Assessment of Drug Resistant Tuberculosis and Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome: Knowledge Levels Among Community Members in Nelson Mandela Metropolitan Municipality

by

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Nelson Mandela Metropolitan University

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DECLARATION

I, Thanduxolo Fana (student number 9620892), hereby declare that this study is my own original work and all the sources referred to or quoted have been indicated and acknowledged by means of complete references.

I have not previously submitted this research study in full or part for an equivalent or higher qualification at any other recognised education institution.

11 January 2013

__________________________________________  ________________________________
T.E. Fana (9620892)       Date
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ABSTRACT

The aim of this study was to assess community members’ knowledge levels regarding Drug Resistant TB and HIV and AIDS. The study was conducted at ward 40 in Green bushes area in Nelson Mandela Metropolitan Municipality (NMMM). A quantitative research method was used in this study. Random sampling is the type of probability sampling method that was used in this study. The sample consisted of 100 respondents above 18 years who were randomly selected from the beneficiary list of for the RDP houses in Green bushes area in the Nelson Mandela Metropolitan Municipality. Data for this study were collected using close ended questions which were administered by the researcher to the selected participants. Data was analysed using bivariate and descriptive statistics according to the identified themes.

The study revealed that community members had high knowledge levels regarding Drug Resistant TB and HIV and AIDS prevention, transmission modes and diagnosis and treatment methods. The findings revealed that community members were highly knowledgeable and aware of the fact that abstaining and practising safe sex were means of preventing the spread of HIV and AIDS as it was spread through unprotected sex, while opening of windows and minimisation of close contact with HIV positive people and children with people infected with Drug Resistant TB are infection control measures or methods of preventing the spread of the disease.

Additionally, the study indicated that female respondents were more aware and knowledgeable about prevention, transmission modes and diagnosis and treatment of Drug Resistant TB and HIV and AIDS than male respondents. Furthermore, the findings revealed that the respondents were highly knowledgeable and aware about transmission of Drug Resistant TB and HIV and AIDS; knowledgeable about prevention and less knowledgeable about diagnosis and treatment. A high percentage of female respondents knew that there was no vaccine to neither prevent nor cure HIV and AIDS and that antiretroviral drug were used to manage it.

The study also showed that female respondents knew that all people irrespective of race and economic class can be infected with Drug Resistant TB and HIV and AIDS. It is important to note that the respondents between 41-60 years possessed more knowledge regarding Drug
Resistant TB and HIV and AIDS than the respondents who were between 18-40 years.

Lastly, the study showed that there were significant differences in gender and knowledge and no significant differences in age and knowledge of the respondents regarding Drug Resistant TB and HIV and AIDS. It is recommended that in future, research regarding knowledge levels about Drug Resistant TB and HIV and AIDS be extended to other wards in the Nelson Mandela Metropolitan Municipality (NMMM). Accurate knowledge should be provided by ensuring that educational materials that are developed, are appropriate for the various levels of literacy, and that more appropriate and relevant information regarding these diseases is made more accessible to community members in their home languages. The researcher further recommends that during training interventions and educational campaigns more emphasis should be put on prevention, diagnosis and treatment of Drug Resistant TB and HIV and AIDS.
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CHAPTER 1

INTRODUCTION, PROBLEM STATEMENT AND OUTLINE OF THE RESEARCH STUDY

1.1 Introduction

The Human immunodeficiency virus or Acquired immune deficiency syndrome (HIV and AIDS) was first identified in 1981. Since then the epidemic has become a serious health and development problem in many countries around the world. At the end of the 2009 the Joint United Nations Program on AIDS (UNAIDS) estimated the number of HIV infection worldwide at about 33.4 million. About 22, 4 million infected people which are 67% of the total infections were in Sub-Saharan Africa, 68% of new HIV infection among adults and 91% of new infections on children. The region also accounted for 72% of the world’s AIDS related deaths in 2008 (UNAIDS, 2009). This study tries to assess the Drug Resistant Tuberculosis (DR-TB) and HIV and AIDS knowledge levels among community members in Nelson Mandela Metropolitan Municipality - Eastern Cape Province in South Africa.

