



**A study to determine the predictors of Tuberculosis defaulting and the  
evaluation of the DOTS Programme within the eThekwinini  
Municipality**

**Submitted in fulfilment of the requirements of the degree of Master of  
Technology: Department of Community Health Studies: Environmental  
Health in the Faculty of Health Sciences at the Durban University of  
Technology**

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**Date:** 2010

## DECLARATION

The author hereby declares the content of this research project is the author's own unaided original work, except where specific indication is given to the contrary (by reference). This work has not been previously submitted to the Durban University of Technology (DUT) or any other University.

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**Date:** 2010

## PRESENTATIONS

**Poster presentation:** EVALUATION OF THE IMPLEMENTATION AND EFFICACY OF THE DOTS PROGRAMME TO COMBAT TB DEFAULTERS IN THE eTHEKWINI MUNICIPALITY: HEALTH UNIT. RAJAGOPAUL A, REDDY P, KISTNASAMY J<sup>1</sup>

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## ABSTRACT

Worldwide Tuberculosis (TB) is a major public health concern. The Directly Observed Treatment Strategy (DOTS) has been used widely internationally and in South Africa (SA) to control the disease yet defaulting on treatment has still not achieved its World Health Organization (WHO) guideline of 5.0%. The eThekweni Municipality reported a defaulter rate of 18.9% in 2007 even with the adoption of DOTS in 1996. This study aimed to investigate the predictors of default amongst informal dwellers of eThekweni and to evaluate the implementation and the efficiency of the DOTS programme within the eThekweni Municipality, KwaZulu-Natal (KZN), and SA.

The study population comprised of 102 defaulters from informal settlement, 16 nurses and 5 health personnel that are involved in TB management and control. The study was a mixed method cross sectional descriptive study that generated both quantitative and qualitative data. The Cyril Zulu Communicable Disease Centre (CDC) Electronic TB Register was used to trace the defaulters from the informal settlements that were interviewed. Non-defaulters were matched from the CDC Electronic TB Register but could not be traced due to accessibility and financial issues. Due to the low response from nurses 16(53%), semi structured qualitative interviews were conducted with health personnel. The three sets of data generated were analysed using descriptive statistics and content analysis.

Multivariate logistic regression models found smoking, drinking and having a family member with TB as statistical significant predictors of default. Based on the multivariate model with a 95% confidence interval (CI), smoking (OR: 11.23, CI: 5.79, 21.78;  $p \leq 0.005$ ), alcohol consumption (OR: 15.22; CI: 7.66, 30.25;  $p \leq 0.005$ ) and had family member with TB (OR: 4.60, CI: 2.34, 9.04;  $p \leq 0.005$ ) were all significantly associated with defaulting. It was apparent that DOTS implementation was partly implemented due to lack of human resources. Tracing of defaulters, DOTS supporters, DOTS sites and incentives to patients and volunteers were major challenges hindering the

effective implementation of the DOTS programme in eThekweni. Defaulting occurs as a result of an association between patient and health care characteristics. This study provides useful information specific to predictors of default amongst informal dwellers and the implementation and efficiency of the DOTS programme specific to informal settlements. The results from this study could be used to improve TB control and management specifically in informal settlements addressing factors that predict default and tracing and supporting patients to ensure adherence to TB treatment.

Dedicated to:

+

God, Jesus Christ

Dad Walter; Mum Joyce & family

My special Friends

&

best friends Sheena and Seema

“I can do all things through Christ that strengthens me” (Philippians 4:13)

“Faith is the substance of things hoped for and the evidence of things not seen” (Hebrews 11:1)

*In loving memory of TICO (1998-2011)*

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## **LIST OF ABBREVIATIONS**

<b>AIDS:</b>	Acquired Immune Deficiency Syndrome
<b>CDC:</b>	Cyril Zulu Communicable Diseases Centre
<b>DOH :</b>	Department of Health
<b>DOTS:</b>	Directly Observed Treatment Strategy
<b>EHO:</b>	Environmental Health Officer
<b>EHP:</b>	Environmental Health Practitioner
<b>HIV:</b>	Human Immunodeficiency Virus
<b>KZN:</b>	KwaZulu-Natal
<b>LHW:</b>	Lay Health Workers
<b>MDR-TB:</b>	Multiple Drug Resistant Tuberculosis
<b>SA:</b>	South Africa
<b>TB:</b>	Tuberculosis
<b>TI:</b>	Treatment Interrupter
<b>XDR-TB:</b>	Extremely Drug Resistant Tuberculosis
<b>UK:</b>	United Kingdom
<b>URC:</b>	University Research Council
<b>IUATLD:</b>	International Union against Tuberculosis and Lung Disease
<b>USAID:</b>	United States Agency of International Development
<b>WHO:</b>	World Health Organization

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Introduction to the study**

Tuberculosis (TB) is a major global public health concern and causes approximately 2 million deaths per year (Hill et al., 2006 and Xu et al., 2009) and requires adherence to long term treatment and tracing of patients and hence is a notifiable disease in most countries around the world (Cayla et al., 2009). It is a leading infectious disease in low and middle income countries (Harling et al., 2008). Additionally, this scenario is exacerbated by extreme poverty, inadequate health facilities, rampant HIV infection rates and defaulting on treatment (Glassroth, 2005; Khan et al., 2002).

South Africa has a long history of high TB burden where in 2005, the estimated national incidence of TB was 600 cases per 100 000 persons per annum, the third highest rate in the world (Harling et al., 2008:493). TB is a communicable disease that is curable by completing a strict 6 month treatment regimen (Paliwal, 2010). However, despite the availability of medication, patients still do not complete this regimen. Defaulting then may lead to death, relapse and resistant strains of TB (Ntshanga et al., 2009). In the South African context, Kandel et al., (2008:47) reported that major predictors of default include: change of living space, lack of money for visiting the clinic to collect treatment, feeling better and lack of available drugs at the clinic. As defaulting is a major challenge of TB control programmes (Dodor and Afenyadu, 2005), ensuring the completion of treatment for patients with TB, is therefore a high priority (Snyder and Chin, 1999:582)

To positively address the defaulter challenge, the Directly Observed Treatment Strategy (DOTS) was implemented in 1996 by the eThekweni

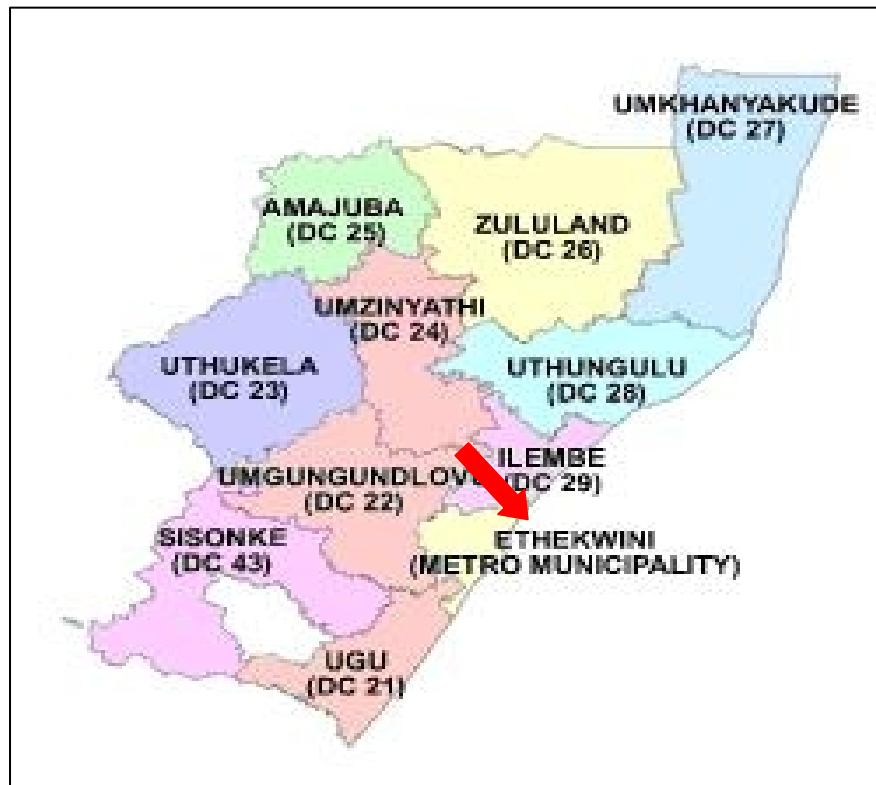
Municipality: Health Unit, a local municipality located in Durban, South Africa servicing both formal and informal areas. This involved patients being observed taking their treatment. The municipality has implemented a TB Crisis Plan (Annexure 1) that is used in conjunction with the South African National Tuberculosis Programme (SANTCP): Practical Guidelines 2004. This is an endeavour to improve the diagnosis and treatment of patients diagnosed with TB; to focus on tracing TB defaulters and to implement health education. Although this serves as an effective method, there is still a high incidence rate of TB sufferers and a high defaulter rate within the eThekweni Municipality's service areas (Dlamini, 2008 and Liebetrau, 2009: personal communication).

## **1.2 Background to the problem**

Durban, with a population of 3.2 million, forms part of the eThekweni Municipality, a local authority servicing a number of formal and informal areas (National TB Crisis Plan: eThekweni Municipality, 2009). In terms of this research study, eThekweni Municipality and eThekweni is used to refer to the Health Department clinics and to the study areas respectively. Durban (eThekweni) and surrounding areas are divided into various sub-districts and zones. There are three districts North, South and West and is made up of 8 zones comprising of both formal and informal housing and include the informal areas: Cato Manor, Clairwood, Inanda, Kwa Mashu, Ntuzuma and Wentworth.

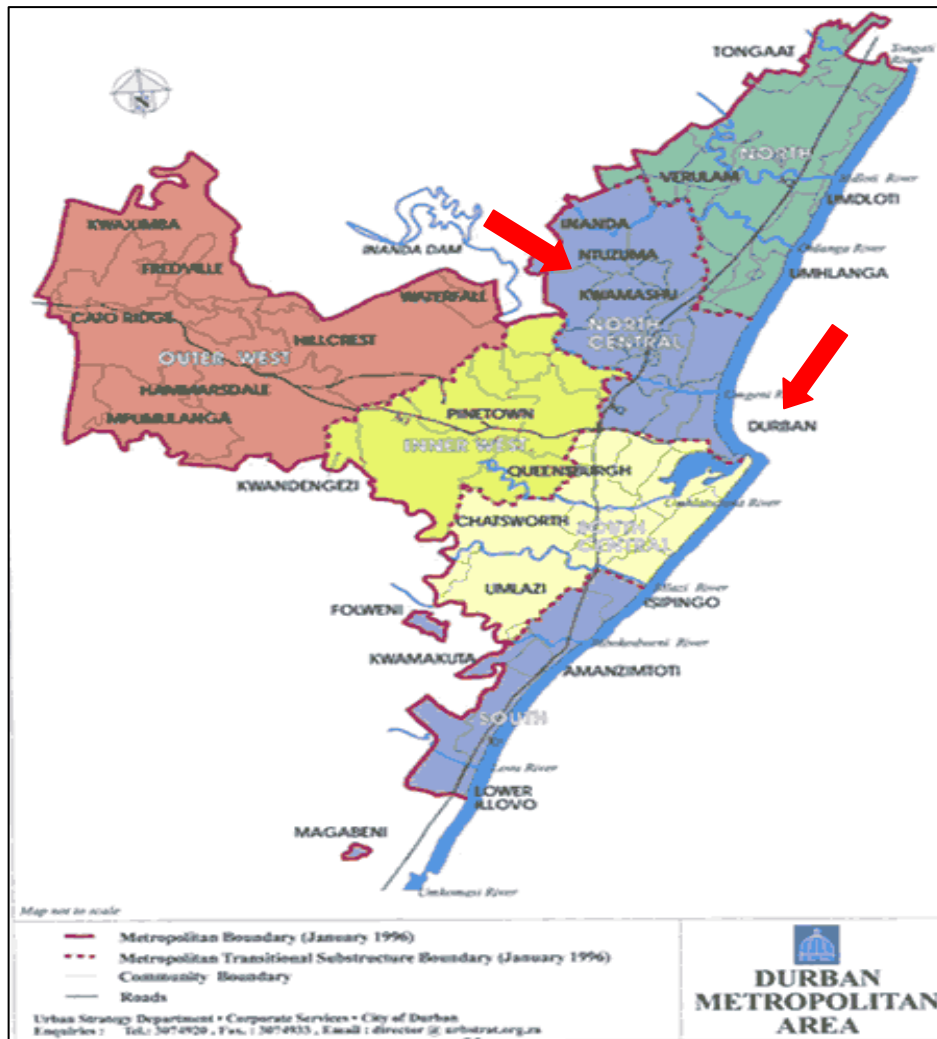
Figure 1.1 below depicts the various districts in KwaZulu Natal (KZN), South Africa (SA). eThekweni was formerly known as the Durban and surrounding areas. There are essentially three sub-districts North, South and West and is made up of eight zones (Figure 1.2) comprising of both formal and informal housing such as Cato Crest, Bottlebrush, Shoyamoya, Burlington Halt and Bhambayi, parts of Kwa Mashu, Inanda, and Ntuzuma, Umlazi and Lamontville amongst others that lie within the eThekweni Municipality's jurisdiction. Additionally there are other informal dwellers that reside in areas

like Clairwood and Wentworth. One of the eThekweni Municipality's: Health core functions is to protect public health and entails delivering free Primary Health Care (PHC) to communities (Liebetrau, 2010: personal communication). Figure 1.2 highlights the different areas serviced by this particular municipality.



**Figure 1.1: Map showing eThekweni in the context of KZN, SA**

Source: KZN Department of Transport



**Figure 1.2: Map of the eThekweni Municipality: Health Unit jurisdiction**

Source: eThekweni Municipality (2010)

The study area is composed of **Inanda, Ntuzuma, Kwa Mashu, Durban (Cato Manor, Clairwood and Wentworth)** – all of which are depicted in Figure 1.2.

On randomly reviewing TB data for the year 2008, it was found that TB was a common infectious disease affecting many areas within eThekweni. Employees of the eThekweni Municipality: Health Unit, were consulted in an attempt to gain insight into the TB burden facing this municipality. These consults revealed that TB was a major concern with respect to specific



settlements in the South district namely: Cato Manor and the Cato Crest informal area (Bennett, 2008: personal communication) and this is evidenced for example by Ntshangas' et al. (2009a) study which reported a case load of 9 830 between October 2007 - February 2008 in eThekweni. TB was and still remains a major, ongoing problem in eThekweni with a defaulter rate of 18.9% in 2007 (National TB Crisis Plan: eThekweni Municipality, 2009) noting that TB patients defaulted on treatment regardless of the availability of drugs and accessibility to health facilities.

### **1.3 Rationale of the study**

TB Studies (Liendhardt et al., 2005 and Bates et al., 2007) and, specifically, risk factors have been done repeatedly in different settings revealing that host related and environmental factors are risks for the disease (Hill et al., 2006). Numerous studies have been done in different setting regarding predictors of default (O'Boyle et al., 2002; Hill et al., 2006; Holtz et al., 2006 and Tshabalala, 2007). An intense literature search has shown similar studies that focussed on defaulters (Tshabalala, 2007 and Norgbe, 2008). However investigation and the evaluation of the DOTS programme simultaneously in a municipality and more especially with regards to an informal settlement was unknown. It is therefore, hypothesized that predictors of defaulters are rife in the informal settlements especially as these areas have high unemployment rates and poverty. There are valid reasons to determine the predictor factors of defaulting as non adherence to medication results in resistant strains of TB. This then puts this particular community at risk of contracting and further spreading the disease in an already immuno-compromised population and therefore possibly increasing the mortality and morbidity rates.

### **1.4 Significance of study**

This study can be used by eThekweni Municipality as a planning tool to better manage and control TB especially with regarding to defaulters residing in informal settlements. By focussing on a specific population such as informal

dwellers, reasons for not adhering to treatment can be determined. Evaluation of the DOTS programme will allow for any gaps to be recognized and appropriate recommendations suggested to better manage TB among informal dwellers.

### **1.5 Research problem /Objectives**

eThekwini reported a defaulter rate of 18.9% for the year 2007 below the WHO target of 5.0% (National TB Crisis Plan: eThekwini Municipality, 2009).

The following key questions were derived from the above problem statement:

- What is the prevalence of defaulting in eThekwini?
- Do informal dwellers present with different risk and/ or predictor factors that make them more susceptible and how then, do these factors influence defaulting?
- How is the DOTS programme implemented?
- Who is responsible for supporting TB patients?
- Who is responsible for tracing TB defaulters?
- Is the DOTS programme effective?

### **1.6 Aims**

This study aimed to, within the jurisdiction of the eThekwini Municipality for the period January 2007 until June 2009:

- determine the prevalence and predictors of default from TB treatment among informal dwellers and;
- evaluate the efficiency and implementation of the Directly Observed Treatment (DOTS) programme in TB management.

### **1.7 Hypothesis**

It was hypothesized that defaulters residing in informal settlements are prone to risk factors for TB that exacerbate default on TB treatment.

## 1.8 Overview of the research methodology used

After tracing TB defaulters via the Cyril Zulu Communicable Disease Centre (CDC) Electronic TB Register, relevant data was gathered from TB defaulters and nursing personnel from the eThekweni clinics. To supplement the study, health personnel (nurses, EHAs and CDC staff) of the eThekweni Municipality: Health Unit participated in semi structured in depth interviews. A literature review assisted in gaining knowledge into the various research methodologies, sampling, data collection and analysis. This study generated both quantitative and qualitative data. The quantitative aspect was analysed using STATA version 11 and Microsoft Excel 2003 whilst the qualitative aspect was content analyzed.

## 1.9 List of definitions

### 1.9.1 Key concepts:

- **Adherence:** means adhering to the recommended treatment course by taking the entire prescribed medications for the complete time necessary which is initially a 6 month treatment duration (SANTCP, 2004)
- **Co infection:** in terms of this study to be infected with both TB and HIV/AIDS at the same time
- **Continuous phase medication:** is given for the next four months where 2-3 tablets are taken again dependent on body weight (KZN Health, 2008)
- **Defaulters:** Patients whose treatment has been was interrupted for more than two consecutive months before the end of the treatment period (SANTCP, 2004 and Dodor and Afenyadu, 2005)

- **DOTS sites:** in the context of this study, it is any place where a person is administered and observed taking their TB treatment that includes their homes, workplace, churches and shops e.t.c
- **DOTS Supporter:** according to this study is someone who observes or supervises a TB patient swallowing their medication and ensuring that the patient completes treatment. DOTS supporters include health personnel, family members and employers amongst others
- **DOTS Programme/ Strategy:** is composed of five distinct elements: political commitment; microscopy services; drug supplies; surveillance and monitoring systems and use of highly efficacious regimens; and direct observation of treatment. The purpose of DOTS is to ensure that the patient with tuberculosis (TB) completes therapy to cure and to prevent drug resistance from developing in the community (SANTCP, 2004).
- **Electronic TB Register:** Kept in all facilities and is used to collect all the information pertaining to a specific patient that will include their demographic, disease classification, treatment regimen, monitoring and outcomes for each registered (SANTCP, 2004)
- **Extremely Drug Resistant Tuberculosis (XDR TB):** caused by strains of *Mycobacterium tuberculosis* that are resistant to Rifampicin and Isoniazid and in addition also resistant to any fluoroquinolone and at least one of the three injectables used as second line drugs for the treatment of MDR-TB (Capreomycin, Amikacin and Kanamycin) (Mc Laughlin, 2007)
- **Health personnel:** in the context of this study refers to nurses and Environmental Health Practitioners (EHPs), and anyone that is involved in TB management and control

- **Human Immunodeficiency Virus/ Acquired Immune Disease Syndrome (HIV/AIDS):** HIV is a virus that attacks the body's immune system, making it unable to fight infection. AIDS is the most serious stage of the HIV infection that results from the destruction of the infected persons immune system(Johanson, 2007)
- **Incentives:** in the context of this study refers to either in the form of money or food parcels given either to supporters in the form of money and money and food parcels to patients encouraging treatment adherence
- **Intensive phase of medication:** Intensive phase medication is given for the first two months i.e. 4 – 5 tablets depending on body weight and should be taken Monday to Friday (KZN Health, 2008)
- **Informal dwellers:** in the context of this refers to people living in informal settlements
- **Informal settlements:** in the context of this study refers to shack settlements within eThekweni that have basic or no access to either electricity and/ or piped water
- **Multiple Drug Resistant Tuberculosis (MDR-TB):** is caused by strains of M. tuberculosis that are resistant invitro to both rifampicin and isoniazid, with or without resistance to other drugs (SANTCP, 2004:65)
- **Primary Health Care:** is essential health care based on practical, scientifically sound and socially acceptable to individual (Jones, 2005)
- **Tracing:** physically tracking down a patient that has interrupted their treatment (defaulter) and rendering health education and putting them

back on a treatment regime; Tracing is carried out to obtain reliable information about who has truly died, transferred out or stopped treatment, and, if possible, to persuade those who have stopped treatment to resume (Ohkado et al., 1998, 1998:551)

- **Treatment regime:** standard treatment of Isoniazid that should be taken for 6 months (SANTCP, 2004)
- **Tuberculosis (TB):** is an infection often caused by *Mycobacterium tuberculosis*, transmitted exclusively by inhalation of infective droplets from patients with pulmonary tuberculosis through coughing, sneezing, talking or spitting (Bello, 2010)
- **Sputum test:** This specimen is obtained immediately after the patient undergoes a bout of coughing and the back of the throat is cleared to expel the sputum (SANTCP, 2004:15).
- **Volunteer:** in terms of this study it is a person who renders their service of observing a patient taking their TB treatment and not being paid.
- **Extremely Drug Resistant Tuberculosis (XDR-TB):** is caused by *Mycobacterium tuberculosis* resistant to the first-line drugs isoniazid and rifampin, and to any fluoroquinolone and to at least 1 of 3 injectable second-line drugs (Basu et al., 2009).

### 1.9.2 Research Design/ Methodology

- **Sequential mode:** is sequential mixed methods data collection strategies involving the collection of data in an iterative process whereby the data collected in one phase contribute to the data collected in the next (Driscoll et al., 2007)

- **Quantitative research:** is the systematic collection of numerical information, often conditions of considerable control and analysis of that information using statistical procedures (Polit and Beck, 2008:449)
- **Qualitative research:** explores peoples' subjective understandings of their everyday lives (Pope and Mays, 2006: 6).
- **Content analysis:** refers to the set of techniques that are used to identify measure, describe and make inferences about specified characteristics within or reflected by written or verbal text (Waltz et al., 2010: 279).
- **Confounder:** is a special type of bias, where the effect of the factor under consideration is mixed up with effects of other factors not directly relevant to the study (WHO, 2001)
- **Cross sectional study:** measure the prevalence of disease and are often referred to as prevalence studies. Data from such studies are helpful in assessing the health care needs of populations (Bonita et al., 2006:44)
- **Descriptive study:** a simple description of the health status of a community, based on routinely available data or on data obtained in special surveys (Bonita et al., 2006:40).
- **Study Population:** is as the aggregate or totality of all the objects, subjects or members that conform to a set of specifications Polit and Hungler (1995:35).
- **Study tools/instruments:** is the instrument that the researcher chooses to use in collecting data (Polit and Hungler, 1995:310)

- **Sample and sampling:** Sampling is the process of sampling a representative portion of the population, as it is not always possible to study the whole population (Polit and Hungler, 1995:278)
- **Purposive sampling:** is sometimes called judgemental sampling. It is a type of sampling in which a researcher more or less handpicks cases (Stommel and Wills, 2004:302).
- **Non-probability sampling:** any technique in which samples are selected in some way not suggested by probability theory. Examples include purposive sampling (Babbie, 2010: 192)
- **Data collection:** is the precise, systematic gathering of information that is relevant to the research purpose or specific objectives, questions or hypothesis of a study (Polit and Beck, 2008:67)
- **Data Analysis:** entails categorising, ordering, manufacturing and summarising the data and describing them in meaningful terms (Brink, 1996:179).
- **Reliability and Validity:** Reliability of an instrument is the degree of consistency with which the instrument measures the attribute (Polit and Hungler, 1995:277). Validity is the degree to which an instrument measures what it is supposed to be measured (Polit and Hungler, 1995:277).
- **Ethical considerations:** Ethics is a system of moral values that is concerned with the degree to which research procedures adhere to a profession as legal and social obligations to the study participants (Polit and Hungler, 1995:701)



### **1.10 Outline of the study**

**Chapter 1:** brief synopsis of the study

**Chapter 2:** elaborates on the reviewed literature

**Chapter 3:** describes the methodology used

**Chapter 4:** reports the results and data analysis

**Chapter 5:** examines the findings of the study including challenges, strengths and limitations

**Chapter 6:** concludes the study, suggests recommendations to be implemented and directions for future studies

### **1.11 Conclusion**

This chapter introduced the reader to the study and provided background, rationale and significance while noting the objectives, research questions and methodology that guided the study. Chapter 2 will elaborate on relevant reviewed literature relating to this study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

According to Polit and Beck (2008:105), a literature review is conducted to assist researchers to comprehend and extend their knowledge of the phenomenon under study. Babbie and Mouton (2001:565) added that the purpose of the literature review is to determine the extent to which the topic under study is covered in the existing body of knowledge. In the light of the above, this chapter then discusses the relevant literature pertaining to this study.

#### **2.2 Status Quo of TB worldwide**

Globally 9.2 million new cases and 1.7 million deaths from TB occurred in 2006, of which 0.7 million cases and 0.2 million deaths were in HIV positive people (WHO Report, 2008). Therein alone lies a major challenge for TB control and even more so in South Africa, as HIV/AIDS is not a notifiable disease (Bennett, 2008: personal communication) and is thus a major confounder in this study.

In 1993, the World Health Organization (WHO) declared Tuberculosis (TB) a global emergency - the disease being a leading cause of morbidity and mortality worldwide as one-third of the global population was infected and 2 million people died annually (Dolin et al., 1994; Stewart and Robertson, 2003). The case incidence was increasing as a result of escalating poverty and population growth (Floyd et al., 1997). Additionally, the HIV pandemic presented a massive challenge for global TB control with the disease occurring in 7-10% of patients each year (Frieden et al., 2003) thus increasing the risk for TB infection. Most deaths are in low and middle-income countries where the major challenge is to ensure that drugs are

available and people complete the long treatment (Maher et al., 2003).

### **2.3 Status Quo of TB in South Africa**

Van Rooyen (2008) noted that the TB epidemic is poorly controlled in South Africa (SA), with local disease rates up to 60 times higher here than in the USA and Western Europe. South Africa (SA) is ranked 4<sup>th</sup> on the list of 22 countries hardest hit by TB (Ntshanga et al., 2009). Yet, despite intensive TB control investments, progress toward reaching programme objectives of obtaining above 85% cure rates has been little (Ntshanga et al., 2009). This is as a result of poor societal response and lack of community involvement in patient care. This roll on effect then creates a negative impact on treatment success and cure rates due to the high defaulter rates. Their (Ntshanga et al., 2009) study reported that in KwaZulu-Natal (KZN), the cure rate is 56% and the incident rate is 1046/100 000 population, of which 30% is from the eThekweni District (Durban).

The strategy of the eThekweni Municipality is 'to provide an effective, efficient and cost effective Communicable Disease Service, to the citizens of eThekweni, thus contributing towards the prevention, promotion, intervention and management of communicable diseases, thereby reducing morbidity and mortality caused by communicable diseases', including TB (eThekweni Online, 2010). One of the key objectives of the municipality is to provide specialized services to diagnose manage and treat TB with 135 facilities offering TB services with further sub-districts offering 18 primary health care service areas (National TB Crisis Plan: eThekweni, 2009). This is especially important because of TB being an opportunistic infection/disease particularly amongst HIV/AIDS patients and because of the high TB burden faced by eThekweni and the high prevalence of HIV/AIDS in South Africa (Liebetrau, 2009: personal communication).

It is envisaged that the case load in eThekweni, of 9 830 reported for the period October 2007 - February 2008 by Ntshanga et al., (2009), will remain

the same or increase until the contributing factors and predictor factors of TB treatment default are reviewed and appropriate recommendations are implemented (Liebetrau, 2009: personal communication). Therefore, in order to make recommendations one needs to focus on the epidemiological nature of the disease namely distribution and determinants with specific focus on the TB treatment defaulters amongst informal settlements.

## **2.4 Informal Settlements and TB**

Informal settlements (also known as shacks in the SA context) are dense squatter settlements illegally situated in formal residential areas (Naidoo et al., 2008) and exist because urbanization has grown faster than a government's ability to provide land, infrastructure and housing. Figure 1.3 depicts a typical example of such a settlement in eThekweni.



