Figure 2.1 TB Hotspots in South Africa**

According to figure 2.1, Western Cape had the highest incident rate on tuberculosis, that is 559 per 100 000 population in 1996 followed by Eastern Cape 504; KwaZulu-Natal 381; Gauteng 375; Northern Cape 340; Mpumalanga 286; North West 271 and lastly Northern Province 260. See figure 2.1 (Singer, 1997:7).

Figure 2.1

## TB HOTSPOTS IN SOUTH AFRICA



Estimated TB cases per 100 000 people, 1996.

Source: MRC

(Singer, 1997:7)

*Within South Africa, certain areas can be singled out as "TB hotspots," or places where TB levels are the highest in the country. While TB is certainly not limited to any one region or group of people, this section seeks to highlight the people and areas hardest hit by the TB epidemic.*

## **2.5.2 Factors contributing to the rise of TB cases in South Africa**

### **2.5.2.1 Fragmentation of health services**

The tuberculosis infection rate in South Africa has its roots in the structure of health services where there was a fragmentation of health services due to the apartheid system. The healthcare system was sustained by the promulgation of racist legislation and the creation of 14 different departments of health and numerous statutory bodies for control of health care professions and facilities in the independent states. There was no team-work, the doctors played a dominant role and there was great emphasis on medical care. There was lack of co-ordination between provincial government, former homeland areas and non-governmental organizations. This rendered the tuberculosis control programme unfocussed and ineffective (African National Congress, 1994:7).

### **2.5.2.2 Overcrowding**

Overcrowded living conditions influenced by low socio-economic status of some segments of the South African population are the major obstacles to the effective TB control (SANTA, 2001:6).

### **2.5.2.3 Poorly managed TB control programmes**

Inadequate TB cases detection, diagnosis and cure threaten to make TB incurable. Poorly supervised TB treatment and treatment interruption causes multiple drugs resistant TB (MDR). This means that a TB patient will remain infectious, spreading the bacilli to other people. It is estimated that drugs for treating MDR TB patients cost about R25 000 per patient excluding hospitalization and human resources whereas treating a straight forward TB

patient costs the department of health R250.00 per patient (Department of Health, 2000:7).

#### **2.5.2.4 TB in the mining industry**

The discovery of gold and diamonds in South Africa in the late 1800s was a great stimulus to the increasing incidence of TB in this country. During this period large numbers of skilled mine workers from England and Europe flocked to the South African mines. Most of them were already infected with TB. Cecil John Rhodes, the mining magnate, came to South Africa already suffering from tuberculosis (Department of Health, 1998:5).

Apartheid encouraged men and women to migrate and seek employment in the cities. Former Transkei is one of the regions from which a majority of South African mine workers used to be recruited, and the destination to which many returned after they had finished their contract or when they had been retrenched. The mining industry contributed directly to the spread of the disease in the rural areas of South Africa by creating conditions in the mines that encouraged the spread of infection within the mines and by repatriating those who became ill. They returned to their families spreading the disease in rural parts of SA and neighbouring countries.

The spread of the disease is attributed to inadequacy of health care facilities, poverty, poor nutrition and overcrowded living conditions. Another cause of the spread of the disease spread was that when miners were found sick, they used to be dismissed from their jobs. This dismissal on grounds of ill-health encouraged the mineworkers not to report their illnesses and disguised their ill-health to escape dismissal, thus fostering the spread of infection.

Mining is a physically demanding labour that is performed in the haze of fine dust, underground, under extremely warm temperatures and in enclosed dark

places for 8-10 hours per day. In such places, a coughed-out bacilli can survive and inhaled by other workers. The disease is complicated by the epidemic of HIV/AIDS to which black mineworkers are susceptible because they often live far apart from their families. Most had multiple sex partners and engaged in unprotected sex. Most former mineworkers have had experience in multiple mining sectors e.g. gold mining, coal mining, asbestos mining industry, diamond mining etc. Today, as a result of economic development and trade union pressures, the living conditions of most mine workers have improved because they are no more dismissed on the grounds of ill-health, instead they are encouraged to report ill-health and treatment is now available on site. Those mineworkers who contract TB are treated on Dots in the workplace (Banwari, 2002:105).

#### **2.5.2.5 TB and HIV in South Africa: The deadly pair**

The high incidence of Human-Immunodeficiency Virus (HIV) infection further compounds the tuberculosis problem. Many TB patients suffer from dual infection of TB and HIV and die. Over 1,5 million TB cases per year occur in Sub Saharan Africa. This number is rising rapidly as a result of HIV/Aids epidemic (Santa News September/October 2000:21). In South Africa TB is the most common opportunistic infection in HIV positive people. TB causes HIV positive patients to develop AIDS disease. The HIV positive patients tend to lose the ability to prevent TB infection from developing into TB disease because HIV slowly destroys the person's immune system leaving the body weak and vulnerable.

It is estimated that about 50% of South African TB cases are attributed to HIV. Someone who is HIV positive is thirty times more likely to be sick with TB than someone who is HIV negative. People who are dually infected with TB and HIV can be successfully treated for TB. TB can be completely cured even if the patient is HIV positive and this reduces the spread of TB, cuts the

costs of the AIDS epidemic, and extends and improves the lives of those living with HIV/AIDS (Singer, 1997:5).

The rapid rise of HIV positive cases in South Africa has played a critical role in the increase of TB rates in recent years. In South Africa, HIV infections were documented later than elsewhere in Africa. The current HIV epidemic is regarded as one of the most rapidly unfolding diseases in the world. Rising trends in TB incidence have been marked in those provinces which are severely affected by the HIV epidemic.

**Table 2.3 TB and HIV in South Africa**

Provinces	TB incidence per 100 000 people	Estimated TB cases	Proportion of TB cases HIV-Positive
Eastern Cape	504	34 371	20.4%
Free State	282	8 272	32.1%
Gauteng	375	26 378	25.2%
KwaZulu-Natal	381	34 178	45.0%
Mpumalanga	286	8 716	39.5%
Northern Cape	340	2 675	13.6%
Northern Province	260	13 927	16.7%
North West	271	9 557	25.9%
Western Cape	559	20 615	12.0%
South Africa	362	158 689	27.0%

(Singer, 1997:5)

Table 2.1 demonstrates the TB and HIV incidence rates per 100 000 population from 9 (nine) provinces in South Africa, based on the 1996

estimates from the Tuberculosis Research Programme, Medical Research Council, Pretoria. The Western Cape has the highest TB incidence rate and lowest percentage of HIV positive 12% cases. KwaZulu-Natal Province has the highest (45%) percentage in HIV positive cases (Singer, 1997:10).

#### **2.5.2.6 The stigma attached to TB**

Some people who have been diagnosed with TB have been reluctant to openly come forward for treatment because of the stigma attached to the disease. Davis 1994:6 reported that in the United Kingdom, in 1838 mortality due to tuberculosis was underestimated because of the reluctance of the relatives and friends of the TB patient to have the death registered because of the stigma attached to the disease where people regarded TB as an inherited weakness that interfered with potential marriages and employment of other relatives.

The hiding of the disease allowed the spread that could have been easily prevented. Inadequate education and lack of understanding by the TB patient of the need to continue with treatment and complete the six months course even when feeling well, often leads to premature interruption of therapy. This results in the relapse of the disease and causes the development of multi-drug resistant form of TB.

Literature shows that even famous South Africans such as former Miss Margaret Gardiner, Archbishop Desmond Tutu and former South African President Nelson Mandela were once afflicted with TB (Singer 1997:1).

A call for the respect of Human Rights was made by Archbishop Desmond Tutu, the former Chairman and President of the Truth and Reconciliation Commission (TRC). Tutu in his address delivered at the 30<sup>th</sup> World Conference on Lung Health in Midrand, Spain in September 1999, when he

said "Treatment for all, there is life after Tuberculosis." During his address he quoted number 25 of the Declaration of Human Rights that says "Everyone has a right to a standard of living adequate for the health and well being for himself and his family including food, clothing, housing and security in the event of unemployment and sickness, old age or other lack of livelihood in the circumstances beyond his control." He is further quoted as saying "The majority of TB patients throughout the world do not have the basic medical care they deserve, because the treatment is not available in their community, unreliable supply of medication, lack of health care workers to monitor their treatment or because of the strong social stigma and discrimination attached to TB in their communities (SANTA, June 2000:6; Spring 2001:14).

In the same address, Tutu, further stressed that TB and poverty form a deadly pair, therefore TB clients feel that they should hide their illness because they will be recognized as poor people. Archbishop Tutu was once afflicted with TB at the age of 13, was hospitalised and received treatment for twenty months. In his speech he made an urgent call to all governments, non-governmental organizations and the United Nations to work together and stop TB by making sure that TB treatment is freely available and accessible and is administered under direct supervision of a treatment supporter (SANTA, June 2000:6).

## **2.6 EFFECTIVE TB CONTROL BY DIRECTLY OBSERVED TREATMENT SHORT COURSE (DOTS) STRATEGY**

DOTS strategy is an internationally recognised health care management system for control of TB that provides support to a TB patient by observing them as they swallow their TB drugs everyday, ensuring that they complete the course of treatment. This strategy was recommended by the World Health Organization (WHO) in 1993 because it was proven to have produced 95% cure rates even in the poorest countries (Dick, et al 1999:1). DOTS

prevent new infections by curing infectious patients and prevents the development of multi-drug resistant (MDR) TB by ensuring that the full course of treatment is completed under supervision of a DOTS supporter (Nursing Update, March 2001).

Once the patient with infectious TB (Bacilli visible in a sputum smear) has been identified by the use of microscopy services, health workers, community workers and trained volunteers who function as DOTS supporters observe patients as they swallow their anti-TB drugs. Sputum smear testing is repeated after two months to check the progress and again at the end of treatment. DOTS supporters record their observations in the patients clinic card until the patients complete the course of treatment which lasts for six to eight months. The patient's clinic cards are checked by the nurses or doctors at the clinic when the patients or DOTS supporters go to collect the anti-TB drugs (Department of Health, 2000:9).

The WHO recommended this treatment strategy because it is a curative as well as preventive strategy. It has been proven to be a powerful solution to TB epidemics in countries like Tanzania, Botswana, India and USA (Dick et al 1999:10).

### **2.6.1 Five elements of Dots**

The new National TB Programme is based on the DOTS strategy promoted by the World Health Organization. There are five elements of DOTS strategy.

#### **2.6.1.1 Direct observation of treatment**

TB patients should be observed by DOTS supporters everyday when swallowing their anti TB drugs until they complete the course of treatment. DOTS supporter can be any responsible member of the community, family

member, colleague or health worker who has been trained on DOTS. It is important for a DOTS supporter to build a trust relationship so that the patient is co-operative. *This improves compliance.*

#### **2.6.1.2 Microscopy services**

The primary method to effectively diagnose TB patients is to check the sputum smear by using microscopy services.

#### **2.6.1.3 Drug supplies**

Using powerful combination tablets five days a week decrease the risk of developing multiple drug resistant (MDR) TB. Therefore the uninterrupted supply of TB drugs to treatment points is crucial.

#### **2.6.1.4 Monitoring system**

Correct monitoring of progress and documenting the cure at the end of treatment gives an accurate measurement of performance and identifies areas which need more support.

#### **2.6.1.5 Political commitment**

The support of the National and the Provincial Heads of the Department of Health ensures that the decision makers invest resources for a successful implementation of DOTS in the country (Enarson, Rieder, Arnadottir, Trébucq 2000:28).

## **2.7 INTRODUCTION OF DOTS IN SOUTH AFRICA**

South Africa, having realised that its TB control efforts have been ineffective, decided to adopt DOTS strategy for detection and cure of TB. The Department of Health in South Africa adopted and implemented a revised TB policy during 1996, based on the World Health Organization strategy – DOTS. The year 1996 saw a historic commitment of Dr Nkosazana Zuma, then the National Minister of Health, in declaring tuberculosis “A top National Priority” for South Africa in her parliamentary speech on the 7<sup>th</sup> November 1996 in Cape Town. This was the first time such an announcement had ever been made for any disease in South Africa. Dr. Zuma called for a countrywide implementation of DOTS. Currently, the National TB control programme is still implementing DOTS (SANTA Annual Report, 1996-1997:4).

### **2.7.1 Review of the South Africa’s TB management programme**

The Department of Health started implementing the DOTS strategy subsequent to the Review of the TB programme by the WHO experts and the Department of Health in 1996. There were six recommendations for the introduction of DOTS made by the Review Team. These were:

- All health facilities caring for TB patients should implement DOTS urgently in order to ensure that 85% cure rates is achieved.
- DOTS should be made accessible to all TB patients who do not have ready access to health facilities of community level and at the work-place.
- Provincial health authorities should ensure that tuberculosis services are integrated into the comprehensive primary health care at district level.

- District co-ordinators should ensure an efficient patient transfer system from one health facility to another and ensure accountability through the use of TB registers to monitor patients' progress until they are cured.
- The National TB Control programme should implement health education and training programmes for health professionals and patients.
- Use of microscopy services to detect TB bacilli and diagnose TB (Matsha, 1999:33).

### **2.7.2 Appointment of TB managers**

In 1996 Dr. Refiloe Matji was appointed as a National TB Control Manager. Her responsibility was to monitor the progress in the implementation of DOTS in all provinces. At provincial level, TB managers were appointed to oversee all the components of DOTS strategies in all provinces. (Singer, 1997:18).

### **2.7.3 The change in the hospital admission and discharge criteria for TB patients**

In the past, TB patients once diagnosed, were admitted in a TB institution for a period of six months or more. With the review of South Africa's TB Management Programme, the National Department of Health developed strict hospital and discharge criteria as a means of shifting TB patients from hospitals to DOTS in the community. This revised admission and discharge criteria allows TB patients to continue to live and work in their communities while they receive treatment, the criteria comprise the following aspects:

- Aims
- Choice of hospital for referral of ill patients
- Admission criteria (see annexure 2).

## **2.7.4 Education and Training of nurses and other health care workers and patients in DOTS strategy**

Training of all health care workers in the techniques of communication, casefinding and caseholding of tuberculosis patients is the cornerstone of the National Tuberculosis Control Programme (NTCP). The National Department of Health took it upon itself to make sure that education and training on DOTS is provided to all those involved in the treatment and control of tuberculosis including TB patients and the community. The revised National TB Control practical Guidelines for the treatment of tuberculosis were distributed by the National Department of Health throughout the country to coincide with the World TB day in March 1996. These guidelines which lay out the components of DOTS strategy were to be used to train health workers. Details of these new treatment guidelines which indicate development in chemotherapy appear in figure 2.1, 2.2 and 2.3 in chapter 2.

### **2.7.4.1 Training of DOTS Co-ordinators**

At district level, District Co-ordinators were trained to provide training to all those involved in the control and treatment of TB patients at primary health care clinics, health centres, TB hospitals and at community level. During training, the "Train-the-trainer" course outlined the following aspects:

- Details of DOTS.
- Roles of different health staff in TB control.
- Principles of patient-centred care.
- Empowering treatment supporters to help stop the TB epidemic in their communities.
- Protection of health workers from TB.
- Supervisory visits at TB clinics once a month.
- Community education and involvement.

(Department of Health 1998:63-74).

#### **2.7.4.2 Training of nurses and other health care workers**

Nurses have always played a key role in TB control, and their continued contributions is crucial if tuberculosis is to be controlled. Every element of DOTS strategy depends on a trained and committed health worker and volunteers. The training of nurses and other health care workers begun at the primary health care clinics. The reason was that the nurse and other primary health worker might be the first to suspect TB in patients who present themselves with all the signs and symptoms of TB and they refer them for diagnosis and treatment.

Training of nurses and other health care workers lasted about 10 days. Topics that were covered during training included basic knowledge about TB, how to diagnose pulmonary TB, multiple drug resistant (MDR TB), how to manage TB and HIV/AIDS patient, DOTS, record keeping, prevention of TB and protection of health workers.

The aim of training health care workers was to assist them in successful control of TB by ensuring that a high smear conversion rate of at least 85% at the end of intensive phase and at least 85% cure rate to all new smear positive cases is achieved.

#### **2.7.4.3 Training of DOTS supporters**

TB control needs community support and involvement. A successful DOTS strategy requires partnership between primary health care team, other sectors and the community. Once a laboratory has confirmed the diagnosis, the treatment is provided with the support of the DOTS supporter for six month or until the patient is cured. The training of DOTS supporters lasted 10 days.

During training the "Tackling TB together" manual was used. This manual covered the following aspects:

- Basic facts about TB.
  - Signs and symptoms.
  - Methods of prevention.
  - Identifying adults and children with TB.
  - Treatment and its side effects.
  - Details of DOTS.
  - Record keeping (see annexure 6 for patients records kept by DOTS supporter)
- (Knight, 1998:1-65).

To complement their training the DOTS supporters were given a chart that outlines their roles (see annexure 5).

#### **2.7.4.4 Patient education about DOTS strategy**

Patients were educated about the disease, its treatment, side effects of medication and what to do if problems develop. The reason for taking lengthy treatment even when feeling was also stressed. TB education was done in clinics where patients collect their treatments, in TB centres/hospitals for those admitted and general public by the use of media and pamphlets distribution.

In addition to educating TB patients about TB, the new guidelines for the treatment and control of TB were also stressed because TB patients and other people knew that TB treatment involves hospitalization in a TB institution for six months or more. The importance of choosing a reliable DOTS supporter of their own choice and to produce sputum at the end of two months and after completion of treatment was also stressed.

Intensive TB education continues in health facilities through media and by the health care workers. World Health days especially March 24 which is a World TB day is celebrated worldwide educating and giving information about TB and its treatment.

### **2.7.5 The use of microscopy to detect TB bacilli**

The National Department of Health recommended the use of microscopy laboratories for diagnosis of TB instead of chest X-Rays. New microscopic laboratories were opened in KwaZulu-Natal primary health care clinics and TB hospitals. This direct examination of sputum is an easy, quick, inexpensive method to diagnose TB, assess the response to TB treatment and to diagnose the cure at the end of six months treatment (Singer, 1997:14-15).

## **2.8 PARTNERSHIP IN TB CONTROL**

The National department of health forged partnership with other non-governmental organizations (N.G.O.) in the treatment of tuberculosis. One of the largest N.G.O.s' that has played a role for a long time in the fight against TB in South Africa is South African National Tuberculosis (SANTA, March, 2001:5).

### **2.8.1 SANTA's role as partnership in fighting tuberculosis**

SANTA is one of the non-governmental organizations committed in the control and treatment of tuberculosis. It was established in 1947 in Durban, pioneered by Dr. Charles James who was the first National Chairman of this organization. It is the largest, voluntary and non-profit making organization involved in implementing strategies aimed at preventing and curing TB. It concentrates on the vital components of health education and TB awareness

strategies. It is responsible for the management of ±5000 TB beds in South Africa. It has 22 Santa hospitalization centres that hospitalise TB patients. In KwaZulu-Natal there are 5 centres, one of them in the South Coast of Durban, in Amanzimtoti area, was named after Doctor Charles James who was the pioneer and the first National Chairman of this organization. In addition, there are 136 branches and 109 care groups nationwide. These branches and care groups consist of volunteers who are responsible for increasing TB awareness to the communities, fund raising, providing support to the patients and their families and to implement and supervise DOTS in the communities (SANTA, 1996-1997 Annual Report:3).

#### **2.8.1.1 Admission of a TB patient in SANTA centres**

Santa implements the DOTS strategy of the National Tuberculosis Control Programmes (NTCP) as laid out in the National Guidelines Criteria for admission as follows:

- Patients who are too ill for outpatient treatment but clinically stable.
- Extra pulmonary TB (selected cases only).
- Multidrug resistant TB (MDR) only to those hospitals with appropriate drugs, for example King George V Hospital in Durban.
- Retreatment patients (treatment failure after one course of TB treatment).
- Social reasons (proven sputum positive TB patients) if clinic or community supported care cannot be achieved. High risk groups are the very poor people who are alcohol dependent or substance abusers, previously non-compliant patients, neuropsychiatric patients and those who refuse treatment.
- Children under 2 years of age are admitted with their mothers as border babies.

### **2.8.1.2 Case finding and diagnosis by sputum microscopy**

In rendering the service, Santa does not actively screen the population for TB, but admits TB patients who have already been diagnosed of TB by the government clinics, private Doctors, hospitals and other institutions through the sputum microscopy. At the end of two months when the patient is being prepared to go home on DOTS, sputum is examined by Santa Microscopic laboratory and if negative and the patient's clinical condition is stable, he is discharged to the clinic nearby his home to continue with TB treatment under direct supervision of his DOTS supporter for four months. Santa keep the laboratory reports of pre-treatment sputum microscopic results for each admitted pulmonary TB patient.

### **2.8.1.3 Patient care**

Santa provides medical, nursing, physiotherapy, occupational therapy, social welfare, health education, counseling, pharmaceutical and surgical supplies to all TB patients admitted in its centres. The pharmaceutical and surgical supplies are provided by the Regional stores of the Department of health.

If the patient is too complicated for the capacity of a Santa Centre, then the patient is transferred to a hospital which provides adequate care.

### **2.8.1.4 Discharge criteria**

Santa centres discharge the patients after 2 months of TB treatment when their sputa are negative or as soon as they are well enough to be treated on outpatient basis on DOTS and are willing and able to access treatment and to be monitored either by going to the clinic or by receiving visits from a treatment supporter. MDR-TB patients are discharged only when they are no longer infectious. Before the patient is discharged the Sants staff contact the

clinic to which the patient is to be transferred, to determine if the patient has been registered at the clinic for follow-up treatment.

#### **2.8.1.5 Community Based Care**

Santa, through its Community Volunteers, and care groups provide community based DOTS. Whenever possible, Santa Volunteers meet with patients before patients are discharged from Santa Centres and act as treatment supporters to the patients after discharged patients and improves their cure rates.

#### **2.8.1.6 District TB co-ordinators**

TB care in Santa Centres, as in other health services, is co-ordinated by the district/ regional TB co-ordinators. Santa centres work closely with TB co-ordinators to improve co-ordination of TB services in the district/region, and improve quality of care.

#### **2.8.1.7 TB and HIV testing**

Santa provides access to HIV testing in all Santa Centres and the staff are trained on HIV counseling according to the Department of Health Guidelines. In view of the close relationship between TB and HIV, staff are trained to provide services for prevention, diagnosis, treatment and referral for HIV – related opportunistic infections according to the Department of Health Guidelines.

#### **2.8.1.8 Clinical and reporting system**

Quarterly reports for case finding and treatment outcomes are completed and submitted to the Department of Health.

### **2.8.1.9 Monitoring Santa centre occupancy**

Santa, in respect of each Santa Centre completes a quarterly report on routine hospital indicators (length of stay in hospital, number of patients, and bed occupancy) and submits this to the Department of Health (SANTA Annual Report, 2001-2002).

## **2.9 THE SUCCESS OF DOTS PROGRAMME IN VARIOUS PROVINCES OF SOUTH AFRICA**

Since the introduction and implementation of DOTS in this country, the improvements in the cure rates have been marked. In 1997 cure rates were 56%. This increased to 62% cure rates in 1998 (Matsha, N. 1998:23).

There has been involvement of non-governmental organization and community based organization in DOTS programme. School teachers have been involved in becoming DOTS supporters for those learners who are to take their treatment at school and these teachers also supervise their colleagues who take their TB treatment during school hours (Matsha, N. 1998:25).

### **2.9.1 Mpumalanga Province leads the way to change with its own TB manual**

Mpumalanga province leadership was convinced that DOTS strategy will defeat tuberculosis soon after the announcement by the National Minister of Health, Dr. Nkosazana Zuma that "TB is a National Priority", urging that we must all use DOTS. They began the training of twenty one communicable disease co-ordinators in 1995 to manage TB services and to keep a detailed register of all TB patients, thereby documenting their treatment. A TB manual

called "Managing TB-Getting it right" was designed to provide health workers of Mpumalanga province with the tools necessary to manage TB.

It is stated in this document that, the WHO, Medical Research Council and the National Department of Health in South Africa endorsed the contents of this document. It is noted that this TB manual is used only to manage TB of the lungs. The extra pulmonary TB, for example TB kidneys, TB meningitis, TB bones, TB glands, etc. are referred to a specialist center. (Mpumalanga Department of Health, 1996).

Today, Mpumalanga province is known as the model province in South Africa because of its successful treatment rate of 80 percent that was achieved by the Standerton district in Mpumalanga Province after implementation of DOTS strategy in 1996. It is noted that the success of the Standerton district is due to a number of people dedicated to TB control in the Mpumalanga Province (Matsha N. 1997-1998:19).

The trained Communicable disease co-ordinators are responsible for TB and other diseases as part of a comprehensive primary health care approach. They also provide technical support and supervision at the clinics and make sure that the TB patients' progress is adequately monitored.