South Africa has the largest number of HIV and AIDS infected people in the world (UNAIDS, 2009). The HIV and AIDS prevalence in the Eastern Cape was 29.9% just below the national prevalence of the country which was 30.2% in 2010 (www.avert.org).

The Nelson Mandela Metro District has the highest HIV prevalence rate than other districts in the Eastern Cape over the period of three years (31.9% in 2006, 28.9 % in 2007 and 29% in 2008).
South Africa is further burdened by Tuberculosis (TB) as its TB rate is double than those found in the other developing countries. The numbers of Multi Drug Resistant-TB (MDR-TB) and Extreme Drug Resistant – TB (XDR-TB) patients have increased due to the concurrent HIV epidemic and inadequate management of TB. In 2009 the National Health Laboratory Services diagnosed 9,070 MDR-TB and 594 XDR-TB cases.

There has been a steady increase in cases since 2006, possibly due to increased case detection. In 2010 the National Health Laboratory Services diagnosed 7,386 Multi Drug Resistant TB cases and 741 Extreme Drug Resistant TB cases and these figures exclude diagnoses that are made through private laboratories as they are not known in the country (South African National Department of Health, 2011).

According to the report released by the National Health Laboratory Services South Africa have 45,196 patients of Multi Drug Resistant and 3,128 Extreme Drug Resistant TB patients from 2004 to 2010. Kwa-Zulu Natal is currently occupying the first spot with 11,393 followed in the second position by the Western Cape with 10,947 and Eastern Cape in the third position with 7,993 Multi Drug Resistant TB patients. The Eastern Cape replaces the Western Cape on the second position with 808 patients and the Western Cape moves up to the third position with only 342 patients when it comes to Extreme Drug Resistant TB patients while Kwa-Zulu Natal continues to hold the first position with 1,499 patients (South African National Department of Health, 2011).

These two diseases pose a serious threat to the economic, health and world development initiatives as they mainly affect people between ages 15 to 49 who are economically active. HIV and AIDS together with Drug Resistant TB strains Multi and Extreme Drug Resistant Tuberculosis (MDR and XDR TB) are spreading very fast and are continuing to bring the worst and the best out of communities.
They bring the best when communities came together and mobilize themselves to take action against HIV and AIDS and DR-TB. On the other hand they bring the worst when the community does not treat those infected with love, respect and dignity or when they are abused, ridiculed, marginalized and rejected even worse by their families, friends and loved ones (Mashabela, 2006).

In South Africa, the National TB Program initially required hospitalization of all Drug Resistant TB patients for an initial period of six months as required by the South African National Department of Health (South African National Department of Health, 2011). A clinical review of the DR-TB services revealed that the TB management program is currently facing many challenges including delayed treatment initiation, inadequate bed capacity, and poor infection control in hospital and poor adherence in treatment. To address these challenges, the length of time that MDR-TB patients are required to stay in centralised DR-TB hospitals was reduced, and a decision made to decentralise and deinstitutionalise services (South African National Department of Health, 2011).

It has been stated that holding patients against their will is illegal and it is not guarantee that patients will indeed heal or be cured from their illness. It is stated that under certain circumstances it better to treat people infected at home where they are not congested in small or overcrowded wards with full support of their families (www.britannica.com).

According to Nordell and Dharmadhikari (2010) the implementation of the decentralised care model will improve efficiency and effectiveness of the DR TB and HIV and AIDS management, if all the relevant stakeholders are playing their role. Key to the successful decentralisation and deinstitutionalisation and effective DR TB and HIV and AIDS programs is effective infection control, effective DR TB and HIV and AIDS advocacy, communication and social mobilisation at community level.
DR TB is managed at three levels namely, tertiary levels, primary health centres and at the community level. Community and family members need to be well informed about the diseases so that they can be in a position to provide emotional support, nursing care to the patients during treatment, help with early identification and reporting of changes in patient’s conditions to the clinic nurse or the community care giver (South African National Department of Health, 2011). In the Eastern Cape, people who are infected with Drug Resistant Tuberculosis (DR TB) are admitted to Jose Pearson and Fort Grey MDR and XDR TB Hospitals up until such time that they are certified to be un-infectious. The hospitalization of patients for the minimum of six months forced patients to relinquish their work, home and family responsibilities.