**Figure 1.3: A typical informal settlement (Cato Crest) within the eThekweni jurisdiction**  
**Source: ([www.northwestern.edu/.../photo\\_gallery2.html](http://www.northwestern.edu/.../photo_gallery2.html))**

Living in these shacks often poses significant health risks and increases one's susceptibility to disease including HIV/AIDS and TB (Coetzee et al., 1988). HIV and TB 'go hand in hand' where HIV infected patients are more susceptible to acquiring TB infection; and TB is the main reason for deaths amongst people living with HIV as proven by numerous global studies (Selwyn et al., 1989; Corbett, 2003; Frieden et al., 2003; Shargie, 2006 ; and

Worley, 2006). Contributing risk factors such as the degree of exposure to adults with active TB, gender (Tam et al., 2003), immune-compromising conditions, poverty, malnutrition, substance abuse, high levels of unemployment, social displacement, poor sanitation, lack of potable water, inadequate food storage facilities and basic cooking and heating facilities can exacerbate respiratory illnesses (Coetzee et al., 1988; Hill et al., 2006; Beith et al., 2009 and Harling et al., 2008). This clearly illustrates why poor communities are particularly vulnerable to contracting TB (Dlamini, 2008: personal communication). Gender wise - males are at greater risk of contracting TB with most new cases occurring in adults aged 15–49 years (Borgdorff et al., 2000; Glassroth, 2005 and Pinidiyapathirage et al., 2008). It is believed in SA that men are responsible to provide for their family and due to their masculinity may default. It is postulated that they sometimes will prefer to seek employment and provide for their families than seek medical help. In eThekweni, these settlements have access to free health education, mobile clinics and immunization services (Liebetrau, 2009: personal communication). Despite such prevention strategies being available in eThekweni, the prevalence of TB is still problematic and defaulting from treatment is a constant threat.

Although monthly TB defaulter rates are not relatively high at the eThekweni clinics - considering its attended by approximately 17 000 annually of which 100 per month may default, (Dlamini, 2008: personal communication and Liebetrau, 2010: personal communication), this study focussed on the defaulter rates of informal dwellers as even one patient that defaults on treatment, is liable to rapidly spread the bacillus, more especially in an area such as an informal settlement.

## **2.5 Tuberculosis (TB)**

Tuberculosis (TB) is a highly contagious airborne infection caused by the *Mycobacterium tuberculosis* (SANTCP, 2004). Pulmonary TB is the most common and is easily spread when a person coughs, speaks or sneeze

(Norgbe, 2008). A persistent cough for 2 weeks or more is the main symptom with one or more of the accompanying symptoms: chest pain, shortness of breath, weight loss, tiredness, fever, night sweats, loss of appetite, and coughing blood (Norgbe, 2008:13). Each person with active TB will infect, on average, 10-15 people yearly (Tsang et al, 2010). TB is a curable disease if detected and treated in its early stages, where patients are required to undergo prolonged completed treatment with antibiotics (Zvavamwe and Ehlers, 2009).

TB is diagnosed by means of a sputum test, chest x ray, skin test or blood assay used either collectively or separately (SANTCP, 2004). Improper diagnosis and treatment, poor adherence to medication and the presence of multi-resistant TB and HIV/AIDS can lead to TB deterioration and increases the risk of morbidity and mortality in patients (Bello, 2010). Additionally a recent South African study (Abdool Karim et al., 2010) concluded that simultaneous treatment of HIV and TB improved survival. Therefore treatment completion is imperative. Immunization with effective vaccines is the best hope of beating TB but for now the only solution to defeat TB is to prevent the disease from occurring hence the importance of completing treatment in order to stop the spread of infection (Walsh, 2008).

## **2.6 TB treatment**

According to the SANTCP (2004), the five aims of TB treatment is to:

1. cure the client of TB,
2. decrease TB transmission to others,
3. prevent the development of acquired drug resistance;
4. prevent relapse and;
5. prevent death from TB or other complications.

Bloom (1994) argues that while a consensus is emerging on the optimal regimen for treating smear-positive pulmonary TB, shorter regimens will

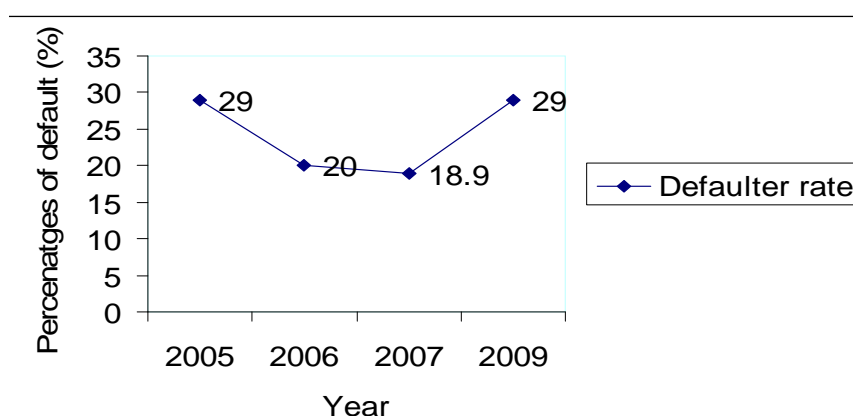
probably lead to higher treatment completion rate and thus a higher cure rate. Medication must be started as soon as possible and must be taken daily according to instructions given by the clinic. It takes 6 months of treatment for TB to be cured completely but within two weeks of treatment, the patient is no longer contagious (KZN Health, 2008; SANTCP, 2004). There is a wide range of essential TB drugs making up the treatment regimen that includes Isoniazid, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin (SANTCP, 2004) and comprises of an intensive phase and continuation phase of treatment. According to Dlamini (2008: personal communication), medication will now need to be taken for the whole 7 days instead of 5 days as done previously. Latest research in treating co-infected HIV and TB patients indicated that the two diseases could be treated simultaneously. The past treatment of commencing HIV treatment after TB infection was cured has been disregarded (Gandhi et al, 2009). At the eThekweni Municipality, medication is not administered in accordance with the SANTCP, 2004 but instead patients are given their monthly supply of medication and are required to return to the clinic once the medication is finished due to staff shortages and the high number of attendees per day at the clinic (Liebetrau, 2010b: personal communication). However, TB drugs cause many side effects that include hepatitis, fever, joint pains, and abdominal pain amongst others and are believed to predict default. There are also management strategies for these side effects documented in those guidelines that can be given to patients to better manage the side effects to facilitate adherence to TB treatment however it is unknown as to whether it is being used to educate the TB sufferers. (National Tuberculosis Guidelines, 2008).

## **2.7 PREVALENCE OF DEFAULTING**

Developing countries for example, India, Uganda and Namibia had a reported defaulter rate of 70-90%, 40% and 51.4% respectively (Taidhi et al., 2002; Chatterjee et al., 2003; Zvavamwe and Ehlers, 2009) whereas a developed country such the United States of American reported a default rate

of 1.7% (Snyder and Chin., 1999). In India and Uganda, health systems are probably weak and there may have been staff shortages as evident in KZN (SA), another developing country (Ntshanga et al., 2009). A possible reason for Namibia's high defaulter rate was amongst others poor data management, poor record keeping and poor follow-up systems of non-adherent TB patients (Zvavamwe and Ehlers, 2009). It is postulated that USA being developed country are not faced with all the challenges faced by developing countries to manage TB. Furthermore due to ethnicity and living conditions, the American population are not very susceptible to TB (Lobato et al., 2005).

Figure 1.4 documents the defaulter rates for eThekweni. However, defaulter rates for KZN in 2004 to 2006 was 23% whilst in the first quarter of 2007, the defaulter rate was 17.4% (KZN Health., 2007). In KZN, there has not been a substantial decrease in the TB defaulter rates for the period 2001-2005. Locally eThekweni reported a defaulter rate of 29% in 2005 (National TB Crisis Plan: eThekweni Municipality, 2009) and 20% in 2006 which dropped to 18.9% in 2007. Thereafter it increased to 29% in 2009 (Ntshanga et al., 2009a). Defaulter rates for 2010 were inaccessible at the time of publication.



**Figure 1.4: Defaulter rates of eThekweni 2005-2009**

Source: National TB Crisis Plan: eThekweni Municipality, 2009 and Ntshanga et al., (2009)



This may be attributed to the patients dying, not returning to the clinics or providing incorrect addresses and therefore no records exist (Liebetrau, 2009a: personal communication). Alternatively, it could mean that the Directly Observed Treatment Strategy is effective. Hence, this study will also help shed light on the perceptions of nurses (who act as the primary service providers) on the DOTS programme's implementation and efficiency with special reference to TB defaulters residing in informal settlements.

## **2.8 Defaulters**

The term 'defaulter' has various definitions. A defaulter is defined as a patient that interrupted treatment for two or more months (Vijay et al, 2003 and Pinidiyapathirage et al., 2008). Then according to the SANTCP (2004), a defaulter is defined as a patient whose treatment was interrupted for two consecutive months or more. However, the eThekweni Municipality define a defaulter as a weekly attendee that did not come to the clinic to pick up the medication to complete treatment (Liebetrau, 2009a: personal communication). A patient missing even one dose of treatment is considered a defaulter at the eThekweni Municipality (Liebetrau, 2009: personal communication). This shorter time period categorising a defaulter is followed to ensure that the patient is returned to their regimen as soon as possible. Patients that default on TB treatment are referred to as Treatment Interrupters (TI) in eThekweni. People need to change their mindsets as suggested by Jaiswal et al. (2003), eThekweni prefer to refer to those that stop their treatment as "treatment interrupters" instead of the derogatory term "defaulters" in an effort to avoid the stigma attached to the disease.

## **2.9 PREDICTORS OF DEFAULTING**

One of the major obstacles to treatment management and an important challenge for TB control is defaulting (Vijay et al., 2003, Upke, 2007) as a person who does not complete and return to treatment is at risk of infecting other persons with TB (Pinidiyapathirage et al., 2008). Defaulting may

increase the risk of developing drug resistant TB strains and may prolong infectiousness, relapse and death (Volmink and Garner, 2004; Shargie, 2006; Pinidiyapathirage et al., 2008 and Liebetrau, 2009a: personal communication). Numerous studies have been conducted to determine the predictors of default in different countries (Shargie, 2006; Pinidiyapathirage et al., 2008, Lamsal et al., 2009). Non adherence was mentioned to possibly result as a result of the interplay between numerous factors including social, economic, patient, demographic, environmental and health care system factors (Liebetrau, 2009: personal communication). These categories will be discussed further as follows:

### **2.9.1 Socio economic and demographic characteristics:**

#### **2.9.1.1 Poverty**

Poverty is known to exacerbate TB and is linked to TB defaulting (Nkabinde, 2008). Interestingly though, Mankodi (1982) did not find an association between poverty and TB defaulting, noting that people defaulted irrespective of whether they were categorized as poor or not. Therefore it is important to identify other default predictors aside from poverty. This was evident within eThekweni as there was high defaulter rates captured in the Electronic TB Register (CDC) for patients who resided in formal areas, suggesting there may be other reasons exacerbating defaulting. Poverty however did contribute to the use of health care service factors such as long distances to clinics and not having travel money (Tissera, 2003 and O' Boyle et al., 2002). For example in Hlabisa, KZN, patients could not access clinics because they could not afford taxi fares (Edginton, 1999).

#### **2.9.1.2 Demographic characteristics**

Gender and age also plays an important role in TB defaulting as numerous studies have highlighted that males are more likely to default from treatment (Chan-Yeung et al., 2003; Demissie and Kebede., 1994a; Comolet et al.,

1998; Al-Hajjaj and Al-Khatim, 2000) and this was higher in individuals over 65 years old (Hasker et al., 2008). Holtz et al., (2006) found men to be older than women ( $p < 0.001$ ). Non compliance tended to be positively related to patients' age with the young patients at the lowest risk of non-compliance, and elderly (over 60 years) patients more likely to default from the prescribed regimen (Al-Hajjaj and Al-Khatim., 2000:346).

#### **2.9.1.3 Education**

Lack of Knowledge and illiteracy was significantly associated with TB default as patients did not understand the instructions given by the doctor or were unable to read the labels of the medication (Chatterjee et al., 2003; Tissera, 2003). Horne and Weinman (2002) recognized that patients might interpret the themes of illness, wellness, and disease differently from health professionals. Hasker et al., (2008) highlighted that patients in Tashkent, Uzbekistan either refused to take treatment or they did not follow the hospital rules. Interestingly, it was also indicated that patients did not go to the clinic and were thought to have defaulted but were actually taking their medication under 'non DOTS' conditions. Patients who complete treatment have a better understanding of the duration of TB treatment than patients who interrupt their treatment (Chandrasekaran et al., 2005). Lack of motivation and belief that they had completed their treatment (Jaiswal et al., 2003) also influenced defaulting. Patients' lack of knowledge on the importance of taking their treatment conscientiously predicts default (Tekle et al., 2002 and Bam et al., 2006).

#### **2.9.1.4 Unemployment**

Another predictor factor is unemployment (Buu et al., 2003) as TB patients who have regular jobs are unlikely to default implying that casual jobs and unemployment are predictors of default. Income showed significant inverse association (Chatterjee et al., 2003) implying the poor were more prone to TB default. Unemployment, being a pensioner, homelessness and overcrowded

living conditions were revealed as important default predictors (Jakubowiak et al., 2007; Hasker et al., 2008; Mateus-Solarte and Carvajal-Barona, 2008) as evidenced in studies for example, conducted in Uzbekistan and Colombia.

#### **2.9.1.5 Patient related characteristics**

Tissera (2003) found that physical disability, inability to get to work on time / no leave, lost appointment cards and patients refusing treatment influenced TB default. Patients that had a history of default were more likely to be non compliant (Al-Hajjaj and Al-Khatim., 2002; Santha et al., 2002 and Chan-Yeung et al., 2003). Jha et al, (2010) reported prior default to be statistically significant (AOR: 1.22, CI: 1.11,1.60). It was reported that having a family member with TB influenced adherence to treatment (O' Boyle et al., 2002). However, patients defaulted once they started to feel better (Kaona et al., 2004 and Lamsal et al., 2009).

#### **2.9.1.6 Stigma**

Community and family members' attitudes may also influence a patients' decision to stop taking TB treatment (Dodor and Afenyadu, 2005). Wasonga (2002) and Tshabalala (2007) also highlighted that there was a social stigma attached to the disease. Stigmatization of TB occurs around the world (Liefhooghe et al., 1995 and Cramm et al., 2010) where patients are not treated well by their family members and community (Dodor and Afenyadu, 2005:831).

#### **2.9.1.7 Grants**

A very important reason influencing defaulting may be the South African government grant that is given to TB defaulters (Liebetrau, 2009a: personal communication). Nakabinde (2008) noted that most South African TB patients survive on the social grants that they receive due to their illness. In the United States where the majority of TB patients are low income and

socially disadvantaged, incentives and free TB drugs are given once diagnosed. However there is a contract that is signed that if the patient defaults from medication, the full cost of treatment must be paid back by the patient (Beith et al., 2009).

#### **2.9.1.8 Substance abuse**

Alcohol abuse, smoking and substance abuse such as smoking hallucinogens like cannabis is associated with TB default (Barker et al., 2002; Holtz et al., 2006; Jakubowiak et al., 2007; Hasker et al., 2008, Lönnroth et al., 2008 and Pinidiyapathirage et al., 2008). It is believed to be a way of people de-stressing and often is merely a “bad habit” that has far reaching consequences. Munro et al. (2007) added that due to alcohol or substance abuse, patients may actually genuinely forget to take their medication and provision for complicated cases like alcoholics were not given any priority (Jaiswal et al., 2003).

#### **2.9.1.9 Side effects of TB medication**

TB medication causes side effects that impact on defaulting from treatment as verified in an Ethiopian study (Chan-Yeung et al., 2003). In a study conducted in Ethiopia by Tekle et al., (2002) found side effects to be statistically significant (OR: 4.20, CI: 1.51,11.66) predictors of default. This study summarised the following reasons for defaulting: the side effects began occurring and made the patient feel miserable and patients were expected to take treatment on an empty stomach which was often associated with nausea. It could therefore be hypothesised that the synergistic side effects from TB medication plus combined with other medication (especially used to treat HIV/AIDS) may result in more severe side effects - thus causing default. TB medication needs to be taken on a full stomach to minimize the side effects however if the patients do not have enough food, this poses a problem and patients may default.

Side effects are believed to be one of the strongest predictors for TB defaulting (Al- Hajjaj and Al-Khatim., 2000 and Tekle et al., 2002) and sometimes patients were intolerant to the medication (Yee et al., 2002; Chatterjee et al., 2003). Common side effects from the drugs includes severe jaundice, hearing loss, vertigo, renal impairment, visual loss, sensory peripheral neuropathy, nausea, vomiting, itching and arthralgia (SANTCP, 2004). Vomiting after taking the medication, sensation of pins in the legs and itching was revealed as the common side effects to TB medication in a study conducted by Upkes (2007) study.

#### **2.9.1.1 Other medication and predisposing medical conditions**

People that are on medication for other medical conditions such as diabetes (Stevenson et al., 2007) and temporary illnesses may be prone to stop treatment (Tissera, 2003; Chatterjee et al., 2003). A study conducted at the Hong Kong Chest Clinics showed that patients defaulting had a predisposing medical condition [either liver disease or lung cancer] (Chan-Yeung et al., 2003) that lowered immunity and further complicated the TB treatment issue.

#### **2.9.1.11 Cultural beliefs**

Interestingly a patient's belief and culture determined their adherence. For example, in Pakistan and Limpopo, patients refused treatment believing that TB was punishment from God or for sleeping with a widow or not abstaining from sexual activity (Tshabalala, 2007). In eThekweni a large number of patients visited traditional healers prior to diagnosis (Liebetrau, 2009a: personal communication) and it maybe worthwhile to include them in TB management programmes possibly as DOTS supporters that proved to increase adherence and improve cure rate in Hlabisa, KZN (Colvin et al., 2001).

#### **2.9.1.12 Overcrowding, homelessness, being an immigrant, no fixed address and living alone**

Overcrowding and defaulting was reported in a study conducted by Lienhardt et al., (2005); homeless and being an immigrant was also associated with default (Tshabalala, 2007). There is a high incidence of TB defaulting where residents do not have a fixed address (Khan et al, 2000:249; Kandel et al., 2008). Cayla et al., (2009) found living alone to be statistically significant in predicting default in a Barcelonan population (OR: 2.35, CI: 1.05, 5.26).

#### **2.9.1.13 HIV/AIDS**

HIV/AIDS co infection is another default predictor and possibly responsible for the high death rate in patients that do not complete their treatment (Adata et al., 2003). HIV (OR: 9.93, CI: 1.48, 66.34) was significantly associated with default amongst a Spanish population (Cayla et al., 2009). As for HIV/AIDS, TB also has a stigma attached and once people became aware of their status; they were treated as misfits by society (Kaona et al., 2004). In a study conducted in KZN, it was highlighted that TB patients that were co-infected with HIV/AIDS were more likely to default however in Ghana; it was found that co-infected patients completed their treatment (Lawn et al., 2001). This difference could be the result of more intense health education on the importance of completing treatment.

### **2.9.2 Inadequate Resources**

#### **2.9.2.1 Patient and health care system characteristics**

Distance to the clinic was associated with TB default in developing countries like Nigeria (Morsy et al., 2003) and South Africa (Kandel et al., 2008). Accessibility and transportation to clinics poses a major problem (WHO, 2005). Treatment failure is also an economic burden attributable to absence from work and the inability to work (Morsy et al., 2003). These studies suggest that patients often face a choice between employment and taking medication for TB (Chatterjee et al., 2003). In a study conducted in 2003 in

Colombo, highlighted reasons for TB defaulting were: no assistance to go to and travelling long distances to the clinic, private treatment due to convenience, unable to go to a DOTS centre daily and imprisonment (Tissera, 2003).

DOTS at a health care facility often meant that a patient had to give up part of their working day to attend and hence patients defaulted (Lamsal et al., 2009). Is this then a viable option? Health care service factors, such as long waiting periods and inconvenient operational hours in clinics, add to economic discomfort and social disruption for patients, and negatively influence adherence (Jaiswal et al., 2003).

#### **2.9.2.2 Flexibility and choice of clinic**

Munro et al (2007) study concludes that flexibility and choice in treatment play an important role in adhering to treatment. Poor availability of health facilities and poor service providers was also associated with default (Wasonga, 2002).

#### **2.9.2.3 Health education by health personnel**

In a study in Kenya, (Wasonga, 2002), it was found that people were defaulting as a result of the poor counselling regarding compliance of treatment. A study by Yee et al. (2002) revealed an interesting notion that health care facilities may play an important role in minimizing TB medication side effects as patients did not complain of any great severity which may imply that there were educated on how to minimize these effects.

#### **2.9.2.4 Health personnel**

Poorly motivated primary health care staff may be responsible for TB defaulting and the lack of community health workers may also limit opportunities for DOTS (Wasonga, 2002). The lack of attention and support at the clinic, difficulty for patients to re-enter the system if they missed treatment; poor interpersonal communication with the health staff and not



given appointments may influence treatment completion (Chan-Yeung et al., 2003 and Tissera, 2003). In KZN, staff shortages can add another dimension to the problem (Edginton, 1999).

#### **2.9.2.5 Challenges faced by health care system**

Jaiswal et al., (2003) highlighted an important factor that non-adherence can be a product of programme failures, such as an inadequate supply of drugs, rather than patient-related problems or failures. The lack of medical facilities to diagnose and treat TB in its early stages and the lack of proper medical care maybe a predictor of default. Patients defaulting were exacerbated by programme failures, such as inadequate supplies of drugs and difficulties in consulting providers (Munro et al., 2007). Lack of transport to trace and conduct home visits was mentioned in KZN (Edginton, 1999)

Munro et al. (2007) sums up the categories of defaulting emphasizing that structural factors (poverty, gender, discrimination), patient factors: motivation, knowledge, beliefs, and attitudes and interpretations of illness and wellness, social context, health care service factors, personal characteristics and adherence behaviour may influence defaulting on treatment. These authors emphasized that factors such as gender and poverty determine individual responses to treatment and subsequent behaviour; and they interact with a patient's social context, their personal characteristics, and the health care service predict default. TB programme managers have found that even where patients are willing to adhere, structural factors such as poverty and gender discrimination may prevent them from doing so. The factors above have shown that defaulting on TB treatment is a common problem and various predictors of default do exist and cannot be separated and are interlinked. It can be clearly seen that most risk factors and predictor factors for TB defaulting are thus closely associated.

### **2.10 Consequences of defaulting**

Defaulting results in death relapse and drug resistant strains of TB such as Multiple Drug Resistant (MDR) TB and Extremely Drug Resistant (XDR) TB (Kandel et al., 2008; Shargie and LindtjØrn, 2007). Defaulting also facilitates the spread of infection especially in informal settlements where overcrowding facilitates the spread of infection (Clark et al., 2002). Treatment of MDR-TB involves second-line, reserve drugs that are much more expensive, more toxic and less effective than first-line TB drugs (Weyer, 2005a:84). This puts extra strain on a countries' perceived health outcome. MDR TB is more expensive to treat compared to normal TB treatment (SANTCP, 2004). As with other forms of drug resistance, MDR-TB is a man-made problem, being largely the consequence of human error in any or all of the following: management of drug supply; patient management; prescription of chemotherapy; and/or patient adherence (SANTCP, 2004:65). XDR-TB publicized a deadly outbreak of XDR-TB in the small town of Tugela Ferry in KwaZulu-Natal. Of 536 TB patients at the Church of Scotland Hospital, which serves a rural area with high HIV rates, some 221 were found to have multidrug resistance and of these, 53 were diagnosed with XDR-TB (Wise, 2006). Dr. Karin Weyer, TB Research Director at the South African Medical Research Council, was concerned since SA is faced with a huge TB/HIV burden and XDR-TB spreads to HIV patients quickly (Weyer, 2007).

## **2.11 TB control programmes**

### **2.11.1 TB programmes in developing and developed countries**

#### **2.11.1.1 Developing countries**

The National Tuberculosis Programme (NTP) is implemented in various developing countries such as China (Xu et al., 2005) and India (Chatterjee et al., 2003). For example, implementation of the NTCP in China provides free TB medication, has wide accessibility and choice of clinics to patients and convenient operational hours. Similarly, South Africa also implements the NTP comprising of the DOTS programme. Patients being supported under DOTS have shown to be successful through many observational studies in South Africa, China, Bangladesh and elsewhere (Walley et al, 2001:664). In Ethiopia, TB clubs have been established to raise disease awareness and have proved successful as the stigma attached to TB has been notably minimized (Demissie et al., 2003).

#### **2.11.1.2 Developed countries**

In the United Kingdom, involvement of community members is encouraged in order to raise TB awareness (Stop TB Partnership, 2010). Also, DVDs and a website have been created where TB sufferers can share their stories. USAID implementation of TB programmes has also had successes such as training more than 5500 professionals in DOTS for the year 2008 allowing for better implementation of DOTS in Mexico (USAID, 2009). In the United States of America (USA), Stop TB USA provides scientific and public health information to the general public and to TB policy makers regarding TB elimination activities (STOPTBUSA, 2010).

WHO/Europe works with many partners to:

- improve the monitoring and surveillance of TB and support the implementation of the Stop TB Strategy in the WHO European Region;
- provide policy guidance and technical assistance to countries for effective TB control;
- develop guidelines and protocols on TB diagnosis, treatment, prevention and care for programme managers, policy-makers, nongovernmental organizations, technical and financial partners and health personnel (WHO, 2010).

A study conducted by Mejuto et al., 2010 emphasized that Western Europe countries with low incidence do not use the DOTS programme. Developed countries such as USA, have the NTP (Lobato et al., 2005).

#### **2.11.2 South Africa (SA)**

An intense literature review revealed that in SA, there are many programmes aimed at reducing the TB burden. Table 1.1 outlines some of the TB programmes available in SA and gives a brief description thereof.

**Table 1.1: TB programmes in SA**

TB programme	Description
<b>DOTS Plus</b> (Shin et al, 2004:59).	These refer to MDR TB programmes implemented within DOTS in low and middle income countries.
<b>The African DOTS Project (AFDOT)</b> (Allen and Dick., 2006)	<ul style="list-style-type: none"> <li>• Aim is to evaluate the effectiveness of DOTS in TB patients in sub-Saharan Africa.</li> <li>• Two study areas have been selected in North West Africa and one in the Western Cape in SA.</li> <li>• The study will include the development of a multi-faceted patient-centered package of care:               <ul style="list-style-type: none"> <li>○ Providing staff with training for improving consultation skills</li> <li>○ Providing patients with brief motivational interviewing</li> <li>○ Providing a patients with a health education booklet</li> <li>○ Providing user-friendly pre-packaging of TB medication</li> <li>○ Providing patients with an adherence chart</li> </ul> </li> </ul>
<b>United States Agency for International Development (USAID)</b> (USAID, 2009)	<ul style="list-style-type: none"> <li>• USAID activities are being implemented in 5 provinces which include training, increasing efforts to minimize infection control, technical assistance to laboratories and raising awareness.</li> </ul>

<b>Traditional Healers in TB management</b>  (Colvin et al, 2001)	<ul style="list-style-type: none"> <li>• Traditional healers were used to administer DOTS to TB patients of Hlabisa.</li> <li>• It was found that patients that received supervision from traditional healers had a higher cure rate of 89 % compared to the 67% cure rate amongst those not supervised by traditional healers</li> </ul>
<b>Action TB</b>  (Sanofi-aventis, 2010)	<ul style="list-style-type: none"> <li>• This is a project that involves the development of new drugs and raises awareness on the disease.</li> <li>• Eighty scientists have been employed to conduct research.</li> </ul>
<b>The Farm Lay Health Worker Project</b>  (Allen and Dick, 2006)	<ul style="list-style-type: none"> <li>• In the Western Cape, many of the farmers and the communities have high TB rates.</li> <li>• A person from the community is nominated to attend an Adult Basic Education Training (ABET).</li> <li>• This person then goes in to the communities armed with skills and knowledge to help fellow community members with TB, such as administering DOTS.</li> </ul>
<b>TB FREE</b>  (TB Free, 2010)	<ul style="list-style-type: none"> <li>• <b>TB FREE</b> has implemented its activities in all 9 provinces of SA. One of these activities saw 33 125 DOTS supporters being trained.</li> </ul>
<b>Treatment Action Campaign (TAC)</b>  (TAC, 2000)	<ul style="list-style-type: none"> <li>• This programme helps to raise awareness and one such initiative is the development of a TB treatment brochure.</li> </ul>
<b>Southern African TB Control Initiative</b> (SATCI)  (SA Healthinfo, 2006)	<ul style="list-style-type: none"> <li>• SA became one of 12 countries in 1995 that formed part of the SATCI in an effort to build partnerships between countries that experienced a TB epidemic</li> <li>• This was initiated to implement effective TB programmes in an attempt to save lives and money <i>AND</i> avoid the duplication of TB control activities.</li> </ul>

<p><b>The first Global Plan to Stop TB (2001–2005)</b> (WHO, 2009)</p>	<p>This was launched in 2001 for five years which identified DOTS expansion and adaptation as critical in confronting the emerging challenges of HIV and anti- TB drug resistance and the importance of boosting research and development for new diagnostics, drugs and vaccines. This plan revealed that TB control was a success globally however serious challenges still remained hindering TB control. Following this, a second Global Plan to Stop TB was introduced.</p>
<p><b>The second Global Plan to Stop TB (2006–2015)</b> (WHO, 2009)</p>	<ul style="list-style-type: none"> <li>• This was introduced by the Stop TB Partnership in 2006.</li> <li>• The Plan describes the actions and funding needed for overall TB control.</li> <li>• Targets are set for each region of the world such as the 85% cure rate.</li> </ul>
<p><b>The Stop TB Programme/strategy</b> (WHO, 2006)</p>	<ul style="list-style-type: none"> <li>• The Stop TB Programme/strategy builds from the DOTS programme which is the fundamental pillar and is now widely accepted.</li> <li>• The strategy aims to reduce the TB burden by 2015 and addressing issues such as MDR-TB</li> <li>• The six principle components of the strategy include: <ul style="list-style-type: none"> <li>a. pursuing high quality DOTS expansion and enhancement;</li> <li>b. addressing TB/HIV, MDR-TB and other challenges;</li> <li>c. contributing to health system strengthening; engaging all care providers;</li> <li>d. empowering patients and communities; and</li> <li>e. enabling and promoting research.</li> </ul> </li> <li>• It was reported that treatment success was below average in the African Region (72%) due to HIV co-infection and in the European Region (75%) due to drug resistant strains of TB (Bulletin of the World Health Organization, 2007).</li> <li>• According to the WHO (2006), there has been substantial progress in extending and increasing the National TB Programmes in sub Saharan African, HIV/AIDS and human resources are posing a challenge.</li> <li>• According to the WHO (2009), the Region of the Americas,</li> </ul>

	<p>the Eastern Mediterranean and South-East Asia regions are on track to achieve the Stop TB Partnership targets of reducing prevalence and death rates by 50 % by 2015.</p> <ul style="list-style-type: none"> <li>• However prevalence and mortality targets will not be met in the African and European regions.</li> <li>• DOTS remains at the heart of the Stop TB Strategy as it is a comprehensive approach to TB control and one of the most cost effectiveness health interventions available (Garcia- Garcia et al., 2002).</li> <li>• It is also envisaged that this programme will help with ensuring patient centred treatment especially for HIV patients (WHO, 2009).</li> </ul>
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## **2.12 TB Programmes: eThekwini**

There are 2 main programmes utilised in the eThekwini, namely

- 1 South African National Tuberculosis Control Programme (SANTCP): Practical Guidelines 2004 and;
- 2 National TB Crisis Plan 2008-2009: eThekwini Municipality

### **2.12.1 South African National Tuberculosis Control Programme (SANTCP): Practical Guidelines 2004**

SA established the SANTCP in 1996, which was recommended by WHO and the International Union against TB and Lung Disease (IUATLD) (Khan et al., 2002). The objective of the SANTCP is to reduce mortality and morbidity attributable to TB, prevent the development of drug resistance and ensure accurate measurement and evaluation of programme performance (SANTCP, 2004:7). In KZN, a combination of SANTCP (including DOTS) and the TB Crisis Management Plan (discussed later on in this chapter) has focused on 4 districts, namely eThekwini, uMgungundlovu, Uthungulu and Umzinyathi. Those areas are known to have a high TB caseload especially with MDR-TB and XDR-TB (eThekwini TB Crisis Plan, 2008-2009). Nationally and locally, the SANTCP (2004) is used by the various municipalities to



implement their DOTS programme. Annual reports are sent to the WHO for evaluation and monitoring. The WHO recommends at least an 85% cure rate of all diagnosed TB cases with a compliance rate of 85% to 90% (et al., 2003). The programme also has set targets for TB control in South Africa and TB management is measured against the following National Tuberculosis Control Programme 2004 indicators (Table 1.2):

**Table 1.2: Indicators for TB control and management**

Characteristic	%age (%)
Case Detection	70.0
Cure Rates	85.0
Smear Conversions	85.0
DOTS Coverage	100
Defaulter rate	5.0

**Source: SANTCP, 2004**

South Africa had 460 000 new TB cases in 2007 and it was reported that DOTS treatment success increased from 65% in the year 2001 to 74% in 2006 (USAID, 2009). However it was reported that South Africa for the first time achieved a case detection rate of 78% in 2007 above the WHO standards and the SANTCP indicators. eThekwini had a defaulter rate that is above the WHO target of 5.0% where in 2007, the defaulter rate in eThekwini was 18.9% (National TB Crisis Plan: eThekwini Municipality, 2009). Defaulter rates for 2009 and 2010 were inaccessible at the time of publication.