They also provide training to DOTS supporter groups which comprise of youth, teachers and traditional healers. Half of their DOTS supporters are traditional healers who have been trained on DOTS by District co-ordinators. The main reason for training traditional healers was that most of the TB sufferers, go to traditional healers first when not feeling well and they use primary health care clinics and hospitals as a last resort when every attempt to treat TB traditionally has been exhausted. The traditional healers were trained on signs and symptoms of TB and to refer to the clinic all those that

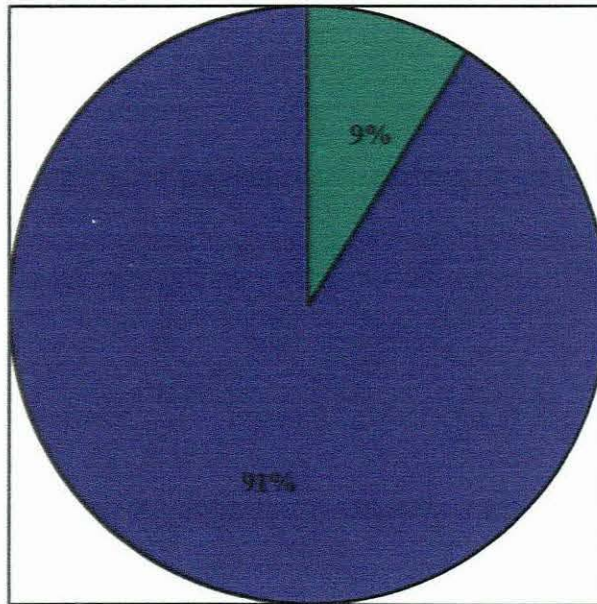
present with signs and symptoms of TB and to act as DOTS supporters when the patient has been diagnosed as TB patient to start on treatment.

Training on DOTS is an on going process, and TB workshops are conducted by health professionals to update the DOTS supporters with TB and DOTS information. The TB action group has innovative ways in which to sustain the enthusiasm of DOTS supporters. One of the innovations is the reward of SANTA T-shirt and cap to DOTS supporter when the patient being supervised has completed treatment and the last sputum test is negative. There were 142 TB patients under supervised treatment recorded in 1998. The TB Action group always make sure that TB remains high on the agendas of the key decision makers (SANTA Annual Report 1996-1997:8).

The successful cure rates of Mpumalanga Province challenged other provinces to start setting up demonstration and training Districts, (Matsha, N. 1997-1998:20).

**Figure 2.2 : Conversion rates of new smear positives, Mpumalanga demonstration and training district, April – June 1997**

**105 New Smear positive cases**



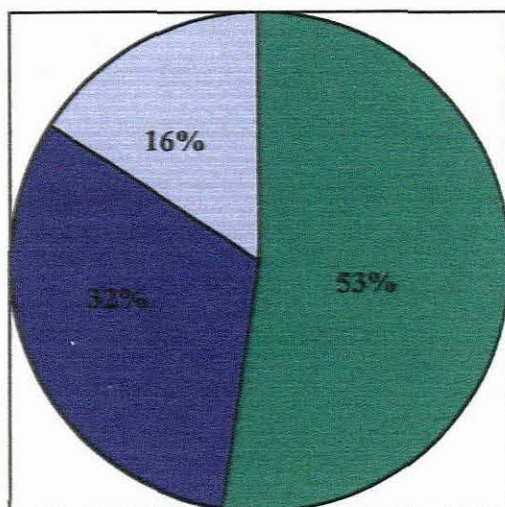
(Matsha, 1998:19)

**Key :** 1 = 9% No information  
2 = 91% Smear negative at 2 months

### **2.9.2 Dots in action in KwaZulu-Natal Province**

A holistic approach in TB treatment in KwaZulu-Natal province is a good example of co-ordinated effort of the KwaZulu-Natal Department of Health with the non-governmental organization like FOSA TB Centre, and SANTA.

**Figure 2.3 : Conversion rates of new smear positives, KwaZulu-Natal demonstration and training district, April-June 1997**



**Key :**

- 1 = 53% Smear negative by 2 months
- 2 = 32% No bacteriology
- 3 = 16% still smear positive at 2 months

Figure 2.3 presents the conversion rates of new smear positive cases from KwaZulu-Natal Demonstration and training District from April to June 1997. It reflects lower cure rates compared to Mpumalanga Province.

**2.9.2.1 The Outer West area of Durban Metro Western Subdistrict**

In 1998, Don McKenzie TB Hospitalization Centre is one of the twenty two South African Nation Tuberculosis Association (SANTA) Centres. It is located in the Valley of Thousand Hills in KwaZulu-Natal province, the Outer West area of Durban Metro Western Subdistrict. According to the current municipalities re-demarcation, it was selected by the KwaZulu-Natal

Department of Health to be one of the DOTS Demonstration and Training Districts. The objective was to demonstrate the effectiveness of DOTS strategy.

DOTS co-ordinator, a professional nurse was appointed and trained by the District co-ordinator about DOTS. Her duties involved conducting monthly meetings with all those involved in administering DOTS, discussing correct DOTS protocols, educating and updating them with DOTS information. DOTS co-ordinator ensures that all the quarterly reports about treatment outcomes are completed correctly by the clinics and TB hospital staff and submitted to the government health authorities in time.

The Don McKenzie TB Centre is adjacent to the Valley Trust, a socio-medical project for the promotion of comprehensive primary health care. These two centres are *non-governmental organizations* and they work very closely with all the government clinics and health centres in the Outer West Health District Community Health worker whose duties in the community involve giving of DOTS and Home Based Care.

Patients are seen by Doctors and Nurses at the Halley Stott Health Centre which is located in the premises of the Valley Trust. If diagnosed as TB, patient is to be treated in the community. Community Health Workers at the Valley Trust are informed and the patient is allocated a DOTS supporter who lives nearby the patient's home to supervise the TB treatment. Patient is educated about the disease and its treatment by the community health worker then given treatment to take home by the clinic nursing staff. Communication about the progress of the patient and treatment is facilitated by the DOTS co-ordinator between clinic staff and Community Health Worker / DOTS Supporter.

Patients who are not suitable for outpatient treatment, either being very sick, retreatment patient (patient who had TB treatment before), clinic to collect treatment being too far from home, alcohol abuse or low socio-economic conditions, are admitted at the Don McKenzie TB Centre for two months. During these two months, investigations about patients' illnesses and contributory causes are done and other opportunistic infections are treated. Health education and information is done by the Health Advisor who also contacts the employer if the patient is employed, gives the information about TB and DOTS and makes arrangements for the patient not to lose his job.

During the hospital stay home circumstances of the patient are being investigated by the DOTS co-ordinator and Community Health Worker, where the patient comes from. If social welfare is needed, the patient is transferred to Social Welfare Department where the social workers will assess and intervene accordingly.

In 1999 the Rotary Club of Hillcrest funded the training of DOTS Supporters. 150 community members volunteered to be Dots supporters. They were trained on DOTS by the DOTS Co-ordinator. This group of DOTS supporters included Community Health workers who were already working in the 5 tribal areas of the Outer West Health District. At the end of their training they were presented with certificates, T-shirts and caps by the President of the Rotary Club on the 24 March 2000. This graduation day coincided with the celebration of World TB day which took place at Don McKenzie TB Hospitalization Centre. The KwaZulu-Natal Minister of Health Doctor Zweli Mkhize was also present.

The DOTS programme is continuing and more patients are treated on DOTS than at the TB Hospital and clinics (SANTA, 1998 Annual Report :4).

A microscopic centre was set up at Don McKenzie TB Santa Centre. The equipment was donated by the British consulate in Durban in 1997. This microscopic laboratory is staffed by 3 laboratory assistants and its service extended to 5 government clinics in the Outer West Health District (Haywood, 1997:4).

### **2.9.2.2 DOTS Programme in Lamontville Township**

According to Matsha (1997:18), Lamontville Township is one of the Townships in Durban that was selected by the province's / Department of Health to be a Provincial Demonstration and Training District for DOTS programme. This township has a population of ±25 000 people excluding informal settlement. It has a clinic that provides comprehensive primary health care to its residents and is run by the Durban City Health Department.

Matsha (1997-1998:18) continues to report that when DOTS programme started, there were ±50 volunteers who were recruited to be trained as DOTS supporters by DOTS co-ordinator who was a local social worker in 1997. On completion of the training course volunteers were presented with DOTS certificates sponsored by Telkom and Rotary club.

DOTS supporters, when they are not in the field to support their TB patients they keep themselves busy at the clinic doing vegetable gardens, sewing and crocheting. Fruits and vegetables from these gardens are given to the most needy TB patients. The volunteers also benefit from the gardens as they receive no monetary incentives from doing DOTS supporting. Vegetable gardens and sewing machines were sponsored by the Rotary club.

A positive development in DOTS in this District is that the DOTS programme has expanded to the schools. Teachers are also involved in the programme by giving TB treatment to school children who are TB patients. The DOTS

programme is now run by a retired volunteer professional nurse who supervises the DOTS supporters (Matsha, 1998:18).

## **2.10 CONCLUSION**

The literature reviewed revealed that part of the TB problem in South Africa was with the previous control efforts. The importance of correct monitoring *the infectiousness of TB was not sufficiently appreciated*. Now, with the new DOTS strategy for Control of Tuberculosis introduced in 1996, the emphasis is on the cure. Reliable reporting system gives an accurate measurement of performance and identifies areas which need support.

## **CHAPTER 3**

### **THEORETICAL FRAMEWORK**

#### **3.1 INTRODUCTION**

This chapter explains the theoretical framework on which the study is based. In health care, self-care fundamentally affirms that people and their families must be allowed to take initiative and responsibility to develop their own potential in being healthy. Dorothea Orem's theory of Nursing was chosen by the researcher as the appropriate foundation to this study because it explains the practice of activities that the individuals perform on their own to maintain life, health and well-being. In this chapter the researcher will indicate how the theory of Orem is applied and how it relates to the researcher's own investigations.

#### **3.2 DEVELOPMENT OF OREMS SELF CARE MODEL THEORY**

Orem developed the theory of self care in the 1950's when she was serving her term of office as a consultant in Nursing and Nursing Education in the Division of Hospital and Institution Services of Indiana State Board of Health. Her experience in Nursing as well as exposure to the nurses and their endeavours led her to search for the meaning of nursing in a way that would deepen its meaning (Fawcet, 1989:206).

During her search, her observations gave her an idea that nursing involved both inductive reasoning and a mode of communication. In 1959, in her publication "Guides for developing curricula for education and a practical nurse, she introduced her conceptual framework. In this publication she maintained that human limitations for self-care that are associated with health deviations give rise to a requirement for nursing.

Orem is considered as a pioneer in the development of distinctive nursing knowledge because she developed the six concepts of her conceptual framework to be discussed in the succeeding section. This was at a time when most of the nursing education programmes were based on conceptual frameworks she emphasised the need for an organised body of knowledge upon which to base the programme of nursing education (Fawcet, 1989:207).

Later, she expanded her focus on individual self care to include the families, groups and the community to take initiative and responsibility to develop their own potential in being healthy, by means of health promotion, disease prevention, early detection of disease and treatment, as well as taking responsibility for others like children and the elderly in their families. This theory is still important today as it fosters independence and provides a comprehensive base for nursing practice. In health care, it emphasises the importance of enabling and allowing people to take initiative in being responsible for their own health where this is possible (George, 1985:136). To support this view, Kuan Tzer, quoted in George (1985:124) says, "If you give a man a fish he will have a single meal; if you teach him how to fish, he will eat all his life (George, 1985:124-125).

### **3.3 THE CONCEPTS ON WHICH OREM'S SELF-CARE THEORY IS BASED**

There are six concepts on which Orem's self-care theory is based namely self-care, self-care agency, therapeutic self-care demand, self-care deficit, nursing agency and nursing systems.

#### **3.3.1 Self-care**

Self-care is described as a goal-oriented activity that is learned through interpersonal relationships, communication and culture. It combines social

and cognitive experiences. According to Orem self-care is performed in relation to three types of self-care requisites, that is universal, developmental and health deviation as follows:

3.3.1.1 Universal requisites are associated with life processes and maintenance of the integrity of human structure and function through performance of activities of daily living.

3.3.1.2 Developmental self-care requisites are those conditions and events that occur to human beings during various stages of life and may adversely affect the development of the human being.

3.3.1.3 Health deviation requisites are associated with genetic and constitutional defects and human structural, and functional development and they need to be medically diagnosed and treated. (Fawcet, 1989:212).

### **3.3.2 Self-care agency**

Self-care agency is the capability to take action towards care of self and true-care of others who are dependent on the agency to perform their daily activities for example, being a self-care agent for her child. The ability to engage in self-care is influenced by certain basic conditioning factors, namely e.g. health, developmental stage, life orientation and availability of resources. Self-care agency operates through instructions and supervision from others as well as by intellectual capabilities and experience in performing self-care measures (George, 1985:131).

### **3.3.3 Therapeutic self-care demand**

Therapeutic self-care demand is a humanly constructed entity that the individual uses to meet some universal, developmental and health deviation self-care requisites. It is a prescription for continuous self-care action through which the self-care requisites that have been identified can be met (Orem, 1980:39).

### **3.3.4 Self-care deficit**

Self-care deficit refers to the individual's insufficient ability to care for himself. It means the relationship between self-care agency and action capability is inadequate (Fawcet, 1989:214).

### **3.3.5 Nursing agency**

According to Orem (1985), nursing agency is the acquired ability of the adult to nurse, utilizing specialized education in the nursing disciplines that provides the foundations for understanding nursing. Its goal is to help people to meet their own therapeutic self-care demand (Orem, 1980:88).

### **3.3.6 Nursing systems**

Nursing systems is the action performed by nurses for the benefit of others. They perform these actions through diagnostic, prescriptive and regulatory operations of nursing practice. There are three types of nursing systems that are performed by nurses, namely wholly compensatory, partly compensatory and supportive education. The details of these systems are explained in section 3.6.3.2 in pages (Orem, 1980:92).

### **3.4 BASIC ASSUMPTIONS OF OREM'S THEORY**

Orem's search for the meaning of nursing led her to the formulation of assumptions that guided her subsequent work. Fawcet (1989:208) cites four assumptions on which Orem's Theory is based:

3.4.1 Nursing is a form of help or assistance given by nurses to persons with legitimate need for it.

3.4.2 Nurses are characterised by their knowledge of nursing and their knowledge of nursing and their capabilities to the use of their knowledge and specialised skills to produce nursing for others in a variety of situations.

3.4.3 Persons with a legitimate need for nursing are characterised by:

- a demand for discernable kinds and amounts of self-care or dependent care,
- health-related limitations for continuing production of the amount and kind of care required.

3.4.4 Results of nursing associated with characterising conditions of persons in need of nursing and including:

- the meeting of existent and emerging demands for self-care and dependent care,
- the regulation of the exercise and or development of capabilities for providing care (Fawcet, 1989:208).

### **3.5 BASIC PREMISES ON WHICH SELF-CARE MODEL FOR NURSING IS FOUNDED**

According to Joseph (1980) in Alan, Pearson and Vaughan (1990:71) there are six premises underlying Orem's self-care model.

- Self-care is based on voluntary actions which humans are capable of undertaking.
- Self-care is based on deliberate judgement that leads to appropriate acts.
- Self-care is required of every person and is a universal requisite for meeting basic human needs.
- Adults have the right and responsibility to care for themselves in order to maintain their healthy life and well-being. Sometimes they may take these responsibilities for others including children and the elderly in their families.
- Self-care is the behaviour that evolves through a combination of social and cognitive experience and is learned through one's interpersonal relationship, communication and cultures.
- Self-care contributes to the esteem and self image of a person and is directly affected by self concept (Pearson and Vaughan, 1990:71).

### **3.6 KEY ELEMENTS IN OREM'S THEORY**

Orem (in Fawcet, 1989:104-111) defines the four key elements around which the theory evolves, that is the individual; health, nursing and society as follows:

### **3.6.1 An individual**

An individual is a healthy adult whose physical, psychological, interpersonal and social well-being are optimally functioning. This person is practising self-care activities under normal circumstances. Suddenly he experiences a deviation in health due to illness. His abilities to perform daily activities are then limited. He goes to the clinic to ask for medical assistance. In the context of this study, he is then diagnosed as having pulmonary tuberculosis. The nurse, as self-care agent intervenes to help the patient to accomplish therapeutic self-care. The nurse does this in a way that promotes independence as speedily as possible by giving the patient and his family adequate knowledge on tuberculosis, its prevention and treatment.

*The nurse will then design the plan of care for this patient based on his condition, financial status and employment status. The nurse will educate the patient and his family about tuberculosis so that they understand the diagnosis and prognosis, not just a label as TB patient. This will enhance self-care and the effectiveness of DOTS. The patients will then be able to cope with the symptoms, and the stigma attached to the disease will be removed.*

### **3.6.2 Health**

Orem supports the World Health Organization's of definition of health that says "Health is the state of physical, mental and social-well-being and not merely the absence of disease or infirmity". To maintain one's health status, it is the responsibility of the individual to take action to meet his universal self-care requisites so that he will be able to perform his activities of daily living. These requisites are associated with life processes and maintenance of the integrity of human beings during all stages of life, and can be adjusted to age and environmental factors. They include drinking clean water, eating

balanced food, breathing clean air, maintaining in balance between rest and sleep and taking active part in social groups (Orem, 1980:43).

Although well-being is associated with health, the experience, of well-being may occur for an individual under adverse conditions, including disorders in human structure and functioning. A healthy individual can find himself unable to perform necessary self care activities due to illness or injury. The self care demand becomes greater than the individuals ability to meet his needs, therefore an imbalance occurs. The person realises that his self-care agent is at the nearby clinic where the diagnosis of his conditions will be made and corrective measures will be taken to restore health.

During various stages of life, there are human developmental processes and events, that occur in the life of an individual and he has to adjust himself to them, for example, loss of employment due to tuberculosis. Some of the TB patients suffer from tuberculosis due to the conditions at their workplace and they have to terminate their service and live on disability grant, which most of the time is less than the salary or wages the person has been getting (Orem, 1980:44).

### **3.6.3 Nursing**

According to Orem, Nursing is a deliberate helping art performance by nurses to assist the individual in need of help in the performance of his activities of daily living. The practice of nursing is based on theory from the nursing discipline, science and humanities (George, 1995:131).

#### **3.6.3.1 Nursing systems construct**

According to Orem there are three types of nursing systems that can be used to nurse the patient. They are:-

- Wholly compensatory
- Partly compensatory and
- Supportive educative system (George, 1985:129).

### **Wholly compensatory system**

There are three types of patients who are nursed under this system:-

- The patient who is totally incapacitated mentally and physically.
- The patient who is physically incapacitated but is aware of the surroundings.
- The patient whose psychomotor activity is not directed towards meeting requirements for life, safety or effective human functioning.  
(George, 1985:129).

These patients are admitted in the health care services because they are very sick and unable to engage in any form of deliberate action. They need a self-care agent to act for them or do things for them. For example, in the case of a patient with dual infection of TB and Human Immuno Virus (HIV), the condition deteriorates and may not be suitable for outpatient treatment on DOTS, the patients HIV status may advance to AIDS and the TB patient becomes bedridden. This patient is admitted in a TB hospital where he will be treated for tuberculosis and other HIV opportunistic infections.

The patient is bedridden, washed, fed and pressure parts care is done by the nursing agents. If home-based care is available in the area where patient lives, the patient is discharged in the same condition to be nursed at home by the home-based care agents. This discharge planning is done through the clinics or institutions who are provide home-based nursing. For example, in the Outer West area of Durban Metro Western Subdistrict, if such a patient is discharged by Don McKenzie TB Centre, the Valley Trust home-based care

department is informed to go and check the home circumstances of the patient if they are suitable for nursing such a patient. If they are suitable, the self-care agent from the home-based care department of the Valley Trust will then fetch the patient and take him to his home where she will continue with the care of the patient, giving directly observed treatment until the patient recovers from illness or dies a peaceful death. If the home circumstances of the patient are not suitable for home-based care, the patient is transferred to the Hospice if available, or continues to be nursed at a TB institution.

### **Partly Compensatory System**

A patient who is nursed under this system is a patient who is able to perform limited tasks due to his sickness or disability. He needs assistance from self-care agent to perform his activities of daily living, for example, a TB patient who is *dyspnoeic, emaciated and has a small baby to take care of*. As a single mother, she has no one at home during the day to help her caring for the baby while she is in a serious condition. She is admitted to a TB institution, with her baby who will be looked after by the self-care agent. The self care agent, will also help her carrying out her daily living activities including directly observed treatment for her tuberculosis until she regains strength and is able to take care of her baby (George, 1985:129).

During hospitalization, health education and information about TB and its treatment is being provided by the self-care agent. A discharge plan is done during the two months of admission where the self-care agent from the TB institution communicates with community health nurses of the clinic nearby the patients home. When the patient's condition has been stabilized, a DOTS supporter visits the TB institution so that he/she is given information about the treatment of the patient before discharge. DOTS supports or a member of the family chosen by the patient to supervise her treatment at home takes over the management of the TB patient until he completes the course of treatment and is discharged.

### **Supportive Educative System**

A system whereby a patient whose life style has been altered by ill-health is assisted by the self care agent to accomplish self-care and prevent further health deterioration. In this state the patient is capable of learning, therefore should be able to perform required self-care measures. The self-care agent will assist the patient by means of support, guidance, counselling, education and information so that he will be able to perform his activities of daily living (George, 1985:129).

Education of the TB patient about his disease and the reasons why he has to take lengthy treatment even when feeling well is very important. This will help the patient to understand his disease and be able to cope with the side effects of the TB drugs.

During patient education, it is very important to involve family members and to get their support in the treatment of a TB patient as the disease is infectious. This will only be successful if they all have knowledge about tuberculosis and if any misconceptions and superstitions about the course of the disease are removed.

The nurse will utilize her professional knowledge of anatomy and physiology of the human being to remove the beliefs that TB is caused by bewitchment (poisoning). The use of anatomical models of the torso to show them the difference between digestive and respiratory system will enhance self-care and the effectiveness of directly observed treatment short course (DOTS) strategy.

It is important at this stage to give them necessary knowledge and confidence to improve their standard of living. The self-care agent can do this by inviting the patient who has been cured of TB to give a talk to other patients as to how he successfully completed the course of treatment. One can also let the

patient watch TB programmes on television for example, Soul City programme on SABC I and radio programmes to get the knowledge and experience from the other patients, especially because some of them have reactivation of the disease. During the education of patients one should try and deal with the indirect cause of TB for example ignorance, stress, unemployment, drug and alcohol abuse and other diseases like malnutrition. This will help prevent the disease and be able to wipe out the dreadful disease. Reading with the patients and providing them with magazines and pamphlets is a useful change from the everyday routine activities.

The individualised education programme will enhance the effectiveness of DOTS.

#### **3.6.3.2 Partnership in care**

A person experiences, deviation in health care. He is unable to care for himself therefore presents himself to a nursing agent who will assist him by performing professional nursing functions. Once the need for nursing has been identified, the nurse-patient relationship aimed at resolving the health problem of the patient is established. This relationship is aimed at determining the patient's requirement of nursing that will meet the patient's daily activities until the patient is discharged from nursing. The manner in which nursing care of the patient will be carried out will depend on his ability and his self-care needs.

According to Orem's theory, a caring relationship with a TB patient will help the patient to feel at ease with the nurse to discuss his or her feelings, expectations and potential barriers or problems to TB treatment. Since TB treatment takes a long time, i.e. 6-8 months, monitoring patient's adherence is very important. A two-way communication between nurse, patient and DOTS supporter will ensure a long lasting relationship which will prevent interruption

of TB treatment. The more informed patients are about TB, the more they will be motivated to complete treatment.

It is also the nurse's responsibility to play an advocacy role in an attempt to secure the patient's job with the employer who dismisses the patient because of TB. A nurse should discuss with the patient how the employer should be approached.

### **3.7 SOCIETY**

Society is a group of responsible individuals who take responsibility of themselves as well as those who depend upon them for their well-being, for example infants/babies, elderly and the sick people. Society plays a major role in this model as it is viewed as a desirable social system that produces the elements necessary for providing health care designed by nurses and performed by the society. The healthy adult individual or group with limited capacity to help themselves to overcome self-care limitations, are helped by society to regain responsibility within their existing capacity. In the case of a TB patient who needs to take his treatment at home or his place of work, a member of the society, either a relative, family member, neighbour or colleague can be chosen by the patient to become a DOTS supporter who will supervise him taking treatment everyday.

The DOTS supporter will be responsible for supervising the patient swallowing his TB tablets everyday until he completes his course of treatment. The DOTS supporter will record in the patient's treatment card that the patient has swallowed his tablets. If the patient experiences any problems during the course of treatment, the DOTS supporter will then communicate with the clinic where the treatment is received. The involvement of the society in the treatment and care of a TB patient increases the awareness of the disease and improves the standard of health education. DOTS also reduces the

workload in the health services and staff as it is community based. The introduction of free health care services in South Africa burdened health care workers with heavy workload, and as a result, they cannot manage TB control programmes effectively.