In 2008 and 2009 patients at Jose Pearson TB Hospital ran away from the hospital to spent time with their families. They used their illness to scare off staff and security guards. The Eastern Cape Department of Health applied for a court order to get them sent back to the hospital as it was stated that they were highly infectious and a danger to the society as a whole. This raised fears and concerns from all stakeholders in the society. Stigmatization and discrimination towards people living with drug resistant TB also increased as people feared of getting infected. The situation went bad to such an extent that some family members were refusing to allow their relatives back home even when they were discharged from the hospital because of fear of getting infected (Ngcebetsha, 2011).

According to Anon (2003) the general awareness of the DR TB and HIV and AIDS issue must be increased in order for people to understand how to protect themselves, reduce the stigmatization of and discrimination against those that are infected by these diseases and ultimately bring the HIV and AIDS and DR TB crisis under control. Overcoming stigma and discrimination is the key to mitigating the effects of DR TB and HIV and AIDS and as society becomes more accepting of people with these diseases, they will be more open and responsive to education and lifestyle changes (Anon, 2003).
The above and the following are some of the factors that have motivated the author to conduct this study. The researcher is currently working in a DR TB Hospital. The hospital is situated between Greenbushes and Bethelsdorp and some of the patients admitted in the hospital are from the surrounding areas. The effective and efficient management of DR TB and HIV and AIDS programs requires infection control, effective DR TB and HIV and AIDS advocacy, communication, social mobilisation at community level, with the view of empowering people with relevant factual information about the diseases and dispel stigma surrounding these diseases in the community. It is on the basis of the above that the author had decided to assess the community members Drug Resistant TB and HIV and AIDS knowledge levels.

1.2 Rationale for the Study

This study intends to establish the knowledge levels of the community members of Ward 40 in the Nelson Mandela Metropolitan Municipality regarding Drug Resistant TB and HIV and AIDS. The Nelson Mandela Metro District has the highest HIV prevalence rate than other districts in the Eastern Cape over the period of three years (31.9% in 2006, 28.9 % in 2007 and 29% in 2008). The NMMM was also declared as having crisis with regard to TB in 2011. The objectives of TB and HIV and AIDS education campaigns are to educate and empower communities with regard issues relating prevention, transmission, diagnosis and treatment or care and support when infected or affected by these diseases. Stigma, ill-treatment and discrimination of people infected with DR TB and HIV and AIDS even after being discharged from DR TB hospitals is an indication of the failure to achieve the objectives of the education campaigns.

This study is therefore intended at establishing whether the community members at Ward 40 have got the appropriate knowledge and awareness with regard to prevention, transmission, diagnosis and treatment of Drug Resistant TB and HIV and AIDS.
Control and prevention of TB and HIV and AIDS is one of the United Nations Millennium Development Goals. South Africa is one of the countries that are working towards achievement of the Millennium Development Goals. This study intends to make recommendations towards TB and HIV and AIDS program design and delivery which will in turn contribute towards increasing knowledge about prevention, management and control of these infectious diseases.

1.3 Research Problem

South Africa has the highest number of HIV and AIDS infected people in the world. South Africa is ranked number three (3) by the World Health Organization, among highest TB burdened countries in the world after China and India (Department of Health, 2011). With the identification of MDR and XDR TB the well-being of people was further threatened. Those infected with HIV and AIDS run the risks of being co-infected with these resistant strains of TB (Ndabeni, 2011).

They further find themselves in a very difficult and serious situation. While faced with death from the disease they are still abused, ridiculed and marginalized. They are not treated with love, respect and dignity once their diagnosis or status is publicly known. They are discriminated, rejected and unfairly treated by their colleagues at work, families and community members at large (Anon, 2003 and Tlou*, 2006). This study tries to establish DR TB and HIV and AIDS knowledge levels among community members in NMMM.
1.4 Research Questions

1.4.1 Main question

What are the community member’s knowledge levels regarding Drug Resistant TB and HIV and AIDS?