In 2008, a TB awareness campaign was held in the study areas of Inanda, Ntuzuma and Kwa Mashu (INK) area (eThekwini Online, 2008). The eThekwini Health Unit officials visited Gugulabasha High School, in Ntuzuma, where 400 pupils were taught about TB, its symptoms and the importance of nutrition and hygiene. However outreach programme should target both the community and scholars to be more beneficial. The campaign encouraged

people who believed they may have TB to visit clinics and get treatment (eThekwini Online, 2005). However it was not certain whether importance of adhering to treatment was emphasized or whether these campaigns are held on a regular basis. In KZN, the Inanda Ntuzuma Kwa Mashu Community Advisory Board (INK CAB) is an example of a successful partnership between health care service providers, researchers and the community in TB control. Various activities were successfully initiated and spearheaded by the INK CAB, and these involved training of Traditional Healers, recruiting of more TB tracer teams, organizing awareness campaigns during TB World Day, establishing TB school peer educators and links with NGOs to support impoverished TB patients all with positive outcomes (Ntshanga et al., 2010b:211&215). Other organizations and programmes include TB Free (educates nurses) and Treatment Action Campaign (TAC) - both raise awareness and help manage the disease.

As part of the eThekwini's control and management strategy of TB, medical health services operating five days a week are rendered free to the community (Liebetrau, 2009a: personal communication). Within eThekwini, there are mobile and fixed site clinics. These programmes have been beneficial as the mobile clinics reach communities where medical services are inaccessible. Immunization programmes implemented at local clinics are used as a preventative measure. Also provided are TB diagnosis and treatment which forms part of the Primary Health Care (PHC) services.

#### **2.12.2 National TB Crisis Plan: eThekwini Municipality (Annexure 1)**

The late Health Minister, Dr. Manto Tshabalala-Msimang, launched the TB Crisis Plan on World TB Day 2006, stating that only about half the country's TB patients are cured, while almost 7.0% remain ill and then go on to develop MDR-TB, which is difficult and expensive to cure (Cullinan, 2006). Reasons for such low cure rates were attributable to treatment non-adherence and that patients are diagnosed too late (WHO, 2005). The TB Crisis Plan is used in conjunction with the guidelines of the SANTCP 2004.

The 3 provinces that implemented the plan were Gauteng, Eastern Cape and KZN because of the high TB burden that these provinces faced, contributing to approximately 80% of the countries TB burden (KZN Health, 2006). Cullinnan (2006) highlighted that the critical elements of the plan included adequate human and financial resources to fight TB, access to laboratory services, better TB reporting, recording and referral of patients and a highly visible social mobilization and media campaign. In KZN, the plan sets out targets that need to be met such as those mentioned in the TB Crisis Plan itself (Annexure 1). There is no information available about the implementation of the TB Crisis Plan in informal settlements. However research has been conducted in the high burden districts that are believed to have several informal settlements (Ntshanga et al., 2009).

### **2.13 Directly Observed Treatment Short Course (DOTS)**

Directly Observed Treatment Short Course (DOTS) as recommended by the WHO, is used globally and has been a central component of TB treatment for at least 30 years (Shin et al., 2004:1529). Its implementation has led to higher treatment success rates in developing and industrialized countries (Khatri and Frieden, 2002). The DOTS programme – a 6 month treatment course -combines five elements: political commitment, microscopy services, drug supply, monitoring systems and direct observation of treatment. Different types of DOTS can take place which include community DOT, workplace DOT and clinic DOT (Nair, 2008). The DOTS programme allows for the tracing of the defaulters and ensuring that they are returned to treatment as soon as is possible (Liebetrau, 2009: personal communication).

#### **2.13.1 Implementation of the DOTS Programme: SA**

Global implementation of DOTS is monitored by the WHO and since 1996, reports have been published annually (WHO, 2009). In 2005, it was reported that 187 countries, including SA (in both rural and urban areas), had implemented the DOTS programme (Cox et al., 2008; Ntshanga et al., 2009). However, there is a great variation regarding the training, selection and

management of the DOTS supporters in their communities (Dick et al., 2005 and Abdool Karim et al., 2009). Once it is decided to implement a DOTS programme, the following information should be collected such as available funding and duration of support, annual TB in cadence in the country of origin, TB control policies in the country or region and the host country, expertise among the national TB programme or non governmental organizations in implementing TB control programmes, funding and work plan resources that are needed.

Other management strategies addressing the challenges facing TB include the Stop TB programme that builds on the successes of the DOTS programme. In eThekweni food parcels used to be given but it is believed to have been stopped (Liebetrau, 2009a: personal communication). DOTS are implemented as part of the SANTCP (2004) although only a few strategies are implemented as DOTS due to the lack of human resources (Liebetrau, 2010b: personal communication). This study however did not investigate the type of DOTS used.

DOTS are recommended for all patients during the entire period of TB treatment. The DOTS Programme comprises diagnosing new cases of TB and thereafter placing the patient on a consecutive treatment regimen for 6-8 months and promoting completion of their treatment regimen in order to ensure the patient is cured (Liebetrau, 2010b; Paliwal, 2010). Generally it is recommended that each patient has a DOTS supporter whose role is to ensure that patients on treatment adhere to their treatment. Patients that have a supporter and are watched swallowing their medication are less likely to default (Schluger et al., 1995; Smirnoff et al., 1998). Note should be taken that the interactions between the patient and supervisor may be more important than DOTS itself (Khan et al., 2005). In a study conducted in Senegal, Frieden and Sbarbaro (2007) found that if DOTS was delivered by a family member, there were greater cure rates and less defaulter rates than those selecting nurses and community health workers. Interestingly, in SA,

patients were more likely to adhere to treatment having traditional healers as supporters (Colvin et al., 2001). This TB programme aims to ensure that the patient receives treatment as close to their home or workplace as possible where the DOTS sites include clinics, chemists and hospitals (Zwarenstein et al., 1998 and National TB Management Guidelines, 2008).

### **2.13.2 IMPLEMENTATION OF DOTS: ETHEKWINI**

Nurses at the CDC acts as supporters for the first dose of medication and the patient is then given medication for 6 days. According to Liebetrau (2009a: personal communication), Lamontville Clinic is one such clinic where the DOTS programme is effective in that there was a cure rate of 70% attributable to active community members that were retired nurses. DOTS supporters were TB patients that have been cured. Also the Rotary Club of Lamontville was instrumental in providing a house as a clinic that reduced the defaulter rate as patients found it easier to access treatment at the house.

In compliance with the standards set out by the SANTCP, training should be on the job and continual (Tshabalala, 2007). Nurses are trained at eThekwini as part of the Workplace Skills Programme (WSP) regarding treatment and control of TB periodically. However, the community health care workers who are the volunteers who support the patients, receive only orientation training. Years ago training after orientation used to happen for community health workers but it has since ceased for unknown reasons (Liebetrau, 2009a: personal communication).

### **2.13.3 DOTS supporters role in implementing the DOTS programme**

The Stop TB Organization Booklet (1994) emphasizes that the following factors are important for DOTS supporters to comply with to ensure the efficiency of the DOTS programme:

- Agree on a time and place to meet with the TB patient. Patients should not be made to wait long periods for the DOTS supporter.

- Give the patient the TB drugs at each appointment according to the schedule.
- Look at the drugs to be sure they are correct. Watch the patient swallow all the drugs.
- Record on the TB Treatment Card each time the patient takes the drugs.
- Be aware of possible side effects. Have the patient eat food with the drugs if needed to reduce nausea. Refer the patient to the health facility if he continues to have side effects.
- Encourage the patient to continue coming for TB treatment.
- Respond quickly if the patient misses a scheduled treatment. When a patient misses a dose for more than 24 hours, visit the patient's home. Find out the problem that caused the interruption. Give the treatment. If unable to find the patient or convince the patient to continue the treatment, contact the health centre for help without delay.
- Go to the health centre to collect a re-supply of drugs each month. Show the patient's TB Treatment Card.
- Review how the patient is doing and discuss any problems.
- Make arrangements if you or the patient will be away for a few days. Give the patient enough drugs to take themselves for a maximum of one week or refer the patient to the health facility to decide what is to be done. Someone else may be asked to help during this time.
- Be sure the patient goes to the health facility when he is due for a follow-up sputum exam.

#### **2.13.4 Defaulting and tracing defaulters on DOTS**

The DOTS programme allows for tracing of the defaulters and ensuring that they are returned to treatment as soon as possible (Liebetrau, 2009a: personal communication). In the event a patient defaults, nurses and allied professionals such as the Environmental Health Practitioners (EHPs) and

Environmental Health Assistants (EHAs), community workers, family, employers and other DOTS volunteers are responsible for tracing the patients. After being traced, counselling, rehabilitation and education are given to them by the nurses or allied professionals (Liebetrau, 2010b: personal communication). There are seemingly no studies focussing specifically on tracing defaulters in informal settlements of eThekweni.

#### **2.13.5 Implementation of the TB Register as part of DOTS**

Globally, all health facilities have a register of some sort even though the Electronic TB Register is considered mandatory (SANTCP, 2004). The Electronic TB Registers was introduced in 2001 and by the year 2006 all countries had implemented the register (KZN Health, 2006). On entry into a health facility and once there have been categorized as a suspected TB case, their details are entered into the Suspect TB Register and only on to the TB Register once confirmed and started treatment. Patient registration is imperative and all clinics and health facilities that confirm diagnosis of TB should enter the patients' details in a TB Register hence the patient will be referred to as a registered patient.

Registry information such as smear, culture, and susceptibility results; clinical status; chest radiograph results; and doses of medications being administered should be obtained and updated on a continuing basis by a specific health department staff member who should review detailed registry information for TB cases at least monthly thereby allowing identification of patients who may have potential problems with adherence or response to therapy (e.g., patients who have persistently positive sputum or who are taking medications to which their TB organisms are resistant) and to ensure follow-up. This will involve initiating field follow-up visits or arranging medical consultation with providers. TB control programs also should maintain records on the examination and treatment status of the contacts of infectious TB patients and other groups of high-risk infectious patients such as those people co – infected with HIV. Keeping a TB Register is done in compliance

with the National TB Control Programme (SANTCP, 2004). In eThekweni, many clinics do not have access to a computer, an electronic TB register is not utilised but instead a written register is used. It has been showed that TB case findings have been strengthened with 565/577(98%) after implementation of the TB Suspect Register in Primary Health Care (PHC) clinics (Dhlomo, 2009).

#### **2.13.6 Training of health personnel & DOTS supporters**

Adequate training of nurses and supporters is vital as their knowledge, attitudes and practices towards TB patients have a direct influence on whether the patient remains on their treatment (Tshabalala, 2007). This indicates that on-going staff training and proper communication skills need to be constantly re-evaluated and or revised. Several studies such as the one in Russia (Gleissberg et al., 1999) have highlighted that nurses trained to handle TB patients have experienced lower defaulter rates. A study in Uganda reported that training of staff, volunteers, and the community resulted in increase awareness and a more educated population (Adatu et al., 2003). The National Department of Health has guidelines and manuals used for training. Training entails new advances in TB management, record keeping and new advances in medication to ensure efficiency of the programme.



## 2.14 EFFICIENCY OF THE DOTS PROGRAMME

Any strategy, including DOTS, will have both positives and challenges. These will now be discussed in the global and South African contexts:

### 2.14.1 Globally

**Table 1.3: Evaluation of the DOTS programme: Global**

Positives	Challenges
<p><b>a) Cost effectiveness:</b></p> <p>The DOTS programme has been called as one of the most cost effective health interventions (Adatu et al., 2003; Mizoev et al., 2008 and Lamsal et al., 2009:26).</p> <p><b>b) Reduction in TB burden:</b></p> <p>It was reported that countries that have implemented DOTS such as Peru, Vietnam, Philippines, USA and China have had significant reduction in TB prevalence. (Cegielski and McMurray, 2004; WHO, 2007; Frieden et al., 2003a:83).</p>	<p><b>a) Six constraints:</b></p> <p>These are: deficiencies in finances, human resources, health sector organization, anti TB drug supplies, public awareness, lack of political will and government commitment (National TB Crisis Plan: 2009),</p> <p><b>b) Treatment/Medication:</b></p> <p>Critics of this programme express concern that standardized chemotherapy with certain TB medication may lead to treatment failures and amplify drug resistant among patients with pre existing resistance to one or more of these drugs (Ciegelski and McMurray, 2002).</p>

<p><b>c) Financial Incentives and other programmes</b></p> <p>Studies revealed that social and various other forms of support given to TB patients resulted in reduced defaulter rates (Davidson et al., 2000; Chan-Yeung et al., 2003, and Jakubowiak et al., 2007).</p> <p><b>d) Training of DOTS supporters</b></p> <p>By training DOTS supporters such as midwives, community members, shop keepers and non-governmental organization members, patients were cured (Balasubramanian et al., 2000, Floyd et al., 1997 and Chowdhury et al., 1997).</p>	<p><b>c) Public Awareness-Health education:</b></p> <p>This aspect was inadequate or needed revising (Jaiswal et al., 2003)</p> <p><b>d) Inadequacies and poor correlation between patient and programme needs</b></p> <p>A lack of communication between the patient and staff AND a lack of access posed a big problem (Balasubramanian et al, 2000; Deruaz and Zellweger, 2004).</p> <p><b>e) Least cost effective:</b></p> <p>In Pakistan, health centre DOTS was reported as being least cost effective compared to community DOTS (Khan et al., 2002).</p>
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## 2.14.2 SA

**Table 1.4: Evaluation of the DOTS programme: SA**

Positives	Challenges
<p><b>a) Cost effectiveness</b> In SA and specifically in eThekweni, DOTS is feasible and cost effective (Liebetrau, 2010b: personal communication).</p> <p><b>b) DOTS coverage</b> By the end of 2000, 77% of SA was covered (Madkour, 2001) with DOTS being implemented in both rural and urban areas (Ntshanga et al., 2009).</p> <p><b>c) Reduction in TB burden</b> DOTS in SA treatment success increased from 65% to 73% in 2006. The case detection target of 70% increased to 78% (USAID, 2009).</p> <p><b>d) DOTS supporters</b></p>	<p><b>a) DOTS coverage</b> This aspect is inadequate in many districts as DOTS is not being adequately implemented (Kironde and Meintjies, 2002; Ntshanga et al., 2009a and PlusNews, 2010).</p> <p><b>b) Tracing of defaulters</b> Patients provide incorrect addresses, especially those residing in the informal settlements that are increasingly difficult to trace (Tshabalala, 2007; Liebetrau, 2009a: personal communication).</p> <p><b>c) DOTS supporters</b> Staff shortages are a major challenge to efficiently support and trace TB patients. Ntshanga et al., (2009).</p> <p><b>d) TB Stigmatization during DOTS visit</b> Even though DOTS supporters were helpful, patients feared being</p>

<p>Community based DOTS were effective in reducing the TB burden in SA. (Tshabalala, 2007; Ntshanga et al., 2009). The study conducted in Hlabisa also showed that by patients were satisfied with care received from traditional healers as supporters (Colvin et al., 2001).</p>	<p>stigmatized in their communities since these supporters had to visit them daily to administer treatment (PlusNews, 2010).</p> <p><b>e) Reporting and recording of DOTS</b>          Poor standardised recording keeping and reporting was a major challenge (Zvavamwe and Ehlers, 2009; Ntshanga et al., 2009:573.</p> <p><b>g) HIV/AIDS and TB</b>          The HIV epidemic poses a challenge to tuberculosis control strategy for Africa (Sonnenberg et al., 2001).</p> <p><b>h) Limitations in the overall implementation</b>          Only certain DOTS strategies are implemented in eThekweni due to staff shortages, lack of resources, inconsistent nutritional supplementation, standardized implementation guidelines not being adhered to, inconsistent sputum turn around time, high treatment interruption rate with high defaulter rate, poor integration with other stakeholders and under diagnosing of children in relation to the number of adult positive (Zwarenstein et al., 1998; Liebetrau, 2010b: personal communication). National TB Crisis Plan: eThekweni Municipality (2009),</p>
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## **2.15 Conclusion**

TB as a disease needs to be understood thoroughly before citing and exploring predictor factors for defaulting and evaluating the DOTS programme. This chapter reviewed a varied selection of literature on the prevalence and predictors of TB defaulters while the DOTS programme was analyzed in detail inclusive of the efficiency of the programme. Chapter 3 details the methodology employed for this study.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

The previous chapter critiqued relevant literature applicable to the objectives of this study. This chapter details the methodology employed to conduct this study. A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems (Kumar, 2005:84). This study is a mixed methods research design which is defined as a research design or methodology for collecting, analysis, and mixing both quantitative and qualitative data in a single study or a series of studies in order to better understand research problems and each type of data involves its own distinct analysis approaches (Swanson, 2005: 317).

#### **3.2 Overview**

This study investigated the predictors of default amongst informal dwellers and the implementation and efficiency of the DOTS programme of eThekweni Municipality: Health (Annexure 2.2). Fieldwork commenced in May 2009 and was completed in April 2010. The study was a sequential mixed mode study. Both quantitative and qualitative data was generated from respondents who agreed to participate (Annexure 3) and triangulated to find associations of interest.

This study consisted of three phases of gathering data using two questionnaires; one administered to defaulters (Annexure 4.1: English and Annexure 4.2: isi Zulu) and the other to nurses (Annexure 5) followed by qualitative semi structured in depth interviews with health personnel (Annexure 6). Defaulters and non-defaulters were purposively selected from the CDC Electronic TB Register from the year January 2007 until June 2009.

In depth interviews were conducted to provide information for evaluation of the DOTS programme particularly when supplementing other methods of data collection (Henning, 2004). Statistical analysis was conducted using STATA version 11 for the quantitative data whilst the qualitative data was content analyzed.

### **3.3 Research design**

This epidemiological study made use of a sequential mixed mode approach, which included both quantitative and qualitative methodology. It was a cross sectional descriptive study which determined predictors of non adherence to treatment in an informal settlement population. The focus was on gathering retrospective and current data relating to the prevalence of TB treatment defaulters (initially sought treatment at the CDC) in 6 areas. The study used sequential modes to determine predictors of non adherence to TB treatment in an informal settlement and the efficiency and implementation of the DOTS programme in the eThekweni Municipality – with special reference to the following study areas, namely Cato Manor, Clairwood, Kwa Mashu, Inanda, Ntuzuma and Wentworth. Data relating to the prevalence of TB treatment defaulters in these 6 areas within the eThekweni jurisdiction for the period January 2007 – June 2009 was reviewed. Non-defaulters (TB patients who had completed treatment) were matched against defaulters (who did not complete treatment) from the CDC Electronic TB Register. A purposive sampling strategy was necessary since not all facilities/clinics have access to an electronic TB register and not all patients were traceable or from informal settlements.

Initially a pre-tested and piloted questionnaire was completed by defaulters from Austerville. This allowed a descriptive assessment of risk factors for default from TB treatment within this group of informal dwellers. Subsequently, the CDC TB Electronic Register was used to select non-defaulters with similar demographic profiles, who had completed TB treatment. The non-defaulters were not traced due to financial and

accessibility issues. There was limited data available from the CDC Electronic TB Register but it was possible to perform a comparison of demographic factors such as age, gender, place of residence. Alcohol, smoking status, previous TB history and family history for both defaulters and non-defaulters were also identified.

Nurses from selected clinics answered a questionnaire focusing on key aspects regarding DOTS implementation at their individual clinics with specific reference to the tracing of TB defaulters and reasons they consider pivotal as predictor factors of default. The qualitative aspect of the research involved semi structured interviews with health personnel of eThekweni Municipality involved in TB management which generated rich narrative data.

### **3.4 Setting**

In the North, study areas included Inanda, Ntuzuma and Kwa Mashu commonly referred to as the INK Area situated 30 km north of the city centre. It comprises of a mix of formal residential townships and informal settlements accounting for 43% of the housing which are home to approximately 510 000 residents. According to the 2001 Census, the area has a population of 6659 (Statistics South Africa, 2001). This has increased to an estimate of 580 000 in 2006 (Provincial and Local Government Department, 2006). Inanda is widespread and subdivided into smaller townships (villages), namely Inanda Newtown A, B and C, Inanda Glebe, Amaoti, Emachobeni, Congo etc.

In the South, study areas included Cato Manor, Clairwood and Wentworth. Cato Manor situated 10 km away from Durban's Central Business District (CBD) with a geographical area of 1800 hectares. It has been reported that there are approximately 7500 families living in six different settlements within the Cato Manor area (Maxwell and Foster, 2002). Clairwood and Wentworth are situated in the South Durban Industrial Basin with a population of approximately 100 000 people.



### **3.5 Sampling strategy**

Non-probability sampling was done as study participants were chosen purposively. A purposive sample is a type of non-probability sampling which the units to be observed are selected on the basis of the researchers' judgement about which ones will be the most useful or representative (Babbie, 2008:205). A multistage sampling strategy was utilized for the quantitative aspects of this study. Firstly, a purposive sampling strategy was used, targeting only TB patients who have defaulted from conventional TB treatment and those who were regarded as informal dwellers and could be traced (Polit and Hungler, 1995). The next stage was matching the defaulters' profiles against the non-defaulters from the CDC Electronic TB Register and comparing risk factors between these 2 groups.

### **3.6 Study population**

The study population comprised of the following categories:

#### **3.6.1 TB patients**

This study was conducted amongst all sputum positive TB patients attending the CDC – which is the only health facility with an Electronic TB Register in the eThekweni (Durban and surroundings) area in KZN, SA. This resource helped identify defaulters and non-defaulters as it contained the personal details and medical records of TB patients and defaulters (as per the municipality's definition) for the period under study i.e. January 2007 - June 2009. This time period was chosen because patients that defaulted needed to be traced. Six purposively sampled sites (Cato Manor, Clairwood, Inanda, Kwa Mashu, Ntuzuma and Wentworth) within the eThekweni Municipality that included TB patients from informal areas were chosen. Non defaulters were matched for the same treatment time period and residential status (with the exception of Wentworth). At Wentworth, the non-defaulters were not from the informal settlements and did not share the same profile as the defaulters hence were not included in the non-defaulters sample population.

### **3.6.2 Nurses**

All the nurses from 10 clinics that were in close proximity to the study areas were invited to participate and 30 questionnaires were allocated. However only 16 nurses from the following 5 clinics: Cato Manor, Clairwood, Wentworth, CDC and Bluff responded.

### **3.6.3 Health Personnel**

Those involved in TB management and control which included EHAs, EHPs, CDC staff and nurses were invited to participate. Willing health personnel were interviewed.

## **3.7 Inclusion and exclusion criteria**

### **3.7.1 Inclusion criteria**

#### **i) TB Patients**

- All TB patients that were captured in the Electronic TB Register of the CDC from January 2007 until June 2009 (defaulters and non-defaulters).
- Patients that defaulted on treatment which is defined as a patient that missed a dose of treatment and could be traced via the address captured in the CDC Electronic TB Register.
- Defaulters who agreed to participate in the study on their own accord.
- Patients that were living in informal dwellings with either no piped water or electricity or an absence of both commodities (defaulters and non-defaulters).
- Patients that completed their treatment and living in informal dwellings (non-defaulters).

**ii) Nurses**

- All nurses employed in the clinics under the study were invited to participate.

**iii) Health personnel**

- Health personnel employed at eThekweni Municipality: Health were purposively sampled and invited to participate in the semi structured in depth interviews. Health personnel included Environmental Health Assistants, Environmental Health Practitioners, Nurses and CDC Staff who were involved in TB management and control.

**3.7.2) Exclusion criteria**

**i) TB patients**

- Patients that resided in formal housing and had access to piped water and electricity.

**3.8 Ethical considerations**

**3.8.1 Ethics**

The study protocol was reviewed and approved by the Faculty of Health Research Committee (FRC) at the Durban University of Technology (DUT). Approval was sought and obtained from the eThekweni Municipality: Health Unit. A letter of permission and the research proposal were forwarded to the eThekweni Municipality: Health Unit to request access to confidential Tracing Forms (Annexure 7) and use of the Electronic TB Defaulter register, which captures the names of all TB patients and the different category (defaulter, transferred and re-treatment case).

### **3.8.2 Informed Consent**

Informed consent (Annexure 3. for patients and nurses and for qualitative interviews – Health personnel) in the language of choice was made accessible to all participants. All participation was voluntary and withdrawal from the study was possible on request at any point in the study. No financial incentives were provided for participation in this study.

### **3.8.3 Confidentiality of the patients**

All data collected was treated as strictly confidential and was maintained under locked storage and only available to the research team.

## **3.9 Data collection**

### **3.9.1 Recruiting and training of fieldworkers**

Four fieldworkers were recruited and attended a training workshop on questionnaire administration, data collection and ethics (Annexure 8.1). All the necessary administration processes were then followed (Annexure 8.2; Annexure 8.3) to enable permission to approach the TB defaulters and conduct the interviews. Interviewers were already active in the community and hence any form of intimidation during the interviewing process between participants and the fieldworkers, were minimized.

### **3.9.2 Piloting of Study Tools**

Piloting is done to determine whether the study tool is clearly worded and free from major biases and whether it solicits the desired information (Brink et al., 2006). Both the TB patient and nurses questionnaires were piloted in the Austerville area and clinic respectively. It is believed that residents were exposed to the same contributing and predictor factors that have been reviewed in the literature that exacerbate TB. Also, Austerville had shown a high defaulter rate for the period January-June 2008.