The involvement of the society in DOTS and TB control is necessary for the following reasons:-

- The South African Police Document on District Health System supports community participation because it provides a sense of ownership among users and ensures responsibility, accountability and transparency.
- The strategy is community based and has been proven to be the most cost effective strategy in the developing or Third World Countries like Tanzania.
- The practical guidelines on Tuberculosis Control in South Africa substantiate the concept of patient centred care.
- In 1978, experts from all over the world declared the concept of "Health for all by the year 2000" at the Alma Declaration on Primary Health Care. It emphasised the involvement of people in providing their own health. *Health is part and parcel of people's lives and rights, and they should be involved fully in this regard.*

### **3.8 CONCLUSION**

Orem's theory had a profound influence on nursing as a profession from the early 1950s when the nursing profession had started to seek an identity of its own. Her self-care model is one of the most frequently applied conceptual models in nursing practice. It is widely used by all professionals working in

the health care sectors for example physiotherapists, speech therapists and others while providing care. It is relevant as a bias for this study since DOTS is a treatment strategy that is intended to promote self-care and independence.

## **CHAPTER 4**

### **RESEARCH METHODOLOGY**

#### **4.1 INTRODUCTION**

This chapter deals with the description of methods and procedures used in this study. The discussion includes the research design, the population, the sample and sampling methods as well as the instrument used for collection of data.

#### **4.2 RESEARCH DESIGN**

A descriptive survey design was undertaken. According to Treece and Treece (1986:174) the descriptive survey method is a non-experimental study in which the researcher investigates a community or a group of people by interviewing, observing what people are doing or by any other technique.

#### **4.3 DELIMITATION OF STUDY**

The study was conducted at those health institutions which were involved in the implementation of DOTS programme in the Outer West area of Durban Metro Western Sub-district of KwaZulu-Natal Province. These institutions were, Halley Stott Health Centre, Mpumalanga Clinic, Umsunduzi Centre and Don McKenzie, TB Centre which hospitalize TB patients. According to the World Health organization (WHO), DOTS is the only recognised strategy for effective control and treatment of tuberculosis. This strategy ensures that the TB patient are cured by using the standardized drug combination therapy.

#### **4.4 POPULATION**

The targeted population for this study were patients registered in the National TB register of the Outer West area of Durban Metro-Western Sub-district District institutions of KwaZulu-Natal and have been treated under the DOTS programme. The patients that were selected were those who had completed six months course of TB treatment when the study was carried out. For the purpose of the study of DOTS outpatients are those who receive their treatment from the clinics and supervised by their DOTS supporters at their convenient places either place of work, school, home etc. All inpatients are those admitted at Don McKenzie, TB Hospital and had their treatment whilst hospitalized, supervised by the nursing staff only.

The study population also included nursing personnel involved in the implementation of DOTS as well as DOTS supporters. Most of DOTS supporters are community health workers and traditional healers.

#### **4.5 SAMPLING AND SAMPLING METHODS**

The eclectic approach which utilizes a variety of sampling methods was used to select relevant participants from the different study population groups. The systematic, purposive, stratified and random sampling methods were used.

##### **4.5.1 Patients**

All patients diagnosed with TB are normally entered in the National TB register for statistics purposes, therefore systematic sampling was a suitable method for the study. All TB registers from institutions under study were combined because they did not have the same number of patients. From the top of the list of names in the register, every eighth patient's name was selected for sampling. A sample of 250 TB patients was obtained.

#### 4.5.2 DOTS supporters

A DOTS supporter is someone who supports the TB patient by actually observing that the pills are swallowed on a daily basis. For the purpose of this study, selection of DOTS supporters was done purposively to get those who were trained to be DOTS supporters by the Department of Health. In this District, DOTS supporters have an office at the Valley Trust where they meet every Monday. The register for all those trained and functioning in the community is kept by their manager.

In terms of systematic sampling method, DOTS supporters who participated in the study were picked from the register by selecting every fourth (4<sup>th</sup>) name out of 122 DOTS supporters. A sample of 30 was obtained. All those who were selected participated in the study.

#### 5.3.1 Nursing personnel from the clinics

A purposive stratified random sampling method was used to ensure that all categories of nursing were represented. The population was divided into strata according to nursing categories and a 50% sample of the study population was selected as indicated in table 4.1.

**Table 4.1 Description of sample of Nursing Personnel in the hospital**

Categories	PNS	E/NS	ENAs	Total
Total population	13	10	22	45
Sample size 50%	6	5	11	22

**Key** : P/Ns - Professional Nurses  
E/Ns - Enrolled Nurses

E/N/As - Enrolled Nursing Auxiliaries

#### 4.5.4 Nursing Personnel from the clinics

Nursing personnel from different clinics under which study was conducted were grouped together, separate from the hospital nursing personnel. The rationale behind this was that at the clinics very few nurses are involved in the DOTS programme. They are allocated in the TB departments for a long time or on permanent basis. Therefore the study was limited to them. It is only at the TB hospital that all nurses are involved in the DOTS programme and they act as DOTS supporters to patients.

**Table 4.2 : Description of sample of nursing personnel from clinics**

Category	PNs	E/Ns	ENAs	Total
Total population	5	6	10	21
Sample size 50%	2	3	5	10

**Key** : P/Ns - Professional Nurses  
E/Ns - Enrolled Nurses  
E/N/As - Enrolled Nursing Auxiliaries

#### 4.6 ETHICAL CONSIDERATIONS

Permission to conduct the study at Don McKenzie TB hospital was obtained from the Board of Management of the hospital. The proposal giving an outline of the study and the questionnaire accompanied the letter of request for permission (Annexure 2).

- Permission was also sought from the Medical Superintendent of the 3 clinics to conduct research in his institutions (Annexure 2).
- Permission was also obtained from the Manager of Health Department at the Valley Trust to use Community Health Workers in distribution of questionnaires and interviewing the respondents (patients) who were unable to fill in questionnaires themselves (Annexure 2).

#### **4.6.1 Informed consent**

Informed consent was obtained from the respondents after being informed about the details of the study in a way that was clear and understandable to them. A written consent to use patients records was obtained from the authorities of the health facility concerned (Annexure 2).

#### **4.6.2 Anonymity and confidentiality**

The respondents were informed not to write their names or names of their institutions anywhere in the questionnaire. They were also assured of complete confidentiality that, by so doing there will be no way of linking response to them or their institutions.

### **4.7 THE RESEARCH INSTRUMENTS**

Data was collected by means of records, questionnaires and structured interviews. The questionnaire consisted of closed and open-ended questions. This instrument was used in the study because it had the following advantages:-

- It is simple and relatively inexpensive to distribute.

- It is less time consuming and can obtain information from a large number of population.
- It safeguards those who prefer to express their views anonymously.
- Analysis and interpretation of data can be easily accomplished.
- Questionnaires are the most rapid and efficient method of gathering data and are more likely to achieve a high rate of response (Enarson, Kennedy, Miller and Bakke, 2001:30).

#### **4.7.1 Designing the questionnaire**

Three (3) different questionnaires were designed. The rationale for this was the different roles played by the TB patient, DOTS supporter and the nursing personnel in the implementation of the DOTS programme. Brief information about the study was provided with the questionnaire. Respondents were advised not to write their names to ensure anonymity and confidentiality (Annexure I)

##### **4.7.1.1 Type of questions**

The formulation of questions was guided by the objectives of the study and the available literature on tuberculosis and DOTS programme.

##### **4.7.1.2 Questionnaire for Nursing personnel**

This was divided into two (2) sections:

###### **Section A**

This section focused on demographic data related to gender, age in years, category in nursing and educational qualifications.

## **Section B**

This section focused on the nurses knowledge, experience and personal opinion on the DOTS programme.

### **4.7.1.3 Questionnaire for DOTS supporters**

The questionnaire for DOTS supporters was also divided into two (2) sections as follows:-

#### **Section A**

This section highlighted the personal particulars and the educational background of DOTS supporters.

#### **Section B**

This section was based on their knowledge and understanding of the DOTS programme they received during training as DOTS supporters and how they implement it.

### **4.7.1.3 Questionnaire for TB patients**

This was divided into two sections as follows:-

#### **Section A**

The aim of this section was to identify the age group, educational qualification residential area and the employment status of patients who had TB during the period of study and had completed the course.

## **Section B**

Patients were expected to demonstrate their knowledge of tuberculosis, its treatment and the role played by DOTS supporters in this programme. Their personal views on the effectiveness of this strategy was also asked.

### **4.8 PRETESTING OF QUESTIONNAIRES**

The pilot study is a smaller version of a proposed study conducted to develop and or refine the methodology such as the instrument or data collection process (Burns, Grove, 1999:40). The questionnaires with open and closed-ended questions were tested on sixteen (16) participants, that is 10 patients (5 were inpatients and 5 outpatients) ; 3 DOTS supporter and 3 nursing personnel. The three nursing personnel were experts in TB programme. They judged and confirmed the appropriateness of the contents of the instrument that it was closely related to tat which was to be measured. These participants were not part of the main study. The questionnaires were modified using the comments and expertise of the pilot group.

### **4.9 DISTRIBUTION OF THE QUESTIONNAIRE AND DATA COLLECTION**

The structured questionnaires for nursing personnel and DOTS supporters were handed over to them personally by the researcher. This method was preferred because the researcher was working in the same district.

The prevailing circumstances in different institutions determined how soon the questionnaires could be completed. Where questionnaires could not be completed the same day, they were left behind and respondents were given one week to complete them.

Questionnaires for TB patients were handed over to the community health workers. These community health workers, work as DOTS supporters in the areas where the respondents were residing. Most of these patients had their houses far apart and some were difficult to reach because this is a rural area. Permission for assistance by community health workers was obtained from their manager at the Valley Trust (Annexure 2).

The researcher had a meeting with community health workers to train them, and give them direction on how to interpret questions, record the answers and proceed through the questionnaires. An interview method, using the structured questionnaires was conducted by the community health workers for those patients who were illiterate. The community health workers felt that it would not cost them extra to collect data as they would collect the data during their daily visits to the areas of study. However the incentive of T-shirts inscribed "TB can be cured, use DOTS" were given to them as they returned the questionnaires. This method ensured a high return rate as all the questionnaires were filled-in and returned. The researcher was able to meet the deadlines on the data collection.

#### **4.10 DATA ANALYSIS**

Data was analysed manually by the researcher. Open-ended questions were analysed qualitatively using the narrative form of reporting and close-ended question were categorized and analysed quantitatively. Data was presented in tables and pie charts and then supported with narrative explanation.

#### **4.11 CONCLUSION**

This chapter dealt with research methodology. A descriptive survey was conducted. Institutions where respondents were selected, were purposively selected because of their involvement in DOTS programme. Questionnaires

with open and closed-ended questions were used as a method of collecting data. Data analysis and interpretations are presented in the next page.

## **CHAPTER 5**

### **DATA ANALYSIS AND INTERPRETATION OF FINDINGS: DOTS SUPPORTERS**

#### **5.1 INTRODUCTION**

In this chapter analysis of data and interpretation of findings from DOTS supporters is presented. Data is presented in the form of tables, and pie charts. Responses to open-ended questions are summarised and categorised into appropriate classification (Polit and Hungler 1991:513).

The sample size for DOTS supporters was 30 (N=30).

#### **5.2 SECTION 1 -PERSONAL PARTICULARS OF DOTS SUPPORTERS**

This section was included to determine the profile of DOTS supporters in order to establish the suitability to their function of supervising the TB treatment.

##### **Item I : Gender**

The purpose of including gender in this questionnaire was to establish how many females as compared to males who are willing to support the TB patients during the course of their treatment.

**Table 5.1 : Gender distribution**

**N=30**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Males	1	3,3
Females	29	96,7
Total	30	100

According to table 5.1 the majority of the respondents, 96.7% (29) were females. There was only 3.3% (1) male respondent. This represents a female to male ratio of 29:1. These findings show that females are more dedicated in the support of treatment of TB patients than males and this is inline with the perception of women as committed to caring and support for those in need and nursing being a predominantly female profession.

**Item 2 : Age Group**

Inclusion of this item was based on the assumption that being a DOTS supporter is a major responsibility which requires commitment and may not be entrusted to teenagers.

**Table 5.2 : Age Distribution**  
**N=30**

<b>Age group in years</b>	<b>Frequency</b>	<b>Percentage</b>
15-24	2	6,7
25-34	20	66,6
35-44	8	26,7
45-54	-	-
55 and above	-	-
<b>Total</b>	<b>30</b>	<b>100</b>

Table 5.2 indicates that the majority of DOTS supporters 66,6% (20) were between age group 25-34 followed by 26,7% (8) in the age group of 35-44. Very few 6,7% (2) respondents were in the 15-24 age group and none in the 45 and above age group. This finding demonstrates that the people who are responsible and committed in the functioning of the DOTS programme are those in the age groups 25-44. In the researcher's opinion, people in these age groups can be entrusted with this responsibility because they are highly productive and matured.

**Item 3 : Marital Status**

This item was included to determine which category of people are more involved in DOTS programme from the marital status point of view.

**Table 5.3 : Marital Status**  
**N=30**

<b>Marital status</b>	<b>Frequency</b>	<b>Percentage</b>
Married	10	33,3
Never married	19	63,4
Widow/widower	1	3,3
Divorced	-	-
Total	30	100

Table 5.3 shows that the majority of DOTS supporters are people who are not married 63,4% (19) followed by the married people 33,3% (10) and lastly 3.3% (1) widow/widower. There were none in the divorced category. This finding gives an impression that people who have more time to dedicate to TB support programme are the unmarried people. Married people usually have family commitments.

**Item 4 : Educational Qualification**

The level of education is important if one has to become a DOTS supporter because he/she has to possess reading and writing skills. DOTS support programme involves more than observing TB patient swallowing treatment. It includes educating TB patients and the community about TB as a disease and other opportunistic infections, motivating TB patients to take their medication, and writing down on the treatment card each time you watch the patient swallowing his medication.

**Table 5.4 : Educational Qualification**  
**N=30**

<b>Educational qualification</b>	<b>Frequency</b>	<b>Percentage</b>
Grade 1-4	-	-
Grade 5-8	5	16,7
Grade 9-11	10	33,8
Grade 12 and above	15	50
Total	30	100

Table 5.4 indicates that the majority of respondents, 50% (15) have grade 12 and above followed by 33,3% (10) grade 9-11. This finding shows that DOTS supporters have adequate education to enable them to work effectively in this role. Those who have grade 5-8, 16,7% (5) are literate enough to act as DOTS supporters with adequate supervision to ensure their understanding.

**Item 5 : Residential Area**

The Outer West area of the West Area of Durban Metro Western Subdistrict comprises a very broad area with rural, semi rural, suburbs, townships and informal settlements as described in chapter 2 of this report. Due to its size and geographical diversity, it is important to investigate the distribution of DOTS supporters since there is a tendency for health services to be concentrated in urban and peri-urban areas.

The Outer West area is divided into eleven (11) tribal areas. Each tribal area has wards. The number of wards differ according to the area.

Table 5.5 presents the Tribal Areas, wards in each tribal area, number of households in each ward, number of DOTS supporters in each area.

**Table 5.5 : Residential Areas in the Outer West Area of Durban Metro Western Sub-district**

<b>Tribal areas</b>	<b>Number of Wards</b>	<b>Number of Houses</b>	<b>Number of DOTS supporters</b>	<b>Number of TB patients on treatment</b>
Ntshongweni	10	1466	15	96
Shongweni Dam	8	864	8	351
Kwa Ximba	13	5713	40	247
Georgedale	10	5917	20	77
Mpumalanga Township	11	14507	54	407
Inchanga	13	2855	22	310
Wyebank	9	2889	13	114
Kwa Mkhizwana	6	528	8	98
Mophela / Sonkotshe	7	1365	9	102
Cliffdale	-	619	2	26
Bucksfarm	-	400	nil	19
<b>Total</b>	<b>87</b>	<b>3177</b>	<b>191</b>	<b>1847</b>

Table 5.5 indicates that 1847 tuberculosis patients are being looked after by 191 DOTS supporter, which means that on the average each DOTS supporter observe about 103 patients per day swallowing their treatment. This is a very big number of patients because the DOTS supporters in the Outer West Area are community health workers who are involved in many other patient care services in the community. TB treatment observation is not

the only job they do. They also do home based care and HIV/AIDS Counselling.

This means that the DOTS supporters do not have enough time to educate TB patients. If they do, it is impossible for them to observe all the patients everyday and be able to give them information they really deserve. They are being overworked because if they find the problem with patient number one, whilst visiting they have to spend time helping that patient before they proceed to the next patient.

It is noted with concern that in this table there is another place called Bucks farm where there are nineteen (19) TB patients on treatment with no DOTS supporter supervising their treatment. TB patients under no supervision by DOTS supporters are likely to default because nobody educates them about the importance of taking treatment everyday and what to do if they experience problems. Such patients discontinue treatment and only avail themselves at the clinic when they do not feel well. Some of these patients under no supervision, discontinue taking treatment when they feel well and do not bother to finish the course of treatment.

It is also noted that there are more DOTS supporters in Mpumalanga Township than in other areas and the number of TB patients in this township is larger than in rural areas. Wyebank is the only suburban area where DOTS supporters in the Outer West Area come from.

**Item 6 : Employment Status in DOTS Programme**

This item was aimed at determining whether DOTS supporters are employed to do DOTS programme or they are volunteers who receive no remuneration. In the researcher's experience DOTS supporters in the Outer West Area are divided into two, although they work together in observing TB patients

swallowing their medication. Firstly there are Community Health Workers (CHW) who are trained and employed by the Government to perform home based community health care duties including DOTS supervision. Secondly there are those who volunteered to do DOTS support to TB patients with no remuneration. Community health workers do DOTS support as part of their daily activities.

**Table 5.6 Employment Status in DOTS Programme**

**N=30**

<b>Employment status</b>	<b>Frequency</b>	<b>Percentage</b>
Employed as CHW	20	66,6%
DOTS volunteer	10	33,4%
Total	30	100

Table 6.6 demonstrates that the majority 66,6% (20) of the respondents are trained community health workers who perform DOTS support to TB patients as part their job description. They have other daily duties to perform in the community as well as meetings and workshops to attend. DOTS volunteers 33,4% (10) are those people who perform DOTS supervision only on voluntary basis.

In the researcher's experience, the number of DOTS supporters who are doing DOTS supervision on a voluntary basis is decreasing every day. The reason is that, these people volunteer to do DOTS with the hope that they will get full time employment in future like it happened before with the Community Health Workers.

In the Outer West area the Community Health Workers started volunteering all the duties they performed in the community under supervision of the Valley

Trust. After some years of volunteer service they started giving them some incentives, then wages. Few years ago the government under Department of Health started training them for home based care and employed them as Community Health Workers with full monthly salaries.

This working together of Community Health Workers and DOTS Volunteers raised hope to the DOTS volunteers that they will be employed in future. If this does not happen, the DOTS volunteer start looking for the paid jobs elsewhere and abandon the DOTS programme and the TB patients.

### **5.3 SECTION 2 : KNOWLEDGE AND EXPERIENCE OF DOTS SUPPORTERS ABOUT TB AND DOTS PROGRAMME**

This section was included to determine the knowledge of TB as a disease and the level of experience the DOTS supporters have about the DOTS programme and also to get their views about the effectiveness of the programme.

#### **Item 7 : Selection of DOTS supporters**

This item was included because of its importance in the DOTS programme. According to the South African Tuberculosis Control programme practical Guidelines for 1996, choosing a DOTS supporter with special qualities like caring, trustworthy, responsible dedicated and willing to give time to others is very important for the effectiveness of the DOTS programme. At the beginning of the treatment the nurse or a TB health worker and the patient discuss together the need for a DOTS supporter and choose together a suitable person to support the TB patient, as discussed in chapter 2.

**Table 5.7 : Selection of DOTS Supporters**

**N=30**

<b>How were you selected</b>	<b>Frequency</b>	<b>Percentage</b>
Allocated by clinic professional nurse	5	16
Allocated by Community Health Facilitator	25	83,3
Chosen by the TB patient and a nurse	nil	nil
<b>Total</b>	<b>30</b>	<b>100</b>

Table 5.7 indicates that the majority 83,3% (25) of the respondents were selected by the Community Health facilitator (a supervisor of Community Health Workers) to go and do DOTS support to TB patients. 16,7% (5) respondents were selected by the clinic professional nurse. None of the respondents were chosen by the patient together with a nurse or a TB Health worker. This is not in line with the South African Guidelines for control and treatment of Tuberculosis. When these DOTS supporters who have been allocated to go to patients' place of residences or their place of work to support their treatment without the patient's involvement in the discussion, they will find difficulty in acceptability by the patient will think the DOTS supporter is interfering with his treatment or privacy.

**Item 8 Number of TB patients supervised by Dots supporters**

The answers from this question varied from no patients at the moment to five patients per day. The stated reason of having no TB patient to be supported whereas there are more than enough TB patients in the area, could be due to their procedure for allocation of DOTS supporters to patients. In this district DOTS supporters supervise treatment of those patients who live in their

vicinity. It might happen that at the time of study the DOTS supporters, 13,3% (4) had no TB patients within their residential area although there were some to be supervised in their district. This non-allocation of patients could demotivate them as they have nothing to do at times and can make them look for the jobs elsewhere.

**Item 9 : DOTS training received by DOTS supporters**

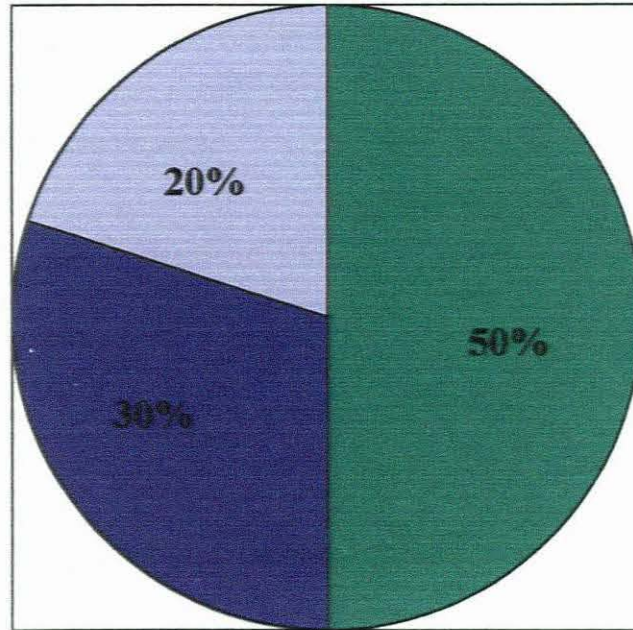
In May 1998, the KwaZulu Natal Department of Health TB control Programme published the training manual for DOTS supporters called "Tackling TB together" signed by the KwaZulu Natal Minister of Health, Dr. Zweli Mkhize. The learning outcomes of this training manual were to enable the TB treatment supporters to understand TB as a disease, be able to identify adults and children with TB, treat TB with DOTS, prevent TB by educating the community. The details of their training is discussed in Chapter 2 of Literature Review (Knight, 1997:1).

All the respondents, 100% (30) indicated that they did receive training to do DOTS programme.

**Item 10 : Duration of DOTS training period**

The purpose of including this item was to determine the period of training that the DOTS supporters spent to receive DOTS information.

**Figure 5.1 : Duration of DOTS training period**



**Key :** 1 = 50% -Two weeks  
2 = 30% - One week  
3 = 20% - One day

According to figure 5.1 the period of training offered to DOTS supporters was not uniform. This raises a question whether the information that they received was the same. As indicated by this finding DOTS supporters who were trained for two weeks were 50% (15) in the sample, those who trained for one week were 30% (9) and 20% (6) of the respondents were trained for one day. According to researcher's experience in the nursing profession there is no training of DOTS programme that can be provided for one day only, especially for people who are not medical or nursing professionals. These 20% (6) Dots supporters lack knowledge about DOTS and this will render the programme ineffective.

**Item 11 : Topics covered during DOTS training**

The inclusion of this item was to determine if the DOTS supporters are knowledgeable enough about the disease they are treating. The training manual for DOTS supporters had 9 chapters and 70 pages of information about TB as a disease and how to administer DOTS as discussed in details in chapter 2, page of Literature Review.

**Table 5.8 : Topics covered during DOTS training compared to training period**

Topic covered during Training Course on DOTS	Number of DOTS supporters	Duration of training	
		Percentage	Number of days
TB as disease including prevention and treatment plus DOTS programme	19	63.4	10
	7	23.3	5
DOTS only	4	13.3	1
Total	30	100	16

According to table 5.8 the analysis shows that 63,4% (19) respondents who were trained on TB as a disease including prevention and treatment as well as trained on DOTS support, were trained for a period of 10 days. This showed that these respondents had enough knowledge of the programme and the disease they are treating because, the training manual had a lot of information to be covered, 23,3% (7) of the respondents indicated that they

received training for 5 days. It is questionable whether these DOTS supporters are knowledgeable enough to function effectively in the programme if the other group of supporters, doing the same job as theirs, trained in twice the number of days they were trained. There must be something that was left out during their training.