1.4.2 Sub questions

1. What are the community member’s knowledge level regarding Drug Resistant TB and HIV and AIDS?
2. Are there any gender related differences in the Drug Resistant TB and HIV and AIDS knowledge levels of the community members?
3. Are there any age related differences in the Drug Resistant TB and HIV and AIDS knowledge levels of the community members?

1.5 Aim and objectives of the study

The main aim of this study is to assess the Drug Resistant TB and HIV and AIDS knowledge levels among community members in Nelson Mandela Metropolitan Municipality – Eastern Cape Province in South Africa.

Objectives of Research

1. Assess Drug Resistant TB and HIV and AIDS knowledge levels of the community members in Nelson Mandela Metropolitan Municipality.
2. Assess whether there are any gender related differences in the Drug Resistant TB and HIV and AIDS knowledge levels of the community members in NMMM.

3. Assess whether there are any age related difference in Drug Resistant TB and HIV and AIDS knowledge levels of the community members in NMMM.

1.6 Delimitation of the study

In order to make the study more manageable for the researcher, the study will focus on the following:

The study will focus on the residents of Ward 40 in Greenbushes in the NMMM which is made up of the town of Port Elizabeth, Dispatch and Uitenhage.

1.7 Significance of the study

This research is of significance as it can provide useful information that can be used to inform program design. It will also help to inform program designers of the type of information that should be disseminated during education and awareness campaigns both to the community and the affected families. This research tries to establish whether community members have got the right knowledge about Drug Resistant TB and HIV and AIDS.
1.8 Layout of the study

In chapter one, the problem statement and research question is presented with the aims and the objectives of the research, delimitation, significance. In chapter two key concepts, issues, together with management and legal aspects regarding HIV and AIDS and DR TB are discussed. In chapter three the researcher outlines the research methodology that was applied in the collection and analysis of data. In chapter four the results of the empirical study are presented and discussed. In chapter five the summary of the findings is given, conclusions are drawn, limitations of the study are outlined and recommendations are made.
CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature pertinent to Drug Resistant Tuberculosis and HIV and AIDS. The chapter explores Drug Resistant TB and HIV and AIDS around the world in order to give a picture on the extent of these diseases. The chapter discusses issues concerning the prevention, transmission, diagnoses and treatment and the legal and ethical aspects in management of Extreme and Multiple Drug Resistant Tuberculosis and HIV and AIDS. The chapter further discusses studies that deal with knowledge about the Drug Resistant TB and HIV and AIDS.

The studies reviewed included those that assessed TB and Drug Resistant TB knowledge, attitudes and practices between healthcare workers, physicians, private and public sector doctors (Vandan, Prasad and Kuroiwa, 2009; Al-Maniri, Al-Rawas, Al-Amji, De Costa, Erikson and Diwan, 2008; Savicevic, 2009; Hoa and Thornson, 2005; Hasim, Kubaisy and Duley, 2003). Studies conducted in Africa included those which were conducted by (Gibson, Cane, Doering and Harns, 2005; Naidoo, Taylor and Jinabhal, 2007; Loveday, Thomas, Chorpa and Ndlela, 2008; Ndoro, 2009; Adebano, 2011).

Second group of studies that were consulted involved those that dealt with assessment of community members HIV and AIDS knowledge levels and attitudes towards people living with HIV and AIDS. This group consisted of the studies by the following (Coetzee, 2002; Strydom, 2002; Pirie and Coetzee, 2009;
2.2 Issues related to HIV and AIDS

This section has three important sub-sections. The first sub-section provides an understanding of HIV and AIDS. The second sub-section discusses about diagnosing HIV and AIDS. The third sub-section looks at HIV and AIDS transmission.