### **3.10 Validity and reliability**

To ensure overall validity and reliability of this study, the two quantitative questionnaires were pre tested and appropriately piloted. Since patients home language was isi Zulu, the TB defaulter questionnaires were translated to isi Zulu to facilitate better understanding. Fieldworkers were recruited from the communities under study and hence patients feeling intimidated were minimized. All the wording and the questions of the qualitative interview schedule was peer reviewed. During the qualitative interviews, the researcher recapped what was said and asked for elaboration to ensure clarity. Furthermore only the researcher conducted the interviews with all health personnel.

### **3.11 Study Tools**

Study tools used included the CDC electronic TB register, a TB defaulter patient questionnaire; a Clinic TB nurses questionnaire and the qualitative interview schedule. The CDC electronic TB register contains the names and the addresses of the TB patients including the date of diagnosis and commencement of treatment and termination of treatment (defaulting). It also includes other information such as if the patient has been transferred to another clinic. Patient questionnaires contained both open-ended and closed questions, were available in English and translated into isi Zulu with back translation to ensure credibility and validity of the measuring tool. The nurses' questionnaires were designed after consultation with the Nursing Manager of the CDC during the study period, Sis JC Liebetrau and highlighted the core components of effective TB management with regard to DOTS.

Qualitative research explores peoples' subjective understandings of their everyday lives (Pope and Mays, 2006: 6). Qualitative in depth interviews were done to gain insight into the DOTS programme from that various health personnel that contribute to its implementation. Primarily, this was done to

obtain insight into the participants experiences through engaged and profound listening (Polit and Beck, 2006). Participants were questioned and replies were then initiated to ensure that rich data could be obtained. A standardized open ended interview schedule was used where all the respondents were asked the same questions so that their answers could be compared. The interviews were conducted as normal conversations with a purpose to produce more in depth information about the DOTS programme (Brink, 1996:158). The qualitative interviews focussed on implementation of DOTS, training of health personnel and health care workers, tracing of defaulters in informal settlements, suggestions to control TB and the DOTS supporters.

### **3.12 Administration of questionnaires**

#### **3.12.1 TB defaulter patient questionnaires**

TB patients were traced by fieldworkers from a list obtained from the CDC Electronic TB Register, where all the names and addresses of the defaulters from were noted. The fieldworker either filled in the answers provided by the patients or alternatively, questionnaires were self-administered. Some patients preferred completing the questionnaires themselves whilst others probably due to literacy found it easier for the fieldworker to ask them the question and write down the answer. Various predictors of default were investigated by including socio economic, demographic and health related factors.

#### **3.12.2 Clinic TB nurses questionnaire**

A second questionnaire was administered to the nursing staff of the 5 clinics within the eThekweni jurisdiction via internal mail from the eThekweni Municipality: Health Unit's Head Office. Attached to the questionnaire was the Form of Informed Consent detailing the aims and seeking consent from potential participants. Each questionnaire that was sent to the clinic was enveloped, marked for the nursing managers or some other pertinent contact

person's attention. The nurses or nursing managers of the specific clinics were either emailed or telephoned and informed to expect delivery of the questionnaire and to confirm that they have received it. Questionnaires were self administered. Nurses returned the questionnaires marked for the researchers' attention in a sealed envelope either by mail or personally.

### **3.12.3 In depth interviews with health personnel**

Semi structured, individual, in depth interviews with health personnel were conducted with 5 respondents to explore their perspectives on the DOTS programme. In depth interviews (also known as intensive interviews) is a commonly used method of data collected employed by qualitative researchers (Hesse-Biber and Leavy, 2006). This type of methodology yields exploratory descriptive and explanatory data which can be used alone or with surveys (Hesse-Biber and Leavy, 2006). The broad categories investigated in the qualitative aspect was implementation of DOTS, training of health care workers, efficiency of the DOTS programme with specific reference to tracing of defaulters in formal settlements, implementable suggestions and their view on the presence and selection of a DOTS supporter. Five participants were purposively sampled who fitted the criteria of desirable participants who can build the substantive theory (Henning, 2004). All participants were employees of the eThekweni Municipality and were interviewed. The health personnel were involved in TB management and control within eThekweni. In depth interviews were conducted to supplement the responses received from the study. Probes are used to deepen the response to a question, to increase the richness of data being obtained, and to give cues to the interviewee about the level of response desired (Patton 2002:125). Probes used included remaining silent during the interview or asking further questions such as 'What do you mean?' In order to elicit a deeper understanding necessary for this study, because when probing an interviewer encourages a respondent to produce more information on a particular topic, without injecting his or own ideas into the discussion (FHI, IMPACT and USAID 2005:53). Interviews were conducted at a place of

convenience for both the interviewer and interviewee and were 40 minutes on average or ended when the participant had finished answering. Data was transcribed verbatim.

### **3.13 Data management**

Completed questionnaires were checked for accuracy and compliance against the CDC Electronic TB Register. Only demographic information available on the register was completed where patients left uncompleted. The information received was entered on a Microsoft Excel 2003 spreadsheet which was then imported into the statistical software package STATA version 11 for data analysis. The in depth interviews transcripts were typed using Microsoft Word 2003 and password protected.

### **3.14 Data analysis strategies**

The researcher analysed the data using the statistical package STATA version 11. A p-value of  $< 0.05$  was considered statistically significant and 95% confidence intervals were calculated.

#### **3.14.1 TB defaulter patient questionnaire**

Data pertaining to the demographics, medical history, occupation, and living conditions including other data were captured using Microsoft Excel 2003. The statistical software package, STATA version 11 and Microsoft Excel 2003 was used to conduct data analysis from both defaulters and non-defaulters. Descriptive and frequency analysis was followed by bivariate analysis using the Pearson's Chi Squared Test. Multivariate logistic models were run both unadjusted and adjusted with selected covariates. Forward stepwise logistic regression with the inclusion of suitable covariates (age, gender and race) was done to evaluate associations of interest.



#### **3.14.2 Clinic TB nurses questionnaire**

The quantitative aspects of this study was captured in Microsoft Excel 2003 and imported into STATA version 11 allowing for simple descriptive statistics to be generated. The open ended questions were qualitatively analyzed.

#### **3.14.3 Health personnel in depth interviews**

The qualitative interviews were transcribed and content analysed, a widely used research technique and refers to the set of techniques that are used to identify, measure, describe and make inferences about specified characteristics within or reflected by written or verbal text (Waltz et al., 2010: 279). Once the data was transcribed and open coding was achieved by highlighting keywords and phrases from the transcripts and highlighting them to find common themes (Polit and Beck, 2006). The transcripts were analyzed by categorising the interview data under the main headings. Categories/themes were combined for all transcripts. After a few days, transcripts were revisited to gather any information that may have been missed during the initial coding phase (Anderson, 2007). The three data sets were triangulated and the data integrated to find commonalities and associations of interest.

#### **3.15 Evaluation of the methodology employed**

A cross sectional study was conducted as it was inexpensive. Face to face interviews with defaulters ensured higher responses as patients are less reluctant to refuse to participant. These interviews also ensured that there was little room for misinterpretation of questions and in the event the patient could not understand a question, the interviewer explained it to them (Polit and Hungler, 1995). Qualitative data generated from health personnel validated nurses' responses. The CDC Electronic TB Register served as the sampling frame and only patients that had initially sought treatment at the CDC and that were informal dwellers were included hence a small sample size of 102 for both defaulters and non-defaulters.

### **3.16 Conclusion**

This chapter detailed the methodology employed to conduct this study. The study was a sequential mixed methods descriptive cross sectional study that generated both quantitative and qualitative data. The chapter that follows presents the findings of the study.

## **CHAPTER 4**

### **RESULTS**

#### **4.1 Introduction**

The previous chapter focused on the research approach employed to obtain data for this study. This chapter presents the findings that were generated from both the quantitative and qualitative aspects of this study that includes: the TB defaulters, nurses and health personnel responses.

Of the 185 defaulters, 102(55%) were located and were interviewed. The varying response rate in Table 1.3 was due to the following factors; some rejected participating, others were deceased or had moved. The researcher was also unable to trace some defaulters due to incorrect addresses given on the register. All non-defaulters matched with the socio demographic characteristic of defaulters. All 102 patients did attend the CDC at one stage or another as their names were recorded on the Electronic TB Register. Patients initially attended and were diagnosed at the CDC and were thereafter transferred to health facilities closer to their residence.

All nurses (N=30) involved with TB management at the clinic under study were administered questionnaires but only a small number (n=16) responded, with a response rate of 53% (Table 1.3). This was due to the nurses' lack of co-operation and the fact that only clinics in close proximity to the study areas were selected. Additionally, all clinics did not have the same number of staff members and nurses were overburdened with work. To supplement the study, qualitative in depth interviews were conducted with 5 purposively sampled respondents.

**Table 1.5: Data Collection Response Rate**

Method	Study Population n(%)
Defaulters Questionnaire (n=102)	185(55)
Non-Defaulters (n=110)	110(100)
Nurses Questionnaire (n=30)	16 (53)
In depth interviews (n=5)	5(100)

**Table 1.6: Return of defaulters questionnaires**

Area	No. of patients on list	No. of Questionnaires Returned	Rejected(R);Deceased (DE); Moved (M); Not available (NA); Wrong addresses (WA); Unable to trace (UT)	Response rate (%)
1. Inanda	19	5	6(UT); 2(NA); 4(DE); 2(M)	5
2. Ntuzuma	19	13	1(NA); 5(DE)	13
3. Kwa Mashu	49	28	4(DE); 2(M); 1(NA); 14(UT)	28
4. Cato Manor	30	16	14(UT)	14
5. Clairwood	42	30	2 (R);12(DE)	28
6. Wentworth	26	14	12(UT)	14
Total				<b>102</b>

## 4.2 PREDICTORS OF DEFAULT-TB defaulters' responses:

### 4.2.1 Socio economic and demographic characteristics

Socio economic, demographic and health characteristics of the study population are summarized in Table 1.7. Of the 185 defaulters residing in informal areas, 102 defaulters were traced (Table 1.6) and agreed to participate. All non- defaulters matched with the socio economic and

demographic characteristic of defaulters were sampled from the CDC Electronic TB Register.

**Table 1.7: Socio economic, psychological & demographic characteristics of defaulters**

<b>Characteristic</b>	<b>N=102 Yes (%)</b>
Gender (n=102)	
Male	70(67)
Female	32(33)
Race n=99)	
Black	91(92)
Colored	8(8)
Nationality (South African)	102(100)
Educational level	39 (38)
Grade 12	20(51)
Occupation	66
Unemployed	33(50)
Self employed	3(5)
Other	30(45)
Residential area	
Inanda	5(5)
Ntuzuma	13(13)
Kwa Mashu	28(27)
Clairwood	28(27)
Cato Manor	14(14)
Wentworth	14 (14)
Income per week (n=67)	
R 100 – R 200	37(55)
R 200 - R 600	30(45)
Family member working (n=101)	77(76)
Previous defaulter (n=100)	35(35)
Stress/Worried (n=98)	
Often	48(49)
Sometimes	33(34)
Very little	14(14)
Never	3(3)
What worries you the most? (n= 94)	
Money	44(47)
Food	39(41)
Family life	28(30)
Employee know of TB status (n=68)	45(66)
Time off to get to clinic (n=83)	38(46)
Smokers at home (n=96)	
One	34(35)
Two – Three	46(48)
More than 3	16(17)
Grants (n=98)	62(63)
Grants used to:	
Buy food (n=59)	36(61)
School fees (n=42)	31(74)
Survive without grant (n=67)	10(15)

Of the 102 defaulters, there were 70(67%) males and 32(33%) females. Of the 99 that responded, the study population (defaulters) comprised of 91 (92%) Blacks and 8(8%) Coloureds. The mean age was 40, (SD=9.85). Educational levels were relatively low with 39(38%) defaulters having matriculated. Five defaulters were sampled from Inanda, 13 from Ntuzuma, 28 from Kwa Mashu, 28 from Clairwood, whilst there were 14 defaulters from both Cato Manor and Wentworth.

Of the 66 defaulters that responded, 33 (50%) was unemployed, 3(5%) was self employed whilst the remaining 30 (45%) had casual jobs that included domestic helpers and tea ladies amongst others. Of the 67 respondents, 37(55%) earned between R100 – R200 and 30(45%) earned R200-R600 per week respectively. Thirty five defaulters had a history of default. Of the 101 respondents, 77(76%) had a family member that was employed. Sixty two (63%) defaulters received a grant; however 36(61%) defaulters responded that the grant was used to buy food and 31(74%) of the defaulters used the grant to pay school fees. Interestingly of the 67 respondents, only 10(15%) defaulters could survive without this grant.

Of the 98 respondents, 48(49%) were stressed often, 33(34%) were stressed sometimes, 14(14%) were stress very little whilst the remaining 3(3%) indicated never being stressed. Forty four (47%) indicated that money was their biggest worry, followed by food (39 defaulters-41%) and family life (28 defaulters – 30%). Of the 68 respondents, 45(66%) indicated that their employees was unaware of their TB status. Thirty eight (46%) of the defaulters did get time off to go to the clinic.

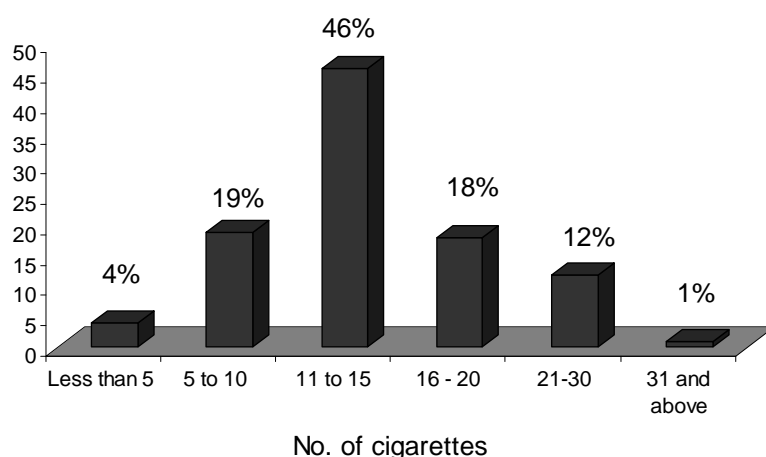
#### **4.2.2 Environmental exposures**

In order to determine environmental exposures questions pertaining to living conditions and cooking methods were administered. Of the 96 defaulters that responded, 47 lived in overcrowded abodes reporting that from 7 to 10

people sharing one abode. With regard to cooking, 22(23%) of the defaulters used gas, 47(48%) used wood/ fire whilst 45(46%) used a stove to cook. It should be noted that the above was used either separately or in combination.

### 4.2.3 Smoking

Thirty four (35%) of the defaulters had 1 smoker at home, 46(48%) had 2-3 smokers whilst 16(17%) of defaulters had more that 3 smokers at home. Of the 96 defaulters that responded, 31% smoked while 25% never smoked. Of the 31% that smoked, 68(67%) interesting answered the question pertaining to how many cigarettes they smoked. Three (4%) smoked less than 5 cigarettes a day, 13(19%) smoked 5-10 cigarettes daily. Thirty one (46%) smoked 11-15 cigarettes a day whilst 12(18%) smoked 16-20 cigarettes, 8(12%) smoked 21-30 cigarettes a day whilst 1(1%) smoked 31 and above.



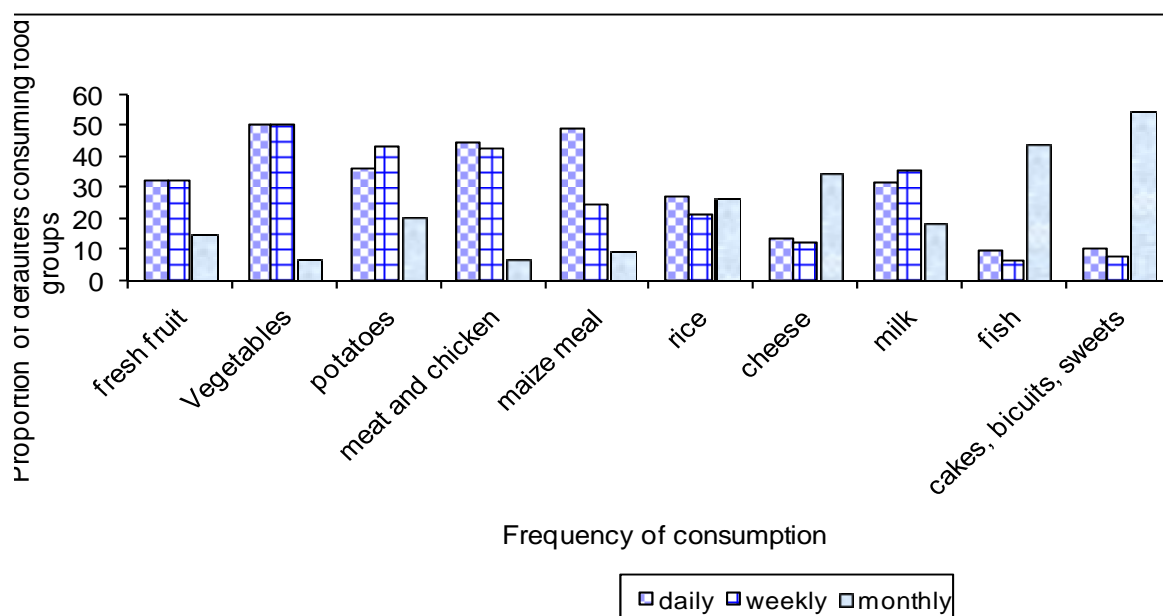
**Figure1.5: Smoking frequencies per day of defaulters**

### 4.2.4 Alcohol consumption

Of the 97 respondents, 43(43%) consumed alcohol regularly, 35(35%) sometimes consumed alcohol whilst 19(19%) never consumed alcohol at all. With regard to alcohol consumption, 82(80%) of defaulters responded. It was

revealed that 8(10%) of the defaulters consumed alcohol daily, 30(37%) weekly, 41(50%) monthly whilst 4(3%) yearly (Figure 1.5).

#### 4.2.5 Nutritional Status



**Figure1.6: Nutritional status of defaulters**

Defaulters were questioned on the different types of food they consumed daily, weekly and monthly to determine their nutritional status. A diet rich in daily and weekly intakes of vegetables, potatoes, fresh fruit and maize meal was evident. However defaulters had relatively lower intakes of fish, cheese and milk. Of the 80 respondents, 65(81%) did eat before taking medication whilst the remaining 14(16%) did not eat before taking the medication. Three (1%) of defaulters indicated that if they did not have food, they did not take the medication as prescribed.

#### 4.2.6 Health characteristics

Table 1.8, includes frequency data for various health characteristics as predictors of default. These included: history of contact with person with TB, persons over 60 years old living with defaulters, family member presently with TB, the disease in the last 2 years, pre disposing medical conditions and



other medications, immunization, treatment adherence and side effects and DOTS supporters.

Of the 101 respondents, 9 of the 101 did not have contact, 16(16%) had contact with a TB infected person a week ago (at the time of study), 17 a month ago, 14 had contact 3 months ago, whilst 26 and 19 were in contact 6 months and a year ago respectively. Thirty eight respondents had a person older than 60 years living with them. Of the 56 respondents, only 44 had a family member with TB. This included their spouse (16%), boyfriend/girlfriend (45%), brother (41%), sister (36%) and their child (32%). Twenty three percent of the 47 defaulters knew of someone that had TB in the last 2 years. Almost all (78%) of defaulters had a DOTS supporter which included family members (62%), a community member (17%), DOTS supporter from the clinic (23%) and nurses (13%).

Medical conditions included diabetes (57%), high blood pressure and asthma (42% each), HIV/AIDS (21%). More than half the respondents (54) were on other medication for their other medical conditions. Forty two percent of the 96 respondents were adamant that they took their treatment regularly. Nausea was the main side effect from the medication followed by vomiting, diarrhea and itchy skin. Symptoms that caused the most discomfort were pain, with nausea and vomiting as depicted in Table 1.8. Medication should be taken on a full stomach however only 49 of the 83 respondents ate first and then took the medication. Thirty four defaulters had been immunized as a baby. Of the 96 respondents, 80% of their children were given immunization.

Data for defaulters and non-defaulters was evaluated using Pearson's chi squared to determine significant predictors. Table 1.9 demonstrates socio economic and demographic frequencies between defaulters and non-defaulters.

**Table 1.8: Health characteristics of defaulters**

<b>Characteristics</b>	<b>Yes (%)</b>
History of contact with person with TB (n=101)	
A week (n=101)	16(16)
A month (n=101)	17(17)
3 months (n=101)	14(14)
6 months (n=101)	26(26)
Year (n=101)	19(19)
More than a year	37(36)
Persons over 60 yrs living with defaulter (n=99)	38(38)
Family member have TB presently (n=56)	
Husband/wife (n=44)	7(16)
Boyfriend/girlfriend (n=44)	20(45)
Brother (n=44)	18(41)
Sister (n=44)	16(36)
Child (n=44)	14(32)
TB in the last two years (n=47)	11(23)
Medical Condition (n=73)	72(98)
Diabetes (n=68)	39(57)
High Blood pressure (n=67)	28(42)
HIV/Aids (n=67)	14(21)
Asthma (n=67)	28(42)
TB injection as baby (n=43)	34 (79)
Children have TB injection (n=96)	77(80)
Taking other medication (n=100)	54(54)
Did you take treatment regularly? (n=96)	40(42)
Side effects (n=92)	
Vomiting	40 (42)
Nausea	56(58)
Diarrhea	21(22)
Pain	11(12)
Itchy skin	29(32)
How did feel when taking medication (n=88)	
Healthy	17(19)
Relaxed	31(35)
Sick	41(47)
Symptoms that caused the most discomfort (n=96)	
Vomiting	11(11)
Nausea	38(40)
Pain	47(49)
Eat first and thereafter take medication (n=83)	49(59)
Presence of a DOTS supporter (n=99)	77(78)
Who?	
Family member (n=74)	46(62)
Community member (n=70)	12(17)
DOTS supporter from clinic (n=70)	16(23)
Clinic nurse (n=70)	9(13)

**Table 1.9: Socio economic and demographic features of defaulters and non-defaulters (n=102)**

Variable	Defaulters (n/N) %	Non-defaulters (n/N) %	Pearsons chi2 p value
Gender			0.519
Male	70/102	65/102	
Female	32/102	36/102	
Race			0.046
African	91/99	100/102	
Colored	8/99	2/102	
TB in family	45/101	15/101	0.000*
Alcohol consumption	78/99	20/102	0.000*
Smoking	72/102	19/102	0.000*

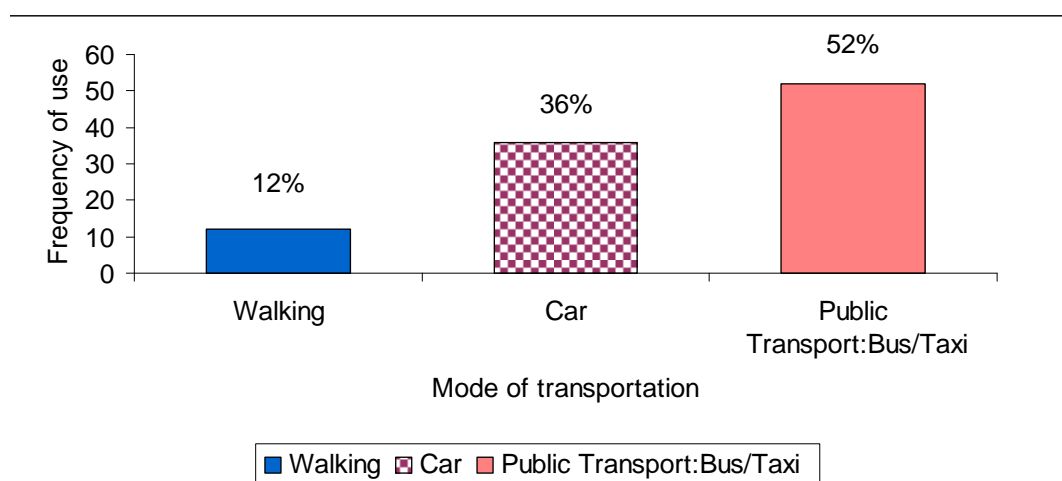
\* p value-<0.05

From Table 1.9, it is evident that smoking, alcohol consumption regularly and TB in family was significantly associated with default from TB treatment ( $p < 0.05$ ) with defaulters when compared with those patients who had completed treatment.

When asked if the employer was informed about their TB status, only 68 defaulters responded to this question. Of the 68 defaulters, 45 informed their employers. The remaining 23 were afraid of losing their jobs and too scared to disclose their status in fear of their employers' reaction. When participants were asked whether they had been given time off to collect their treatment from the clinics, it was revealed that only 38 (46%) defaulters were given time off. As breadwinners in their homes they could not afford to stay away as the "no work, no pay" system applied. Defaulters sometimes just stayed away without telling their employers. Reasons for not adhering to treatment specifically regarding the collection of medication were that 49% of defaulters could not afford to leave work whilst 17(38%) defaulters responded that employers did not give them time off.

#### 4.2.7 Health system characteristics

Of the 98 respondents, 74(75%) agreed that nurses were helpful. Waiting times varied from 1 hour (31%) to 2 hours or more (11%). It was discovered that the clinic stopped treatment for 8 patients whilst 13 patients revealed that the clinic had no stock of medication and this resulted in them stopping treatment. Accessibility to the health facility was determined by asking patients their mode of transport and who paid for their transportation.



**Figure 1.7: Mode of transportation to clinic/ health facility**

As depicted in Figure 1.5 above; 12(12%) of defaulters walked, 51(52%) used public transport (bus/ taxi) whilst 35(36%) used a car either separately or in combination during the times that they visited the clinics.

#### 4.2.8 Opinions about health care services

Defaulters confirmed that the majority of the nurses were helpful (75%). It was highlighted that sometimes the nurses were initially angry because the patient was in a bad condition prior to diagnosis or commencement of treatment but in the end nurses proved to be very helpful. Furthermore one defaulter mentioned that doctors 'did not meet the expectations of the patient and treated them disrespectfully compared to nurses who were helpful and

respectful'. The majority of the defaulters agreed that the clinic staff explained their treatment regime.

#### **4.2.9 Self reported knowledge of TB management by defaulters**

The defaulters' knowledge of TB was evaluated in order to ascertain whether their level of knowledge was a predictor of default. More than half the defaulters stopped smoking after being diagnosed with TB (57%). The majority of the 72(76%) defaulters were aware that TB is a disease caused by a bacterium that can be cured if detected early and treated. However 21(22%) defaulters believed that TB was similar to the flu, approximately the same number of patients, 22(23%) defaulters believed that the disease was not contagious.

A total of 97 patients answered the question regarding the importance of taking medication of which 22(23%) defaulters felt they will feel more sick with side effects, 16(16%) defaulters believed that they will get better faster, 60(62%) defaulters knew that one could die if medication is not taken and adhered to. Interestingly 13% felt that none of the above will happen. About 43% of patients suspected that they may have TB even before they visited a doctor. It is known that taking ones TB treatment conscientiously is imperative and 42% of patients revealed that they had taken their treatment regularly whilst on treatment. A high percentage (85%) responded that they had forgotten to take their medication during treatment whilst 24% revealed that the clinic did not provide medication which is why treatment could not be adhered to it. More than half of the defaulters (59%) did visit a traditional healer at some point during their diseased state for a cure.

#### **4.2.10 Bivariate analysis**

Bivariate analysis also revealed that patients who smoked, consumed alcohol and had a family member with TB were significantly associated with default. Forward stepwise logistic regression models were done to evaluate risk

factors that were associated with predicting default after covariate adjustment.

#### 4.2.11 Logistic regression

**Table 1.10. Logistic regression models**

Characteristics	Unadjusted (Crude)			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Gender	0.82	(0.46;1.47)	0.52	0.84	(0.38;1.88)	0.68
TB in family	4.60	(2.34;9.04)	0.00	2.96	(1.29;6.81)	0.01
History of TB	1.18	(0.65;2.11)	0.58	1.15	(0.52;2.55)	0.72
Alcohol consumption	15.22	(7.66;30.25)	0.00	7.04	(2.96;16.71)	0.00
Smoking	11.23	(5.79;21.78)	0.00	2.79	(1.15;6.77)	0.00

Logistic regression models adjusted for gender and race

Based on the multivariate logistic model it was evident that smoking (OR: 11.23, CI: 5.79,21.78;  $p \leq 0.005$ ), alcohol consumption (OR: 15.22, 7.66,30.25;  $p = p \leq 0.005$ ) and having family member with TB (OR: 4.60, CI 2.34,9.04;  $p \leq 0.005$ ) were all significantly associated with defaulting from treatment. Covariates included in the model were gender and race.

### 4.3 IMPLEMENTATION AND EFFICIENCY OF THE DOTS PROGRAMME

#### 4.3.1) Clinic nursing staff responses

In order to gain insight into the DOTS programme, questionnaires were administered to nursing staff that are responsible for implementation of the DOTS programme within the study area. A total of 30 questionnaires were sent out and only 16 were returned. Frequency analyses of the responses from the nurses are included in Table 1.11. Although the data is limited, it allowed for triangulation of data.