13,3% (4) of the respondents reported that they had only one day training. These respondents also indicated that they were trained only on DOTS. Based on this information, there are DOTS supporters who have no knowledge about the disease they are treating but they administer the treatment to the patient.

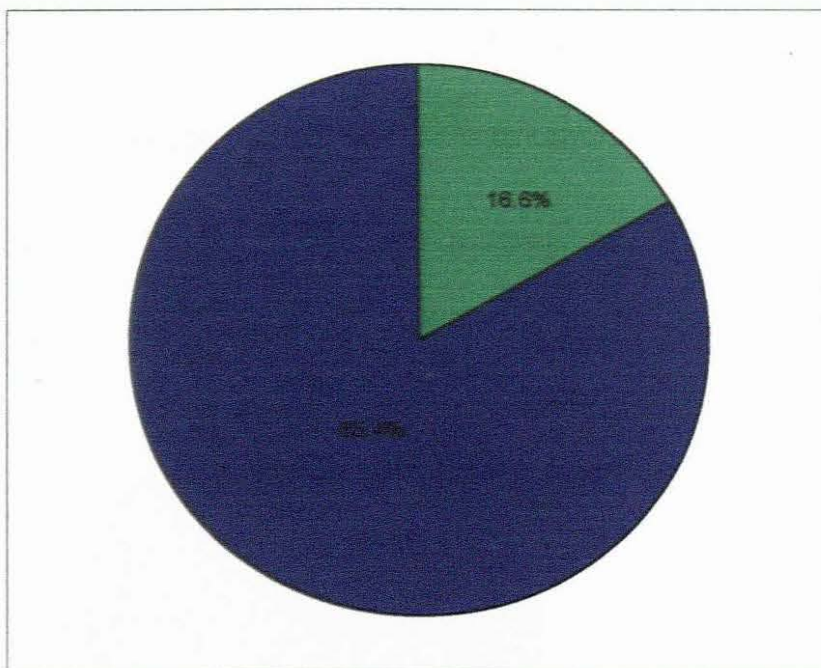
In the researcher's experience, having little or no knowledge about the disease you are treating is dangerous, as the medication/tablets have side effects which could be the reason for non-compliance. These DOTS supporters have no medical or nursing background, therefore it is impossible that they can acquire knowledge about DOTS programme in one day. They won't be able to help the patient who suffers from side effects of medication and or be able to answer questions from the patient about the disease that is being treated.

Side effects of anti-TB drugs are discussed in details in chapter 2 of Literature Review. There are minor side effects which are most likely to occur in the first months of taking treatment. These common side effect include gastro intestinal discomfort, mild skin reactions, joint pains, flu-like symptoms. It is important that the DOTS supporter reassures the patient who complains about these side effects, that they are temporary and they will disappear as the patient continues taking treatment. DOTS supporter must be able to discuss the importance of tolerating side effects.

**Item 12 : Update of information about DOTS programme received by Dots supporters**

The inclusion of this item was to establish how DOTS supporters keep themselves up to date with DOTS programme. There are on-going development in Chemotherapy and improvements in the strategy for control of tuberculosis. Media reports on new information on these developments, therefore if DOTS supporters do not keep themselves abreast with new information they will be left behind and DOTS will be perceived as ineffective.

**Figure 5.2**



**Key :** 1 = 83,4%- No formal update on DOTS information

2 = 16,6% - Formally updated on DOTS programme

Figure 5.2 indicates that out of the 30 respondents in the sample, the majority 83,4% (25) indicated that they last received formal update of information on DOTS programme, when they were trained. The majority of DOTS

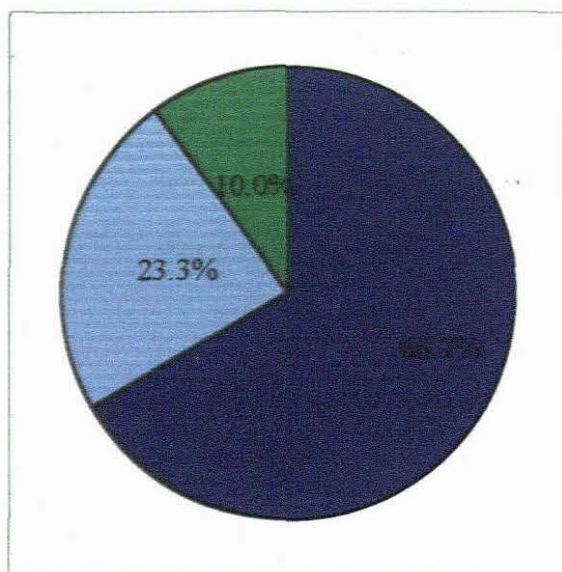
supporters therefore had no formal update on DOTS information. They also mentioned that they keep themselves abreast with information about DOTS through the media, that is listening to the radio, watching television and our Health days celebrations like World TB day that takes place every year on the 24<sup>th</sup> of March. The 16,6% (5) of the respondents mentioned that they do receive update of information about DOTS programme.

**Item 13 : Distance travelled by patients to DOTS supporters**

All respondents 100% (30) stated that none of their patients come to them to swallow their TB treatment. TB patients are visited at their residences or places of work by the DOTS supporters to supervise them swallowing treatment.

**Item 14 : Distance travelled by dots supporters**

**Figure 5.3 : Distance traveled by Dots supporters**



**Key : 1= 66,7% - Very long distance (5 kilometers)**

2= 23,3% - Long distance (2 kilometers)

3= 10% - Short distance (Less than 2 kilometers)

Figure 5.3 indicates that the majority of the respondents 66,7% (20) travel a very long distance which is about 5 kilometers when visiting each patient. 23,3% of the respondents travel long distances of about 2 kilometers per patient. These very long and long distances could be due to the size and geographical diversity of the study area. Another reason could be the fact that most of the houses being visited are in the remote rural area and far apart.

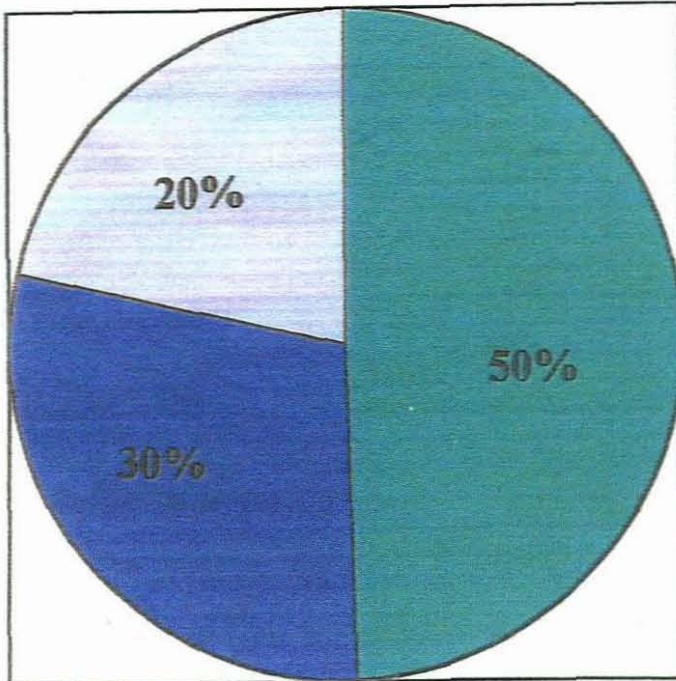
These findings could render the DOTS programme to be ineffective because of the long distances walked by DOTS supporters and they will not be able to visit all their TB patients every day as expected.

**Item 15 : DOTS supporters frequency of visits to TB patients**

The inclusion of this item was to establish whether DOTS supporters function according to the National Tuberculosis Control Programme Guidelines, 2000. These guidelines state that DOTS is a strategy whereby DOTS supporter observes a TB patient swallowing his medication everyday.

**Figure 5.4 : DOTS supporter's frequency of visits to TB patients**

**Figure 5.4 : DOTS supporter's frequency of visits to TB patients**



**Key :** 1= 50% - Daily visits  
2= 30% - Once a week  
3= 20% - Twice a week visit

Figure 5.4 shows that 50% (15) of the respondents visit their patients to see them swallowing treatment everyday. This is what is expected of them to render the DOTS programme effectively. 30% (9) of the respondents visit patients once a week and 20% (6) respondents visit patients twice a week. This could be due to long distances which are difficult to travel on a daily basis, aggravated by the fact that residences are far apart in the rural areas. Based on these findings, it is noted that the respondents who visit TB patients once a week and those who visit them twice a week are not doing direct observation of treatment, they are doing outpatient treatment because they rely on the patient to take his/her medications under no supervision. For TB

patients, it is crucial that they are supervised everyday when swallowing treatment because these tablets have side effects of which some of the patients stop taking medication if they experience side effects. This will cause non-compliance with the treatment and render DOTS programme none effective because patients will develop multi-drug resistance TB.

**Item 16 : Collection of TB medication from the clinic**

This item was included for the purpose of establishing who collects TB medication from the clinic.

All respondents 100% (30) indicated that the collection of TB medication from the clinic is the patient's responsibility and they respect it. These findings give an assurance that patient and the nurse take action to overcome the patients self care limitations. When the patient presents himself at the clinic to collect medication, it is not a matter of taking TB treatment and go, but a supportive-educative programme designed to assist the patient by guiding, supporting, teaching the patient about DOTS is used. At the clinic the nurse would also guide the patient on diet, personal hygiene and provision of an environment that is conducive to their well being. They are also checked for signs of improvement by weighing them and nurses listen to their concerns and try and help them to solve their problems.

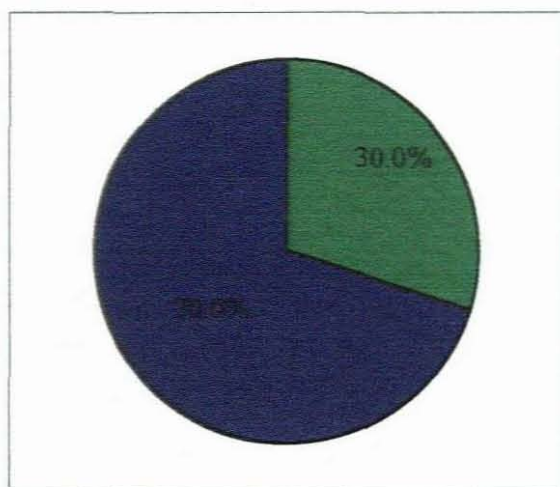
**Item 17 : Record keeping of patients under DOTS programme by DOTS supporters**

According to the National TB Control Programme Guidelines 2000, a reliable recording and reporting system is necessary to monitor the progress of DOTS programme and of patients. Good record keeping gives an accurate measurement of performance and these records can be used to identify areas that need support.

Seven different of records and report forms are used routinely to indicate whether patient oriented activities such as case finding, diagnosis and treatment are being performed. Of these seven records, only two are used by DOTS supporters when supervising the patient. There is a pocket-sized treatment card (GW 20/15) as indicated in annexure 1. This card is kept by the patient for presentation during visits of DOTS supporters or at the clinic when they go to collect their treatment. supporters sign the green card everyday when they have witnessed the patient swallowing his treatment.

The second record used by the DOTS supporters is a transfer form (GW 20/14) presented in annexure 2. This form is used by DOTS supporters to trace the TB patient after being diagnosed by the clinic or the hospital. When the patient has been located the form is sent back to the clinic with the report that the patient has been found and treatment started. This method of using the pink form to trace the patient ensures that there is continuity of care of the TB patient.

**Figure 5.5 : Record keeping of DOTS under Dots supervision**



**Key :**

1 = 70% - Do not keep records

2 = 30% - Keep records

According to figure 5.5 there is a severe lack of accurate record keeping from DOTS supporters. Out of 30 respondents in the sample, only 30% (9) DOTS supporters keep records of patients for whom they supervise treatment. This lack of record keeping by DOTS supporters may result in misinformation or inadequate information being recorded in the National TB register of the Department of Health. The outcome of treatment for those patient under DOTS programme in the community will not be recorded, thus not known to the Department of Health authorities. The maintenance of records plays an important role in reporting TB control to the National Government. It also acts as a means of monitoring progress of patients throughout their course of treatment and as a means of internal evaluation of the programme.

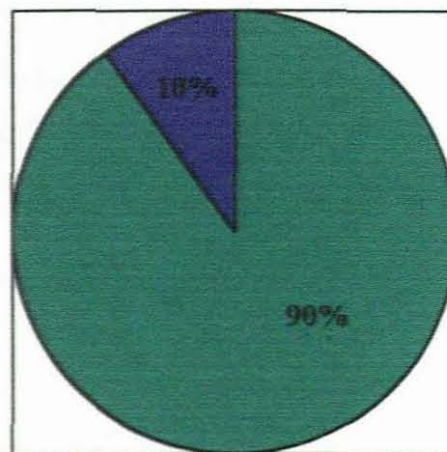
DOTS supporters rely on the paperwork from the clinics to trace their patients, (that is the pink transfer form). Keeping papers like those pink forms

indefinitely is unrealistic, while maintaining log books is ideal because they keep it forever and refer to it when there is a need.

**Item 18 : Supervision of the work done by DOTS supporters**

The inclusion of this item was to establish whether the work done by DOTS supporters is supervised or not, and by whom. DOTS supporters differ in their educational background and undergo different training periods as DOTS supporters. Therefore they need a person who will supervise the job they are doing, who has a high level of knowledge on the DOTS programme. Responses to this item are presented in figure 5.6.

**Figure 5.6 : Supervisor on the work done by DOTS supporters**



**Key :** 1 = 90% - Supervised by Community Health facilitator  
2 = 10% - Supervised by professional Nurse

Figure 5.6 indicates that 90% (27) of the respondents are supervised by the Community Health facilitators and 10% (3) of the respondents are supervised by a professional nurse. The effectiveness of the supervision done by the

Community Health facilitators is questionable because their qualifications to the job they are doing vary considerably. According to the researcher's knowledge, there are only two facilitators who have a nursing background and they belong to the enrolled nurse category. The rest of the facilitators have no nursing or medical background. They were community health workers before and because they were literate they were appointed to be facilitators. Each of them was given a group of community health workers and DOTS volunteers to supervise according to their residential areas.

**Item 19 : Problems encountered in drug supply**

One of the five key elements of a national TB programme is to ensure that there is a reliable, uninterrupted supply of anti TB drugs available to all so as to conquer this TB epidemic. All the respondents 100% (30) mentioned that they experience no problem in getting the supply of TB drug. This finding will help the running of DOTS programme in this area to be effective because the TB drugs are always freely available when needed. This uninterrupted supply of drugs will help prevent the problem of multi drug resistant TB which is more difficult and expensive to cure. The problems encountered are presented in table 5.8.

Item 20 : Problems encountered by DOTS supporter when visiting TB patients in their homes

Table 5.9 : Dots problems as reported by DOTS supporters

Difficulties in the running of DOTS programme reported by Dots supporters		
N = 30	Frequency	Percentage
Seen as intruders in the patients home environment – lack of introduction by nurses	7	23
Not known by the community as DOTS supporters therefore not welcome.	5	16.6%
Lack of understanding of DOTS programme by the patients and the community at large.	11	36.6%
Lack of knowledge about TB as a disease separate from being HIV positive and AIDS.	19	63.3%
Patients with dual infection TB/HIV positive have a feeling of insecurity about their status being known to others.	6	20%
Poor living conditions where many people are living in one overcrowded house or room without fresh air.	10	33.3%
Poor social conditions where patients are not working and have no food to eat therefore refuse to take tablets.	21	70%

Food parcels from the clinics are available for the selected few and they are also consumed by other members of the household.	23	76.6%
Alcoholism and drug abuse to young adults.	17	56.6%
Lack of proper addresses on the follow-up form that is used to trace the patient.	9	30%
Patients change their location without notifying DOTS supporters.	5	16.6%
Long distance walked by DOTS supporters to patients' homes.	22	73.3%
Decrease in the number of DOTS supporters who work on voluntary basis as they get employment elsewhere.	24	80%
Increase workload for DOTS supporters who are community health workers as they have other jobs to do daily.	14	46.6%
Patients insist on being admitted to TB hospitals as a better solution to their social problems.	15	50%
Area to be serviced by DOTS supporters is rural and expansive.	9	30%

People are not taking responsibility for their health, they say government must look after them as they voted.	17	56.6%
Due to high role of unemployment people are engaged in casual employment, at times they stay at the place of work or nearby place of work.	9	30%

(Respondents could give more than one response)

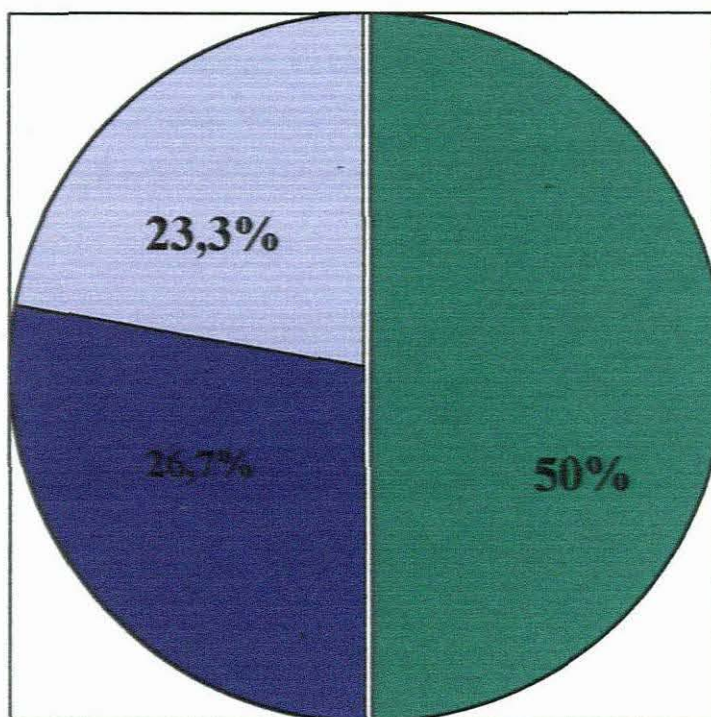
According to table 5.8 the highest percentage of respondents 80% (124) expressed concern about the decrease in the number of DOTS supporter who do voluntary work. This dropping out of DOTS supporters as they get paying jobs elsewhere will jeopardise the continuity of the DOTS programme because every-time there is a TB patient to be supervised, a new DOTS supporter has to be found and trained to do the job. TB patients will have several new faces before completing the course of treatment. This will result in non compliance with TB treatment.

**Item 21 : Establishing whether DOTS supporters are aware of side effects of anti TB drugs**

The inclusion of this item was to establish whether the DOTS supporters are aware of the side effects caused by the anti TB drugs. They should also be able to help and advise the patients when experiencing side effects of TB drugs. Minor side effects are common when taking anti-TB drugs, for example when taking Rifampicin, urine, stool and semen could change to pink – orange. Patients should be warned that this side effect, may last up to 2 months after treatment is stopped. They must be encouraged to continue with the treatment (Department of Health, 1998:50).

For the serious side effects, like visual disturbance, stop treatment immediately and patients should be warn to notice and report any failing eyesight. The clinic where a patient collects medication should be contacted immediately. Side effects of anti-TB drugs are discussed in details in Chapter 2 of the literature review.

**Figure 5.7 : Knowledge of side effects of anti-TB drugs by DOTS supporters**



**Key :**

- 1 = 50% - Mentioned both serious and common side effects
- 2 = 26,7% - Knew only common side effects
- 3 = 23,3% - Lack of knowledge of side effects

Responses indicate that not all dots supporters are aware of the side effects caused by anti TB drugs as it was only by 50% (15) of the respondents who mentioned both common and serious side effects. Of the 30 respondents, 26,7% (8) were aware of the common side effects but nothing mentioned about the serious side effects which can be more damaging to the patient. This finding indicates that these DOTS supporters will keep on reassuring the patient, asking the patient to continue with medication even if it's a serious side effect. This can be more dangerous as some of these drugs can cause permanent damage to the patient's body parts e.g. ethambutol tablet can cause permanent eye blindness, if neglected. Another 23,3% (7) respondents confused the common things to be noted when taking anti-TB drugs with the side effects. This finding shows that this group of respondents did not know the side effects of anti TB drugs and this could be dangerous to the patients life.

**Item 22 : Management of side effects by DOTS supporters**

Inclusion of this item was to find out if the DOTS supporters knew what to do if the patient complains about side effects. In the researcher's knowledge and experience, the TB patients should be warned before starting anti TB drugs that he/she might experience side effects of these drugs. Common and serious side effects should be mentioned and what to do if these sides effects are experienced as mentioned in chapter 2 of literature review.

The majority 60% of the respondents reported that, if the patient complain of side effects they are the patient to go and report at the clinic on the day they collect their treatment supply. This is very dangerous because some of the side effects need to be reported immediately at the clinic. Only 40% of the respondents indicated that they knew what to do when patients present with side effects.

**Item 23 : Opinions of DOTS supporters on the effectiveness of the programme**

The importance of including this item was to get the opinions of the DOTS supporters whether they view the programme they are involved in as effective or not. This will serve as a recommendation to the policy makers to improve the programme from the bottom up approaches point of view.

The majority, 73,3% (22) of the respondents perceived DOTS programme as ineffective because of the problems they encountered when visiting patients of home (as indicated in table 5.8 of this report), as well as large number of patients recorded with TB but very few discharged cured as indicated in the Health Facilities report. The minority 26,7% (8) respondents perceived it as effective. These perceptions should be taken seriously by the policy makers because they are expressed by the people on the ground who are practically involved in the implementation of the programme. The health authorities must try and remedy the problems encountered by these DOTS supporters which make them view the programme as ineffective.

**Item 24 : DOTS supporters' recommendations about improving treatment compliance**

Directly Observed Treatment Short Course is a strategy that has been proven to be a powerful solution for TB epidemics by the World Health Organization. For this strategy to be effective, a TB patient needs to be observed by a treatment supporter everyday, when swallowing treatment for at least six months. If patients stop taking their treatment before the end of the course, just because they no longer feel sick, they are susceptible to multi drug resistant TB which is difficult and expensive to cure, therefore compliance with the treatment is the key element to effective DOTS

programme. The respondents were asked to recommend how compliance with TB treatment can be improved.

**Table 5.10 : DOTS supporters recommendations about treatment compliance**

<b>Recommendations about treatment compliance</b>	<b>Frequency</b>	<b>Percentage</b>
Jobs for people to have money to buy food and other needs.	17	56.6%
Improve home environment conditions to avoid overcrowding. Low cost housing must be provided.	15	50%
Incentives to patients who completed the course of treatment without difficulties.	24	80%
Government to employ those who volunteer to do jobs and pay them salaries.	27	90%
Increase the number of DOTS supporters.	22	73.3%
Provide transport for DOTS supporters who live far from their patients.	19	63.3%
Provide soup and bread for patients who are on DOTS.	9	30%
Increase the amount of food parcels given to TB patients.	16	53.3%
Educate patients more about TB by sending nurses to schools, churches and community halls to do the awareness.	12	40%
Clinic staff to introduce DOTS supporters to patients and families rather than DOTS supporters introducing themselves..	7	23.3%

Educate patients not to take alcohol when on TB treatment and to give up drugs.	5	16.6%
Admit TB patients to TB hospitals until they finish treatment as was done before.	11	36.6%

Table 5.10 represents DOTS' supporters recommendations that can help improve compliance with TB treatment. The majority 90% of the respondents recommended that the Government i.e. Department of Health should employ those who volunteer DOTS programme and that they must be paid salaries. This is in line with the perceptions about the weakness of the DOTS programme made by DOTS supporters, that the DOTS volunteers abandon the DOTS programme if they get paying jobs.

#### **5.4 CONCLUSION**

In this chapter, analysis of data and interpretation of findings from DOTS supporters was done. Their knowledge and experience of tuberculosis and its treatment demonstrated gaps that would interfere with the effectiveness of DOTS programme. Their recommendations about improving treatment compliance by the TB patients was gathered for the purpose of helping patients comply with TB treatment.

## CHAPTER 6

### DATA ANALYSIS AND INTERPRETATION OF FINDINGS: TB PATIENTS

#### 6.1 INTRODUCTION

In this chapter analysis of data and interpretation of findings from tuberculosis patients is presented. Data is presented in the form of tables and pie-charts. Responses to open-ended questions are summarised and categorised into relevant themes (Polit and Hungler 1991:513).

#### 6.2 SECTION 1 : PERSONAL PARTICULARS OF TB PATIENTS

##### Item 1 : Gender

The inclusion of this item was for the purpose of identifying the gender of people mostly affected by tuberculosis.