2.2.1 An understanding of Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome

HIV is a retro-virus that contains RNA and three types of retro-viruses are identified. HIV is a lentivirus, which means that it has a slow, long-term effect. The first cases of AIDS were reported in the USA in 1981 when an unusual lung infection was seen in men who had sex with other men (Van Zyl, 2011). According to Cornelissen (2006) AIDS was first thought to be specific to homosexuals and was initially called Gay-Related Immune Deficiency Syndrome (GRID). Investigations into the cause of AIDS focused on the perceived lifestyle of homosexuals, including suggestions that drug use and overexposure to semen were causes of AIDS. In 1982, the first cases of AIDS were found in haemophiliacs and the differences in lifestyles of homosexuals and haemophiliacs led scientists to look for other causes of the disease, which led to the isolation of the HI Virus, which is the precursor to AIDS. In 1984 the HIV1 virus was identified while the HIV2 virus was identified in 1985 in Africa (Ngcakaza, 2012).
Factors that led to the rapid spread of the virus include the role of international travel. Patient Zero, who had AIDS and was a Canadian flight attendant, travelled extensively worldwide and early cases of AIDS showed a link to the flight attendant and those affected, leading to the conclusion that international travel had an effect on the transmission of the virus. Blood transfusions are also attributed to the spread of HIV and AIDS. The routinized use of blood transfusions in the USA, as well as donors who were intravenous drug users being paid to donate blood, led to the spread of the virus. Lastly, an increase in the use and availability of heroin in the 1970s, as well as the accessibility and sharing of disposable plastic syringes, opened another route through which the virus could be spread (Ncayo, 2012).

Cornelissen (2006) stated that diseases and poverty are widespread in South Africa and these are key factors that are contributing to the rapid spread of HIV. Loss of income due to medical and funeral expenses impacts on households. The financial impact of HIV and AIDS on a household has been shown to be 30% more than deaths arising from other causes. Professional health services are not freely available and the burden of caring for those that are infected rests with the family.

Gender inequalities have also contributed to the fast spread of HIV and AIDS. South Africa has the highest level of rape in the world for a country that is not at war. Women are infected through rape and sometimes unable to access drugs to prevent HIV infection. The HIV and AIDS epidemic is mainly driven by the interaction of gender, sex and power relations. The effects of traditional masculine roles and behaviours, including men having power over women, having multiple sexual partners, violence between men, use of alcohol and drugs and engaging in forced sex make up part of the problem. Understanding of the broader economic and social factors interconnected with power and sex is required, rather than an examination of individual values and choices (Van Zyl, 2011).
The transmission of HIV occurs when cells with CD4 molecules on their surface come into contact with HIV. Cells like this are found in the immune system and are called T-cells. T-cells are white blood cells that switch on the immune system to fight disease. Once the virus is inside the T-cell, HIV reproduces millions of these little viruses, which kill the cell and then spread to infect other cells. HIV causes AIDS. The virus attacks the immune system of the body and when the immune system is broken down, the body loses the ability to protect itself from serious and even deadly infections and cancers. These are called opportunistic infections and it is these that cause death. AIDS is the condition that allows these opportunistic infections to take hold. It can take months or years for an individual’s immune system to weaken enough for the symptoms of HIV to be seen. The development of symptoms is also dependent on the general health of the individual (Van Zyl, 2011).

2.2.1.1 The Life Cycle of HIV and AIDS

In order to learn the activity of Human Immunodeficiency Virus in the human body and what the responses of the human body are to HIV, it is important to know the life cycle of HIV. HIV is a retrovirus which reverses the normal flow of genetic information (Van Dyk, 1992). In cells where the genes are expressed, the genetic material is DNA. The DNA is first transcribed into a messenger RNA (mRNA), which serves as the template for the production of proteins. The genes of the retrovirus are encoded in RNA; and before they can be expressed, the RNA must convert into DNA. Only then are the viral genes transcribed and translated into proteins in the sequence (Barnett & Whiteside, 2006). The retroviruses do not have their own DNA as a template for the production of proteins; therefore they have to use the gene materials-DNA of a target cell as their template. It means HIV cannot multiply itself without host cells and has to use target cells for replication. In the human body, CD4 which are important cells controlling and supporting the immune system, become target cells of the HIV.
After entering the body, HIV attaches to the CD4 receptors, mainly on the dendritic cells and T lymphocytes, as well as other cells, such as monocytes, macrophages and others, as long as they possess a CD4 receptor on their surface. Once attachment and entry into the CD4 cells have occurred, the HIV finally destroys the cells (Evian, 2000).