#### **4.3.1.1 Role players of the DOTS programme, DOTS supporters and tracing of defaulters**

Nurses indicated community members (40%) were the major role players of the DOTS programme. When asked how the DOTS programme was implemented at the clinic and the steps of an effective DOTS programme there was a consensus that DOTS supporters were supervised by nurses. According to the nurses, tracing of defaulters were normally conducted by Environmental Health Practitioner, Environmental Health Assistants/ Officers or community members. Almost all of the nurses (94%) indicated that Environmental Health Practitioners (EHPs) were responsible for the tracing of defaulters. Once these defaulters were traced, they would be rehabilitated by health education by health person and returned to treatment.

#### **4.3.1.2 Counseling**

Counseling of these defaulters is a major component of an effective DOTS programme implementation. Counseling (94%) for TB patients and defaulters was evident. The function of counseling is to put the defaulters back on treatment and rehabilitate them. Counseling is done by nurses and other health personnel that are trained.

**Table 1.11: Frequency analysis of nurses' responses**

<b>Characteristic</b>	<b>Yes (%)</b>
Role players of DOTS (n=15)	
Community members	6(40)
Nursing staff	15(100)
Counselling	15 (94)
Person responsible for tracing defaulters (n=14)	
EHPs	1(7)
EHAs	11(79)
Community Members	4 (29)
Rehabilitation of defaulters (n=14)	
Counselling	14(100)
Training	3(21)
Health education	11(73)
Training of DOTS supporters	15(94)
DOTS supporters supervised?	15(94)
Training of nurses (n=15)	14(93)
Predictors of default	
No food (n=15)	12(80)
Got work (n=12)	8(67)
Feel better (n=12)	11(92)
No DOTS supporter (n=12)	10(83)
Lack of knowledge (n=12)	9(75)
Lack of education/Knowledge (n=12)	9(75)
Lack of transport/money to get to clinic	3(20)
Reason for high incidence and defaulter rate (n=14)	
Lack of training of staff	2(14)
Lack of commitment by patient and staff	14(93)
Lack of medication	1(7)
Lack of staff	2(14)
Measures to minimize defaulters (n=15)	
More training for health staff and DOTS supporters	6(40)
More health education	12(80)
Implementable suggestions (n=15)	
More training	5(33)
Improvement: implementation of the DOTS programme	12(80)
How many DOTS supporters (n=14)	
Nil	2(14)
One	5(36)
Two/ more	7(50)
DOTS supporter visit patients (n=14)	
Once a day	5(35)
Once a week	6(43)
Efficiency of the DOTS programme (n=15)	11(73)



#### **4.3.1.3 Training**

Continuous training is imperative and training encompassed a wide scope of information. Due to staff shortages and no constant number of nurses dealing with TB patients per clinic, training sessions were attended by a varied number of nurses. Although the majority of the nurses specialising in TB had undergone some training, it was highlighted that only managers and those in authority were given extensive training. Not all the nurses interviewed received the same level and frequency of training. The majority of the nurses answered that three nurses had undergone training. The maximum number of trained nurses at the CDC was eight since the health facility did have a larger number of staff. With regard to the scope of training, Inanda Seminary nurses reported that they were trained on 'everything regarding the disease including management, screening and care'.

The CDCs' training encompassed general nursing and community nursing science including

- Side effects of TB drugs
- Contra indications
- supervision
- administration
- recording
- lifestyle modification
- drug interaction
- dosage
- education regarding lifestyle changes
- compliance of treatment including treatment regimen
- signs and symptoms of TB
- sputum test and collection
- mantoux testing
- DOTS programme

Attending symposiums and consulting private literature also formed part of their training. The nurses at the Bluff Clinic were also trained regarding the collection of a sputum sample, record keeping (entering of patient details in files and cards), diet and lifestyle modifications, treatment regimens and screening of TB patients and referrals if necessary. Record keeping was mentioned as essential to ensure follow up of defaulters.

#### **4.3.1.4 Nurses' perception of predictors of default**

Nurses also gave their perception of why patients default on treatment. Lack of commitment by patients (65%) was highlighted as the main reason for defaulting by nurses. Other reasons cited for defaulting was incorrect addresses given on registration, living far away, difficulty to get to the clinic, the stigma attached with HIV/AIDS, lack of self responsibility by patient and that patients feel better after the initial phase of treatment and are therefore more likely to default. Other factors included dissatisfaction of patients regarding clinic care; giving incorrect addresses just to attend a particular clinic (CDC) and because of the availability of the chest x ray for diagnosis. It was mentioned that patients seemed to be more confident in the chest x ray compared to the sputum test as a means of diagnosis and hence the high number of attendees at the CDC.

#### **4.3.1.5 Minimization of the defaulter rate**

Nurses suggested the following as measures to minimize the defaulter rate:

- More training for health staff and DOTS supporters (80%) and increased health education to patients.
- Involvement of community members in the DOTS programme
- Stricter control with proof of residence,
- educating employers, managers and supervisors on DOTS and encouraging sharing of information to co workers.

It was suggested that having more training and improvement with the implementation of the DOTS programme would increase the TB cure rate.

#### **4.3.1.6 Minimization of the spread of infection**

An open ended question was asked regarding the methods that the clinic could implement to reduce TB infection at the clinic. The following methods were mentioned:

- Air conditioners, sunlight and fan extractors were common methods of prevention.
- Glass bricks were suggested to allow for sunlight to enter the health facility and a specific isolated place set aside where patients could wait to reduce overcrowding hence decreasing the spread of infection.
- It was highlighted that patients should be separated from children and other patients.
- Nurses and patients should wear masks.
- At the Merebank clinic, the patients are treated in a container outside the clinic thus reducing infection.
- Health education was given priority and should be conducted on a continuous basis to raise awareness on treatment regimens and the importance of staying healthy. There should be a sputum room available where patients can cough hence practicing cough hygiene together with ensuring care is taken with collection and disposal of sputum.
- Early diagnosis and treatment was also mentioned as important to reduce the infection rate at the clinics.

#### **4.3.1.7 Efficiency of the DOTS programme**

After exploring the factors above, nurses were questioned on the overall efficiency of the DOTS programme. On the one hand, majority of the nurses (73%) felt the DOTS programme was effective as currently being implemented. By having a DOTS supporter, patients were less likely to default on treatment because they are seeing a supporter regularly. DOTS makes the patient report to the clinic for treatment daily or weekly makes it

easy to do follow up when defaulting and improve compliance. The cure rate should be high with implementation of DOTS. It ensures continuity and availability of treatment building a relationship of trust between the patient and the supporter.

On the other hand, the remaining 27% of the nurses felt that the programme was ineffective. Those nurses pointed out that patients and staff are inadequately trained or counselled about TB medication and treatment. Additionally it was mentioned that TB treatment regimens constantly changes and all DOTS volunteers and nursing personnel are not updated timeously, staff recovery training often do not practice DOT treatment and do not impart their knowledge to other staff members.

#### **4.4.2 QUALITATIVE INTERVIEWS WITH HEALTH PERSONNEL**

As per the interview schedule (Annexure 6), answers were transcribed and evaluated using thematic analysis.

##### **4.4.2.1 Implementation of the DOTS programme**

Firstly the researcher sought to obtain insight into the general implementation of the DOTS programme. Thereafter questions regarding various strategies of DOTS were asked with specific reference to predictors of defaulter. When asked, 'How was the DOTS programme implemented?' it was highlighted that the programme is implemented two fold namely; at facility level and community level respectively. It was emphasized that the clinic links the defaulter to a supporter at facility level however this was not happening. At clinic level, the treatment regimen should be explained to the patient but respondents were not sure if this was the case. TB district supervisors see that the programme is well implemented'. DOTS at the facility are within 'walking distance' as mentioned by Respondent 3 adding that DOTS also took place at various shops in town centres. One respondent felt that the programme was not working and described DOTS as 'not being fruitful'. The

respondent cited that accountability was a major barrier to the efficiency of treatment adherence and proper implementation of the DOTS programme.

**‘Dots supporter not accountable to clinic since we do not pay them ... no one do follow ups... that’s my point.**

Respondent 4 explained further as to why the programme is not fruitful,

**‘when patient is diagnosed they are asked who they would like to be their supporter... and in some cases this supporter does not report to anyone’.**

#### **4.4.2.2 Implementable Suggestions**

Implementable suggestions given by nurses to improve DOTS support included the provision of a stipend for DOTS supporters, involvement of key figures from the community such as pastors, councillors and non – governmental organisations. It was also revealed that contracts of nurses employed at eThekweni can render services on a shift basis hence enabling DOTS clinics to be operational 24 hours.

**Stipend should be given to supporters ‘be better everybody wishes for something’.** (Respondent 1)

**‘Involvement of key figures “faith based, NGO’s, strengthen relationships and may cause the patient to stay on treatment’.**  
(Respondent 1)

**‘DOTS could be easily accessible 24 hours by being open 24 hours so patients do not have to take time off work to get treatment or medication’.** (Respondent 2)

**'Involvement of local people, councillors key people prominent nkosis like if there is business people in area they can support patients, Incentives is one way of improving cure rates instead of being done by volunteers, I have said to you.. supervision community facilitator depend on a situation others can take week supply not 6 months supply patient dotted at clinic straight by nurses for two months'. (Respondent 2)**

**'Dedicated facility and staff makes it user friendly and efficient; Mother clinic diagnoses the patient, gives green card which should allow medicines to be given to any other facility, records are kept at mother clinic but not at the other clinic so they do not know who defaulting, system fall down, should trace a patient after two weeks, if go to one clinic that's why need dedicated staff...Fast Queue.**

**More than one dedicated facility in district so that patients won't have to move earth to get to that one and then not be able to continue there, they can go to nearest and get expert help efficiently'. (Respondent 5)**

**'Involvement courses should be done environmental health that component should be involved, they access survey health education can make a patient take patient reviewing monitored reduce defaulters. EHPs but EHOs big question used to do think what to do that hands are full need other people involved TB intervention'. (Respondent 4)**

**'They need to employ more nurses at clinic level, increase tracing teams, partnerships with other departments, need to have community health awareness, once every quarter, need to treat HIV/ TB together'. (Respondent 3)**

It was mentioned that by having more facilities within a district, the workload will be minimised and patients had the opportunity to go to any clinic seeking treatment. There needs to be more dedicated facilities and staff in order to combat TB. Furthermore it was highlighted that the names of supporters should be made available and forums should be held to ensure accountability.

#### **4.4.2.3 Predictors of defaulting**

Poverty, living in informal areas, unemployment was all common factors mentioned by respondents as predictors of default. One respondent implied that the DOTS programme was not 'fruitful' (Respondent 4) and was a possible predictor of default. The respondent added that there was no accountability at the Municipality and job functions were not clearly defined. It was also mentioned that informal settlement residents were more susceptible to the disease and prone to defaulting but it was not **'unique to informal settlements'**. (Respondent 5)

**'There is a lot on why people default. At CDC our main problem is that patients give false contact details - incorrect addresses so they can be seen at this clinic, and incorrect tell no's, we can't trace them. This doesn't seem to be unique to Durban as I have spoken to doctors working with TB patients in New York and they have the same problem - they say it is related to stigma. With the cell phones in SA - patients may give us their correct no but since most use pay as you go - when that runs out they buy a new number hence difficult for us to trace'**. (Respondent 5)

**'wrong addresses are a threat "because beyond control" intentional access to clinic, reach national targets at stage, wrong addresses don't want to be known especially foreigners, high mobility'**. (Respondent 1)

It was further explained that in higher socio economic areas, the prevalence of disease is lower and hence a lower defaulter rate. Further to this it was mentioned that patients residing in informal areas were more difficult to trace.

**‘not mad in mind that patients default, lots of side effects to treatment. rash allergy to a certain tablet made of a lot of 4 tablets fixed doses combination u are allergic to a single dose replace hospitals not all can keep no rehabilitation as such’.**

(Respondent 3)

Side effects were highlighted as a predictor of default.

**‘side effects react different urine reddish not problem, rash allergy to a certain tablet made of a lot of 4 tablets fixed doses combination u are allergic to a single dose replace’.**

(Respondent 3)

#### **4.4.2.4 Staffing of nurses/ attitudes of nurses and clinic staff**

It was observed that nurses are over burdened at the health facilities across eThekwini. One respondent quoted the following.

**‘diagnosed 12 00 per 100 000 pop... us 250 per 100 000 four times more, that’s how over burdened nurses are’.** (Respondent 1)

There was a consensus amongst all respondents that a major challenge is that all health facilities were understaffed. It was observed that in some facilities, there was only one nurse that was designated to TB patients. It was said that since nurses are over burdened, they were stressed and may behave negatively to a patient.



#### **4.4.2.5 Training**

Training revealed the different aspects concerning training.

**‘Oh yes given training working with NGO, have in TB Free specialised Training of patient , really train health care workers and DOTS CHW call them omompilo two types DOTS volunteers those that are paid HCW receive a stipend per employer under NGO pay them, they are not only doing, they doing DOTS home based , caring for home based care duties’. (Respondent 2)**

Nurses are trained by organisations such as the University Research Council (URC) and Task TB.

**‘Trained nurses supervised, go to facilities trained by province national, TB crisis plan supports also support them. URC University Research Council TASK TB train nurses all categories ENS, nursing managers they need to know the programme, supervisors know’. (Respondent 2)**

**‘Tracers we teach them counselling...’ (Respondent 3)**

**‘EHP but EHOs big question used to do think what to do that hands are full need other people involved TB intervention’. (Respondent 5)**

**‘Training various types of training every quarter TB updates ja train health care workers on TB management and control to understand recording and TB suspect registers train’. (Respondent 3)**

**‘Training use to happen not anymore...training of volunteers in communities ceased, stopped 5 years, Health Care Workers only training that they receive HCW training; Professional nurses**

**clinics only, CDC Nursing Service Manager has been to all sub districts and offered training in service, not formal training, updates are given on request, also part of the PMC training course covers TB, CDC Nursing Service Manager does orientation of all new staff overview. Different levels are given to different people. CDC Nursing Service Manager goes out to industries, talks, seminars nurse training at institution of learning, DUT highway Hospice got no idea of tracer teams, training professional'. (Respondent 5)**

On one hand it was highlighted that training did happen for stakeholders involved in TB management. Stakeholders mentioned included the DOTS supporters, health care workers, facilitators and nurses. It was revealed that nurses and those involved in TB management who are employees of eThekwin Municipality are given training as part of eThekwin's Workplace Skills Programme (WSP). It was maintained that training is given according to the level of authority and their involvement in TB management.

**'medical training differ according to specific person that need training...we are updated whenever new information arises'.**

(Respondent 1)

Training included the following aspects:

- Basic TB as a disease
- Signs and symptoms
- Causes/ risk factors
- Procedure to follow for a TB suspect case
- TB management
- TB Crisis Plan
- Side effects

**‘Taught basic TB as a disease, signs and symptoms, what causes it, what to do with someone presenting sign, management, treatment expectation, side effects of medical training differ according to specific...sustained formal training “teach communities” 2- 3 day update when new information... when we want to reach at a particular area. DOT supporter one on one with nurses employers- nurses give training, initiate treatment, programme nurses doctors, got pros and cons’.** (Respondent 1)

On the other hand, it was revealed that “training used to happen for the DOTS supporters previously” (Respondent 5) but respondents were unsure whether this was still the case currently. It was also mentioned that there was a lack of training amongst all the stakeholders involved in TB management. It was revealed that nurses used to be trained by the previous Nursing Services Manager of the CDC (NSM CDC) and orientation of new staff members do occur. Respondent 5 also highlighted being unaware of any tracer teams that were trained or available regarding TB. The NSM CDC previously conducted seminars at industries, institutions of higher learning such as DUT and Highway Hospice but there is uncertainty whether this will continue since the NSM CDC has since been transferred to another health facility.

**‘Training of volunteers in communities have ceased’**  
(Respondent 5).

#### **4.4.2.6 DOTS supporters leave for better employment opportunities/ no stipend**

DOTS supporters generally are unemployed members of the community and render their services voluntarily in the hope that they will get a permanent paying job one day. It was also mentioned that there are not enough supporters. Unfortunately when they do get a job they leave the patient which is a common predictor of default. Respondent 5 highlighted that the supporter

does not report to the clinic in some cases so the clinic is unaware when the patient is no longer supported.

**‘The bad side of it not enough volunteer supporters because there is no stipend, be better, everybody wishes for something’.**

(Respondent 1)

**‘DOTS supporter not paid look for greener pastures’.**

(Respondent 2)

#### **4.4.2.7 Presence and selection of DOTS supporter**

It was revealed that there was DOTS supporters’ presence in some cases whilst this proved consensus, one respondent was not aware of their presence in informal areas. In the event that a patient is diagnosed they are then informed to choose a DOTS supporter from a list available at the clinics. This list has the names of supporters from the various areas. Respondents mentioned that patient had the choice to choose a supporter and in most cases they chose a person known to them; however the proportion of defaulters supported by a known person was unknown.

**‘Up to patient, not going to be anyone care and love to patients dedicated enough can be any one who shows commitment’.**

(Respondent 3)

**‘A DOTS supporter can be a community person can be placed by office suitable from programme not family member officer must be involved supervised judging looking down health care worker dots supporter, not necessary a community member’.**

(Respondent 4)

On the other hand at the CDC, **‘once a patient is diagnosed they are dotted at the clinic for the first two months’** (Respondent 5) and then are referred to another clinic which should introduce them to a supporter.

**‘They are no trained DOTS as they are no definite catchments area’** (Respondent 5)

**“Informal organised place structured programme looks well within eThekwini 37 something standing 15-17 % less than 20 % for exact figures, great improvement for instance informal settlements’.** (Respondent 3)

At the CDC nurses were identified as supporters to TB patients. It was highlighted that persons known to the patient was not advised as supporters. Often family and friends felt sorry for the defaulters and may allow patients to miss treatment.

**‘DOTS supporters family, my sister, brother, family... very difficult not feeling well, you feel sorry for me, very different to do what you call this family member , oh shame she does not want to take it’.** (Respondent 2)

It was advised that the patient should not be a relative or friend to the supporter although sometimes patients did successfully complete their treatment when supported by either a family member or someone known to them.

**‘Family member as a supporter compliance rate is very low’**  
(Respondent 5)

It was revealed that the CDC had no DOTS supporters since patients from the whole of eThekwini attended the facility. It was mentioned that DOTS supporters living in the community work better to improve adherence and cure rate.

#### **4.4.2.8 Tracing of the defaulters and tracer teams**

Various reasons for not adhering to treatment were revealed but the following reasons took precedence amongst the respondents. Firstly, defaulters are often not traced in time to return to their treatment regimen due to them residing in informal areas and the high mobility. It was revealed that in the event the patient does not return to treatment, they are regarded as 'untraceable'; they assumed that the patient will seek help in another medical facility. It was mentioned that there are no tracer teams at the CDC but all the defaulting tracing are given to the respective health offices for the EHOS to trace, render health education and return the patient to the treatment regimen.

**'Tracing...have no idea of tracing my experience once patient becomes patient fieldworker environmental health assessing condition that give talk health education on dates visiting patients deteriorating defaulters once person give correct defaulters just an excuse don't take now clinic give no one confirming addresses unknown patient these dots supporters not fruitful must be ones confirm this condition won't be easy for patient to default.'** (Respondent 4)

It was emphasized that recently there have been attempts to try and trace the patients and make sure the status of a defaulter by linking with Home Affairs to see if defaulters have died.

**'I say that link with Home Affairs to establish whether defaulters are actually defaulters or whether they have died'.** (Respondent 5)

Firstly as mentioned earlier, respondents were uncertain whether there were tracers and if they had undergone any training. Two respondents were adamant that there was a 'lack of communication' (Respondent 4) and

personnel were absolving responsibility. It was uncertain who was actually tracing defaulters.

**‘EHA tracers’ commitment not very good and I am being polite when I say that’.** (Respondent 5)

#### **4.4.2.9 Electronic TB Register**

It was revealed that the CDC was the only facility that is in possession of an electronic register which is mandatory under then SANTCP (2004). However, it is not mandatory for a facility to have an Electronic TB Register but it is for the districts. It was said that this register captures vital information allowing for patients to be traced and that the CDC only captures those patients that are diagnosed at their clinic. Additionally in the event a patient is transferred to another facility, this is captured however once they leave the CDC, the patient is not followed up and is not the CDCs’ responsibility to trace or support the patient. Other facilities use the register that consists of pink forms that are given by the National Department of Health. Respondent 2 highlighted that the district office also keeps an Electronic TB Register that captures all the patients from all the eThekweni clinics.

**‘Register case finding smear second page, taken sputum pink page 2 months treatment intensive phase and continuation and end of continuation last sputum taken’.** (Respondent 3)

#### **4.4.2.10 DOTS Sites**

It was mentioned that previously, there were many DOTS sites but this has now been decreased substantially. A reason for this was uncertain. Health personnel mentioned that DOTS sites did include shops, clinics, **‘workplace DOTS’** (Respondent 1) or any place that can be easily accessible to a patient. Faith based organizations such as churches and NGOs was observed to strengthen relationships between the supporter and the patient.

However these DOTS sites were not listed to their knowledge so an actual number could not be specified.

**‘Faith based NGOs as DOTS sites are effective in strengthening relationships’.** (Respondent 1)

#### **4.4.2.11 Direct Involvement of Nurses**

Nurses’ direct involvement was highlighted to be responsible for high cure rates and low defaulter rates in informal areas such as Bottlebrush in Chatsworth, Kwa Zulu Natal. In Bottlebrush, a provincial nurse is based in the informal area and patients are monitored from there. It was highlighted that this enabled patients to adhere to treatment and to be traced promptly. It was highlighted that where provincial nurses are specifically involved with the defaulters, those areas have very low defaulter rates.

**‘Okay I’m going to give you a curveball, DOTS very ineffective however in Bottlebrush where researchers from put nurse in area started with 45 patients now doing DOTS and ARV adherence rate of 85% with over 200 in their books, cant say cure rates, staying in treatment, rest eThekwin problem with treatment’.**  
(Respondent 5)

#### **4.4.2.12 Involvement of Local People**

It was highlighted that by involving faith based organisations such as churches, there was a higher rate of adherence to treatment. Furthermore it was mentioned that since these organisations were fixed, patient often found it “convenient” to be supported there (Respondent 5).

**‘Involvement of local people, councillors key people prominent nkosis like if there is business people in area one way of improving very difficult just involve local people incentives is one way of improving no done by volunteers, I have said to you..**



**supervision community facilitators depend on a situation’.**

(Respondent 2)

#### **4.4.2.13 Food parcels/Incentives to patients**

**‘In the past food parcels were given and it proved quite efficient but then these were stopped’** (Respondent 5). Reasons for these remains uncertain and none of the respondents knew as to why this had stopped. Furthermore grants were only made available to those severely disabled by the disease.

**‘Grants are only given to patients that are debilitated by the disease and cannot work’.** (Respondent 5)

Most of the defaulters in this study were unemployed but were not debilitated *per se*. It was unclear as to whether they had lost their jobs because of the disease. It was also noted that patients were selling their infected sputum and other members of the community in order for them to access grants. For this reason, these grants are now discontinued. It was revealed that the eThekweni Municipality was not involved in administering those grants to the defaulters.

#### **4.5 Conclusion**

This chapter presented the findings from the three sets of data generated namely patients (defaulters and non-defaulters), nurses and health personnel. Chapter 5 discusses the implications of these findings.

## **CHAPTER 5**

### **DISCUSSION**

#### **5.1 Introduction**

The previous chapter focused on the findings of this study. This chapter will discuss the implications of these findings as related to the objectives and will include the strengths, the challenges and limitations of the study.

#### **5.2 Strengths**

- To the researchers' knowledge, this was the first such study conducted in eThekweni investigating predictors of default amongst informal dwellers and evaluation of the DOTS programme simultaneously.

#### **5.3 Challenges**

- Tracing of patients was a challenge. Some defaulters were unavailable due to their employment commitments. Some patients provided incorrect addresses hence finding some areas in the informal settlements were impossible whilst others had since moved residence or were deceased.
- Although the patients were all from informal settlements, the number of defaulters differed from each other, obviously due to the different burden of the disease faced in different areas.
- Patients were also reluctant to participate because of fear that they will be in 'trouble'. Some of the nurses and health personnel were reluctant to participate for fear of prejudice and being over burdened due to staff shortages at the clinic.
- Tracing forms are often lost in circulation and could not be utilised. Hence tracing patients using this tool was eliminated.
- Not all clinics had electronic TB registers. Clinics used written registers which proved to be difficult in that either the writing was not

#### **5.4 Limitations**

- This study only sampled defaulters from 6 informal areas and could not trace controls due to financial and accessibility issues.
- Additionally, a major confounder in this study is the HIV/AIDS co-infection.

The findings of this study will be discussed according to the research questions mentioned in Chapter 1 namely:

1. What is the prevalence of defaulting in eThekweni?
2. Do informal dwellers present with different risk and/ or predictor factors that make them more susceptible and how then, do these factors influence defaulting?
3. How is the DOTS programme implemented?
4. Who is responsible for supporting TB patients?
5. Who is responsible for tracing TB defaulters?
6. Is the DOTS programme effective in the current format?

#### **5.5 PREVALENCE OF DEFAULTING IN ETHEKWINI**

In Hlabisa, South Africa in 1994 and 1995, it was reported that 629(17%) out of 3610 surviving patients failed to complete treatment (Kandel et al.; 2008), with eThekweni reporting a similar defaulter rate of 18.9% in 2007. Similar to this study, a study conducted in Eastern Cape in 2001 found 13% of patients interrupted treatment while an evaluation in the OR Tambo district municipality in 1999 and 2000 found an interruption rate of 19%. In this study, defaulter rates varied, where in 2007, eThekweni reported a defaulter rate of 18.9%, 26% in 2006 and 19% in 2008 (National TB Crisis Plan: eThekweni

Municipality, 2009). As mentioned before in Chapter 2, defaulter rates at eThekweni for 2009 and 2010 were inaccessible at the time of publication. At a time when HIV/AIDS pandemic is on the increase, TB has resurged with high defaulter rates (Kandel et al., 2008).

## **5.6 PREDICTORS OF DEFAULT**

The question that commonly arises is why some patients complete treatment whilst others do not (Vijay et al., 2010). It is known that high defaulter rates are responsible for the high treatment failures, drug resistance and death (Jakubowiak et al., 2007). It is no doubt that patients often take their tuberculosis medication under very difficult conditions and several mitigating factors influence their adherence (Munro et al., 2007). This study aimed to identify those predictors of default particularly in informal settlements where poverty and unemployment is rife. Several studies have been conducted to explore socio economic and demographic factors such as age, gender, social status, smoking status, alcohol consumption, income and education and its relationship to treatment outcome (Balbay et al., 2005; Munro et al., 2007 and Cayla et al., 2009). However it must be acknowledged that these studies include different populations and varied study designs. This study is uniquely placed in the informal settlement context.

Socio economic, demographic, health and environmental characteristics all influence the outcome of treatment as was investigated in this study. Defaulting on treatment is one of the most important challenges facing any TB control programme (WHO, 2003). Evidently eThekweni has had defaulter rates above the WHO targets of 5.0% despite the implementation of DOTS (National TB Crisis Plan: eThekweni Municipality, 2009). In this study 45% of the defaulters in the CDC Electronic TB Register were not available to participate because of they had either moved, provided the wrong addresses, untraceable, deceased or their questionnaires were incorrectly completed and hence had to be rejected. A possible reason for giving incorrect

addresses probably indicates mistrust, even defiance with the health team on first contact (Comolet et al., 1998:895). It should be noted that this study's findings may not be reflective of the general population and is debatable as our relatively small sample size has limited statistical power. All of the defaulters in this study were South African citizens that had sought initial diagnosis and treatment at the CDC. All the defaulters within eThekweni might have been excluded from the Electronic TB Register, as they may have initially sought diagnosis at a clinic close to their home and not the CDC itself.

This study has shown that males made up 67% of the non-defaulters that had completed treatment implying that more males contract TB. Defaulting was largely associated with males in India, South Africa, Gambia and Ethiopia (Kandel et al.; 2008), which was similar to this study. A possible reason for this was suggested by a study in the United Kingdom (UK) was that males were unwilling to seek help from health care facilities and took risks with their health (Norgbe, 2008). In contrast to this, females tend to be more responsible and adhere to treatment. This study did not find gender to be a significant risk factor ( $p$ -value = 0.52). Nevertheless it was observed that males were mostly the breadwinners of their homes and may not have had time off from work which could result in defaulting. This study did not take into account the marital status of the patients but rather focused on their residency as informal dwellers.

Of the 102 defaulters, 91 were African, 8 Colored and 3 did not specify their race. The mean age of defaulters in this study was 40 similar to the study by Liam et al. (1999) amongst a Malaysian population reporting a mean age of 41.9. Although some studies have not shown any significant association between age, ethnicity and defaulting (et al., 1999), it was reported that the age group 20 to 30 years had a greater risk of defaulting, implying that the work force is compromised (Bello, 2010). Only 39 of the defaulters in this study had matriculated. In this study, educational levels did not significantly

predict default. Low educational levels may mean that patients have a limited understanding of the treatment regimen, the importance of adhering to treatment and the implications of defaulting. Stress was common amongst defaulters with money dominating their stress followed by food and family life. Due to the high unemployment rates present in these informal areas, patients may genuinely be stressed and forget to take their treatment conscientiously. Many of the defaulters (50%) were unemployed and the relatively high unemployment points to the poverty level amongst patients. This study that reported 55% and 45% of defaulters receiving an income of R100- 200 and R 200- 300 per month respectively indicates a possible impact on default. This was similar to the study conducted in Ghana (Dodor and Afenyadu, 2005) showed income per month to be significantly associated with default ( $p=0.03$ ). Interestingly 35% of patients had previously defaulted. History of default was a common predictor in several studies (Al-Hajjaj and Al-Khatim, 2000; Santha et al., 2002 and Chan-Yeung et al., 2003).