**Table 6.1 : Gender distribution**

**N = 250**

Gender	Frequency	Percentage
Female	88	35,20
Male	162	64,80
Total	250	100

Table 6.1 indicates that the majority 64,80% (162) of the respondents were male patients. This finding gives an impression that TB affects more males

than females. It is supported by the fact that in the area under study a TB hospital (Don McKenzie TB Centre) has 140 male TB beds and only 40 for females.

**Item 2 : Age groups of respondents**

This item was included with the assumption that people from age 15 are matured enough to give a verbal or written information about their feelings for DOTS programme and what their observations are as far as the programme is concerned.

**Table 6.1 : Age distribution**

**N = 250**

Age group in years	Frequency	Percentage
15-24	84	33,60
25-34	74	29,60
35-44	56	22,40
45-54	28	11,20
55 – above	8	3,20
Total	250	100

These findings demonstrate that the highest incidence of TB, 63,2% (159) was among the 15-34 age groups. The findings are in line with the fact that these are the age groups most affected by HIV and AIDS which is a close partner of tuberculosis. In item 2 chapter 5, it was found that the highest percentage of DOTS supporters were in the 25 – 34 age group. This could be a positive factor as it suggests peer group supervision for the predominantly young group of patients in the 15-34 age group, as reflected in table 6.2.

This age group is also a reproductive group, some of them are still at school and some are planning to have families. In this case precautionary measures should be taken by those who are on contraceptives because Rifampicin tablet reduces the efficacy of oral contraceptives. TB patients on oral contraceptives should be advised to take injectable contraceptives or insertion of Intra uterine contraceptive device (IUCD).

**Item 3 : Educational qualifications**

The item was included to determine literacy levels of the respondents, since reading and writing skills are considered important to facilitate the understanding of the treatment regimen. Some of the respondents were still at school.

**Table 6.3 : Educational qualifications**

**N = 250**

<b>Educational qualification</b>	<b>Frequency</b>	<b>Percentage</b>
No formal education	15	6
Grade 1-4	29	11,6
Grade 5-8	44	17,6
Grade 9-11	102	40,8
Grade 12 and above	60	24
Total	250	100

Table 6.3 demonstrates that the majority 40,8% (102) of the respondents were people with a grade 9-11 educational qualification followed by 24% (60) of grade 12 and above. Grade 5-8 respondents were 17,6% (44), Grade 1-4 were 11,6 (29) and those with no formal education were 6% (15). Since

some of the respondents with TB were still at school, the assumption is that they may spread infection at school by infecting each other because TB is rife where people get together, like in schools. It further indicates that the majority of the respondents can read and write.

**Item 4 : Residential area**

The inclusion of this item was to identify the areas mostly affected by tuberculosis in the Outer West Area of Durban Metro Western Subdistrict with the aim of giving the health authorities information so that urgent attention is given to these places. The respondents were asked to name the areas where they live. These areas were grouped according to the wards, as defined by the local authority.

**Table 6.4 : Residential area**

**N = 250**

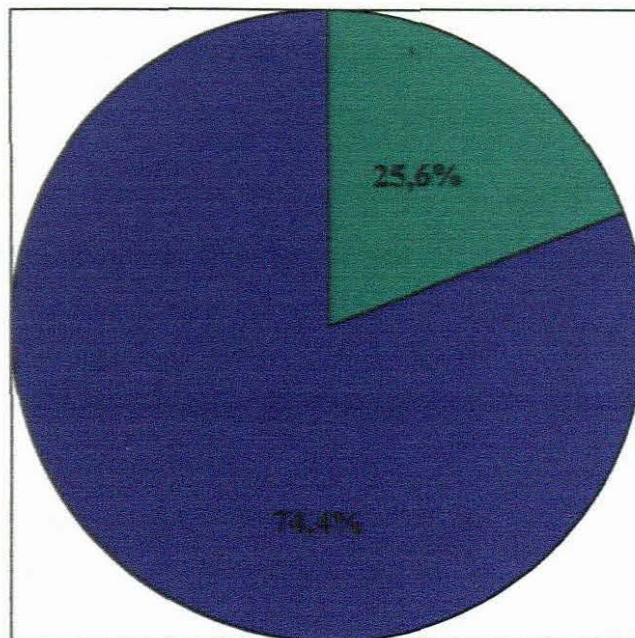
Area	Frequency	Percentage
Ntshongweni	15	6
Shongweni Dam	73	29,2
Cliffdale	14	5,6
Bucks farm	2	0,8
KwaXimba	17	6,8
Georgedale	24	9,6
Mpumalanga Township	19	7,6
Inchanga	20	8,0
Wyebank	18	7,2
Mkhizwane	21	8,4
Maphelo/Sankontshe	27	10,8
Total	250	100

According to Table 6.4, Shongweni Dam area has got the highest number 29,2% (73) of TB patients. This is the most affected area in the Outer West Health area. In the researchers knowledge this area has no clinic and is served only by the mobile clinic that comes only once a week (Mondays only) from Bothas Hill Health Centre. In the other areas, prevalence ranged between 0,8%(2) and 10,8% (27).

**Item 5 : Employment Status of the patient**

There is a perception that tuberculosis is a disease that mostly affects people who are poor as a result of unemployment Literature emphasises that unemployment is one of the contributory causes of people developing and spreading tuberculosis, as indicated in Chapter 2. The type of occupation, for example people who work in the dusty areas like in the mining industry, construction industry, are susceptible to tuberculosis. Most of these people live in over-crowded conditions after work e.g. hostels .

**Figure 6.1 : Employment status**



**Key :**        1 = 25,6% - Employed  
                  2 = 74,4% - Unemployed

Figure 6.1 clearly demonstrates the high level of unemployment since the majority, 74,4% (186) of the respondents were unemployed. Only 25,6% (64) were employed in different industries. This is in line with the literature that says poverty and unemployment are factors that are related to high incidence of TB.

## **SECTION B.**

### **6.3 KNOWLEDGE AND EXPERIENCE OF DOTS PROGRAMME**

This section was included with the aim of finding out how much knowledge do patients have about TB and its treatment. It is the duty of a nurse to empower patients with knowledge because if the patient understands the disease and its treatment, this information will be passed on to the community and as a result, other people will be encouraged to come forward for diagnosis and treatment. The patient will gain insight and take an active part in the treatment and cure programme.

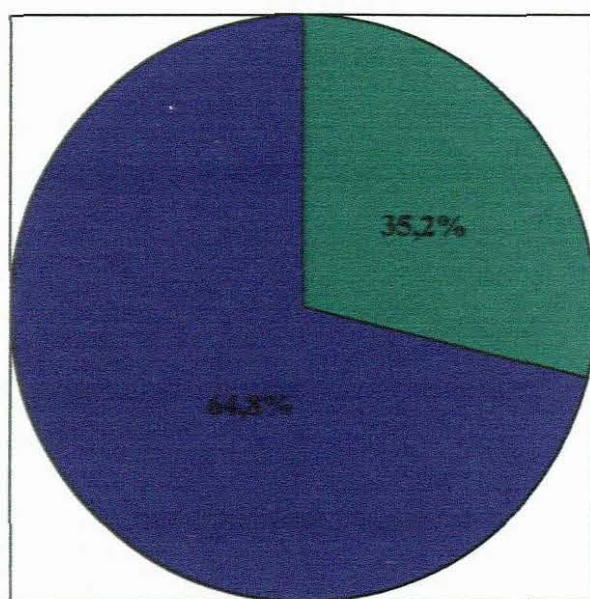
#### **Item 6        :        Diagnostic method**

The inclusion of this item was considered very important. The National Practical Guidelines for Diagnosis and Treatment of TB in South Africa 1996, emphasise that the bacteriological method of diagnosing TB on direct microscopy must be the only method used to identify infectious patients prior to commencement of their treatment.

Chest X Ray methods are considered to be expensive. It is recommended that they are used as a clinical aid in TB suspects who cannot produce

sputum specimen. The results of X-rays must be interpreted in the light of the patient's history and clinical findings. The literature emphasises that they must not be used as the basis for diagnosis of TB because they may show lung fibrosis or destruction due to old TB. This may lead to over-diagnosis of pulmonary tuberculosis.

**Figure 6.2 : Method of diagnosis of TB**



**Key :** 1 = 64,8% - diagnosed on chest X-Ray  
2 = 35,2% - diagnosed bacteriologically on sputum smear

According to figure 6.2 the majority of the respondents 64,8% (162) indicated that their TB was diagnosed on Chest X-Ray. This practice is against the recommendations of WHO and of the National Practical Guidelines for Diagnosis and treatment of TB in South Africa. Only 35,2% (88) of the respondents were diagnosed by sputum smear bacteriologically.

The findings indicate that some of the health providers do not comply with the National guidelines for treatment and control of TB. Some of the provincial hospitals do not diagnose patients on sputum because they find Chest X-Rays convenient to them. Many of the TB patients diagnosed by private doctors are diagnosed on X-Rays. The respondents, when asked if they knew the reasons for being diagnosed on chest X-Rays, they mentioned the following reasons:-

- Dry cough, unable to produce sputum.
- They prefer to consult private doctors because they have short queues as compared to clinics.
- They do not have to wait for a long time before they are attended to.

**Item 7 : In patient or out-patient**

This item was included to determine whether the patient was admitted in hospital during his treatment or was treated as an out-patient on DOTS. According to the National Guidelines of treating TB, not all patients diagnosed with TB must be admitted in hospital. TB patients must be treated at home or in the workplace under DOTS programme. There is a criteria for admission of TB patients which the hospitals must comply with.

**Table 6.5 : Status as TB patient**

**N = 250**

Status as a TB patient	Frequency	Percentage
In patients	76	30,4
Out patient	174	69,6
Total	250	100

The majority of the respondents 69,6% (174) indicated that they were treated as outpatients, collecting treatment from different points. This is in line with the National Guidelines for diagnosis and treatment of TB which emphasises that TB patients must be treated as outpatients on DOTS programme.

The minority of the respondents, 30,4% (76) indicated that they were treated as inpatients.

**Item 8 : Reasons given for admission**

Those who were treated as inpatients indicated the following reasons for admission:-

- Too ill to go to clinic and collect medication everyday.
- No one at home to look after the patient and administer treatment.
- No DOTS supporters nearby.
- Unemployed therefore no food to eat after taking treatment.
- Patient was a re-admission, had to be injected by nurses everyday.
- Clinic too far from home.
- Retreatment after previous cure.

The reasons for admission to hospital given by the respondents were in line with the admission criteria stated by the guidelines for treatment of tuberculosis which emphasises that only those patients with specific needs must be admitted to hospital. These specific needs are stated as:-

- Patients too ill for outpatient treatment.
- Patients with MDR TB.
- Social reasons with proven sputum positive.
- Where clinical or community support cannot be achieved.
- Small children admitted with their mothers.
- TB Control Programme in KwaZulu-Natal (September 1996).

**Item 9 : Frequency of collection treatment**

The rationale for inclusion of this item was the assumption that patients on Dots programme should present themselves to the clinic at least once a month so that they are observed for signs of improvement. This is done by assessment of clinical appearance and body weight. It is done by the doctor or nursing staff. The improvement in the body weight will facilitate the review of treatment as it is given according to body weight.

**Item 6.6 : Collection of treatment from clinic**

**N = 250**

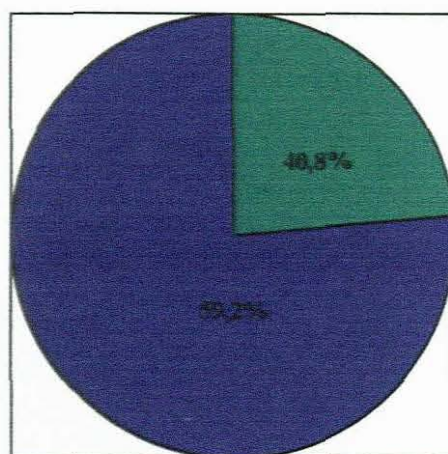
<b>How often</b>	<b>Frequency</b>	<b>Percentage</b>
0 – once a week	8	3,20
Twice a week	56	22,40
Once a month	158	63,20
Once in two months	28	11,20
Total	250	100

Table 7.6 indicates that there are different times set by different clinics to collect treatment. As shown in this table, patients were collecting treatment once a week, once in two weeks and once a month. This indicates that at least once a month a patient was seen by the nursing staff of the clinic and observed for signs of improvement followed by possible changes in the treatment where necessary. This means that the treatment outcome of TB patients was recorded and reported by the clinics to be able to complete their quarterly reports reflecting cure rates, as needed by the Department of Health.

**Item 10 : Supervision of TB treatment**

The National Guidelines for treatment and control of tuberculosis recommended that every TB patient should have the support of another person to ensure that they swallow their medication daily. The guidelines further state that, the most important determinant of whether or not the patient will complete treatment is the relationship between the person providing the care/support and the person suffering from the disease.

**Figure 6.3 : Availability of DOTS supporter**



**Key :**

1 = 40,8% - Patients had DOTS supporter

2 = 59,2% - Patients did not have DOTS supporters

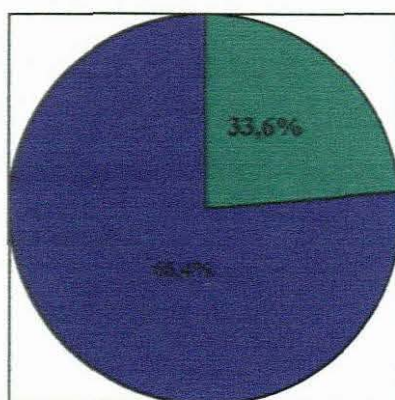
Figure 6.3 indicates that 40,8% (102) of the respondents had DOTS supporters and 59,2% (148) did not have DOTS supporters. This is contrary to the Department of Health guidelines for treatment of tuberculosis as these patients who did not have DOTS supporters are not known whether they were taking treatment everyday according to the prescription.

**Item 11 : The choice of DOTS supporter**

This item was included to determine whether DOTS supporters are of patients' choice or are imposed on them by the institutions. The National Guidelines emphasise the importance of choice the DOTS supporter by the patient together with the health worker. They should discuss the need for a suitable, reliable, responsible person who will be trusted by the patient. This will contribute to the effectiveness of the DOTS programme.

**Figure 6.4 : Choosing the DOTS supporter**

**N = 250**



**Key :** 1 = 33,6% - DOTS supporter chosen by the patient.

2 = 66,4% - DOTS supporter chosen by nursing staff.

Figure 6.4 indicates that the majority, 66,4% (166) of treatment supporters were allocated by the nursing staff to go and supervise TB treatment. This is detrimental to the effectiveness of the DOTS programme. A strange DOTS supporter who was imposed on a patient will not be acceptable to the patient

or the patients family. 33,6% mentioned that DOTS supporters who supervised them were their own choice.

If the patient has no one to act as DOTS supporter, there are community health workers in the neighbourhood who do DOTS support as part of their job. It is essential that a nurse has a meeting with the patient and the community health worker to build a strong relationship in which a patient believes and trusts the advice given by the community health worker as treatment supporter.

**Item 12 : Period of time the treatment was taken**

There is a specific period that a patient has to take treatment even when feeling well. For TB treatment to be effective, it is crucial that the current treatment is given for a period of six months. Within this six months period there are two phases. The first phase or initial phase is the first two months of treatment and the continuation phase is the last months of treatment.

**Table 6.7 : Period the treatment was taken**

**N = 250**

<b>Period the treatment was taken</b>	<b>Frequency</b>	<b>Percentage</b>
0-1 month	27	10,8
1-2 months	49	19,6
2-3 months	41	16,4
3-4 months	17	6,8
4-5 months	12	4,8
5-6 months	104	41,6
Total	250	100

Responses presented in table 7.7 varied from two months to six months. Based on these findings, it is evident that some of the TB patients did not finish the course of treatment. This behaviour of treatment interruption could lead to multiple-drug resistant TB, which means that TB drugs will have less or no effect against the TB bacilli found in patients' sputum, therefore a patient will spread the bacilli in the community. This will jeopardise one of the overall objectives of the National TB Control Programme (NTCP) which is to prevent the development of drug resistant TB.

**Item 13 : Reason(s) for taking lengthy treatment even when feeling well**

Tuberculosis is a chronic disease which requires the TB patient to take and complete prescribed treatment. It requires that the patient understands the nature of the disease and its treatment. This will be achieved through the relationship developed between the patient and the DOTS supporter. If the relationship is strong, the patient will be more likely to follow the treatment as required, then the high cure rate will be achieved.

**Table 6.8 : Reason for lengthy treatment**

**N = 250**

<b>Reason for lengthy treatment</b>	<b>Frequency</b>	<b>Percentage</b>
Knew the reasons	119	47,6
Did not know the reasons	131	52,4
<b>Total</b>	<b>250</b>	<b>100</b>

Table 6.8 indicates that the majority of patients 52,4 (131) did not know the reasons why they had to take the lengthy treatment even when feeling well. This lack of knowledge might be a contributory cause of interrupted treatment.

When patients felt better because the signs and symptoms of TB had disappeared, they had less motivation to continue with treatment.

**Item 14 : Last sputum examined**

According to the National Tuberculosis Control Programme, two sputum specimens are taken on three separate occasions, i.e. pretreatment, during treatment, and at the end of treatment.

**Table 6.9 : Last Sputum Examination**

**N = 250**

<b>Last Sputum Examination</b>	<b>Frequency</b>	<b>Percentage</b>
Pretreatment	88	35,2
During treatment	102	40.8
At the end of treatment	60	24.0
Total	250	100

Table 6.9 shows that the majority of the respondents, 40,8% (102) had their last sputum examination during treatment at the end of two months, and 35,2% (88) indicated that they had their last sputum examined when they were diagnosed with TB i.e. pretreatment. Twenty four percent (60) had their sputum examined at the end of six months. Based on these results, it is obvious that the majority of TB patients on DOTS programme have their last sputum examination after two months of treatment. At the end of six months of treatment many, 40,8% (102), did not have their sputum examined. As a result, the cure rate of TB patients on DOTS programme is not accurately recorded and reported to the Provincial Authorities, thus making it difficult to measure the effectiveness of DOTS.

**Item 15 : Patients' understanding of TB as a disease**

It is important that the nurse, as a self-care agent helps the patient to accomplish therapeutic self-care, in accordance with Orem's self-care theory, by conveying the knowledge and information about tuberculosis and its treatment. The more informed the patients are about TB, the more they are motivated to complete the treatment. This will enhance self-care and the effectiveness of DOTS programme. Knowledge of TB was assessed by asking the patients to indicate whether or not they were taught about TB. They were further asked whether they knew the side effects of TB drugs and what to do if those side effects could arise.

**Table 6.10 : Education about TB**

**N = 250**

<b>Educated about TB</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	84	33,6
No	166	66,4
Total	250	100

According to table 6.10 the majority of the respondents 66,4% (166) were not educated about TB. Only 33,3% (84) indicated that they were educated about TB. Such findings indicate that the public is not aware of the seriousness of TB. This will hinder the progress and level of compliance with DOTS.

**Item 16 : State the side effects that could arise from taking TB medication**

The majority 66,4% (166) of the respondents mentioned very few side effects, that is nausea and orange urine.

The minority of the respondents 33,6% (84) who indicated that they were educated about TB, knew what side effects could arise, for example anorexia, abdominal pains, joint pains, burning sensation in feet and orange or red urine. The major or dangerous side effects like dizziness, skin itchiness/rash, deafness, visual impairment, confusion, jaundice and vomiting were not mentioned in their responses.

**Item 17 : Patients' perceptions about DOTS strategy**

In this item the respondents were asked to give their own opinion about the change of the approach to TB treatment. In South Africa, before the year 1996, TB patients, once diagnosed of TB were hospitalized in a TB institution for six months. They were only discharged when they were completely cured of TB. South Africa adopted and implemented the strategy as recommended by the World Health Organization. This strategy recommended that all TB patients must be treated as outpatients on DOTS programme and only admitted to the hospital for only two months if they fit the admission and discharge.

The respondents were asked to indicate whether they were happy with the DOTS strategy or not.

**Table 6.11 : Patients' feelings about DOTS strategy**

**N=250**

<b>Patients feelings</b>	<b>Frequency</b>	<b>Percentage</b>
Happy	88	35,2
Unhappy	162	64,8
Total	250	100

Table 6.11 demonstrates that the minority of the respondents 35,2% (88) were happy with the DOTS strategy. The majority 64,8% (162) were not happy with the change from six months hospitalization to DOTS programme.

#### **Perceptions about strengths or positive points about DOTS**

Patients were asked to mention positive points about DOTS strategy. Patients who were happy about DOTS strategy mentioned the following reasons:

- It is a good programme because it allows patients to be treated at home and be with the family all the time.
- Those employed do not lose their jobs as they are treated at the workplace.
- The reduced number of tablets taken everyday from 11 tablets to 5 tablets daily as well as the fact that streptomycin injection is not part of the treatment makes patient happy. Only those patients who are retreatment cases get injections.

- School children continue with their schooling as DOTS is administered at school during weekdays.
- A break in the treatment during weekend is a blessing to the patients because swallowing tablets everyday for six months is very strenuous and needs commitment.
- A patient gets a friend, someone who cares like DOTS supporter. It is not like in the olden days where TB patients were shunned and neglected by the community.
- Family members are involved in the patients' treatment.
- Happy with free TB treatment as most of TB patients are unemployed.

#### **Perceptions about Weaknesses or Negative Points about DOTS Programme**

- Patients are not happy about DOTS supporters being people who live in their neighbourhood. They feel that if they were hospitalized and treated in hospital, they would be known only to the nursing and medical staff and not to the whole community.
- TB still has a stigma, people still believe that they have been bewitched or the ancestral / curses.
- The emergence of HIV/AIDS epidemic with similar signs and symptoms of TB make the patients hide their disease as they are afraid that they will be mistaken for HIV positive/AIDS sufferers.

- Shortage of DOTS Supporters as some of the patients come from remote areas where it is difficult for DOTS supporters to reach.
- TB patients not co-operating DOTS supporters who visit patients residences are asked to bring food by the patients so that they eat first before taking tablets.
- Respondents stated that when they visit some of the patients they find *them in the shebeens already drunk, having not taken their treatment.*
- Long queues at the clinic where patients wait for hours to collect TB treatment. They prefer to go straight to TB room or clinic instead of queuing with sick patients.
- DOTS supporters abandon their jobs if they get the paying jobs, leaving the patient in the middle of the treatment to take care of himself or herself.
- The rate of unemployment is too high, patients have nothing to eat before swallowing tablets and that makes them skip treatment at times.

#### **6.4 CONCLUSION**

In this chapter, analysis of data from the TB patients was done. Their knowledge and experience of Tuberculosis as a disease and its treatment was analysed and found to be very weak because of the DOTS volunteers abandoning the programme at any time and the new ones entering the programme before being trained. This will affect the effectiveness of the DOTS programme.

## CHAPTER 7

### DATA ANALYSIS AND INTERPRETATION OF FINDINGS : NURSING PERSONNEL

#### 7.1 INTRODUCTION

In this chapter analysis of data obtained from nursing personnel is presented. The questionnaires from all institutions under study were grouped together for the purpose of analysis except where specific points needed to be highlighted. Sample size was 32. Data is presented in the form of tables and pie charts.

#### 7.2 SECTION I

##### PERSONAL PARTICULARS

Item 1 : Gender

The inclusion of this item was to establish how many female nurses are involved in the DOTS programme as compared to male nurses.

Table 7.1 : Gender distribution

N = 32

Gender	Frequency	Percentage
Female	29	90.6
Male	3	9.4
Total	32	100.0

According to table 7.2 the majority of respondents, 90.6% (29) were females. Males were only 9.4% (3) of the total sample. These findings prove the fact that nursing profession is female dominated.

**Item 2 : Ages of the respondents**

Inclusion of this item was based on the assumption that, to be a nurse, the person would have passed the teenage age group.

**Table 7.2 : Age distribution**

**N = 32**

Age group in years	Frequency	Percentage
18 – 27	4	12,5
28 – 37	6	18,75
38 – 47	9	28,13
48 – 57	12	37,05
58 – and above	1	3,12
Total	32	100

The majority of nursing personnel 37,05% (12) were in the 48-57 age group followed by 28,13% (9) in the 38-47 age group and the 18,75% (6) in the 28-37 age group. There were only 12,5% (4) in the 18-27 age group and 3,12% (1) in the age group of 58 and above.

Although the retirement age group in South Africa is 55 (early retirement) to 65 years of age (maximum age retirement), it was discovered that in these institutions there are nurses who retired but still work on contract, that is why age group above 58 was included.

**Item 3: Nursing category**

This item was included because nurses are divided into different categories according to their qualifications in nursing and they play different roles in the DOTS programme, therefore their points of view and opinions on the effectiveness of the DOTS programme will differ.