The study by Khan et al., (2005) reported that patients often did not divulge their TB status to family members and neighbours for fear of hostile responses from them. We found that the majority of the patients were allowed to take time off work to collect their medication and their employers knew of their TB status so even though stigma was attached to the disease, some patients did risk telling their employers. Stigma as a predictor of default although not significant in this study did predict default in many studies (Wasonga, 2002; Tshabalala, 2007 and Dodor and Afenyadu, 2005). In this study some defaulters were also reluctant to divulge their status to their employers to get time off to seek diagnosis or treatment for fear of losing their jobs. Further investigations need to be done to determine whether the patients that were given time off to collect medication and whose employers knew their status are still employed or not.

Malnutrition is a risk factor for TB (Cegielski and McMurray, 2004) and can be assumed to influence treatment adherence. Most defaulters indicated

eating before taking treatment since medication should be taken on a full stomach to work optimally. Additionally to minimize the side effects experienced, patients need to have a well balanced diet. It is believed that good nutrition increases ones immunity (Chandra, 1997). In order to determine whether patients were eating a healthy well balanced diet, patients were questioned on the categories and frequencies of food consumed. Most patients consumed mostly biscuits, sweets and cakes during the month, which seems strange, but may be attributed to these items sold cheaper than staples.

Numerous studies have indicated that lowered immunity is the most important risk factors for the disease (Ayles et al, 2008; and Cegielski and McMurray, 2004). In this study defaulters presented with diseases such as diabetes, high blood pressure and asthma and were taking other medication which may have influenced default. These conditions also may have weakened their immune systems and increased their susceptibility to contracting TB. HIV/ AIDS was a confounder in our study because TB is an opportunistic disease in patients with HIV/AIDS. Since HIV/AIDS is not a notifiable disease in SA, only 14 defaulters disclosed their status in this study.

Presence of a DOTS supporter is no doubt pivotal in ensuring that the patients adhere to their treatment regimen. In this study, 77 defaulters were observed yet still defaulted. However it was evident that patients were mostly supervised by a family member (74 defaulters). However at some point in their treatment, they were supported by community members, a supporter from the clinic and/or a nurse. This leads to questions surrounding the efficiency of the different types of DOTS supporters and whether it is worthwhile to have so many different supporters observing the same patient throughout their treatment. Would it be more successful in ensuring that one supporter observes one patient throughout their treatment?

Poor TB medication availability was highlighted in Pakistan (Khan et al., 2000) as a predictor of defaulting. Interestingly this finding did bear some truth in this study with 8.0% of the defaulters revealing that the clinic did not provide medication and that forced them to stop treatment. Additionally 13 defaulters revealed that the clinic did not have stock of medication hence they could not complete their treatment. This warrants clarity on why some clinics were not provided with adequate supply of medication or was the patient deliberately denied medication? Patients also indicated nurses were more helpful compared to doctors who were disrespectful towards patients. There was a consensus amongst all respondents (nurses and health personnel) that a major challenge was that all health facilities were short staffed causing a poor rapport with patients. This study highlighted that sometimes nurses' negative attitudes may be predictive of default however majority of patients (76%) said that nurses were helpful.

Nurses also added that patients should take responsibility for their conditions and that there was a lack of commitment on the patients' part to complete treatment. In this study some defaulters mentioned sometimes forgetting to take their treatment. Side effects of medication were another possible predictor with nausea being the most common side effect (Bello, 2010) mentioned by defaulters in this study. Pain was also a common symptom experience with intake of medication. Side effects were mentioned by both nurses and health personnel as predictors of default. In a study conducted in Australia, 23% of patients had stopped treatment because of side effects (Awofeso, 1998). Nurses felt that patients were defaulting as a result of feeling better. This clearly illustrates the lack of knowledge on the patients' part which implies that health education was ineffective and/ or lacking. An array of studies revealed that lack of information or insufficient health education strongly predicted default (Hasker et al.; 2008; Comolet et al.; 1998; Bam et al., 2006 and Liam et al., 1999). In this study, patients were knowledgeable about the disease; they knew that it is contagious and knew the repercussions of not completing treatment so lack of knowledge was not



a predictor for default. Patients should be made aware that during the intensive phase, they will start to feel better but should nevertheless complete their treatment regimen (Shargie and Lindtjorn, 2007). TB treatment is generally taken for 6 months and very few patients complete their treatment regimen without any side effects (Bello, 2010). Side effects, a known predictor of default (Chang et al., 2004), emerged strongly in this study that included vomiting, nausea, diarrhoea, pain and itchy skin. The majority of patients felt sick and therefore stopped treatment. Patients also mentioned that pain was a common side effect experienced.

Factors relating to the provision of health care services emerged strongly in this study. DOT at a health care facility often meant that a patient had to give up part of their working day to attend (Khan et al., 2000). In this study, patients were collecting their own medication and hence needed time off work. Some patients could not get time off. Many patients were the breadwinners of their homes and had the responsibility to provide for their family and therefore treatment may not have been a priority for them. Distance to clinics was a problem with defaulters because they were not able to afford transport to the clinic. Most patients used public transport to get to the clinics. Sometimes they could afford transport costs whilst at other times family members, friends, neighbours and even employers assisted them with the costs. More than 50% of the defaulters waited for an hour at the health facility. For a clinic such as the CDC which services a high number of patients daily, this waiting period was adequate. Nurses also highlighted that patients generally preferred visiting the CDC; aside from the easy accessibility being situated in the city centre; the patients felt that the chest x ray conducted at the facility was more reliable in diagnosing TB. Further investigations need to be conducted at the other clinics regarding their diagnostic methods. Although it was uncertain as to whether it was before or after diagnosis, patients may have consulted with traditional healers before going to a clinic. In this study, many patients sought treatment with traditional healers (59 defaulters) hence traditional healers need to be involved in TB

management. The study in Hlabisa (Colvin et al., 2001) found that patients that were supervised by traditional healers were happy with the care received although treatment completion was not significantly higher among patients supervised by traditional healers compared to other DOTS supporters ( $p=0.3841$ ).

In this study, 98(63%) of the defaulters received a grant. It needs to be remembered that TB grants in eThekweni are only given to patients that have been de-bilitated by the disease, so there is the likelihood that patients are referring to social grants that are given because of pre disposing chronic medical conditions and unemployment. Patients indicated that the grant was used to pay for food and school fees and they would not be able to survive without the grant. It remains uncertain whether the incentives received served as a motivating mechanism for patients to adhere to treatment since most defaulters used the money to pay for school fees. This means that the core responsibility or priority of the patient was survival, providing for their families and ensuring that their children were given a school education. It should ideally be used for food to allow better facilitation of medication. These grants have since been discontinued due to patients abusing it and some even selling their infected sputum. eThekweni Municipality was not involved in administering those grants to the defaulters so it is uncertain as to the procedures and full criteria involved in issuing these grants and should be further investigated as incentives have shown to improve adherence to treatment in other studies. Patients are exposed to many barriers that affect their treatment adherence and incentives such as food and money for transport may be effective in reducing default (Jakubowiak et al.; 2007 and Beith et al., 2009). Incentives in this study were a major challenge to effective implementation of the programme. Increasing incentives such as adding bonuses influenced patients to adhere to treatment (Davidson et al., 2000).

In this study, bivariate analysis using Pearsons chi squared test showed that patients that smoked, consumed alcohol and had history of TB in family was

significantly associated with TB default ( $p \leq 0.005$ ). Multivariate regression analysis showed that patients that smoked, consumed alcohol and had history of TB in family were at increased odds of defaulting and the association between these risk factors and defaulting were statistically significant. In this study smoking (OR: 11.23, CI: 5.79, 21.78;  $p \leq 0.005$ ), alcohol consumption (OR: 15.22, CI: 7.66, 30.25;  $p \leq 0.005$ ) was significant predictors of default. Alcohol (OR: 6.01, CI: 1.68, 19.47;  $p < 0.05$ ) was also a strong predictor of default in a study conducted in Tashkent, Uzbekistan (Hasker et al., 2008). A study conducted in Barcelona by Alcaide et al., (1995) showed daily smoking to be a risk factor for TB (OR: 3.53; CI: 1.34-9.26;  $p < 0.05$ ). In this study defaulters (57%) stopped smoking after being diagnosed with TB. Interesting although 31% indicated that they smoked, 67% of the 102 defaulters indicated how many cigarettes they had smoked. This implies that patients were reluctant to disclose their smoking status. This could be attributed to the health education they received at the health care facility which highlighted their knowledge on the disease but despite this, patients still did not complete treatment. In this study, there were more males that defaulted but were also associated with unhealthy practices such as smoking and alcohol consumption hence influencing defaulting (Pinidiyapathirage et al., 2008).

History of TB in family was mentioned by 45 defaulters whilst 15 non-defaulters had a history of TB in family. Most defaulters had contact with a person that had TB in the last 6 months. History of TB was significantly associated with default ( $p = 0.00$ ) implying that patients that live in informal areas due to overcrowding are at increased risk of spreading infection. It was uncertain whether the family member with TB had defaulted or completed treatment. A study by Hill et al. (2005) highlighted that patients in Gambia whose family had a history of TB were not likely to default in contrast to this study. However another study by Hill et al., 2005, investigating the risk factors for TB in Gambia showed that patients that smoked, lived in overcrowded housing and had exposure to a TB case was risk factors for TB.

Interesting in this study those risk factors emerged as significant predictors of default proving our hypothesis that those living in informal dwellings are at increased risk of TB and default hence risk factors for TB and predictors of default are associated. In this study, with regard to having been exposed to a family member with TB, most defaulters (77) indicated that their children were immunized but with other mitigating factors such as malnutrition giving rise to lowered immunity, their children may still be unprotected against TB. With respect to environmental exposures, a high percentage of defaulters (48%) used wood to cook and this is a known risk factor for respiratory illnesses. It was reported that 38 defaulters had a person that was over 60 years old living with them implying the TB burden faced by those living in informal housing. Furthermore patients were living in overcrowded abodes may make them more susceptible to the TB bacterium due to the lack of adequate ventilation especially in the informal settlements. Respiratory illnesses are known to exacerbate TB and even though the research study did not focus directly on the incidence of TB, this needed to be probed into as defaulting of treatment by TB patients puts those in the community and especially those living closely to them in the same household at greater risk of spreading the disease. Since these patients were defaulting there is the consequence of spreading MDR-TB and XDR-TB. According to the SANTCP (2004), it was reported that in SA, there is 6000 new cases of MDR-TB each year, which is expensive to treat costing than 25 times the cost of conventional TB treatment. MDR-TB also poses a risk to effectiveness of the DOTS programme (SANTCP, 2004).

The following predictors of default was emphasized from the observation of the nurses that included: no food, poverty, unemployment, feeling better, no DOTS supporters, lack of education/ knowledge, lack of commitment by patients, and lack of transport/ money to get to the clinic. Lack of training of staff and staff shortages including medication unavailability was not mentioned as major predictors of default. Health personnel in contrast to nurses felt that the staff was overburdened and could possibly predict default.

## **5.7 IMPLEMENTATION AND EFFICIENCY OF THE DOTS PROGRAM**

### **5.7.1 Implementation of the DOTS programme**

The eThekweni Municipality adopted the DOTS programme in 1996 in an effort to control the TB burden. It was highlighted that the programme is implemented two fold namely at facility level and community level respectively. DOTS at the facility (clinic) are within walking distance and include various shops and churches amongst others. In eThekweni, it is evident that DOTS is relatively inefficient (Ntshanga et al., 2009). It was revealed that DOTS is implemented in parts and this may be responsible for its underperformance. Other studies have shown evidence of high cure rates with the implementation of DOTS where the DOTS programme is found to be one of the largest public health programmes found to be beneficial in the world (Muniyandi et al., 2005:188). According to Tshabalala (2007:82), in South Africa TB treatment is offered free of charge at public clinics and hospitals, but for the poor and unemployed, it is still a problem because they default treatment while looking for employment. Nurses believed that the role-players of DOTS were mostly community members and nurses themselves. It was concluded that nurses play a pivotal role in implementing the DOTS programmes which should include health education to patients, counseling and rehabilitation amongst others. The current DOTS programme at eThekweni aims to use tracer teams to trace defaulters, DOTS supporters and education programmes rendered to patients. Recordkeeping is an important part of DOTS implementation (Ntshanga et al., 2009). It has been reported that the Electronic Register has been implemented in all provinces with provincial paper based registers used in other clinics.

### **5.7.2 Efficiency of the DOTS programme**

The majority of the nurses (73%) felt the DOTS programme was effective as currently being implemented. Reasons included that by having a DOTS supporter; patients were less likely to default on treatment because they are

seeing a supporter regularly. DOTS makes the patient report to the clinic for treatment daily or weekly and makes it easy to do follow up when defaulting and improve compliance. On the other hand, the remaining 27% of the nurses felt that the programme was ineffective. Those nurses pointed out that patients and staff are inadequately trained or counselled about TB medication and treatment. Additionally it was mentioned that TB treatment regimens constantly changes and all DOTS volunteers and nursing personnel are not updated timeously, staff receiving training often do not practice DOT treatment and do not impart their knowledge to other staff members to ensure the success of the programme. Additionally, qualitative interviews emphasised that the programme may not be very successful due to the lack of stipends to supporters, lack of nurses, supporters, tracer teams, and incentives to patients, a lack of accountability and communication between all stakeholders. There were gaps in that no one knew for certain whose responsibility was it to trace the defaulters. In the event that a supporter left patient, the clinic was unaware of this, showing the lack of accountability from all parties involved. The following issues became apparent from the data generated hindering the performance of the DOTS programme: the TB registers, training of health personnel and staff shortages, supporting of the TB patients and tracing of defaulters.

### **5.7.3 TB Registers**

As mentioned earlier, not all facilities had an Electronic TB Register however others did implement the written provincial register. Patients that were transferred or sought treatment initially from other clinics such as the Inanda Seminary Clinic amongst others were untraceable. It was revealed that the “mother clinic” has the records of the patient and if the patient defaults, they are unaware of it as it is not recorded in the Electronic TB Registers (CDC or Highway House). Since it was observed that not all health facilities were in possession of an Electronic TB Register, implementation of DOTS was relatively ineffective. Specific information such as the addresses of patients was not fully written hence tracing defaulters was a problem.

#### **5.7.4 Training of health personnel**

Training is no doubt beneficial to implement any programme as shown in many studies (Balasubramanian et al., 2000 and Chowdhury et al., 1997). The majority of the nurses (93%) were under the impression that DOTS supporters were trained however qualitative interviews revealed that training 'used to happen' by the former Nursing Services Manager of the CDC whilst others were unaware of any training. However orientation of new staff members does still occur. The CDC Nursing Service Manager had conducted seminars at industries, institutions of higher learning such as DUT and Highway Hospice but there is uncertainty whether this will continue since the CDC Nursing Service Manager has since been transferred to another health facility. Health personnel were unaware of any tracer teams that were available or trained regarding TB. The following questions that arise are that: who are training these volunteers, who do they report to and what are their functions, and are they aware of their functions? Training of nurses included a wide scope of information. Training encompassed the following namely basic TB as a disease, signs and symptoms, causes/risk factors, procedure to follow for a TB suspect case, TB management, TB Crisis Plan and side effects. However due to staff shortages and varying numbers of nurses dealing with TB patients per clinic, training sessions were attended by a varied number of nurses. Although the majority of the nurses specialising in TB had undergone some training, it was highlighted that only managers and those in authority were given extensive training. It was mentioned that not all the nurses interviewed received the same level and frequency of training. It was revealed that nurses and those involved in TB management who are employees of eThekweni Municipality are given training as part of eThekweni's Workplace Skills Programme (WSP).

Nurses outlined CDCs training which encompassed general nursing and community nursing science including side effects of drugs, contra indications, supervision, administration, recording, lifestyle modification, drug interaction,

dosage, education regarding lifestyle changes, compliance of treatment including treatment regimen, signs and symptoms of TB, sputum test and collection, mantoux testing and essentially the DOTS programme. Attending symposiums and consulting private literature also formed part of their training. The nurses at the Bluff Clinic were also trained regarding the collection of a sputum sample, record keeping (entering of patient details in files and cards), diet and lifestyle modifications, treatment regimens and screening of TB patients and referrals. Record keeping was mentioned as essential to ensure follow up of defaulters. Health personnel added that nurses are trained by organisations such as the University Research Council (URC) and Task TB. If nurses directly involved with the TB patients do not receive training, this will pose a problem. This leaves gap in the adequate service delivery of patients especially to ensure treatment adherence. Nurses were overburdened and had to render administration functions which compromised their support to patients.

#### **5.7.5 Support to TB patients**

This study highlighted that DOTS supporters are generally unemployed members of the community and render their services voluntarily in the hope that they will get a permanent paying job one day. Health personnel mentioned that there are not enough supporters and unfortunately when they do get jobs they leave the patient hence predicting default. Since the supporter in some cases does not report to the clinic, the clinic is unaware when the patient is no longer supported. This study emphasized the importance of a DOTS supporter in ensuring that patients adhere to treatment. It was revealed that the presence and selection of a DOTS supporter influences treatment outcome. Ntshanga et al., (2009) showed that in KZN, the fewer patients allocated to a DOTS supporter had higher cure rates. Patients had the choice to choose a supporter from a list containing the names of supporters from the various areas close to a patients' home to facilitate accessibility. In most cases they chose a person known to them or from their community. Majority of the defaulters had a family member as a



supporter and this may have predicted default. This is reinforced by health personnel that persons known to the patient was not advised as supporters yet they were given the choice to choose their supporters. Health personnel mentioned that often family members and friends “feel sorry” for their family members and may allow them to miss a dose of treatment and were not considered the ideal person to observe the patient in this case their family member.

At the CDC, once patient is diagnosed, they are referred to another clinic close to their homes and that clinic should introduce them to a supporter. At the CDC nurses were identified as supporters to TB patients for the first two months of treatment.

It was revealed that the CDC had no DOTS supporters from the community since patients from the whole of eThekweni attended the facility and there was no definite catchment area. The presence of DOTS supporter has been shown to improve adherence however it was argued that patients who self administered their treatment were unlikely to default (Khan et al., 2005). A study conducted in Malaysia (Naing et al., 2001) reported that patients that were not part of a DOTS programme had an increased risk of default. In this study 78% of defaulters had a DOTS supporter yet still defaulted.

It was revealed that most nurses were not active DOTS supporters however nurses were aware of patients being visited either weekly or daily. This raises concern on the efficiency of a patient receiving DOTS daily or weekly. In the event that the patient is visited daily, they will be observed swallowing their medication which essential of DOTS. In contrast to a supporter visiting a patient once a week, observing their treatment but that same patient may have missed doses on previous days of the week. There was a consensus by nurses (50%) that recommended two or more DOTS supporters. This may prove effective to ensure that at least one of them reaches the patient if another fails to and when supporters leave for better employment. It was

unknown whether the patient was reporting to the DOTS supporter or the supporter visited the patient and further studies need to be conducted regarding this. Since DOTS supporters are not paid an incentive their efficiency and dedication is debatable. Other key issues emerging from the DOTS supporters were DOTS sites incentives.

DOTS sites were a major challenge. It was mentioned that there are numerous DOTS sites such as clinics but here again there is no accountability as these sites are not listed for follow up. They merely mentioned that shops and various landmarks such as religious buildings serves as DOTS sites. It can be safely concluded that the sites are assumed to be existing and operational. Anecdotal sources mentioned that there were once 51 DOTS sites previously but when health personnel were questioned about this, they were uncertain of the number of sites in existence currently.

Incentives were shown to improve defaulter rates in numerous studies (Davidson et al., 2000; Chan-Yeung et al., 2003 and Jakubowiak et al., 2007). It was emphasized that the Vulindlela TB home-based care (HBC) project was started at Ntafufu Clinic in Port St Johns in February 2004 and is one success story of DOTS effectiveness. Before the project, 74% of TB patients did not complete the course of treatment (Kandel et al.; 2008:48). The issue of monetary incentives remains controversial (Dick et al., 2005:12). These authors further added that the concept of volunteerism is associated with self-sacrifice, but can one expect people living in poverty to dedicate their energies to assist the health services achieve their objectives without compensation?

Furthermore the late Health Minister Tshabalala- Msimang in 2003 urged the compilation of Lay Health Workers (LHW) to receive a stipend of R1 000 in KwaZulu-Natal and in the Free State. This was recommended as “there is the danger associated with setting up as system of incentives without an efficient support system in place for DOTS supporters (Dick et al., 2005:13). In

contrast is these EHAs are paid but also have issues in tracing patients as part of their job function and nurses do not go out tracing defaulters. In depth interviews revealed that nurses did not visit the patients at their homes and revealed it is the duty of the DOTS supporters to trace patients. Here again there is a lack of accountability with everyone passing responsibility to someone else. Under normal circumstances, tracing of defaulters should happen when the tracing forms are given to the Health Unit. However, this is not always the case. It needs to be investigated as to what happens to these forms as EHAs and EHPs mentioned that it is not part of their job function. It is known for certain that the EHAs are responsible for rendering health education when a patient is traced however if a patient is not traced, this does not occur. Once the patients are traced these forms are filed. Once these defaulters were traced, they will be rehabilitated by health personnel and returned to treatment. Even though nurses were not responsible for tracing defaulters, nurses from the CDC supported the patient for the first two months of treatment. It is interesting to delve into what happens to those patients that are untraceable. Are there other alternative ways such as contacting a family member or contacting them by cell phone in order to ascertain their status? It was mentioned that even though cell numbers are given, patients often do not have money for airtime and if it is a contract phone, then the network is blocked. Health personnel also reiterated other alternatives where they are linking with the Home Affairs Department to determine whether the patient has deceased. However most were unsure if the tracer or DOTS supporter was reporting to a person of higher authority. Again a lack of accountability among role players of the DOTS programme emerged.

Tracing defaulters is another challenge. Once these defaulters were traced, they should be ideally rehabilitated by health education and returned to treatment. EHAs are responsible for rendering health education when a patient is traced but tracing is very difficult.

### **5.7.6 Challenges in implementation of DOTS**

This study revealed that there were many challenges to proper implementation of the programme. These included frequency and intensity of counselling and rehabilitation, staff shortages, DOTS supporters including DOTS sites, incentives to patients and volunteers, training of health personnel, record keeping and tracing of defaulters. Counseling of these defaulters is a major component of an effective DOTS programme implementation. The function of counseling is to put the defaulters back on treatment and rehabilitate them by means of training and health education. Even though counseling for TB patients and defaulters was evident, respondents were not probed further on when counseling took place or the intensity of it. Nurses are often understaffed and cannot cope with the high number of attendees at their clinics where in some facilities, there is only one TB nurse designated. Sometimes nurses have to render administrative functions and this further overburdens them. If human resources are increased, this will greatly reduce the over burden of the nurses. However it was mentioned that there was a lack of commitment amongst health care workers and no accountability so one wonders whether recruiting more staff will solve the problem. It will presumably only solve the problem if new staff is dedicated to their jobs.

This study highlighted the challenge of no standardized reporting that became evident especially when trying to trace defaulters from the clinics without the TB electronic registers. Ntshanga et al., (2009) confirmed this by reporting that there was no standardized method of recording and reporting which is important for systematic monitoring and evaluation.

Results from this study showed that patients such as those residing in informal areas are at increased risk of defaulting. These risks were significantly associated with default especially if they smoked, consumed alcohol and had TB in family. Patient characteristics coupled with the health care system factors are linked and predict default. It is a challenge to clinics

to support patients and to trace defaulters living in informal settlements. In some cases since patients cannot be supported, they do not adhere to their treatment and this was evident in this study where patients admitted that they did forget to take treatment. Since this study found that health personnel where not sure whose jobs function it was to trace these patients, this would have mostt likely led to patients spreading the disease in overcrowded dwellings.

## **5.8 Conclusion**

This chapter discussed the findings of this study. As can be seen, defaulting results as interplay by various factors. Common areas of interest that predict default and the implementation and efficiency of the DOTS programme were discussed. The following chapter includes the conclusion of the study, recommendations and future studies.

## **CHAPTER 6**

### **CONCLUSION, RECOMMENDATIONS AND FUTURE STUDIES**

#### **6.1 Introduction**

The previous chapter focused on discussing the findings of this study. This chapter will conclude the study; suggest recommendations to be implemented and directions for future studies.

#### **6.2 Conclusion of the study**

Similar to the study conducted by (Holtz et al., 2006), this investigation provides various levels of information about patient and health system level factors that may influence patient default from TB treatment. There is no doubt that adherence to treatment is multidimensional, involving the interplay between socio demographic and patient characteristics (Balbay et al., 2005:157). Health care and environmental characteristics predict default and play a pivotal role in ensuring the patient adheres to treatment. Defaulting is a common problem and special attention should be given to those residing in informal areas where there is obviously neglect. Predictor factors need to be addressed holistically and not be isolated since TB in informal areas are also attributed to factors outside the health care system (David et al, 2007). This study aimed to determine the prevalence and predictors of default among informal dwellers and the evaluation of the implementation and efficiency of the DOTS programme in eThekweni.

Common predictors of default that emerged were gender (male), unemployment, poverty, no money to go to clinics including distance to clinic, side effects from medication and issues surrounding DOTS supporters and the lack of the different categories of staff taking the responsibility to trace defaulters. Multiple regression analysis showed significant associations between defaulting and alcohol, smoking and having a family member with

TB. The implementation of the DOTS programme is plagued with challenges. The DOTS program as described in the SANTCP (2004) is not implemented to its full capacity in the eThekweni Municipality due to unavailability of adequate human resources. At eThekweni some of the DOTS programme components are incorporated as part of their existing TB programmes implemented under the SANTCP (2004). Wrong addresses emerged strongly in this study hindering the tracing of defaulters. Tracing and supporting defaulters, especially amongst informal dwellers was shown to be major barriers to effective TB control and management. Another weakness in the system that emerged was that there was no accountability and lack of communication between the various TB management stakeholders including nurses, tracers and DOTS supporters. It thus appears that there is a direct conflict between policy and implementation on the ground.

It seems that living in informal areas poses many challenges to patients to complete treatment. It is no doubt that defaulting is not limited to a specific place but it can be safely postulated as evident in this study that the reasons for default in informal areas are exacerbated. It seems that the risk of developing TB and default is greatest when there is interplay of socio demographic economic, environmental and health care system characteristics.

It is no doubt that patients in informal areas need to be given special attention to overcome the many barriers faced by them to ensure adherence. This study makes several noteworthy contributions to the TB situation specifically predictors of defaulting and the implementation and efficiency of the DOTS programme in the informal settlements of eThekweni.

### **6.3 Recommendations**

On reviewing relevant literature, those recommendations could be implemented since there are similarities between the settings but obviously needs to be adapted to the South African context specifically in eThekweni.

- **Minimizing the predictors of default**

A patient screening questionnaire should be done when a patient is diagnosed with TB. This should focus on the various barriers to adherence and these patients can be given extra care to ensure adherence. TB treatment and control programmes need to address nutrition of the patients during treatment. It is suggested that special attention be given to patients that have previous defaulters. Patients' perception and the stigma attached to the disease need to be addressed to ensure adherence to treatment.

- **Improving health education , counselling and rehabilitation**

Health education, counselling and rehabilitation need to be intensified and held frequently. Health education needs to be given to patients regarding the importance of adhering to their treatment regimens. Since this study found smoking and alcohol as major predictors of default in informal settlements, anti substance abuse campaigns/ programmes are suggested. Patients should receive counseling before, during and after completion of treatment.

- **Training of health personal**

Training of health personnel need to be continuous and include all nurses to ensure effective service delivery. DOTS supporters and tracer teams need to be adequately trained.

- **Tracing of defaulters**

Roles of various stakeholders involved in TB management need to be defined to ensure adequate implementation of the programme. Since patients in the informal settlements live in overcrowded conditions so contact tracing needs to be implemented to prevented the scourge of family members contacting TB and also inevitably preventing defaulting.



- **Supporting of TB patients**

All supporters need to be listed and should be trained, follow a protocol and report to a person of higher authority overseeing DOTS implementation. Involvement of community members is recommended.

- **Incentives and food parcels**

Incentives should be given to patients to encourage treatment adherence. EHAs tracing patients should administer food parcels to ensure that patients do receive it. A stipend should be given to DOTS supporters to ensure their commitment to supporting patients.

- **DOTS sites**

These sites need to be identified and recorded. In the event a clinic is a DOTS site, health personnel suggest clinics be operational 24 hours. In that way, patients do not have to take time off work to collect medication.

- **TB Registers**

A standardized reporting protocol to ensure accountability and communicability should be implemented. Even without the electronic TB register, persons capturing patient information should record as much information as possible to facilitate tracing of patients should they default. Funding to aid better reporting systems needs to be considered.

- **Increasing staff**

Staff shortages should be addressed. More nurses should be employed to relieve the high burden currently faced by clinics.

- **Improving diagnosis**

The Department of Health (DOH) is encouraging reducing diagnosis by X-ray and increasing sputum testing to increase bacteriological coverage thus

increasing performance of programme indicators such as smear conversion rate and cure rate.

### **6.3 Future studies**

- It is recommended that the findings of this study could be used to further interview the same defaulters to gather more in depth information by means of semi structured in depth interviews to gain their perception of the disease management as well as a closer investigation into their experiences at the health facility.
- Further investigations are suggested focusing on rehabilitation of defaulters which will include counseling and health education regarding their frequency and intensity.
- It is suggested that future research should trace DOTS supporters and sites in eThekweni and determine whether their presence and selection influences treatment adherence.
- A cohort study is suggested dealing with the implementation of a screening questionnaire and following up with these patients' treatment outcome.

### **6.4 Conclusion**

The results of this study may shed light on various issues that warrants future investigations to prevent default and improve the implementation of the DOTS programme hence ensuring its efficiency as well as sustainability in eThekweni.

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**Figure 1.4:** Defaulter rates of eThekweni 2005-2009

Ntshanga, P.S., Rustonjee, R. and Mabaso, M.L.H. 2009. Evaluation of directly observed therapy for tuberculosis in KwaZulu-Natal, South Africa. *Transactions of the Royal Society of Tropical Medicine and Hygiene* [Online], 103: 571-574. Available at WWW: <http://www.sciencedirect.com> (Accessed 20 September 2010).& National TB Crisis Plan: eThekweni Municipality, 2009.

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## **ETHEKEKWINI TB CRISIS PLAN APRIL 2008 – MARCH 2009**



***“I am Stopping TB”***

## ABBREVIATIONS

<b>ACSM</b>	<b>A</b> dvocacy <b>C</b> ommunication & <b>S</b> ocial <b>M</b> obilization
<b>AIDS</b>	<b>A</b> cquired <b>I</b> mmunodeficiency <b>S</b> yndrome
<b>ARV</b>	<b>A</b> nti <b>R</b> etroviral <b>D</b> rugs
<b>ATBAK</b>	<b>A</b> nti <b>TB</b> <b>A</b> ssociation <b>K</b> wazulu
<b>CBO's</b>	<b>C</b> ommunity <b>B</b> ased <b>O</b> rganization
<b>CHCC</b>	<b>C</b> ommunity <b>H</b> ealth <b>C</b> are <b>C</b> arers
<b>DOTS</b>	<b>D</b> irectly <b>O</b> bserved <b>T</b> reatment <b>S</b> trategy
<b>EU</b>	<b>E</b> uropean <b>U</b> nion
<b>FBO's</b>	<b>F</b> aith <b>B</b> ased <b>O</b> rganization
<b>FOSA</b>	<b>F</b> riends <b>O</b> f the <b>S</b> ick <b>A</b> ssociation
<b>HAST</b>	<b>H</b> IV & <b>A</b> IDS <b>S</b> TI & <b>TB</b>
<b>HTA</b>	<b>H</b> igh <b>T</b> ransmission <b>A</b> reas
<b>IDP</b>	<b>I</b> ntegrated <b>D</b> evelopment <b>P</b> lan
<b>INK</b>	<b>I</b> nanda <b>N</b> tuzuma <b>K</b> wamashu
<b>IRT</b>	<b>I</b> n <b>R</b> elation <b>T</b> o
<b>KGV</b>	<b>K</b> ing <b>G</b> eorge <b>V</b> <b>H</b> ospital
<b>MCDI</b>	<b>M</b> edical <b>C</b> are <b>D</b> evelopment <b>I</b> nternational
<b>MDR</b>	<b>M</b> ulti <b>D</b> rug <b>R</b> esistance
<b>MOU</b>	<b>M</b> emorandum <b>O</b> f <b>U</b> nderstanding
<b>MRC</b>	<b>M</b> edical <b>R</b> esearch <b>C</b> ounsel
<b>NHLS</b>	<b>N</b> ational <b>H</b> ealth <b>L</b> aboratory <b>S</b> ervices
<b>NID</b>	<b>N</b> ation <b>I</b> ntegrated <b>P</b> lan
<b>PLWA</b>	<b>P</b> eople <b>L</b> iving <b>W</b> ith <b>H</b> IV& <b>A</b> IDS
<b>QA</b>	<b>Q</b> uality <b>A</b> ssurance
<b>RHRU</b>	<b>R</b> eproductive <b>H</b> ealth <b>R</b> esearch <b>U</b> nion
<b>SA</b>	<b>S</b> ervice <b>A</b> rea
<b>SAMTA</b>	<b>S</b> outh <b>A</b> frican <b>M</b> aterial <b>TB</b> <b>A</b> ssociation
<b>SCR</b>	<b>S</b> meat <b>C</b> onversion <b>R</b> ate
<b>SLA</b>	<b>S</b> ervice <b>L</b> evel <b>A</b> greement
<b>TAT</b>	<b>T</b> urn <b>A</b> round <b>T</b> ime
<b>TB</b>	<b>T</b> uberculosis
<b>URC</b>	<b>U</b> niversity of <b>R</b> esearch <b>C</b> o-operation
<b>XDR</b>	<b>E</b> xtreme <b>D</b> rug <b>R</b> esistance

## 1. INTRODUCTION

### Background

TB was declared an emergency by the WHO in 1993. South Africa is ranked 7<sup>th</sup> on the list of 22 Countries hardest hit by TB. The incident rate for KZN is 1046/100 000 populations of which 30% are from the Ethekwini District

A National TB Crisis Plan was developed. The Ethekwini District was one of the Districts identified for the implementation of the TB Crisis Plan.

The Ethekwini District has a population of 3,2 million. The district is divided into 3 sub-districts viz North, South and West Sub-districts. The sub-districts are further divided into 18 Primary Health Care Service Areas

- 1 8 PHC Service Areas in the South sub-district
- 2 6 PHC Service Areas in the North sub-district
- 3 4 PHC Service Areas in the West sub-district

Facilities offering TB Services

South Sub district	: 62
North Sub district	: 41
West Sub district	: 32

**Laboratory services** – 21 sites offering microscopic services and 1 Drug sensitivity site. The sites are distributed as follows

South	: 10
North	: 7
West	: 4

## **2. MAIN CHALLENGES IDENTIFIED/EXPERIENCED DURING 07/08**

1. No extra funding for the implementation of the crisis plan
2. Shortage of staff at facility level
3. High staff turnover
4. Poor recording and reporting
5. Inconsistent nutritional supplementation
6. Standardized implementation guidelines not being adhered to
7. Inconsistent sputum Turn around Time
8. High treatment interruption rate with high defaulter rate
9. Poor integration with other stakeholders
10. Under diagnosing of children in relation to the number of adult positive cases identified.



## 2. AIM

The main aim of the plan is to increase smear conversion rates and cure rates by more than 10% and to decrease the defaulter rate by 10% within the end of Project year

## 3. CURRENT SITUATION

The following table indicated the TB trends identified in the district, in relation to case finding, smear conversion rates and treatment outcomes

	<b>2005 Actual</b>	<b>2006 Actual</b>	<b>Target 2007</b>	<b>2007 Actual</b>	<b>Target 2008</b>
Case Finding All TB cases Smear positive		23 662 9 545	50-70%	16 598 12 791	50-70%
Smear Conversion Rate New Smear Positive Re-treatment		48.1% 42.3%	58.1% 52.3%	52.9% 55%	63% 65%
Treatment Outcome Cure Rate Defaulter Rate	32% 29%	34% 20.3%	44% <10%	51% 18.9%	61% 8%

## ETHEKWINI DISTRICT TB CRISIS MANAGEMENT PLAN 08/09

### GOAL 1: EARLY DETECTION OF TB

OBJECTIVE: 1 Decrease the pool of infection by increasing the index of suspicion

TARGET: 5% of new cases detected

Baseline: 1.9%

Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
Case finding Index in relation to new cases, contacts, including interrupters, defaulters, MDR and XDR at community level	1. Network with existing community structures and link to facilities(NGO,s CBO;s, NIP Sites, Youth ambassadors, Ward Councilors (as champions), HCC, FBO's, DOT supporters, traditional healers/leadership	Updated Data base of community structures 100% community structures linked to clinics	1.9%	5%		5%	5%	5%	5%
Proportion of awareness programmes that have sputum collection points	2. Develop and Implement monitoring & evaluation tool.  3. Establish sputum collection points during awareness campaigns, door to door campaigns,  4. Raise index of suspicion - Identify and address missed opportunities in all health facilities and community based	Monitoring & evaluation tool for community outreach programmes  12 awareness campaigns ( with sputum collection points)  Sit analysis report & intervention plan by end of April  Number of new HCW and security and general staff trained							

	<p>facilities.</p> <p>5. Enroll all new health workers and train security and general staff</p> <p>6. Provide resources for the transporting of specimens to the lab site</p> <p>7. Enroll private sector, in case detection</p> <ul style="list-style-type: none"> <li>- Private practitioners, traditional healers, private hospitals, industry, prisons, hostels,</li> </ul> <p>8. Active case finding for the children</p> <p>9. Implement, monitoring and evaluation system</p>	<p>No of facilities achieving daily transportation of sputa.</p> <p>Data base of enrolled private sectors per area</p> <p>Number of practitioners collecting sputa initiating treatment</p> <p>Number of contacts traced</p> <p>Monitoring &amp; Evaluation Systems in place</p>							

GOAL 2: Improve Management of TB

OBJECTIVE: Strengthen capacity to diagnose, treat and manage TB

TARGET: 100% staff trained in TB management

Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
HSA & facilities submitting monthly reports on TB (HAST) comprehensive plans	1. Development & implementation of comprehensive HSA & institutional TB crisis plans.	All HSA & Facilities with Crisis plans implemented  INK area TB plan (number of best practice sites identified and visited)  HAST TB coordinator in each facility holding monthly meetings on HAST on information management Teams at institutional level  Number of facilities with dedicated TB staff  Updated skills audit, training plan developed and monitored.	100% reporting routine data elements – no comprehensive institutional TB Crisis plan	100% SA & facilities with comprehensive TB reports submitted monthly		100%	100%	100%	100%
% of facilities with dedicated TB staff	2. Identify and fill 42 EN'S TB posts	Training plan developed and monitored. (see Annexure 4)							
100% HCW, skilled on TB management	3. Identification of training needs. (skills audit Annexure 1)								

Number of facilities with monthly intervention plans based on supervisory visits	4. Development of training plans								
	5. Conduct supervisory visits monthly to all private/public, hospitals CHC's, clinics, private, GP's	All facilities to have support visits by the team consisting of the following people. PHC, TB supervisor and coordinators, area supervisors and institutional TB supervisors, QA team, District medical manager, CDC cluster Manager, District HAST coordinator, community outreach programme coordinator and District Pharmacists							
% facilities implementing HAST	6. Facilitate roll out and implementation of HAST at all facilities	All facilities implementing HAST							
% Reduction in radiological diagnosis	7. All PTB Patients to be diagnosed by sputa especially in Hospitals Public/Private and CHC's	Improved bacteriological coverage							
% facilities implementing TB Q/A programmes	8. improve quality standards of TB management	All facilities initiating treatment within 72 hours							
% of facilities with TAT of < than 48 hrs	9. Identify facilities that do not meet with TAT of <48hrs	Number of facilities receiving constant supply of nutritional supplements							
Adhering to TB referral protocol	10. Monitoring adherence to TB referral Protocol including MDR & XDR TB	All facilities adhering to TB referral protocol.							

GOAL 3: TO IMPROVE CASE HOLDING

OBJECTIVE: 1 To improve SRC & CR by 10% and reduce the defaulter rate to be less than 10% within the project year

TARGET: Less than 10% defaulter rate and increase SCR and CR by 10%

Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
Reduce Defaulter rate Improve SCR & CR	11. Identify & Priorities facilities with defaulter rate of more than 10%	No of facilities with defaulter rate of more than 10%	18%	<8%		<8%	<8%	<8%	<8%
	2. 100% TB patients to receive adherence counseling	No of facilities Linked to CHW's DOT Volunteer, TB Defaulter tracer teams, youth ambassadors, EU Tracer teams, CBO's, NGO;s to clinics							
	3. Implement and monitor defaulter tracing mechanism	No of facilities with effective defaulter tracing mechanism							
	3.1 All identified interrupters to be put back on treatment within 10 days in intensive phase and 2 months in continuation phase.	Number of defaulters identified, traced and put back on treatment							
	4. Strengthen referral system of TB Patients using the appropriate documentation (transferred book)	All facilities using appropriate transferred book							
	5. Monitor implementation of DOT Supporter programme	All facilities with effective DOT support programme 100% community structures linked to							

		clinics							
<b>GOAL 4: STRENGTHENING OF INFECTION CONTROL MEASURES</b> <b>OBJECTIVE: TO INCREASE VIGILANCE AND EXPERTISE TO MINIMISE THE RISK OF TB INFECTION</b>  <b>TARGET: 100% Facilities</b>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
% Of facilities with functional TB infection control programmes	1. Implementation of TB infection control policy	All facilities with functional infection control policy in place.	(100% facilities work shopped and issued with policy guidelines.	100%		25%	50%	75%	100%
	2. Monitoring and evaluation to be included in Q/A								
	3. Enroll Q/A, Infection Control & OH&S co coordinators	Minimize risks for spread of TB infection							
	4. Physical assessment of all priority facilities (see annexure 1	List of facilities assessed and with improvement plans							
% Of priority facilities assessed by physical assessment team.									
<b>GOAL 5: STRENGTHEN MANAGEMENT OF CO INFECTED PATIENTS</b> <b>OBJECTIVE: 1 Improve TB &amp; HIV &amp; AIDS Collaboration</b> <b>TARGET: 50% of facilities to provide integrated management of TB &amp; HIV AIDS</b>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
% of TB patients offered VCT	Monitor screening of all PLHIV for active TB	Number of patients counseled and screened for TB.	25%	100%		25%	25%	25%	25%

% of facilities providing integrated management of TB & HIV & AIDS	Training of HCW in integrated in TB & HIV Management	Number of integrated training done							
% of TB patients tested for HIV	Facilitate placing of Lay counselors within TB sections for the provision of HIV testing to all TB patients and train HIV/AIDS Lay Counselors in TB	Number of HIV positive patients screened for TB							
% of HIV positive clients screened for TB	Implement monitoring & reporting system								
<p>OBJECTIVE: 2 ESTABLISH MECHANISMS FOR TB /HIV COLLABORATION</p> <p>TARGET:100% facilities with integrated TB and HIV management</p>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
No of meetings held	Carry out joint TB & HIV planning	Monthly collaboration meetings No of committees formed.		Bimonthly		1	1	2	2
No of committees established	Establish TB &HIV & AIDS committees at District, HSA, service area, facility and community level								
<p>GOAL 6: IMPROVE MANAGEMENT OF MDR AND XDR TB</p> <p>OBJECTIVE: IMPROVE DETECTION TREATMENT AND REFERRAL OF MDR AND XDR</p> <p>TARGET: Less than 1% of all TB cases</p>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4



No of patients diagnosed with MDR & XDR TB	Effective and efficient management of TB (New and Retreatment cases)	No of MDR/XDR cases detected	Unknown	<1%					
No of facilities with effective isolation units	Tracing and monitoring of all MDR, XDR contacts								
	Identify facilities with isolation unit and system	Number of facilities with isolation units.	322 beds at KGV and FOSA 200	100% of patients to be admitted					
	Implementation of effective referral system between the MDR unit and other facilities		MDR Register at KGV						
<p>GOAL 7: CREATE AWARENESS THROUGH ADVOCACY AND SOCIAL MOBILISATION</p> <p>OBJECTIVE 1: TO IMPROVE HEALTH SEEKING BEHAVIOUR AMONGST COMMUNITIES</p> <p>OBJECTIVE 2 : TO MOBILIZE POLITICAL COMMITMENT AND RESOURCES FOR TB</p>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
100% patient compliance	1. Identify, network with and involve existing stakeholders within HSA (see activity in goal 1)	Improved treatment outcome	Not evaluated 3.2%	0% not evaluated		3	3	3	3
100% patients with outcomes evaluated	2. Develop and implement joint ACSM plans with the above stakeholders ( <b>see annexure 2</b> )								

	3. Monitor & evaluate implementation of plan  4. Feedback to communities and stakeholders								
<b>GOAL 8 : ENGAGE IN INTERSECTORAL COLLABORATION</b> <b>OBJECTIVE: Strengthen partnerships with Donor funded partners and other Departments</b>									
Measure	Activities	Output	Baseline	Target	Cost	Quarter			
						1	2	3	4
% Donor funded organization with co-designed plans and SLA's implemented	Identify and invite stakeholders and ensure that their activities are in line with the Crisis plan. (see <b>Annexure 4</b> )	Organization plans aligned with crisis plan  Joint Business plans per organization	50 % partners have MOU's signed	100% jointly developed MOU's and SLA					
Number of inter-sectoral plans implemented in support of TB ( HAST)	To obtain an intersectoral plan from MRC	Intersectoral plan in place	MOU/SLA's						

## **ANNEXTURE 1**

### **Summary re: TB Training Plan for Health Care Workers (Doctors, Professional Nurses, Enrolled nurses)**

- HAST training was conducted by Human Resource Systems Development during the course of 2007 and early 2008. Total of 3 sessions for doctors and 2 sessions for nurses.
- Facilities were requested to nominate candidates from their facilities to attend these trainings.
- No feed back has been received from the facilitators regarding the number of actual attendees and from which institution.
- A Situational Analysis is in the process of being conducted which will identify the exact no of doctors and nurses trained on HAST and what the gaps are in relation to training requirements.
- The information gathered will inform the development of a training plan for doctors and nurses on HAST for 08/09.
- The process leading to the development of the training plan to be completed by end of April 08.
- *Aim is to have minimum of 2 doctors and 2 professional nurses trained on HAST per institution*

## ANNEXURE 2

### 1. Aligned systems plan

MEASUR	ACTIVITY	RESPONSIBLE PERSON	RESOURCE REQUIREMENTS	STATUS	COST
1. No of facilities with conducive environment/ infrastructure	1. Identify facilities with non conducive environment/infrastructure  2. Prioritize and implement plan improvement plans for renovations  3. Purchase and supply resources at sputum collection points during awareness's and door to door campaigns  4. Improve communication measures  5. Maintain infection control measures	Maintenance  CUPB  TB Team  TB Team & NHLS  Quality Assurance	Human resource  Transport  Sputum Jars Cooler bags Ice packs Mobile fridges Lab technicians Lab services TB Stationery Venue for event Cough Booth Fax machines Gloves N95 masks Computers	30 Facilities without fax machines	
1. No o facilities with dedicated TB Teams	Motivate for the filling of the following posts <ul style="list-style-type: none"> <li>• 42 E/N nurses (L4)</li> <li>• 19 TB Asst pos(L4)</li> </ul>	HRD & Cluster Programme			R1 911 636

	<ul style="list-style-type: none"> <li>3 TB Co ordinators (L10)</li> </ul>	Manager			
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### *ANNEXTURE 3*

## **DISTRICT ADVOCACY COMMUNICATION & SOCIAL MOBILIZATION IMPLEMENTAION PLAN**

### **Main messages**

#### **February - April**

TB prevention messaging: Increase cough hygiene, increase case detection an treatment initiation.

#### **May – July**

Care & Support including DOT support messaging: Increased DOTS coverage

#### **August – October**

Facility friendly management: Increase suspects for screening, increase disease integration and therefore better care for patients

#### **November – January**

TB Treatment and Adherence messaging: Increase cure, treatment successful rates as well as reduced defaulter and treatment interruption

<b>OBJECTIVE</b>	<b>ACTIVITY</b>	<b>OUTPUT</b>	<b>RESOURCE</b>	<b>COST</b>
------------------	-----------------	---------------	-----------------	-------------

Increase HCW, Public awareness & Health seeking behaviour	<p>Send educational awareness message to a wider audience to improve</p> <ul style="list-style-type: none"> <li>➤ Case detection</li> <li>➤ Adherence to RX</li> <li>➤ RX outcomes</li> </ul> <p>Conduct campaigns Imbizos, door to door campaign targeting HTAs, Hostels, taxi ranks, truck inns, shopping malls, street vendors, prisons, toll roads, cross roads</p>	SCR CR DR	<p>Human resources</p> <p>Posters</p> <p>Pamphlets</p> <p>Loud hailers Community meetings</p> <p>Local radio station announcements</p> <p>Tokens with TB Messages</p> <p>Transport</p> <p>Refreshments</p> <p>Venue for event/meetings</p> <p>Sputum collection booths</p> <p>Sputum specimen bottles, cooler bags, ice packs</p> <p>Refreshments</p> <p>Venue for event/meetings</p> <p>Stationery (invitations)</p> <p>TB Stationery</p>	
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#### ANNEXTURE 4

ATBACK (former SANTA)  
 Dept Of Housing  
 Dept Of Labour  
 Dept Of Works  
 Dept Of A & E  
 Dept Of Education  
 Dept Of Transport  
 Dept of Social Development  
 Durban Chamber of Commerce  
 European Union  
 Keep a child alive (KCA)  
 McCord ZOE - Life and ARK  
 MCDI

Metro IRT 2010 and beyond (IDP)  
MRC  
Nelson Mandela School of medicine  
NHLS  
Pepfer (RHRU)  
Sandoz  
TB Free  
Thembalabantu  
Tourism  
URC (Task II TB)

# ETHEKWINI DISTRICT TB CRISIS PLAN 2008 – 2009

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C Frame  
Clinical & Programmes Manager

DATE.....

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S Shezi  
District Manager – Ethekwini District

DATE.....



**Annexure 2.1**



eThekweni Municipality: Department of Health  
Communicable Diseases  
9 Old Fort Road  
Durban

15 August

2008

To whom it may concern

**RE: PERMISSION TO CONDUCT RESEARCH ON TUBERCULOSIS**

I wish to conduct a research project in the Cato Manor and Inanda Congo area regarding Tuberculosis.

It is envisaged that the study will be conducted over a 2 year period with fieldwork done over a period of 4 months in 2009.

**The key objectives of the study are:**

6. To determine the TB Incidence Rate and the TB Treatment Defaulter Rate amongst residents of the area
7. To examine contributing factors that increase ones risk of TB infection and defaulting on treatment.
8. To review TB management and the sputum test in the two health facilities (Inanda Seminary Clinic and Cato Manor Clinic)

In order for me to meet the objectives of this project I would require access to medical records (tracing forms). These will be treated with utmost confidentiality and will only be used for research purposes. All participants will be treated as anonymous.

I would really appreciate it if you would grant access to this information in order to allow my study to commence.

Should you require clarity on this matter, please feel free to contact my research supervisor Ms. Joy Kistnasamy on the following [joyk@dut.ac.za](mailto:joyk@dut.ac.za) or 031 3732249

Thanking You

Yours faithfully

Althea Rajagopaul

**Contact Details:**

Cell: 0729381615

Email: [althea\\_rajagopaul@yahoo.com](mailto:althea_rajagopaul@yahoo.com)

## Annexure 2.2



**ETHEKWINI MUNICIPALITY**  
**Health, Safety and Social Services**  
**Health Unit**

9 Old Fort Place  
Durban 4001

P O Box 2443  
Durban 4000

Tel: (031) 3113679  
Fax: (031) 3113710

Website: <http://www.durban.org.za>

Our Ref

Your Ref:

Enquiries:

Phone 031 3113679

16 October 2008

Althea RAJGOPAUL Student DUT

Cell 0729381615

Email [althea.rajgopaul@yahoo.com](mailto:althea.rajgopaul@yahoo.com)

Supervisor Joy Kistnasamy Email [joyk@dut.ac.za](mailto:joyk@dut.ac.za)

Phone 031 3732249

Dear Althea Rajgopaul

**PROTOCOL TITLE COMPARATIVE STUDY IN 2 INFORMAL  
SETTLEMENTS TO EVALUATE CONTRIBUTING FACTORS THAT  
IMPACT ON THE RISK OF TUBERCULOSIS INFECTION AND  
DEFAULTING ON TREATMENT**

**AIM: Prevalence and incidence of TB and Treatment defaulters in Cato Crest  
and Inanda; examine contributing factors leading to contracting TB and  
defaulting TB**

Final approval is granted for the above study to be conducted at EtheKwini Health Clinics

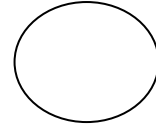
We wish you all the best in your research. Please send us a report on completion. Please find attached contact details of subdistrict heads whom you can present your research to and who will facilitate you. In the West Busi Grootboom - 0833079150, North - Mr Dumisani Shoba - 0833079151 and in the south Mr Selva Mudaly - 0833079082. Please contact Dr. Cheryl WEAICH on 031 - 311 3679 for any queries

Yours faithfully

Mr Sipho CELE  
DEPUTY HEAD : HEALTH

## **LETTER OF INFORMATION AND CONSENT**

## **LETTER OF INFORMATION AND CONSENT**



A study to determine the predictors of Tuberculosis defaulting and the evaluation of the DOTS Programme within the eThekweni Municipality.

**Principal Investigator:** Miss Althea Rajagopaul

**Co Investigators:** Ms Joy Kistnasamy & Dr. Poovendhree Reddy

### **Brief Introduction and Purpose of the Study**

Tuberculosis (TB) is a disease that spreads from one person to another. This study will look at the factors that cause people to get TB and why so many people do not take their medicine everyday and even stop taking their TB medicine. Furthermore by reviewing TB management at the clinics, any shortfalls in the health care system could be identified and rectified.

### **The study aims to achieve the following objectives for a 6 month period in 2009:**

1. To determine the prevalence and predictors of default from tuberculosis treatment within eThekweni Municipality.
2. To evaluate the implementation and efficiency of the Directly Observed Treatment (DOTS) programme in TB management within the eThekweni Municipality.

### **Outline of Procedures**

#### ***For the patient***

A person that works in the Health Department will come to your house and you must sign this letter that you are reading now if you want to take part in this study. Your forms from the clinic will be used and you must answer the questionnaire. When the study is over then the report will be given to the clinic if you want to have a look at it.

#### ***For staff***

The researcher will forward the questionnaire to the Nursing Manager of the two clinics.

### **Risks or Discomforts to the Subject:**

There will be no harm done to you. It will be greatly appreciated if you will take your time to answer the questionnaire.

### **Benefits:**

The study will help to see why there are so many people that get TB do not complete taking their medicine and what can be done to help them. It will also allow the researcher to publish the studys' results so that you and other people could be helped.

**Reasons why the subject may be withdrawn from the Study:**

If you feel that you cannot continue answering the questions you are allowed to stop. Nothing will happen to you if you do not want to take part in the study.

**Remuneration:****Costs of the Study:**

You will not pay anything to take part in this study.

**Confidentiality:**

The Questionnaire used in the interview and tracing forms will be treated confidentially. Your names will only appear on the Form but not on the Questionnaire and when the report is done.

**Research – related Injury:**

No one will be paid because no one will be hurt in this study.

**Persons to Contact in the event of any problems or Queries:**

Ms Joy Kistnasamy

Tel (w): 031 373 2249

Fingerprint  
of  
participant

**Statement of Agreement to participate in the Research Study:**

I ,.....

*(Subject's name and ID number)*

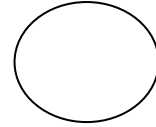
have read this document in its entirety and understand its contents. Where I have had any questions or queries, these have been explained to me by..... to my satisfaction. Furthermore, I fully understand that I may withdraw from this study at any stage without any adverse consequences and my future health care will not be compromised. I, therefore voluntarily agree to participate in this study.

Subject's name (print).....Subject's signature:.....Date:.....

Researcher's name (print).....Researcher's signature:.....Date:.....

Witness name (print):.....Witness signature:.....Date:.....

Supervisor's name (print).....Supervisor's signature:.....Date:.....



Ucwaningo oluhlose ukuveza inani labantu abangawaqedi amaphilisi esifo sofuba endaweni yasi eThekwini. Luzophinde luveze indlela iDOTS esebenza ngayo kanye nokutshalwa kwalo loluhlelo lwe- DOTS kuMkhahdlu weTheku.

Umcwaningi omkhulu:

Nks'z Althea Rajagopaul

Ababambisene nomcwaningi:

Nks'z Jjoy Kistnasamy noDokotela Poovendhree Reddy

### **Isingeniso nenhloso yocwaningo**

Isifo sofuba yisifo esithathelanayo. Lolucwaningo luzobheka izinto ezenza abantu babe nesifo sofuba nokuthi kungani abantu abaningi bengawadli amaphilisi ofuba nsukuzonke, okanye bavele bayeke ukuwadla. Ngokubhekisisa uhlelo lwesifo sofuba emakliniki, kungaveza futhi kulungise izinqginqamba ezikhona kwezempilo.

### **Inhloso yocwaningo esikhathini esiyizinyanga eziyisithupha ku-2009:**

1. Ukuveza ubungako nembangela yokuthi abantu bangawaqedi amaphilisi esifo sofuba emkhandlwini weTheku.
2. Ukuhlola ukusabalaliswa kanye nokusebenza kohlelo lwe-DOTS emzameni yokulwa nesifo sofuba emkhandlwini weTheku.