**Table 7.3 : Nursing category**

**N = 32**

Category of nursing	Frequency	Percentage
Chief professional nurse	5	15,63
Senior professional nurse	8	25
Professional nurse	6	18,75
Senior enrolled nurse	2	6,25
Enrolled nurse	3	9,37
Senior Auxiliary nurse	6	18,75
Auxiliary nurse	2	6,25
Total	32	100

The majority of the respondents 25% (8) were in the Senior professional category, followed by two categories with the same percentages of 18,75% (6), that is professional nurses and senior nursing auxiliaries respectively. The chief professional nurses were 15,63% (5) followed by 9,37% (3) of the enrolled nurse category, and lastly, two categories with the same percentage of 6,25% (2) that is senior enrolled nurse and nursing auxiliaries respectively.

**Item 4 : Length of service**

This item was included to determine the degree of staff stability among nursing personnel. The stability of nurses in the workplace gives assurance that there will be continuity because the patient is likely to be nursed by the same nurses throughout his course of treatment.

**Table 7.4 : Length of service**

**N = 32**

Length of service	Frequency	Percentage
<b>Less than 1 year</b>	<b>3</b>	<b>9,37</b>
<b>1 – 10 years</b>	<b>6</b>	<b>18,75</b>
<b>11 – 20 years</b>	<b>19</b>	<b>59,38</b>
<b>21 and above</b>	<b>4</b>	<b>12,5</b>
<b>Total</b>	<b>32</b>	<b>100</b>

The majority 59,38% (19) were in the 11-20 years service range, followed by 18,75% (6) in the 0-10 years range and 12,5% (4) in the 21 and above years of service. Only 9,37% (3) were less than one year. These findings gives the assurance that the patients are cared for by the same nurses from the time they needed wholly compensatory nursing to partly compensatory nursing until they are able to perform the required self care measures through support, guidance, teaching and provision of development / environment by the nurses, in accordance with Orem's self care theory.

**Item 5 : Place of employment (clinic or TB hospital)**

The inclusion of this item was very important for the researcher to be able to find out the involvement of the clinics and TB hospitals in the DOTS programme.

**Table 7.5 : Place of employment**

**N = 32**

<b>Place of employment</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Clinic</b>	10	31
<b>TB hospital</b>	22	69
<b>Total</b>	32	100

The majority 69% (22) of the respondents were found to be working in hospital and 31% (10) were employed at the clinic. From the researcher's experience, these findings are inline with the procedure used for allocation of nurses in the TB departments of the clinics. In a TB hospital all nursing staff are involved in the treatment of TB patients whereas at the clinic only a few nurses are involved in the treatment of TB patients. There is a fragmentation of tasks where a nurse who is allocated in other departments like family planning, maternity department etc., stays in that department for many years and has got little or nothing to do with TB patients. This fragmentation of tasks hinders the effectiveness of the DOTS programme because if one person who is involved in the DOTS programme is not available when information about TB is needed, everything delays until she is available. The nurses who were selected from the clinics, were selected purposely because they are allocated in the TB units of the clinics or mobile clinics.

### 7.3 SECTION 2

#### 7.3.1 KNOWLEDGE, EXPERIENCE AND OPINIONS OF NURSING PERSONNEL ON DOTS PROGRAMME

**Item 6 : Guidelines for treatment and control of TB**

This item was important, considering that the protocol for treatment of TB patients is provided in the National Practical Guidelines for Diagnosis and Treatment of Tuberculosis recommended by WHO and obtainable free of charge from the Department of Health Offices. Nurses were asked this question so as to establish whether TB patients are uniformly treated by different institutions using the same guidelines.

**Table 7.6 Availability of practical guidelines for treatment and control of TB**

<b>Guidelines</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	32	100
No	0	0
Total	32	100

The findings in table 7.6 indicated that all, 100% (32) of the respondents had the guidelines for the treatment and control of TB which they use to treat TB patients.

**Item 7 : Training about DOTS programme**

Nurses have always played a key role in TB control, and their continued contributions is crucial if tuberculosis is to be controlled. Training of all

nursing personnel in the techniques of communication, casefinding and caseholding of tuberculosis, patients is the cornerstone of the National Tuberculosis Control Programme. The nurses were asked this question to establish if they were equipped with knowledge, as this programme was new in South Africa.

All the respondents 100% (32) reported that they did receive training on DOTS when the programme was introduced. Training manuals and Protocols for treatment were distributed. District and regional TB co-ordinators conducted the training of all those involved in the implementation of DOTS.

**Item 8 : Understanding of DOTS**

This item was included to find out whether nurses understood the strength of this strategy, compared to previous TB control strategies in South Africa, where patients were issued with six months supply of TB drugs to take home with no one supervising them swallowing the tablets.

All the respondents 100% (32) demonstrated thorough understanding of DOTS. They explained that TB patients are able to complete the course of treatment without interruption, with the help of DOTS supporters who watch them swallowing their tablets everyday. These results give an assurance that if people who implement the programme have a thorough understanding of the strategy, TB will be conquered.

**Item 9: Inservice training and update of the DOTS programme**

The responsibility of a nurse does not end with the prescription of the correct regimen of treatment, but also to improve their skills and knowledge of the

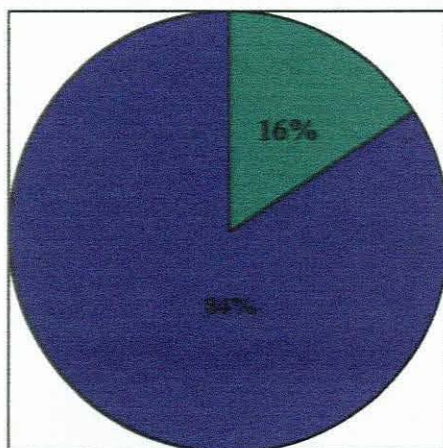
National Tuberculosis Control programme in order maintain the high standard of patient care.

Nurses were asked if they do receive continuing training and supervision on the programme. All the respondents 100% (32) mentioned that the Out West area of Durban Metro Subdistrict has a dedicated TB co-ordinator who is easily accessible, she attends meetings and workshops on DOTS and comes back with the information to retrain, motivate and supervise them. She does the onsite training as well as conducting monthly meetings with all the people involved in the implementation of the DOTS programme. In these meetings, it is where they voice their problems and their concerns as well as the progress on TB patient care.

**Item 10 : Criteria for admission and discharge of a TB patient in a hospital**

*The inclusion of this item was to find out if nurses were aware of the criteria that is used when admitting and discharging TB patients. The National Tuberculosis Control Programme states clearly that, once the patient is diagnosed of TB, he or she should be managed as an out patient at the clinic. But there are those who are totally incapacitated by the disease, who need the nursing staff to manage and provide them with health care on a continuous basis. These patients, once stabilized and having regained their human functioning as well as being able to meet their self care needs, they are discharged back to their community to continue with DOTS under the supervision of their chosen DOTS supporters.*

**Figure 7.1 : Nurses knowledge of the criteria for admission and discharge of a TB patient in a hospital**



**Key**

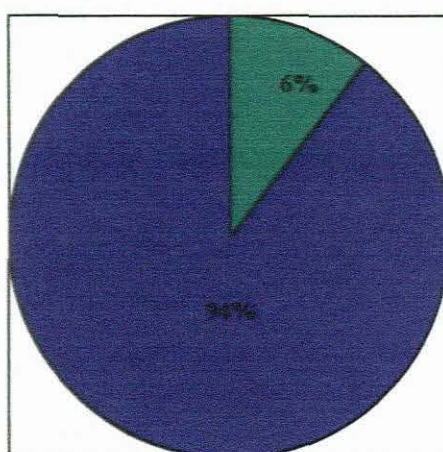
- 1 = 84% - Had accurate knowledge of the Criteria for admission and discharge of a TB patient in a hospital.
- 2 = 16% - Had no knowledge of the criteria for admission and discharge of a TB patient in a hospital

Figure 7.1 demonstrates that 84% (27) of the respondents had accurate knowledge of the criteria for admission and discharge, as described in the National TB training manual and the National document pertaining to the criteria for admission and discharge of a TB patient. 16%(5) of the respondents mentioned incorrect criteria. This was an indication that they were not aware of the criteria defined in the National document.

**Item 11 : Period of time to get the sputum results back from the laboratory (sputum turn around time)**

This item was included to determine the turn around time of sputum because it is very important to treat the patient the same day he is diagnosed with TB.

**Figure 7.2 Sputum turn around time**



**Key :**

- 1 = 94% - Sputa turn around time 24-48 hours
- 2 = 6% - Sputa turn around time 72 and more

The majority 94% (30) of the respondents reported that their sputa turn around time is 24 to 48 hours. This is a good indication of the efficient laboratory services because the patients with positive sputa will be started on the correct treatment as soon as possible. This will prevent them from infecting their families and other people in the community. 6% percent (2) reported that, due to transport problems, taking their sputa specimens to and from the microscopic centres, the results take long, from 72 hours and more. Sometimes patients who are TB suspects are asked to take their sputa specimens to the microscopic laboratories themselves. This practice will

hinder the effectiveness of the programme because if the patient has got no time or money to go to the laboratory centre, he or she will end up going home not knowing whether he or she has a positive sputum or not, thereby infecting other people.

**Item 12 : Effectiveness of DOTS programme in the District**

This item was included so that those who are involved in the implementation of DOTS strategy, have a chance to voice their opinions and concerns about it. Their opinions will be taken to the Department of health to make remedial actions so that the programme is more effective and good results are achieved.

**Nurses' opinions about the effectiveness of the programme**

The responses varied from not effective, effective and fairly effective. The majority 56,25% (18) of the respondents mentioned that DOTS programme is not effective in the district and stated the following reasons:

- Lack of dedicated DOTS supporters. Many of these volunteers do the job with the hope that they will be employed as community health workers in future. If they get the paying job elsewhere they abandon the voluntary service without noticing the patients or the clinic, leaving the patient unsupported.
- Patients give wrong addresses when visiting the clinics. This makes it difficult for the DOTS supporters to trace or follow up patients.
- Social problems still exist in the community, for example unemployment, alcohol abuse, overcrowded living conditions which hinder the

Thirty one percent (10) of the respondents mentioned that DOTS programme is effective in the district. In support of their perception of the programme being effective, they stated the following factors:

- DOTS is community based. The economy of the country is not adversely affected because patients do not need to be hospitalized, which is very costly.
- DOTS ensures job security for employees because patients do not lose their jobs, they are treated at their workplace and continue working until they complete the course of treatment.
- Decentralization of microscopic laboratory services has improved the sputum turn around time, patients do not have to wait longer than two weeks to get their sputum results whilst infecting other people. They are treated as soon as possible.
- Combination pill, which reduced the number of tablets prevent multiple drug resistant TB because patient can now swallow their tablets consistently for the full course of treatment and do not stop when they no longer experience TB symptoms.
- Community involvement has strengthened the programme. Community members have taken part in overseeing TB treatment of patients in their community thereby ensuring that the TB patients are accepted by the community and encourage them to finish the course of treatment.
- There is a regular and uninterrupted supply of TB drugs to ensure that patients are successfully treated.

The 12,75% (4) of the respondents who mentioned that, DOTS was fairly effective in the district supported their judgment that, although they have seen patients showing signs of improvement after completion of the course of treatment, they could not say with conviction that it is effective. The reason is that at the end of six months treatment most patients are unable to cough and produce sputum for examination.

#### **7.4 RECORDS OF TREATMENT OUTCOMES**

The TB records that were used for recording and reporting of information about DOTS programme in the Outer West Area of Durban Metro Western Subdistrict were analysed. The clinical TB register and quarterly reports are the valid documents to provide an effective monitoring system and record of treatment outcomes. They also provide information on how to manage the National TB Control Programme at all levels i.e. National, provincial and district.

These records revealed that there were low cure rates of TB in the Outer West Area of Durban Metro Western Subdistrict, as reflected in table.

**Table 7.7 : Health facility TB reports of treatment outcomes for all new smear positive cases in 2002**

Treatment outcome	Don McKenzie Centre	Halley Stoff Clinic	Mpumalanga Clinic	Msunduze Clinic
TB cases newly registered in the facility	N=169	N=506	N=322	N=58
Cured	0%	0%	12%	6%
Treatment completed	2%	0%	16%	36%
Treatment failure	0%	0%	0%	1%
Died	29%	0%	4%	6%
Treatment interrupted	5%	0%	10%	18%
Results not evaluated	16%	85%	53%	26%
Results not available	38%	82%	59%	35%
Transferred moved	47%	15%	5%	6%

(KwaZulu-Natal Department of Health, 2002)

Table 7.7 demonstrates the treatment outcomes recorded in the quarterly reports of these four health facilities. These treatment outcomes are for only newly diagnosed TB patients with smear positive sputa.

#### **7.4.1 Treatment outcomes**

There were 1155 TB patients registered in the TB register, that is 169 Don McKenzie Centre, 506 Halley Stoff Clinic, 322 Mpumalanga Clinic and 58 Msunduze Clinic.

#### **7.4.1.1 Cured patients**

Table 7.7 indicates that Don McKenzie Centre was recorded with 0% cure rates. This is because this health facility hospitalises tuberculosis patients for only two months and discharges them to DOTS in the community to continue with treatment under supervision of DOTS supporters. It does not keep patients until they are cured unless there is a recommendation from the doctor.

At Halley Staff Clinic there were also no cure rates, 0% for the year 2002. This record indicates that patients were treated on DOTS but not cured. Mpumalanga clinic was 12% and Msunduze clinic 6%. These cure rates indicate poor in the DOTS programme. The objective of the National Tuberculosis Council Programme is to cure at least 85% of all new smear positive cases with DOTS.

#### **7.4.1.2 Treatment completed**

Treatment completed means patients completed their six months course of TB but did not produce sputa at the end of treatment to be checked whether they are positive or negative.

*At Don McKenzie Centre 2% of patients completed treatment. The reason for this low percentage is that patients who are hospitalised are discharged at the end of two months intensive phase of treatment to continue with DOTS in the community. The 0% record of patients who completed treatment gives check* The record give an indication that out of 506 patients admitted in the year 2002 none were recorded as completed treatment in the TB register.

In Mpumalanga Clinic, (in KZN) 322 TB patients recorded in 2002 are susceptible to multi-drug resistant TB because they did not finish the course

of treatment. Table 7.7 demonstrates that Msunduze had 18% of TB patients who interrupted treatment, followed by Mpumalanga clinic 10%, Don McKenzie 5% and there were none at Halley Stott Clinic.

#### **7.4.1.3 Results not evaluated**

These are TB patients who are lost in the system during treatment. They were registered as new TB cases in the facilities but nobody can account for their treatment outcome. It is not known whether they completed treatment or not. Table 7.7 indicates the highest percentage, 85% of Halley Stott TB patients being lost in the system of treatment, followed by Mpumalanga clinic 53%, Msunduze clinic 26% and Don McKenzie 16%. In the researcher's opinion this is very dangerous to the communities because these patients are not known whether they completed their treatment or not and they may be spreading the TB bacilli infection to other people.

#### **7.4.1.4 Results not available**

These patients failed to produce the sputum at the end of intensive phase or continuation phase of treatment. Those who completed two months, they were put on continuation phase of treatment because of completing the phase and not because of their sputa results. Those who completed their six months course of treatment were recorded as treatment completed and not as cured, because they were unable to produce sputum for evaluation of the effectiveness of treatment. According to table 7.7 Halley Stott clinic had the highest percentage (82%) of patients who did not produce sputum at the end of treatment phases, followed by Mpumalanga clinic 59%, Don McKenzie Centre 38% and Msunduze clinic 35%.

#### **7.4.1.5 Patient transferred or moved**

These are patients who have been treated by the TB facility and transferred or moved to another facility for continuation of treatment. According to table 7.7 Don McKenzie transferred out 47% to other facilities, the reason being that this institution hospitalises patients for only two month. Once stabilized they are transferred to other facilities in the community to continue with DOTS. Halley Stoff clinic transferred 15% of 169 TB patients newly registered in this facility, at Msunduze clinic 16% of 58 registered TB patients and Mpumalanga Clinic 5% of 322 registered patients were transferred or moved.

#### **7.4.1.6 Treatment failure**

Table 7.7 indicates that Don McKenzie Centre, Halley Stott clinic and Mpumalanga clinic had no patients who were recorded as treatment failure.

Treatment failure cases are those patients who were treated and found to be still positive after intensive phase of treatment i.e. two months treatment and or after six months of treatment. Msunduze clinic had only 1% of the 58 registered new TB cases.

#### **7.4.1.7 Deaths**

Table 7.7 demonstrates that the highest percentage (29%) of TB patients died at Don McKenzie Centre, followed by 6% at Msunduze clinic, 4% at Mpumalanga clinic and 0% at Halley Stott clinic.

#### **7.4.1.8 Treatment interrupted**

Treatment interrupting patients are those who start the treatment and discontinue on their own. This interruption of treatment will cause TB drugs to have little or not effect against TB bacilli thus causing multi-drug resistant TB.

### **7.5 CONCLUSION**

The data obtained from nursing personnel was analysed. This information was gathered for the purpose of investigating the effectiveness of the DOTS programme. The respondents demonstrated reasonable knowledge of the DOTS programme and were able to voice their concerns and problems about it. This will help the health authorities to take remedial actions against those problems.

## **CHAPTER 8**

### **SUMMARY, LIMITATIONS, DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **8.1 INTRODUCTION**

In this chapter a brief version of the study is presented. Prominence is given to significant findings, conclusions, limitations and recommendations.

#### **8.2 SUMMARY**

This study aimed at evaluating the effectiveness of DOTS in the Outer West area of Durban Metro Western Sub-district of KwaZulu-Natal province. The main concern was the increase in the number of patients with tuberculosis despite the availability of effective anti-TB drugs. The literature reviewed confirmed the seriousness of TB epidemic in South Africa, particularly in KwaZulu-Natal with low cure rates.

A descriptive survey was conducted in health institutions of the Outer West area of Durban Metro subdistrict in KwaZulu-Natal Province which were registering TB patients in the National TB register during the period of study. The eclectic approach to sampling, including systematic, purposive stratification and random sampling, was used to select relevant participants from the different study population groups. The study population was limited to only those who were involved in the implementation of DOTS programme, that is nursing personnel and DOTS supporters. It also included patients who were treated and had completed the course of treatment, supervised by the trained DOTS supporters in the community and also in the hospital

The study was based on Orem's self-care theory which emphasizes the need for individuals to take responsibility for their own health.

**Objectives of the study were:**

- To assess the effectiveness of DOTS programme that has been implemented in the Outer West area of Durban Metro Western Sub-district of KwaZulu-Natal in the fight against TB.
- To assess the perceptions about DOTS programme that are held by those Involved in its implementation including patients.
- To identify the problem areas regarding the implementation of DOTS programme.
- To identify opportunities for improvement in the implementation and to make recommendations to Health Authorities regarding this programme - "A bottom-up approach."

The objectives of the study were accomplished, as will be indicated in the section of conclusions.

### **8.3 LIMITATIONS**

Delays occurred because some patients were illiterate or semi literate and could not complete questionnaires on their own therefore research assistants were utilized to assist them with completion of questionnaires.

## **8.4 DISCUSSION OF FINDINGS**

The researcher used the objectives and assumptions of the study as a foundation for discussion of findings in this section.

### **8.4.1 Objective 1**

To assess the effectiveness of DOTS strategy that has been implemented in the outer West area of Durban-Metro Western subdistrict of KwaZulu-Natal in the fight against tuberculosis.

#### **Treatment outcomes as reflected in the health facilities report for the year 2002**

The TB records that were used for recording and reporting information about DOTS were analysed. The clinical TB registers and quarterly reports are the valid documents to provide an effective monitoring system and records of treatment outcome. The records revealed that there are low cure rates of TB in the Outer West area Health District as reflected in table 2.2 of chapter 2, section 2.9.2.2 to 2.10.8 and accompanying discussions.

### **8.4.2 Objective 2**

To assess the perceptions about DOTS programme that are held by those involved in its implementation, including patients treated on DOTS during the period of study.

The findings were based on responses of the three categories of respondents, that is, patients, DOTS supporters and nursing personnel.

#### **8.4.2.1 TB Patients**

##### **- Patients understanding of TB as a disease**

The assessment of patients' understanding TB as a disease revealed lack of knowledge and understanding. This lack of knowledge was demonstrated, as the majority, 66,4% (166) mentioned that they were not educated about TB. This was also confirmed by their failure to mention major side effects of drugs and what to do if problems arise.

##### **- Patients' understanding of DOTS**

Patients understanding of DOTS as a strategy to combat TB was assessed by asking them to give their opinions about the change of approach to TB treatment, that is from hospitalisation for six months to DOTS in the community. Although 64,8% (25) mentioned that they were not happy with the DOTS programme, their opinions were based on personal issues than on the effectiveness of the programme.

The following is a summary of some of the comments elicited from the patients questionnaires when asked about the effectiveness of DOTS programme.

- Long queues at the clinics where patients collect the treatment make patients reluctant to collect treatment.
- Shortage of DOTS supporters in the community, other patients are without DOTS supporters.
- Volunteer DOTS supporters abandon the programme when they get full time paying jobs.

- DOTS supporters imposed on patients by the nursing personnel at the clinics invade their privacy as some do not want to be known as suffering from TB, due to the stigma attached to the disease.

#### **8.4.2.2 DOTS supporters**

- The selection criteria for DOTS supporters were found not to be in accordance with the National Tuberculosis Control Programme Guidelines. The majority 83,3% (25) of the respondents mentioned that they were selected by their supervisors and the nursing staff to go and supervise treatment. This created problems for DOTS supporters as they were perceived as intruders in the patients' life and in their homes.
- Allocation of DOTS supporters to patients is problematic : Some DOTS supporters have very few patients and some have many patients to supervise. Those with many patients are unable to perform their duties as expected and as recommended by WHO, because they have other duties to perform in the community. WHO recommended that DOTS supporters must supervise patients everyday swallowing their medication, but these DOTS supporters rely on family members to supervise patients everyday and they come only once or twice per week.
- Transport problems when visiting patients in their homes : The area is very expansive as this is a rural area. Houses are far apart. They have to walk long distances to see patients or they spend their own money for transport.
- Collecting medication from the clinics: Patients are expected to report physically at the clinic every month so that they are weighed to check the progress. Sometimes patients do not report to the clinics on the expected

dates because they have no money for transport. This practice was found to be another reason for increased treatment interruption rate.

- Community health workers who work as DOTS supporters reported that they are being overworked by this programme. They have other important duties to perform in the community but are expected to supervise patients swallowing TB medication everyday.
- *Dropping out of volunteer DOTS supporters programme* : Most of these DOTS supporters volunteer to work with a hope that they will be paid in future. If this does not happen they abandon the patients for full time paying jobs.
- Record keeping is very poor: DOTS supporters do not have any record kept by them to record their daily duties. They rely only on the transfer form from the clinic that is used to trace the patient. Once the patient is found, the form is returned to the clinic. Then they are left with nothing to monitor their progress and to evaluate their performance.

These findings indicate that there is a problem with DOTS in the community that need to be addressed in order to achieve the 85% cure rate of all smear positive sputum as required by the National Tuberculosis Control Programme.

#### **8.4.2.3 Nursing Personnel**

Data collected from nursing personnel revealed that nurses have been trained about DOTS. They demonstrated the understanding of the guidelines and treatment protocols.

- It was noted that they experience a variety of problems in the implementation of the programme, for example:

- The communities they serve have many social problems like alcoholism and unemployment. They drink liquor and refuse to take tablets. They only show up at the clinic or mobile clinics when they are in an advanced stage of the disease.
- Shortage of staff at the clinics prevents them from performing health education to TB patients before dispensing medication. Nurses feel that all TB patients should be hospitalised for at least two weeks for health education purposes before they are treated on DOTS programme.
- Nurses mentioned that the amount of paperwork involved in proper running of DOTS programme is too large. They waste time filling in different statistics forms which should be done by clerical staff.
- Dispensing of medicines to patients is an added responsibility : They stated that the institutions should provide pharmacists and pharmacy assistants who will dispense medication to patients. Patients who come to the clinics are hungry and cannot afford to wait a long time in queues, therefore want to leave the health facility as quickly as possible. Some of them are very sick and need special attention.
- Lack of communication between health care providers. Nurses from the clinics mentioned that there is lack of communication between DOTS supporters and the nurses at the clinic because only patients come to the clinic to collect medications. Patients sometimes come with verbal information from DOTS supporters which is inadequate.
- Nurses in the TB hospital stated that, although they do DOTS in hospital successfully for two months, they loose their patients when

they are discharged to DOTS in the community. There is no reporting mechanism in place to inform them of what happened to the patients they discharged to DOTS. They only see some of these patients coming for re-admission, sick again and having not completed the course of treatment. They stated that the number of patients re-admitted in hospital is increasing. These patients, when asked the reasons for interrupting the course of treatment, stated that they had no food to eat therefore decided not to take treatment in an empty stomach.