### **Indlela okuzokwenziwa ngayo**

#### ***Ezigulini***

Kuzofika isisebenzi somnyango wezeMpilo emzini wakho bese usayina lencwadi oyifundayo njengamanje uma ufuna ukuba yingxenywe yalolucwaningo. Amafomu akho asekloniki azosetshenziswa futhi uzogcalisa neqoqo lemibuzo. Uma ucwaningo seluphuthuliwe imiphumela izotholakala ekliniki uma ufuna ukuyibona.

#### ***Kubasebenzi***

Umcwaningi uzothumela iqoqo lemibuzo kumphathi wamanesi wamakliniki amabili.

### **Ubungozi nokungaphatheki kahle kwababambe iqhaza:**

Abukho ubungozi ozokwenziwa bona. Kuzoncomeka uma ungathatha isikhathi sakho uphendule imibuzo.

**Inzuzo:**

Ucwaningo luzosiza ukubonakalisa ukuthi kungani abantu abaningi ababesifo sofuba bengawuqedi umuthi wokulapha lesifo nokuthi yini engenziwa ukubasiza. Umcwaningi uzosabalalisa imiphumela yalolucwaningo ukuze kusizakale nabanye.

**Izizathu zokuyeka ukubamaba iqhaza kulolucwaningo:**

Uma uzizwa ungasathandi ukuqhubeka nokuphendula imibuzo, unelungelo lokuyeka ungaqhubeki nokubamba iqhaza. Akukho okubi okuzokwenzeka uma ungasathandi ukuqhubeka nokuba ingxenye yocwaningo.

**Inkokhelo:****Costs of the Study:Imali yocwaningo**

Uwuzukhokha lutho ukuze ube ingxenye yalolucwaningo.

**Okuphathelele nokulimala kulolucwaningo:**

Akekho umuntu ozokhokhelwa ngoba akekho umuntu ongalimala ngoba lolucwaningo alunabungozi.

**Ubumfihlo bocwaningo:**

Iqoqo lemibuzo namafomu okulandelela zizogcinwa ziyimfihlo. Igama lakho lizovela efomini kuphela. Angeke livele kwiqoqo lemibuzo nakwimiphumela yocwaningo.

**Okuphathelele nokulimala kucwaningo**

Akekho umuntu ozokhokhelwa ngoba akekho ongalimala kulolucwaningo. Abantu ongaxhumana nabo uma unemibuzo noma unezinkinga:

Ms Joy Kistnasamy

Tel (w): 031 373 2249

**Isivumelwano sokubamba iqhaza kulo luwaningo:**

Mina, .....  
(igama nenombolo kamazisi wakho)

**Isithupha  
sobambe  
iqhaza  
kulolucwa  
ningo**

Ngiyifundile imininingwano equkethwe ilamaphepha futhi ngiyayiqondo kahle. Lapha engihlangabenzane khona nenkinga noma nginombuzo, incazelo ngiyithole ku..... ngendlela egculisayo. Futhi ngiyaqonda ukuthi ngingayeka ukuba ingxenye yalolucwaningo noma kusiphi isigaba ngale kokuhlangabezana nezinkinga nangaphandle kokubeka impilo yami engcupheni. Ngalokho-ke ngiyavuma ukuba yingxenye yalolucwaningo.

Igama lobambe iqhaza.....Sayina..... usuku.....

Igama lomcwaningo.....Sayina..... usuku.....

Igama likafakazi .....Sayina..... usuku.....

Igama lomphathi.....Sayina..... usuku.....



**TB DEFAULTER QUESTIONNAIRE****Section A**

Please tick appropriate block

☒**1. DEMOGRAPHICS, HISTORY AND SOCIO ECONOMIC FACTORS**1.1 Gender: Male ☐ Female ☐

1.2 Age \_\_\_\_\_yrs

1.3 Country of birth \_\_\_\_\_

1.4 Race \_\_\_\_\_

1.5 Highest education level \_\_\_\_\_

1.6 What type of work do you do? \_\_\_\_\_

1.7 Income per week (*optional*)

R100- 200

☐

R200 – 600

☐

Other Specify \_\_\_\_\_

1.8 a) Is there any other person in your family that is working? YES

☐

NO

☐

b) If yes, how many other people, beside you, are working?

1.9 Did you stop taking your medicine before? YES

☐

NO

☐**Section B: Contributing and Predictor Factors****2. Substance Abuse****2.1 Smoking**

a) Do you

Smoke ☐Ever smoked ☐Never smoked ☐

b) If yes, how many cigarettes per day

Less than 5 ☐5 – 10 ☐11 –15 ☐16 –20 ☐21-30 ☐31 or more ☐

c) Have you stop smoking? YES ☐ NO ☐

d) When did you last smoke and how many did you smoke per day?

---

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e) How many smokers are there at your home?

- 1) One ☐  
2) two – three ☐  
3) more than three ☐

## 2.2 Alcohol

a) Do you: Drink ☐ Ever drink ☐ Never drink ☐

b) How often do you drink alcohol?

Daily ☐ Weekly ☐ Monthly ☐ Yearly ☐

## 3. NUTRITIONAL STATUS

3.1 How often do you have?

Daily Weekly Monthly

9. Fresh fruit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Potatoes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Meat and chicken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Maize meal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Cakes, biscuits, sweets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### **4. HOUSEHOLD INFORMATION**

4.1 How many people live in your household?

- a) None
- b) 1-2
- c) 3

d) Other specify \_\_\_\_\_

4.2 How many children \_\_\_\_\_ adults \_\_\_\_\_ live with you?

4.3 Are there any older people living with you? (Over 60 yrs old) Yes  No

4.4 What do you use to cook?

- a) Stove
- b) Wood/fire
- c) Gas

4.5 When you were last in contact with a person infected with TB?

A week  A month  3 months  6 months

Year  More than a year ago

#### **5. MEDICAL CONDITIONS AND HISTORY**

5.1 Does any one in your family have TB at the moment? Yes  No

- a) Husband/Wife
- b) Boyfriend/Girlfriend
- c) Brother
- d) Sister
- e) Child

f) Other specify \_\_\_\_\_

5.2 Did anyone have TB in the last two years? Yes  No

Who was it?

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5.3 Do you suffer from?

- a) Diabetes ☐
- b) High Blood Pressure ☐
- c) HIV/AIDS (*optional*) ☐
- d) Asthma ☐
- e) Other specify \_\_\_\_\_

5.4 Did you have your TB injection when you were a baby? Yes ☐ No ☐

5.5 Did your children have their TB injection? Yes ☐ No ☐  
Other Specify \_\_\_\_\_

---

5.6 Are you taking any other medication? Yes ☐ No ☐

## **6. STRESS**

6.1 Do you feel worried often ☐ sometimes ☐ very little ☐ never ☐

6.2 What worries you the most?

- Money ☐
- Food ☐
- Family life ☐
- Other \_\_\_\_\_
- Specify \_\_\_\_\_

## **7. MEDICAL FACILITIES**

7.1 How did you find out you had TB?

- a) Went to the doctor for something else ☐
- b) Felt sick and knew that you could have TB ☐
- c) Other \_\_\_\_\_
- Specify \_\_\_\_\_

7.2 What tests did you undergo to check if you did have TB?

- a) Sputum tests ☐
- b) Skin test ☐
- c) X ray ☐

d) Other

Specify \_\_\_\_\_

7.3 Does your employer know that you have been diagnosed with TB? Yes ☐ No ☐

If no, why not?

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7.4 a) Do you get time off work to get your treatment from the clinic? YES ☐ NO ☐

b) If no, why not?

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c) Cannot afford to leave work?

☐  
☐

d) Boss would not let you go

e) Other

specify \_\_\_\_\_

7.5 Which clinic did you visit?

a) Cato Manor Clinic

☐

b) Chesterville Clinic

☐

c) CDC

☐

d) Inanda Seminary

☐

e) Other

Specify \_\_\_\_\_

7.6 How did the staff treat you?

a) Helpful

☐

b) Rude

☐

c) Other

Specify \_\_\_\_\_

7.7 What is TB?

☐  
☐  
☐

Flu

A disease that is not contagious

A disease caused by a bacterium that can be cured if detected early and treated

Other specify

---

7.8 What do you think will happen to you if you do not take your medicine?

- a) You will get better faster ☐
- b) You will get sicker ☐
- c) You will die ☐
- d) None of the above ☐
- e) Other Specify

---

7.9 Did the clinic explain to you about how you should take your TB medicine? Yes/ No  
Explain.

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### **8. PREDICTOR FACTORS**

8.1 Did you take your treatment regularly? Yes ☐ No ☐

If No, Why don't you take it?

- a) Forget to take it ☐
- b) Clinic did not provide medication ☐

8.2. What side effects do you have (if any)?

- a) Vomiting ☐
- b) Nausea ☐
- c) Diarrhoea ☐
- d) Pain ☐
- e) Itchy body ☐

f) Other

Specify 

---

8.2 Did you go to a traditional healer? Yes ☐ No ☐

8.3 How did you feel when taking the medicine?

- a) Healthy ☐

b) Relaxed ☐

c) Sick ☐

d) Other

Specify \_\_\_\_\_

8.4 Which of the symptoms caused you the most discomfort?

a) Vomiting ☐

b) Nausea ☐

c) Pain ☐

d) Other Specify \_\_\_\_\_

8.5 Did you eat first and then take the medication? Explain Yes ☐ No ☐

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---

8.6 Did someone help you and give you support during your treatment?

Yes ☐ No ☐

8.7 Who was it?

a) Family Member ☐

c) DOTS supporter ☐

b) Community Member ☐

d) Clinic personnel ☐

e) Other specify \_\_\_\_\_

8.8 How did you go to the health facility? How much does it cost you to get to this clinic?

a) Walking ☐

b) Car ☐

c) Bus/Taxi ☐

d) Bicycle ☐

e) other ☐

f) Cost \_\_\_\_\_

g) Who paid your transport money?

1) Family member ☐

2) Boss ☐

3) Other

specify \_\_\_\_\_

8.9 How long did you have to wait at the clinic before you were attended to?

- a) 30 min ☐
- b) 1hr ☐
- c) 2hr or more ☐

d) Other Specify \_\_\_\_\_

8.10 Did the clinic stop your treatment? Yes ☐ No ☐

8.11 Did the clinic always have stock of the medicines? Yes ☐ No ☐

### **9. GRANTS**

9.1 Do you receive a Disability grant? Yes ☐ No ☐

9.2 What do you do with the grant?

- a) Buy food ☐
- b) Pay school fees ☐
- c) Other specify

9.3 What other source of income do you get?

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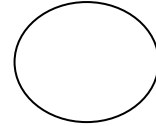
9.4 Can you survive without the grant? Yes ☐ No ☐

***Thank you***

Interviewed by .....

Date: .....



**Isengezo 4.2****Imibuzo Mayelana Nesiguli****Isigaba A**

Beka uphawu ebhokisini elifanele

**1. IMININGWANE NGOMUNTU, UMLANDO NOKUMAYELANA NOMNOTHO NENHLALO**1.1 Ubulili: Owesilisa ☐ Owesifazane ☐

1.2 Ubudala \_\_\_\_\_ iminyaka

1.3 Izwe owazalelwa kulona \_\_\_\_\_

1.4 Uhlanga \_\_\_\_\_

1.5 Iqophelo eliphezulu lemfundo \_\_\_\_\_

1.6 Wenza msebenzi muni? \_\_\_\_\_

1.7 Iholo ngesonto (*uma uthanda ukusitshela ngalo*)

R100- 200

☐

R200 – 600

☐

Okunye Chaza \_\_\_\_\_

1.8 a) Ukhona omunye umuntu emndenini wakho osebenzayo? YEBO ☐ CHA ☐

b) Uma uthi yebo, bangaki abanye abantu abasebenzayo, ngaphandle kwakho? \_\_\_\_\_

1.9 Wayeka imithi yofuba ungayiqedanga? ☐1.10 Wake wayeka ukudla imishanguzo yakho ngaphambilini? Yebo ☐ Cha ☐**Isigaba B: Okunomthelela nokungabikezela****2. UKUSEBENZISA IZIDAKAMIZWA NGENDLELA ENGAFANELE****2.1 Ukubhema**a) Uyabhema ☐ Wake wabhema ☐ Awukaze ubhema ☐

b) Uma uthi yebo, ubhema imindweza emingaki ngosuku?

Kayifiki kwemi-5 ☐ 5 – 10 ☐ 11 –15 ☐ 16 –20 ☐ 21-30 ☐ 31 nangaphezulu ☐

c) Wayeka ukubhema?

☐ Yebo☐ Cha

d) Wagcina nini ukubhema futhi wawubhema imindweza emingaki ngelanga?

e) Bangaki abantu ababhemayo ekhaya?

4) Munye ☐

5) babili – bathathu ☐

6) beqile kwabathathu ☐

## 2.2 Utshwala

a) Uyaphuza ☐ Uke uphuze ☐ Awukaze uphuze ☐

b) Ubuphuza kangaki utshwala?

Ngelanga ☐ Ngesonto ☐ Ngenyanga ☐ Ngonyaka ☐

## 3. ISIMO SOKUDLA

3.1 Kuba kangaki udla?

Ngelanga Ngesonto Ngenyanga

- a) zithelo ezisezintsha
- b) Okusamifino/Amaveji
- c) Amazambane
- d) Inyama ebomvu neyenkukhu
- e) Impuphu
- f) Ilayisi
- g) Ushizi
- h) Ubisi
- i) Ufishi
- j) Amakhekhe,  
amabhisikidi,uswidi

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## 4. IMININGWANE NGEKHAYA

4.1 Nihlala nibangaki ekhaya?

a) Akukho muntu ☐

b) 1-2

c) 3


d) Okunye chaza \_\_\_\_\_

4.2 Zingaki izingane \_\_\_\_\_ abantu abadala \_\_\_\_\_ ohlala nabo?

4.3 Bakhona abantu abadala ohlala nabo? (Abangaphezu kuka-60 weminyaka ubudala)

Yebo ☐ Cha ☐

4.4 Nipheka ngani?

d) Ngesitofu

e) Ngomlilo wezinkuni

f) Ngegesi


4.5 Sekuyisikhathi esingakanani wagcina ukusondelana nomuntu ophethwe yisifo sofuba (i-TB)?

Isonto ☐ Inyanga ☐ izinyanga ezi-3 ☐ izinyanga eziyi-6 ☐

Unyaka ☐ Uphelile unyaka ☐

## **5. ISIMO SOKWELASHWA NOMLANDO**

5.1 Njengamanje ukhona ophethwe ufuba ekhaya? Yebo ☐ Cha ☐

a) Umyeni/Unkosikazi

b) Isoka/Intombi

c) Umfowethu

d) Udadewethu

e) Ingane


f) Omunye chaza \_\_\_\_\_

5.2 Esikhathini esingangonyaka esedlule lomuntu samphatha isifo sofuba futhi kwakungubani?

Yebo ☐ Cha ☐

Ukhona ophathwe ufuba kule minyaka emibili edlule?

\_\_\_\_\_

5.3 Ziyakuphatha lezi zifo?

f) Isifo sikashukela

☐  
☐

g) Isifo somfutho wegazi (i-BP)

h) INGULAZA/IGCIWANE LAYO (kukuwena ukukhetha ukusitshela) ☐

i) Isifuba somoya (Asthma) ☐

j) Okunye chaza

5.4 Wawuthola umjovo wokugomela isifo sofuba useyingane?

5.5 Izingane zakho zawuthola umjovo wokugomela ufuba? Yebo ☐ Cha ☐  
Okunye Chaza

5.6 Ikhona eminye imithi oyisebenzisayo? Yebo ☐ Cha ☐

## **6. INGCINDEZI**

6.1 Uvamide ukukhathazeka ☐ ngesinye isikhathi ☐ kancane kabi ☐  
angikaze ☐

6.2 Yini ekukhathaza kakhulu?

Imali ☐  
Ukudla ☐  
Impilo yekhaya ☐

Okunye Chaza

## **7. IZIMFANELO ZOKWELASHWA**

7.1 Wathola kanjani ukuthi unofuba?

a) Wawuziyele kudokotela ngokunye nje ☐

b) Wawuzizwa ungaphilile kodwa wazi ukuthi kungenzeka kube unofuba? ☐

c) Okunye Chaza

7.2 Wahlolwa kanjani ukuthola ukuthi unalo ngempela yini ufuba?

- a) Kwahlolwa isikhwehlela  
b) Kwahlolwa isikhumba  
c) Wahanjiswa esithombeni


d) Okunye Chaza \_\_\_\_\_

7.3 Umqashi wakho uyazi ukuthi utholwe unofuba? Yebo ☐ Cha ☐

Uma engazi, kungani engazi?

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7.4 a) Emsebenzini uyasithola isikhathi sokuphuma uye emtholampilo uyolanda imithi?

Yebo ☐ Cha ☐

b) Uma kungenjalo, kungani?

---

c) Awukwazi ukushiya umsebenzi?


d) Umphathi ngeke avume?

e) Okunye chaza \_\_\_\_\_

7.5 Uhamba muphi umtholampilo?

- a) eCato Manor  
b) eChesterville  
c) eCDC


d) Okunye Chaza \_\_\_\_\_

7.6 Bakuphatha kanjani abasebenzi bakulo mtholampilo?

- a) Babe nosizo  
b) Bangidelelile


c) Okunye Chaza \_\_\_\_\_

7.7 Yini ufuba?


Umkhuhlane

Yisifo esingathelelani

Yisifo esibangwa yigciwane eselaphekayo uma sisheshe sabonakala selashwa

Okunye Chaza

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7.8 Ucabanga ukuthi kungenzekani kuwe uma ungayisebenzisi imithi yakho?

- a) Ungelulama ngokushesha
- b) Ungagula kakhulu kunakuqala
- c) Ungafa
- d) Lutho


e) Okunye Chaza

7.9 Wachazelwa emtholampilo ukuthi uwasebenzise kanjani amaphilisi ofuba? Yebo/ Cha Chaza.

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### **8. IZIMPAWU EZINGABIKEZELA**

8.1 Amaphilisi ubuwasebenzisa njalo? Yebo/Cha. Uma uthi Cha, kungani ungawasebenzisi?

- a) Ukukhohlwa
- b) Umtholampilo kawunginikanga


8.2. Akubangela ini (uma kukhona akubangayo)?

- a) Ukubuyisa
- b) Inhliziyo encane
- c) Isisu esihambisayo
- d) Ubuhlungue)
- e)Ukuluma komzimba


f) Okunye Chaza

8.2 Waya enyangeni?

Yebo

--

Cha

--

8.3 Wazizwa unjani uma usebenzisa imithi?

- a) Uphilile
- b) Ugenaxhala
- c) Ugula


d) Okunye Chaza

8.4 Yiziphi izimpawu zokugula ezazikukhathaza kakhulu?

a) Ukubuyisa

b) Inhliziyo encane

c) Ubuhlungu


Okunye Chaza \_\_\_\_\_

8.5 Wawuqala ngokudla bese ulandelisa ngokuphuza amaphilisi? Yebo ☐ Cha ☐

Chaza \_\_\_\_\_

\_\_\_\_\_

8.6 Ukhona owayekusiza ekweseka ngesikhathi welashwa?

Yebo ☐ Cha ☐

8.7 Kwakungubani?

a) Ilungu lomndeni

b) Ilungu lomphakathi


c) umeseki we-DOTS

d) Abasebenzi basemtholampilo


e) Okunye Chaza \_\_\_\_\_

8.8 Wawuya kanjani esikhungweni sokwelashwa? Kukubiza malini ukufinyelela kulo mtholampilo? ☐ ☐ ☐

a) Ngezinyawo

b) Ngemoto

c) Ngebhasi/ngethekisi

d) Izindleko \_\_\_\_\_

e) Ngubani owakukhokhela imali yokugibela?

1) Ilungu lomndeni

2) Umphathi

3) Omunye Chaza \_\_\_\_\_


8.9 Walinda isikhathi esingakanani emtholampilo ngaphambi kokuba kufikwe kuwe?

a) Imizuzu engama-30

b) Ihora elilodwa

c) Amahora amabili noma ngaphezulu


d) Okunye Chaza \_\_\_\_\_

8.10 Umtholampilo wakumisa ukwelashwa kwakho? Yebo ☐ Cha ☐

8.11 Njalo umtholampilo wawuhlala unayo imithi?

Yebo

☐

Cha

☐

### **9. IZIBONELELO**

9.1 Ingabe uyasithola isibonelelo sokukhubazeka kuHulumeni? Yebo

☐

Cha

☐

9.2 Wenzani ngemali yesibonelelo?

a) Uthenga ukudla

☐

b) Ukhokha imali yesikole

☐

c) Okunye chaza

9.3 Yimiphi eminye imithombo othola kuyona imali?

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9.4 Ungakwazi yini ukuphila ngaphandle kwalesi sibonelelo osithola kuHulumeni?

Yebo

☐

Cha

☐

***Siyabonga***

Obebuza.....



**QUESTIONNAIRE TO NURSES**

1. Who are the role players in the DOTS programme?

a. Community members

☐

b. Nursing staff

☐

c. Other

Specify \_\_\_\_\_

2. How is the DOTS programme implemented at your clinic? What are the steps of an effective DOTS Programme?

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3. Is counselling given to the TB patients and defaulters? Yes ☐

No ☐

4. Who are responsible for the tracing of defaulters?

a. Environmental Health Practitioners

☐

b. Environmental Health officers/assistants

☐

c. Community members

☐

d. Other Specify

\_\_\_\_\_

5. What measures are in place to rehabilitate defaulters?

a. counselling

☐

b. training

☐

c. health education

☐

d. Other specify

\_\_\_\_\_

6. Do the DOTS supporters undergo training? Yes ☐

No ☐

7. a) Are the DOTS supporters supervised? Yes ☐

No ☐

b) Who is responsible for their training?

8. Do of the nursing staff have training in treating TB patients? Yes ☐ No ☐

a) If yes, how many received training? \_\_\_\_\_

b) If yes what did the training entail?

9.1 Are follow up sputum examinations done?

How often?

a. once

b. Twice

c. Other Specify \_\_\_\_\_


9.2 When?

a. after a month

b. after a week

c. Other Specify \_\_\_\_\_


10. Why do you think people are defaulting on treatment?

a) No food

b) Got work

c) Feel better

d) No DOTS supporter

e) Lack of education/knowledge

f) Lack of transport/money to get to clinic

g) Other

Specify \_\_\_\_\_


11. Do you know why the defaulter rate and incidence rate is high in your clinic?

a. Lack of training by staff

b. Lack of commitment by the patient and staff

c. Lack of drugs

d. Lack of staff

e. Other Specify \_\_\_\_\_


12. What do you think can be done to minimize the defaulter rate?

a. More training for health staff and DOTS supporters

b. More health education to patients


c. Other

Specify\_\_\_\_\_

13. Give implementable suggestions on how TB cure rate can be improved in your clinic?

a. More training

b. Improvement with the implementation of the DOTS management programme

c. Other

specify\_\_\_\_\_


14. What methods are already in place to reduce the risk of TB infection at the clinic?


15. How many DOTS supporters are recommended for a patient at the health facility?

a. Nil

b. One

c. Two or more


d. Other specify\_\_\_\_\_

16. How often do the DOTS supporters visit the patients?

a. Once a day

b. Once a week

c. Other Specify\_\_\_\_\_


17. What do you understand by cough hygiene? How are you implementing cough hygiene at your clinic?


18) Do you think the DOTS Programme is effective?

☐ Yes

☐ No

Explain

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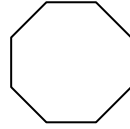
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**Thank You**

Interviewed by.....

Date:.....



**SEMI STRUCTURED INTERVIEW**  
**SCHEDULE**

**Questions**

1. How is the DOTS programme currently implemented?
2. What kind of training is given to those health personnel and health care workers implementing the DOTS programme?
3. How effective do you think that this programme is especially in the informal areas of eThekweni with specific reference to tracing of defaulters?
4. What are some implementable suggestions that the programme could adopt?
5. What is your view on the presence and selection of a DOTS supporter?
6. Additional questions that arose from the participants as will be unfolded in Chapter 4.

**ETHEKWINI MUNICIPALITY  
COMMUNICABLE DISEASES CONTROL DEPARTMENT**

**TB TRACING FORM**

Issue Date			
Client Number		Client Name	
Patient Id. No.			Age
Registered @ : CDC	DOTS @:		TB Review Date
Type of visit required :	New case	X	Defaulted
Interrupted treatment during:	Intensive Phase		Continuation Phase
Home address :			Sub District S4
HomePhoneNo:			
Work address :			
WorkPhone No:		Employee No:	Department:
<b>VISIT FINDINGS</b>			
Date visited	Visit completed by:		
No such address	Unknown	Nobody at home	Left work
Gone to farm (indicate where):		Other (please specify)	
Default reason	Financial	Clinic access	Work problems
Physical appearance	Ambulant	Bedridden	Ill health
Comments :			
<b>Tear off here for Patient/Contact</b>			
Client Number		Client Name	
Date patient was visited:			
Clinic to attend : Prince Cyril Zulu Communicable Diseases Centre ,off Warwick Avenue, Durban			
Clinic phone number : 031 3101600		Time to Attend: 7.00am to 8.00am	

## **WORKSHOP**

### **The role and responsibilities of the interviewer**

This particular research involved the help of fieldworkers for the specific areas mainly for two reasons. It involved the fieldworker visiting the specific patients at their homes and administering the questionnaire. The questionnaire was in isi Zulu and since the specific patients had to be traced and interviewed fieldworkers that were familiar with the study area needed to be involved. Each interviewer was required to fill in an Agreement between them and myself (the researcher). The purpose of the interviewer/ fieldworker was to administer the questionnaire to the defaulter and ensure the accuracy of the information/data gathered.

#### **Characteristics of the fieldworker**

Due to the sensitivity of the study, the interviewer needed to be a person that was able to approach people and build a rapport with them first. The fieldworker also needed to have a good understanding of the questionnaire. This was made possible during the workshop where the fieldworker was explained the questionnaire and what was required of them. The researcher also explained to them the importance of capturing the data properly since this information will be vital to continue the study. The fieldworker was also told to be friendly and not to force people to answer the questionnaires but rather to try and convince them of the importance of answering them.

The researcher also stressed that they would not be able to divulge any information be it to their family, friends or people in the community e.t.c during the fieldwork and when the fieldwork was concluded as was signed in the Agreement Form. They were told that they would be dismissed if the researcher found out that this was the case. They were told to dress appropriately and use their discretion in gathering the data in an ethical

manner. Since they were going to informal areas, they needed to blend in and not stand out as this could have caused problems.

## **Ethics**

The researcher highlighted the following:

- only ask what was on the questionnaire
- do not sell or promote anything like a belief whether religious or not
- do not give your opinion with regard to any matter
- try to prompt an answer by explaining the importance of answering the question and not prompting a certain answer.

## **Time**

The interview may take 30 – 45 minutes on a questionnaire although the questionnaire may require approximately 15 minutes if the questionnaire was ticked by the participant themselves. Some of the patients may take longer to answer and the interviewer needs to be patient.

## **Before leaving the area**

- Make sure all questions are answered properly
- Ensure that the respondent has signed the Form of Informed Consent which ideally should be done prior to commencement of the interviewing session.
- Each respondent must be thanked for their time and the valuable information that they have shared.
- The questionnaire must be signed by the interviewer and dated.

With regard to the open ended questions, the interview had to make sure that one of the choices was ticked. With regard to demographics and income, the researcher asked for it in an open ended format. The researcher



### **Information for the fieldworker**

Each fieldworker will be paid R20 for each completed questionnaire. The researcher explained to them how payment would be made. Fieldworkers either agreed to have their payment at the end of the week, or once the questionnaires were completed. They were also told that they will be given receipts for all payment made.

Overall the interviewing workshop was a very brief one that encompassed the crux of how to get the information needed and the role and responsibility of the fieldworker.

‘

**Annexure 8.2****AGREEMENT**

This is to certify that the fieldworkers are engaged to conduct the administration of the questionnaires to the TB Defaulters in the respective areas within eThekweni Municipality's jurisdiction.

**Fieldworkers need to conform to the following:**

1. All information with regard to the questionnaire administration including scope of the study and the patient details must be kept confidential. This information must not be divulged to anyone in the community for discussion and no stigma must be associated with the patient.
2. All questionnaires must be returned as soon as they are completed.
3. Fieldworkers will be paid according to the number of completed questionnaires. They will either be paid weekly or when all the data have been completed. Receipts will be issued.
4. These questionnaires must be returned in good quality and not torn and dirty.
5. The researcher will not be liable to any harm caused to the fieldworker during the interviews.
6. Information will not be reproduced or copied in any manner.
7. Fieldworkers will be acknowledged in the dissertation.

Althea Rajagopaul (researcher)\_\_\_\_\_

I, \_\_\_\_\_ understand and agree to abide to these conditions.

Fieldworkers signature:

\_\_\_\_\_

Witness name signature:

\_\_\_\_\_

Date: \_\_\_\_\_

**LETTER OF PERMISSION**

A project is being undertaken by eThekweni Municipality and the Durban University of Technology to find out why people do not take their TB medicines so that they could find ways to help them. I, Althea Rajagopaul work at eThekweni Municipality and would appreciate it if you would allow the fieldworker\_\_\_\_\_ to ask you some questions that will help government to help you and it is strictly confidential. Your names will not be used.

Researcher: Althea Rajagopaul \_\_\_\_\_

Fieldworker: \_\_\_\_\_

Date: \_\_\_\_\_