- Nurses in the hospital were concerned about the patients admitted in the hospital. They seek medical help in an advanced stage of TB having started by using traditional medicines. If these traditional medicines fail, then they go to the clinics. This results in a high number of deaths in the TB hospital because they come late for treatment.
- Emergence of HIV / AIDS worsens the problem of TB as most of these patients suffer from dual infection. Their condition deteriorates and most of them die.
- Nurses mentioned that patients are unable to cough up sputum at the end of two months to check if the treatment has worked or not. They report that they have dry cough after taking treatment. At the end of the course of treatment, these patients cannot be recorded as cured because of no sputum available, therefore are recorded only as treatment completed.

These findings are in relation with the low cure rates recorded in this district as reflected in table 2.2, chapter 2.

- Nurses mentioned that in some cases where the patients comply with treatment there is a good indication that DOTS is effective because patients are discharged back to their communities fit and cured of TB. These patients are very few and some of them act as DOTS supporter in their communities.

### **8.4.3 Objective 3**

To identify the problem areas regarding the implementation of DOTS.

Numerous problems regarding the implementation of DOTS programme were mentioned by nurses during data collection. They are summarised as follows:

- Lack of education of patients and the community about TB. This results from shortage of staff in the clinics. Nurses have no time to spend with TB education.
- Poverty and unemployment of patients result in non-compliance with treatment.
- Too much paperwork with this programme. As previously stated nurses feel the filling in of the forms and registering patients is a clerical job which takes most of their time which should be used for patient education.
- Nursing is becoming a stressful job leading to low staff morale and lack of motivation because nurses see patients dying in the presence of effective anti TB treatment. Most of TB patients suffer from dual infection and die.

- TB institutions lose trust from the community they serve. Previously TB patients were admitted into TB institutions and discharged home cured after treatment. Now there is an increase in the number of TB patients dying. The public is not aware that there are patients with dual infection which aggravates the condition.
  
- Transport problem.  
This prevents health workers from visiting the communities where the DOTS supporters experience problems. Mobile clinics visit remote areas only once a week because of transport problems.
  
- Lack of continuing education for DOTS supporters hinders the effectiveness of the programme because they are not updated with information.
  
- Quality assurance by those in charge of DOTS supporters is a major problem since DOTS supporters do not have any records of the work they do in their possession. There is lack of accurate record keeping.
  
- Budgetary constraints  
Basic expenses for salaries of the community health workers come out of the budget of the Department of Health. However, volunteer DOTS supporters are not paid a salary. They are only provided with incentives. This causes problems because the DOTS volunteers also expect to be paid salaries. There is no budget to assist those involved in DOTS to apply measures of alleviating poverty, unemployment and alcoholism which inhibits compliance with DOTS programme.

#### **8.4.4 Assumption 1**

This study is based on the assumption that this global tuberculosis epidemic can be eradicated if the government health services join forces with non-governmental organizations involved in the prevention and control of TB. These include South African National Tuberculosis Association (SANTA) which is very much involved in the proper implementation of DOTS.

The findings for this study revealed that :

- In the Outer West area of Durban Metro Western Subdistrict, Valley Trust (a non-governmental organization) trains and supervises DOTS supporters to work in the community. There is no government institution that does the same work in this district.
- Don McKenzie Centre, a non-governmental organization, hospitalises TB patients free of charge according to the criteria for admission and discharge of TB patients supplied by the National Department of Health.
- Don McKenzie Centre also provides the laboratory services for sputum smear examination for five Department of Health in this district at no cost. Turn around time for sputums is 24 to 48 hours. This makes it possible for the patients to be diagnosed and treated in time.
- Assumption one is therefore confirmed.

#### **8.4.5 Assumption 2**

Local authorities may play a role in facilitating the effectiveness of DOTS strategy by improving housing as well as providing safe drinking water for all communities to improve the health of people.

Although local authorities in the Outer West area have provided the communities with safe drinking water through communal taps, the improvements in other home conditions is very slow. People still live in overcrowded home conditions. Low cost housing project was started in 1999. Concrete slabs and toilets were erected in the land identified for these houses, but to date nothing further is happening.

It is not clear who takes full responsibility for this aspect on the basis of a special dedicated programme like DOTS. It seems to be left to the primary health care providers to struggle with it. There does not seem to be a visible and formal joint venture between the department of health and the department of social welfare, in terms of fighting TB and poverty as a major predisposing factor.

#### **8.4.6 Assumption 3**

The DOTS strategy is believed to provide extra ordinary benefits that no other TB control strategy comes close to being as effective and as affordable as DOTS.

There are still obstacles to progress of this DOTS programme that result in low cure rates in the Outer West area. The Health Facilities Treatment Outcomes reports demonstrated low cure rates in smear positive new patients (see table 2.2).

### **8.5 CONCLUSIONS**

Based on the findings of this study as discussed under objectives and assumptions, the researcher draws the following conclusions:-

- The Department of Health is working together with non-governmental organizations in the fight against the TB epidemic as confirmed in assumption I.
- There is very little progress done by the local health authorities in helping the poor and to relieve them from overcrowded living condition.
- Low cure rates in this district, demonstrated the ineffectiveness of DOTS strategy.
- Patient education is ineffective to provide them with knowledge and understanding of the disease and its treatment.
- DOTS supporters were found to be ineffective in their roles of ensuring that patients receive their treatment as according to the National Guidelines for Treatment and Control of TB.
- Lack of communication between health care providers. Nursing staff and community health workers do not meet to discuss patients problems encountered by DOTS supporters in the community.
- Lack of supervision and evaluation of the work done by DOTS supporters in the community.
- Transport problems prevent community health workers to function effectively in their roles as DOTS supporters in this expansive rural area.
- Social problems like unemployment and poverty prevent compliance with TB treatment and renders DOTS programme ineffective.

- Staff education on treatment protocols is done by one DOTS co-ordinator. It is concluded that one DOTS coordinator cannot function effectively in the whole Outer West area.
- Budgetary constraints prevent those involved in the implementation of DOTS in assisting the needy TB patients with solving some of the problems that hinder compliance with DOTS programme.
- Poor record keeping by community health workers and lack of understanding of the importance of keeping records.
- TB patients suffering from dual infection of TB/HIV is the main concern for nurses as this emergence of HIV increases number of deaths from TB.
- Political advocacy and commitment to preventive measures to fight TB is lacking.

## **8.6 RECOMMENDATIONS**

In relation to the findings and conclusions of this study, the researcher makes several recommendations. In order for the DOTS programme to be successful in the Outer West area of Durban Metro Western Subdistrict and to achieve the goal of the National Tuberculosis Control Programme, that is cure rates of at least 85% of all new smear positive patients and at least 85% conversion rates at the end of the intensive phase, the following recommendations are made:

- **Create the second post of DOTS co-ordinator because one is insufficient.**

The community is diverse and the area is expansive, it is impossible for one person to co-ordinate the nursing staff, community health workers and volunteer DOTS supporters. Two DOTS co-ordinators will share the responsibility of taking action to rectify the problems encountered, for the success of DOTS programme.

- **Internal Audit System**

Develop a system of evaluation of the work done by DOTS supporters, for example internal audit of staff and patients' records on a monthly basis. This will help in keeping accurate records and staff will be able to evaluate their work performance.

- **Quality Assurance through continuous supervision, monitoring and evaluation systems**

This will ensure that all those involved in DOTS programme are performing to their full capacity and that patients are receiving the best possible care on a continuous basis. Feedback received on a monthly basis with no evidence of continuous day to day supervision, monitoring and evaluation is not enough to assure quality. It is important to establish specific goals and set a well planned strategy to achieve them. The co-ordinators should ensure that the DOTS supporters are fully conversant with these.

- **Transport availability**

Since the area that DOTS serves is expansive, it is not feasible for DOTS supporters to visit their patients everyday by foot or by financing their own transport. Access and availability of free transport must be provided for them to fulfil their job responsibilities.

- **Continuing education for nursing staff, DOTS supporters and patients**

Continuous update on TB information and its treatment is very important to be in line with new strategies. Education and training on DOTS should be centred around treatment outcome and compliance.

- **An outreach community project as a comprehensive approach to fighting TB**

The only way in which the poverty stricken patients can be assisted is through the establishment of self-help projects. Some of these projects may require short term skills training programmes to be undertaken.

Political advocacy and commitment is required to strengthen the fight against tuberculosis.

- **Early recognition and diagnosis of HIV related pulmonary diseases.**

Health workers and patients must be educated about the human immunodeficiency virus so that they are able to recognise the clinical features of HIV infection that are common in TB patients. The link between HIV and TB is becoming more and more well known to

members of the public. Therefore TB patients should be offered counselling and voluntary HIV testing if they want to know their status. This service should be offered by trained counsellors. All clinics and TB hospitals should offer HIV voluntary counselling and testing (VCT) as a cost effective HIV preventive strategy. VCT clinics should help TB patients who suffer from dual infections with antibiotics and antiretroviral drugs.

- **Budget to deal with the social problems of TB patients**

The problems which often hinder the patients' compliance, such as unemployment, hunger, poverty and alcoholism need a specific budget to allow those involved in DOTS to take measures to alleviate them.

- **Further research on tuberculosis and DOTS**

More intensive research on TB is to be encouraged so that problems can be identified at their onset. Prompt problem solving helps to correct the deficiencies that arise in the DOTS programme. It is recommended that a further research by all Santa Centres in KwaZulu-Natal as they are located in different districts be done so that a comparison on the TB cure rates will be done. A larger study should be developed nationally as the whole South Africa is affected by this TB epidemic.

## **8.7 PRESENTATION OF THE DOTS MODEL**

The researcher has developed a model that can be used as a guide to facilitate the effectiveness of the DOTS programme. "The Cross of Lorraine" Model for effective and sustainable DOTS Community Involvement is presented in figure 8.1.

† Figure 8.1 "THE CROSS OF LORRAINE" Community involvement model for effective and sustainable community based Dots Program. †



## **Key components of the model**

### **1. Community entry**

- Public health sector
- Private health sector
- Health forums
- Health committees

### **2. Meeting with all stakeholders**

- Department of health
- NGO representative
- CBO representative
- Community leaders
- Key people
- TB patients representative

### **3. Community involvement**

- Community orientation
- Stop TB initiatives
- Self help projects
- Ongoing health education

### **4. Implementation**

- Community mobilization
- Recruitment of DOTS supporters
- Education and training of DOTS supporters.

### **5. Evaluation**

- Assessment and evaluation of all the activities implemented

The model presented in figure 8.1 emphasises the involvement and commitment of all stakeholders in accelerating action against tuberculosis through implementation, monitoring and evaluating the DOTS programme according to the National TB Control Programme, in line with the internationally accepted WHO standards.

### **8.7.1 The Cross of Lorraine**

The Cross of Lorraine was used as the pillar on which the proposed model is founded. The double-barred cross of Lorraine was adopted as the world wide symbol of the crusades against tuberculosis of a conference held in Berlin in October 1902. It is the emblem of the daily fight against invasion by tuberculosis.

Lucien Viborel states that the double barred red cross has penetrated to the four corners of the earth and has become a rallying sign, which reminds us of the social responsibility of all people about the campaign against tuberculosis (SANTA Voluntary Workers Guide: 1995).

The Cross of Lorraine was used to demonstrate the active participation of all people in the development of global partnership to stop TB. It emphasizes responsibility, accountability and ownership of all TB initiatives. It demonstrates that, for the Nation to be able to combat TB, the collaboration across non-governmental organizations, private health sector, Department of Health as well as community based organizations' action is required.

### **8.7.2 The DOTS coordinator**

The community based DOTS is the strategy that brings TB treatment closer to the patients. It makes it easier for the patients to access treatment without traveling long distances and waiting long hours at the clinics. In the model,

the role of the DOTS coordinator is displayed around the arms of the “Cross of Lorraine” . The DOTS coordinator plays a pivotal role in facilitating the success of the DOTS programme.

### **8.7.3 Components of the Model**

This model has five components.

#### **8.7.3.1 Community entry**

*This is the most important phase of involving community, whereby the DOTS coordinator meets with the local health authorities to discuss the TB problems and DOTS strategy. These local health authorities include health care providers from hospitals and clinics, health forums and health committees. In this meeting the importance of involving the community in the DOTS programme should be emphasized. Once the agreement of involving the community in the DOTS programme has been entered into, the DOTS coordinator will establish the community profile to ensure that the sufficient resources are available to enable them to combat tuberculosis.*

#### **8.7.3.2 Stakeholders' meeting**

The DOTS coordinator should meet with all stakeholders who are concerned with poverty alleviation and sustainable development to discuss the present approach to TB treatment, which focuses on the DOTS supporters and encouraging TB patients to complete treatment. These stakeholders should commit themselves, politically and financially to help the TB programme achieve or exceed the global targets of 85% cure rates.

A working committee should be established. This committee should consist of community members, health care providers, community based

organizations and non-governmental organizations' representatives as well as representatives of TB patients. The committee should develop and initiate successful and cost effective intervention strategies and activities that will ensure compliance with TB treatment.

### **8.7.3.3 Community involvement**

The next step is orientation of the community by addressing them on the issue of TB epidemic and the effective preventive and care programmes. The DOTS coordinator should brief the community working committee on the benefits of effective use of all appropriate "Stop TB initiatives" and activities that will lead to community development and empowerment. These activities should include raising awareness and mobilizing the community to undertake TB prevention and care of TB patients, by doing DOTS support. The importance of uninterrupted TB treatment should be stressed and also ongoing health education and training should be encouraged.

Self help projects that will teach the community to be self-sufficient and be responsible for their own nutritional status should be encouraged. Kuan-Tzer in George (1985:124), supports this when he states that if you give a man a fish he will have a single meal; if you teach him how to fish, he will eat all his life. The long term community development projects like cultivating vegetables (in individualized or communal gardens) sewing, brick or block making, hand craft etc. will help the community transform from a welfare – assisted community to a more responsible developed community.

The South African Policy document on District Health System supports community involvement and participation.

#### **8.7.3.4 Implementation**

During this phase, DOTS supporters should be identified and recruited. DOTS coordinator should help the community with the training of DOTS supporters. During training the role of DOTS supporters as, outlined by Knight (1998:10) should be emphasized. DOTS coordinator should make sure that all TB patients have access to effective care by implementing preventive and care programmes based on the DOTS strategy, in line with the internationally accepted standards and practices. DOTS supporter should monitor progress of the programme by having regular meetings with those involved in its implementation in the community, to assess and identify problems that need to be solved in time.

#### **8.7.3.5 Evaluation**

All activities implemented need to be evaluated in order to measure the progress and achievements of the community involvement. Specific systematic, scientific, evaluation tools should be developed by all stakeholders, assessed and approved by the Department of Health. This evaluation will prove the effectiveness or non-effectiveness of the DOTS strategy in the community as well as areas that need support in the implementation of the DOTS programme.

### **8.8 CONCLUSION**

The study has demonstrated that DOTS strategy has not been as effective as desired in KwaZulu-Natal Province. It also highlighted the importance of involving all stakeholders in DOTS programme with the emphasis on active

community involvement and participation. The responsibility to ensure adherence to TB treatment, thereby achieving at least 85% cure in all smear positive patients, as required by the National TB Control Programme, has been emphasized.

## BIBLIOGRAPHY

1. AFRICAN NATIONAL CONGRESS 1994. National Health Plan for South Africa. Johannesburg, April 1994:7.
2. AUTHOR UNKNOWN, 1997. DOTS: A Break Through in TB Control. Nursing Update. July Vol,21, No.7:10
3. AUTHOR UNKNOWN, 1997. Tuberculosis: A Global Emergency. Nursing Update. Vol. 21, No.7: 47.
4. AUTHOR UNKNOWN, 1998. Activities of the International Union Against Tuberculosis and Lung Diseases (IUATLD). IUATLD News Letter. January 1998:8.
5. AVIDI, D. 2002. Tuberculosis : Your easy guide to follow: Health Times, First edition, March 10.
6. BANWARI, L.M. 2002. Patterns of lung Diseases in Former Mineworkers of the Former Republic of the Transkei. International Journal of Occupational and Environmental Health. April/May 2002. Vol.8, No.2 : 105.
7. BURNS, S., GROVE, S.K. 1999. Understanding Nursing Research. Second edition. Philadelphia: WB Saunders Company.
8. DEPARTMENT OF HEALTH 1996. The South African Tuberculosis Control Programme. Practical : Guidelines. Pretoria: Department of Health.

9. DEPARTMENT OF HEALTH 1998. A Training Manual for Health Workers. Tuberculosis. First edition. Pretoria.
10. DEPARTMENT OF HEALTH 2000. The South African Tuberculosis Control Programme. Practical Guidelines. Pretoria. Department of Health.
11. DICK, J., MBEWU, A., MATJI, R. 1999. AI is not well in TB Control Programme. South African Medical Journal, Vol 88, 2 February: 132.
12. ENARSON, D.A., RIEDER, H.L., AMADOTTIR, T., TREBUCQ, A. 2000. Management of Tuberculosis. A Guide for Low Income Countries. Fifth edition. 2000. Paris, INATLD.
13. ENARSON, D.A. KENNEDY, S.M., MILLER, D.L. BAKKE, P., 2001. Research Methods for Promotion of Lung Health. A Guide to Protocol Development for Low-Income Countries. Paris, IUATLD.
14. FAWCET, J. 1989. Analysis and Evaluation of Conceptual Models of Nursing. Second edition. Philadelphia: F.A. Davis Company.
15. GEORGE, J.B. 1985. Nursing Theories. The Base for Nursing Practice. Second edition. New Jersey, Prentice-Hall.
16. HAYWOOD, T. 1997. TB Fighters. The Mercury, May 28:4.

17. HEALTH SYSTEMS TRUST (H.S.T.) 2000. Tuberculosis in South Africa. Update for Health Workers, Planners, and Managers. H.S.T. Update. Issue No.56, October 2000.
18. KIRONDE, S. (Undated). Tuberculosis Cure Rates. Kimberley: Oxford University, Institute of Health Sciences, England Medical Research Council.
19. KNIGHT, S. 1998. Tackling TB Together: Training Manual for TB Treatment Supporters. KwaZulu-Natal Department of Health.
20. KWAZULU-NATAL DEPARTMENT OF HEALTH 1996. The South African Tuberculosis Control Programme in KwaZulu-Natal. September, KwaZulu-Natal Department of Health.
21. KWAZULU-NATAL DEPARTMENT OF HEALTH 2002. TB Reports: KwaZulu-Natal Tuberculosis Programme. Health Facility Report. (Durban Sub-district).
22. MATSHA, N. 1998. Strides and Struggles in TB Control. Annual Report 1997-1998. Pretoria.
23. MATSHA, N. 1999. Faces of TB. TB Advocacy Publication. 1998-1999. Pretoria.
24. MPUMALANGA DEPARTMENT OF HEALTH 1996. Managing TB: Getting it Right. Mpumalanga Province.
25. OREM, D.E. 1980. Nursing: Concept of Practice, Second edition. New York. McGraw Hill Book Company.

26. PEARSON, A., VAUGHAN, B. 1990. Nursing Models for Practice. Halley Court, Jordan Hill, Oxford.
27. POLIT, D.F., and HUNGLER, B.P. 1991. Nursing Research Principles and Methods. Fourth edition. Philadelphia: J.P. Lippincolt.
28. PORTER, J.H.D., McADAM, K.P.W.J. 1994. Tuberculosis: Back to the Future. Chichester: John Wiley and Sons Ltd.
29. RIEDER, H.L., CHONDE, T.M. MYKING, H., URBANCZIK, R. LASZLO, A., KIM, S.J., VAN DELDIN, A. and TREBUCQ, A. 1998. The Public Health Services. National TB Reference and the National Laboratory Services. Paris : IUATLD.
30. RIEDER, H.L. 1999. Epidemiology: The Basis of TB Control. First edition. IUATLD.
31. RIEDER, H.L. 2002. Interventions for Tuberculosis Control and Elimination. Paris. IUATLD.
32. SANTA, 1995. Voluntary Workers Guide, 1995:2.
33. SOUTH AFRICAN NATIONAL TUBERCULOSIS (SANTA) 1996. T.B. is the National Priority. Santa T.B. and Health News. December Vol.36 No.5:1
34. SANTA, 1997. Annual Report, 1996-1997. Johannesburg.
35. SANTA, 1998 : Annual Report, 1998. Johannesburg.

36. SANTA, 1999. Stop TB and use Dots. Santa T.B. and Health News. April/May. Vol.38. No.2 :4.
37. SANTA, 2000. Forging New Partnership to Fight TB. Santa TB and Health News. April/May 2000. Vol.39, No.4/5:12.
38. SANTA, 2000. Forging New Partnership to Fight TB. Santa TB and Health News. June 2000. Vol.39, No.6:8.
39. SANTA, 2000. Uniting to Beat TB. Santa TB and Health News. March, 2000, Vol.24. No.3: 9,14.
40. SANTA, 2001. Dots: TB Cure for All. Santa TB and Health News. March, Vol.40, No.1:6.
41. SANTA, 2001 : Dots: TB Cure for All. Santa TB and Health News. Winter, Vol.40, No.2:11,14 and 21.
42. SANTA, 2002. Annual Report 2001 – 2002. Johannesburg.
43. SANTA, 2003. Annual Report 2002 – 2003. Johannesburg.
44. SMITH, L. 1999. Managing Community Based Dots. Department of Health Western Cape :59.
45. SINGER,C. 1997. TB in South Africa. The People's Plague. Department of Health. Pretoria.

46. SOUTH AFRICAN DEVELOPMENT COMMUNITY (SADC) 2000:  
Tuberculosis: Defying a common foe. Southern African Tuberculosis  
Control Initiative (SATCI). TB Advocacy Report. SADC/SATCI 2000.
47. TREECE, F.W. and TREECE, J.W. 1986 : Elements of  
Research in Nursing. Fourth edition: ST. Louis, CV Mosby Company.
48. WORLD HEALTH ORGANIZATION (WHO) 1997 : Country  
Profiles. WHO Tuberculosis Cites Geneva.

## **ANNEXURE I**

### **QUESTIONNAIRES**

1. Questionnaire for DOTS Supporters
2. Questionnaire for TB patients
3. Questionnaire for Nursing Personnel

# QUESTIONNAIRE FOR DOTS SUPPORTERS

DEAR PARTICIPANT

KINDLY COMPLETE THE ATTACHED QUESTIONNAIRE, DO NOT WRITE YOUR NAME THE INFORMATION IS GATHERED FOR RESEARCH PURPOSES. THERE ARE NO RIGHT OR WRONG ANSWERS. INFORMATION WILL BE TREATED CONFIDENTIALLY. THE RESEARCH AIMS AT INVESTIGATING THE EFFECTIVENESS OF DIRECTLY OBSERVED TREATMENT SHORT COURSE STRATEGY IN THE WEST HEALTH DISTRICT IN KWAZULU - NAATAL.

## SECTION A. - PERSONAL PARTICULARS - PLEASE TICK IN AN APPROPRIATE BOX

- |                                  |                  |                          |
|----------------------------------|------------------|--------------------------|
| 1. GENDER                        | Male             | <input type="checkbox"/> |
|                                  | Female           | <input type="checkbox"/> |
| 2. AGE GROUP                     | 15 - 24          | <input type="checkbox"/> |
|                                  | 25 - 34          | <input type="checkbox"/> |
|                                  | 35 - 44          | <input type="checkbox"/> |
|                                  | 45 - 54          | <input type="checkbox"/> |
| 3. MARITAL STATUS                | Married          | <input type="checkbox"/> |
|                                  | Never Married    | <input type="checkbox"/> |
|                                  | Widow/Widower    | <input type="checkbox"/> |
|                                  | Divorced         | <input type="checkbox"/> |
| 4. EDUCATIONAL QUALIFICATIONS    | Grade 1 - 4      | <input type="checkbox"/> |
|                                  | Grade 5 - 8      | <input type="checkbox"/> |
|                                  | Grade 9 - 11     | <input type="checkbox"/> |
|                                  | Grade 12 & Above | <input type="checkbox"/> |
| 5. RESIDENTIAL AREA (NAME) ..... |                  |                          |
| 6. EMPLOYMENT STATUS             | Employed         | <input type="checkbox"/> |
|                                  | Unemployed       | <input type="checkbox"/> |

## SECTION B.

KNOWLEDGE, EXPERIENCE AND OPTIONS ABOUT DOTS PROGRAMME.

DOTS IS THE GLOBALLY RECOGNISED STRATEGY FOR EFFECTIVE CONTROL OF TUBERCULOSIS RECOMMENDED BY WHO AND ADOPTED BY THE NATIONAL DEPARTMENT OF HEALTH IN SOUTH AFRICA.

7. HOW WERE YOU SELECTED AS DOTS SUPPORTERS?

.....

8. HOW MANY PATIENTS DO YOU SUPERVISE? .....

9. WHERE DID YOU RECEIVE TRAINING ABOUT DOTS? .....

10. HOW LONG WERE YOU TRAINED? .....

11. WHAT TOPICS WERE COVERED DURING DOTS TRAINING?

.....  
.....

12. DO YOU THINK YOU HAD ENOUGH TRAINING?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

13. DO THE PATIENTS YOU SUPERVISE COME TO YOU OR DO YOU GO TO THEM?

13.1 " I go to them"

<input type="checkbox"/>
<input type="checkbox"/>

13.2 " They come to me "

14. WHAT DISTANCE DO YOU TRAVEL TO SUPERVISE YOUR PATIENTS?

Short Distance  
Long Distance  
Very Long Distance

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

15. HOW OFTEN DO YOU VISIT YOUR PATIENTS TO SUPERVISE THEIR TREATMENT?

.....

16. WHO COLLECTS T.B. MEDICATION FOR YOUR PATIENTS FROM THE CLINIC?

.....

17. DO YOU KEEP RECORDS OF TB PATIENTS UNDER YOUR SUPERVISION?

Yes	No.
<input type="checkbox"/>	<input type="checkbox"/>

18. WHO SUPERVISE THE WORK YOU ARE DOING?

.....

19. ARE THERE ANY PROBLEMS YOU EXPERIENCE IN THE DRUG OR TREATMENT SUPPLY?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

19.1 If yes to No.19, what are the problems?

.....  
.....  
.....

20. WHAT PROBLEMS DID YOU EXPERIENCE OR ANTICIPATE WITH DOTS PROGRAMME/ WHEN VISITING PATIENTS?

.....  
.....  
.....

21. WHAT ARE THE SIDE EFFECTS OF TB DRUGS?

.....

.....

22. WHAT DO YOU DO IF A PATIENT REPORTS SIDE EFFECTS OF MEDICATION?

.....

23. WHAT IS YOUR OPINION ABOUT THE DOTS PROGRAMME?

Effective   
Not Effective

Effective
Not Effective

24. HOW DO YOU THINK COMPLIANCE WITH TREATMENT CAN BE IMPROVED?

.....

.....

.....

.....

21. WHAT ARE THE SIDE EFFECTS OF TB DRUGS?

.....  
.....

22. WHAT DO YOU DO IF A PATIENT REPORTS SIDE EFFECTS OF MEDICATION?

.....

23. WHAT IS YOUR OPINION ABOUT THE DOTS PROGRAMME?

Effective  
Not Effective


24. HOW DO YOU THINK COMPLIANCE WITH TREATMENT CAN BE IMPROVED?

.....  
.....  
.....  
.....

## **ANNEXURE 2**

### **LETTERS OF PERMISSION**

1. Letter of request to conduct research in Outer West Clinics
2. Letter of permission from the Department of Health Outer West Clinics
3. Letter of request to conduct research at Don McKenzie Centre
4. Letter of permission from Don McKenzie Centre
5. Letter of request to be assisted by Community Health Workers to collect data from TB patients at the Valley Trust.
6. Letter of permission from the Valley Trust.

6 Abroth Road  
Westville North  
Westville  
3630

10 March 2000

The Medical Superintendent  
Dr L. Mbhele  
Kwa Dabeka Community Health Centre  
P.O.Box 371  
3602

Dear Dr Mbhele

**REQUEST TO CONDUCT RESEARCH IN SELECTED CLINICS IN THE  
OUTER WEST HEALTH DISTRICT OF KWA ZULU-NATAL PROVINCE  
IN FULFILMENT OF M CUR DEGREE IN NURSING:UNIVERSITY OF  
ZULULAND UMLAZI CAMPUS.**

These Clinics are :

- 1.Halley Stott Clinic
- 2.Umsunduzi Clinic
- 3.Mpumalanga Clinic

**TOPIC OF RESEARCH**

**Effectiveness of Directly Observed Treatment Short course Strategy (DOTS) for  
control of Tuberculosis in the Outer West Health District of Kwa Zulu-Natal  
Province.**

I write this letter to request permission to conduct research at the selected clinics  
under your jurisdiction in the Outer West Health District of Kwa Zulu- Natal.

Please find enclosed herein the proposal, which gives details of proposed study, proof of  
registration of the project with the research committee and the sample of  
questionnaires to facilitate your evaluation of this study. Copy of the research will  
be forwarded to your institution.

Thank you , for your cooperation

Yours Sincerely

O.T.Khanyile

-M Cur student Registration no. 996244

Signature



Province of KwaZulu-Natal Isifundazwe SakwaZulu-Natal Provinsie KwaZulu-Natal  
Health Services Ezempilo Gesondheidsdienste

DR BEL MBHELE  
TEL: 031-7074871  
FAX: 031-7072665

KwaDabeka CHC  
P.O. BOX 371  
Clernaville  
3602  
25<sup>th</sup> March 2000

e-mail: H993145 @ dohho. kzntl. gov. za.

ATTENTION: MRS OT KHANYILE  
Don Mackenzie Centre  
PO Box 27  
Botha's Hill  
3660

Dear Mrs Khanyile,

**RE: REQUEST TO CONDUCT RESEARCH AT OUTER WEST CLINICS IN  
FULFILMENT OF THE REQUIREMENTS OF M.Cur Degree: Unizul( Umlazi  
Campus).**

**Title: Perceptions on the effectiveness of Directly Observed Treatment –  
Shortcourse(DOTS) strategy for control of Tuberculosis in the OuterWest Health  
District in KwaZulu Natal Province.**

This confirms that you have been granted authority to conduct research on  
perceptions on the effectiveness of DOTS strategy for the control of TB in the  
following Clinics which fall under our jurisdiction:

- 1) Halley Stott
- 2) Mpumalanga
- 3) Msunduze.

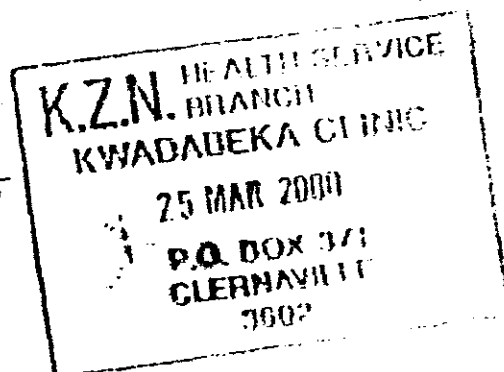
Receipt of the Research Proposal is also hereby acknowledged.

Kindly ensure that patient confidentiality is maintained and that, on completion of  
your thesis, the areas of research are acknowledged. We would appreciate receiving  
a copy of your dissertation .

Wishing you all the best in your educational endeavours,

Yours truly,

  
Head: KwaDabeka CHC



6 Abroth Road  
Westville North  
Westville  
3630  
17 March 2000

The Medical Superintendent

Dr J.I. Maxwell  
Don McKenzie Centre  
P.O.Box 27  
Bothashill  
3660

Dear Dr Maxwell

**REQUEST TO CONDUCT RESEARCH AT DON MCKENZIE CENTRE IN  
FULFILMENT OF THE REQUIREMENTS OF MYMASTERS DEGREE  
(M CUR) IN NURSING: UNIVERSITY OF ZULULAND DURBAN –  
UMLAZI CAMPUS.**

**TOPIC OF RESEARCH**

**Effectiveness of Directly Observed Treatment Short course Strategy (DOTS) for  
control of Tuberculosis in the Outer West Health District of Kwa Zulu-Natal  
Province.**


I write this letter to request permission to conduct research at Don McKenzie Centre  
in the Outer West Health District of Kwa Zulu- Natal.

Please find enclosed herein the proposal, which gives details of proposed study, proof of  
registration of the project with the research committee and the sample of  
questionnaires to facilitate your evaluation of this study. Copy of the research will  
be forwarded to your institution.

Thank you , for your cooperation

Yours Sincerely

O.T.Khanyile

Signature: 

M Cur student Registration no. 996244

# DON MCKENZIE CENTRE

(IN ASSOCIATION WITH TOC H SOUTHERN AFRICA)

FUND-RAISING NUMBER 06 600365 0006

ary's Office:  
DUNSTONE FINANCIAL SERVICES  
BOX 543  
F

764-6537  
764-5352



*"Ethembeni"*  
NPO No. 002-366

Centre:  
P.O. BOX 27  
BOTHAS HILL  
3660 NATAL  
TELEPHONE 777-1155/6  
FAX 777-1717

Attention: Mrs O.T Khanyile

Don McKenzie Centre  
P.O. Box 27  
Bothashill  
3660

17 March 2000

Dear Mrs Khanyile

Request to conduct research at Don Mc Kenzie T.B. Centre to fulfil requirements of Masters of Curationis Degree :University of Zululand Umlazi campus.

TITLE:

EFFECTIVENESS OF DIRECTLY OBSERVED TREATMENT SHORTCOURSE (DOTS) STRATEGY FOR CONTROL OF TUBERCULOSIS IN THE OUTERWEST HEALTH DISTRICT IN KWAZULU-NATAL PROVINCE.

This letter serves to confirm that you have been granted the authority to conduct the research on the perceptions on the effectiveness of Directly Observed Treatment Shortcourse (DOTS) Strategy for control of tuberculosis in this institution provided that you adhere to the following:

- Prior approval from the heads of departments is obtained
- Confidentiality is maintained
- The Centre is acknowledged , and
- The Centre receives the copy of the report on completion.

Yours truly,  
Medical Superintendent  
Dr J.I. Maxwell

P.O Box 2146  
Westville  
3630  
28June2000

The Director  
Dr Keith Wimble  
The Valley Trust  
P.O.Box 33  
Bothashill  
3660

Dear Dr Wimble

**REQUEST TO BE ASSISTED BY THE COMMUNITY HEALTH WORKERS  
DURING DATA COLLETION WHEN CONDUCTING RESEARCH IN  
THE OUTER WEST HEALTH DISTRICT OF KWA ZULU-NATAL  
PROVINCE IN FULFILMENT OF M CUR DEGREE IN NURSING AT  
THE UNIVERSITY OF ZULULAND (UMLAZI CAMPUS).**

**Topic of Research**

**Effectiveness of Directly Observed Treatment Shortcourse (DOTS) Strategy  
for control of Tuberculosis in the Outer West Health District of KwaZulu-Natal  
Province.**

I write this letter to request permission to be assisted by the Community Health  
Workers who operate under your jurisdiction in the Outer West Health District of  
KwaZulu-Natal Province , during distribution of questionnaires and data collection  
from T.B. Patients supervised by them under DOTS programme .

Please find herein the proposal, which gives details of proposed study ,and the sample  
of the questionnaires to facilitate your evaluation of this study.

Thank you,

Yours sincerely  
O.T.Khanyile  
Master of Curationis Student  
Registration no.996244

Signature





**A Centre for Comprehensive Primary Health Care**

Registration No.: 002-280 NPO

PO BOX 33, BOTHAS HILL, 3660, KWAZULU-NATAL, SOUTH AFRICA TELEPHONE: +27 (31) 777 1955 FAX: +27 (31) 777 1114

E-MAIL: vtrust@wn.apc.org WEBSITE: www.thevalleytrust.org.za

30 June 2004

Attention: Mrs OT Khanyile  
PO Box 2146  
WESTVILLE  
3630

Fax no.: 031-777 1717

Dear Mrs Khanyile

This letter serves to confirm that you have been granted permission to be assisted by the Community Health Workers in distributing questionnaires and in collecting data from tuberculosis patients on the DOTS programme which is supervised by them.

I wish you well with your research.

Kind regards

Yours sincerely

*Dr Keith Wimble*  
Dr Keith Wimble

**EXECUTIVE DIRECTOR**

Executive Director: Dr K Wimble

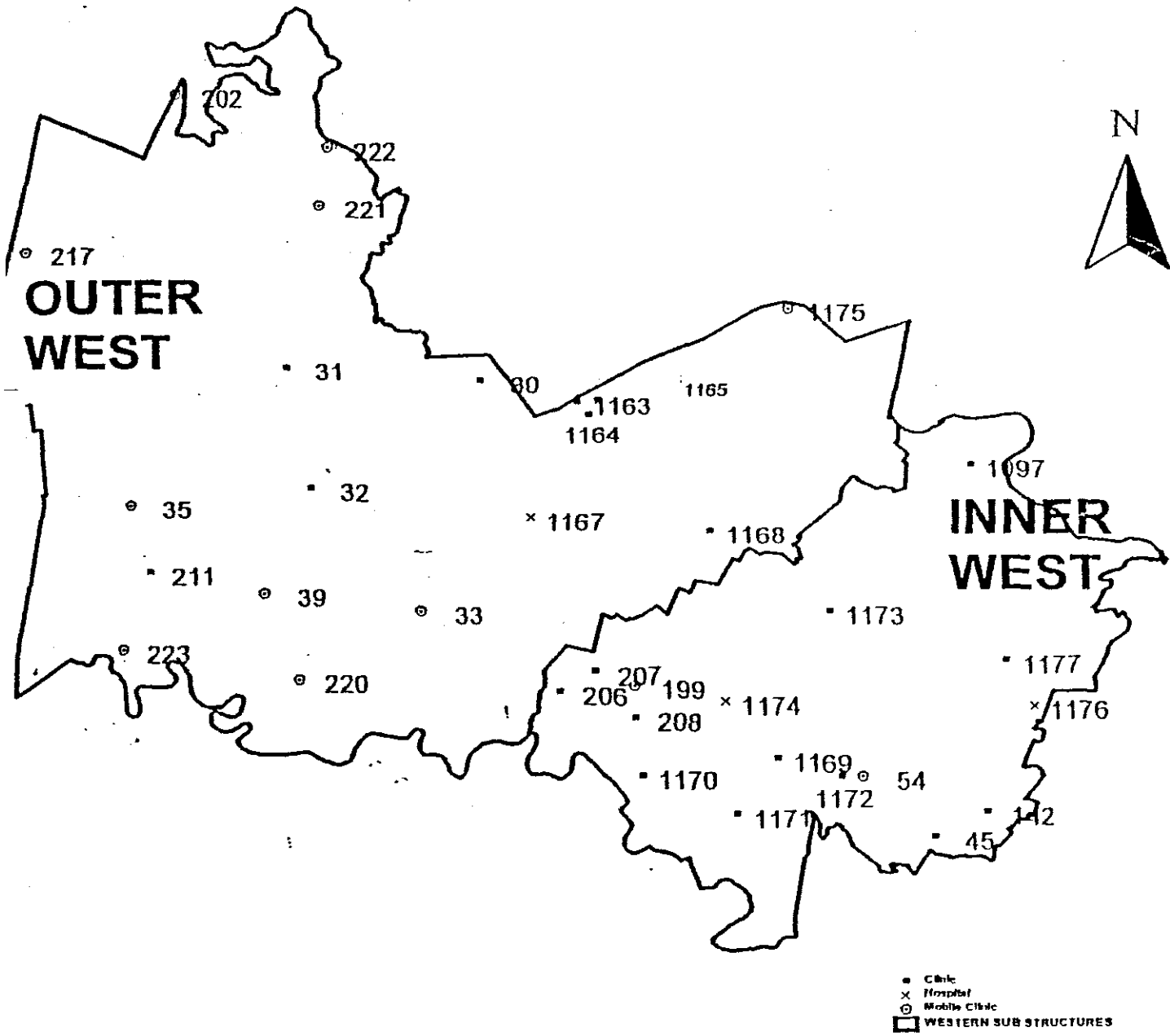
Trustees: Prof SV Nzimande (Chairman); Mr A Ewing; Mr M Mthiyane; Mr M Hodgkinson

## **ANNEXURE 3**

### **MAP OF DURBAN METRO WESTERN SUB-DISTRICT**

1. Map showing clinics, hospitals and mobile clinics in Durban Metro Western substructure areas.

# MAP SHOWING CLINICS, HOSPITALS & MOBILE CLINICS IN DURBAN METRO WESTERN SUB STRUCTURE AREAS



## **ANNEXURE 4**

### **ADMISSION AND DISCHARGE CRITERIA FOR TB PATIENTS**

1. Department of Health's Admission and Discharge criteria for TB patients.

## **ANNEXURE 5**

### **STANDARDISED TB TREATMENT REGIMENS**

1. Regimen 1 : New adult patients
2. Regimen 2 : Retreatment adult patients
3. Regimen 3 : Children with TB.

# C H A P T E R 9

## INITIATION OF TREATMENT

**NB:** Dosages of treatment five times per week in the intensive phase. For continuation phase treatment can be given five times or three times a week. Ensure that you give the correct doses.

### 9.1 (Regimen1) New adult patients

New smear positive and other serious pulmonary and extra pulmonary tuberculosis.

2 Months Initial Phase (treatment given 5 times a week)	Patient under 50 kg	Patient over 50kg
Combination tablet RHZE 120/60/300/200 mg*	4 tabs	5 tabs
4 Months Continuation phase (treatment given 5 times a week)	Patient under 50 kg	Patient over 50kg
Combination tablet RH 150/100 mg	3 tabs	
Combination tablet RH 300/150 mg		2 tabs

If conditions do not allow for giving treatment 5 times a week, treatment can also be given 3 times a week.

4 Months Continuation phase (treatment given 3 times a week)	Patient under 50 kg	Patient over 50kg
Combination tablet RH 150/100 mg	3 tabs	
H 100 mg	1 tab	
Combination tablet RH 300/150 mg		2 tabs
H 300 mg		1 tab

R=rifampicin; H=isoniazid (INH); Z=pyrazinamide; E=ethambutol; S=streptomycin

\*Ethambutol 225 mg in combination is also acceptable

**9.2 (Regimen 2) Retreatment adult cases**

**smear positive retreatment cases (failure, relapse and return after interruption)**

<b>2 months Initial Phase (treatment given 5 times a week)</b>	<b>Patient under 50 kg</b>	<b>Patient over 50 kg</b>
RHZE 120/60/300/200 mg*	4 tabs	5 tabs
streptomycin	750 mg	1000 mg
<b>3rd month (five times a week)</b>	<b>Patient under 50 kg</b>	<b>Patient over 50 kg</b>
RHZE	4 tabs	5 tabs

R=rifampicin; H=isoniazid (INH); Z=pyrazinamide; E=ethambutol; S=streptomycin

\*Ethambutol 225 mg in combination is also acceptable

<b>5 months Continuation Phase (5 times a week)</b>	<b>Patient under 50 kg</b>	<b>Patient over 50 kg</b>
RH 150/100 mg	3 tabs	
E 400 mg	2 tabs	
RH 300/150 mg		2 tabs
E 400 mg		3 tabs

**Note**

Streptomycin should be reduced to 750 mg per day to those older than 45 years and not be given to those over 65 years. It should also not be given during pregnancy.

\* Ethambutol 225 mg in combination is also acceptable

<b>5 months Continuation Phase (3 times a week)</b>	<b>Patient under 50 kg</b>	<b>Patient over 50 kg</b>
RH 150/100 mg	3 tabs	
H 100 mg	1 tab	
E 400 mg	2 tabs	
RH 300/150 mg		2 tabs
H 300 mg		1 tab
E 400 mg		4 tabs

### 9.3 (Regimen 3) Children with Tuberculosis

Pretreatment body weight	2 months initial phase (treatment given 5 times a week) RHZ 60/30/150 mg	4 months continuation phase (treatment given 5 times a week) RH 60/30 mg
3-4 Kg	1/2 tab	1/2 tab
5-7 Kg	1 tab	1 tab
8-9 Kg	1 1/2 tabs	1 1/2 tabs
10-14 Kg	2 tabs	2 tabs
15 -19 Kg	3 tabs	3 tabs
20 - 24 Kg	4 tabs	4 tabs
25 - 29 Kg	5 tabs	5 tabs
30 - 35 Kg	6 tabs	6 tabs

R = rifampicin; H = Isoniazid; Z = pyrazinamide

If conditions do not allow for giving treatment 5 times a week, treatment can also be given 3 times a week.

Pretreatment body weight	2 months initial phase (treatment given 5 times a week) RHZ 60/30/150 mg	4 months continuation phase (treatment given 3 times a week) RH 60/60 mg
3-4 Kg	1/2 tab	1/2 tab
5-7 Kg	1 tab	1 tab
8-9 Kg	1 1/2 tabs	1 1/2 tabs
10-14 Kg	2 tabs	2 tabs
15-19 Kg	3 tabs	3 tabs
20-24 Kg	4 tabs	4 tabs
25-29 Kg	5 tabs	5 tabs
30 -35 Kg	6 tabs	6 tabs

**Note**

Refer to weights before treatment for all regimens

All children with severe forms of tuberculosis (TB-bone, meningitis, spine, peritonitis, miliary TB) should be referred to hospital for management. Guidelines for management of such cases are different and longer.

### 9.4 Chemoprophylaxis

Active case-finding is recommended for all children under the age of 5 years. Such children in close household contact with a smear positive case of pulmonary TB or who are tuberculin skin test positive (see 11.3) should be given prophylaxis. The correct regimen to give as prophylaxis to a well child under 5 is 5mg of Isoniazid per kg for 6 months.

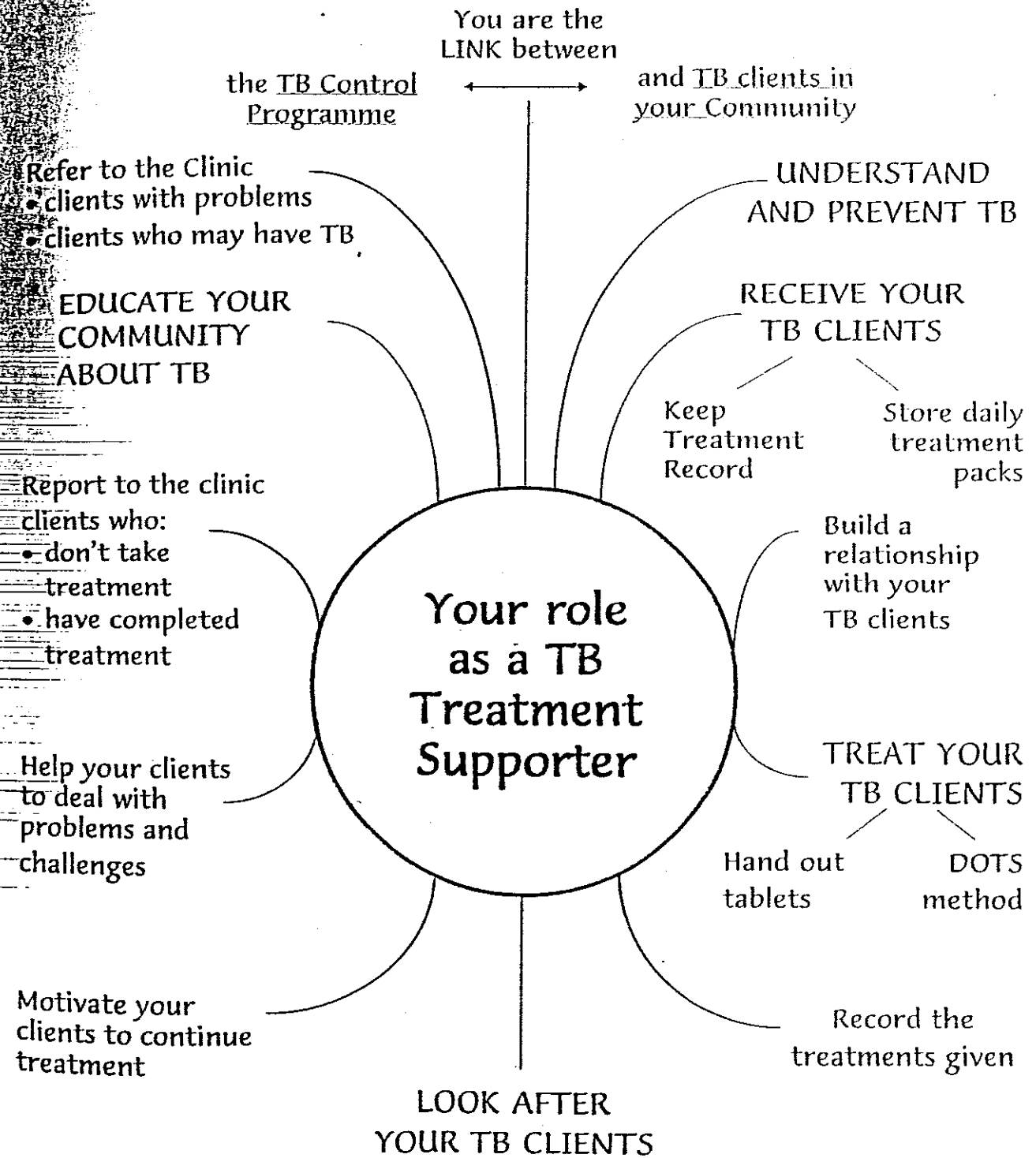
Routine chemoprophylaxis of those older than 5 years is not recommended.

## **ANNEXURE 6**

### **DIAGRAM : ROLE OF DOTS SUPPORTERS IN KWAZULU-NATAL**

1. Diagram showing a role of DOTS Supporters in Kabuli-Natal TB Control Programme

Use this diagram to discuss your role as a TB Treatment Supporter in the KwaZulu-Natal TB Control Programme:



## **ANNEXURE 7**

### **PATIENTS' RECORDS**

1. Patient transfer form - GW 20/14
2. Patient treatment card- GW 20/15