### 2.2.1.2 The Effect of HIV on the human body

Once HIV invades the human body, they survive and replicate in the human body, and lead to the human body’s eventual death. According to Van Zyl (2011) the immune system of the human body has a strong repairing ability and therefore, it takes a long time to develop AIDS. According to Van Zyl (2011) a person who becomes infected with HIV will usually go through various clinical stages that occur over a long period of time. According to Evian (2000), the following are the stages of HIV infection:

#### I. The Acute Phase

The acute phase of HIV infection which may begin as early as a week after infection, it usually precedes sero-conversion, which generally develops 6 to 12 weeks (sometimes longer) after infection. Sero-conversion means conversion from HIV negative to HIV positive (Van Dyk, 1992). This period is called the window period. HIV antibodies are usually detected after about 6 weeks. Some individuals may need 12 weeks, and very few may need 6-12 months before their HIV test becomes positive (Evian, 2000). The symptoms of the acute phase are fever, tiredness, rash, sore throat, muscle and joint pains and some swelling of the lymph glands and present for a period of (1-2 weeks) sero-conversion illness. According to Barnett and Whiteside (2006), during early infection period an HIV and AIDS test can be negative and a person is able to pass on the virus to others during this window period. The more people there are in the early stage of infection, the greater the chance of effective transmission between people.
II. The Asymptomatic Carrier Stage

The second stage of HIV infection is the asymptomatic carrier stage at which a person infected with HIV develops antibodies, becomes a carrier of the virus for life, but displays no symptoms (Van Dyk, 1992). The HIV-infected person usually experiences a period of good health in which the virus remains clinically silent or latent. The phase may last between 3 and 7 years, even up to 10 years; but the virus is active in the body, usually causing progressive damage to the immune system. The person is able to spread the virus during this phase, and the HIV test is positive (Van Zyl, 2011).

III. The Symptomatic Phase

After about 5-8 years following HIV infection, the viral load tends to increase progressively and the immune system continues to deteriorate and become immune deficient. The most common signs and symptoms of this stage of HIV-related disease are as follows (Evian, 2000):

• Oral or vaginal Candida infection (thrush), usually persistent and recurrent
• Hairy leukoplakia on the tongue
• Recurrent herpes simplex infection, “cold sores” or genital herpes infection
• Herpes zoster (shingles)
• Acne-like bacterial skin infections
• Persistent and unexplained fevers and night sweats
• Skin rashes
• Generalised lymphadenopathy or shrinking of previously enlarged lymph nodes
• Persistent diarrhoea
• Weight loss (more than 10% of usual body weight)
• Reactivation of tuberculosis may also be associated with this stage of infection, especially in people from low socio-economic communities, where tuberculosis is common.
IV. The severe symptomatic phase: AIDS, severe HIV-related disease

The symptomatic phase usually progresses over the next year or 18 months into the fully developed AIDS phase of the disease. Signs and symptoms of AIDS may differ from one patient to another and depending on which infection, cancer or organ is affected. According to Van Zyl (2011), people who are infected suffer from the following during this stage:

- Respiratory infection usually presents with persistent cough, chest pain and fever.
- Candidiasis presents with oral and or genital thrush.
- Infection of the bowel is present with on-going diarrhoea.
- People with AIDS usually experience severe tiredness, fatigue and weakness.
- Occasionally there may be some memory and concentration loss, and some people may eventually develop severe mental deterioration and confusion.

Patients with AIDS have high HIV viral loads, or signs of HIV disease or low CD4 cell count, therefore risk of transmission is increased in this stage. In order to guide clinical treatment, the World Health Organisation set up the international Adults HIV and AIDS staging system (National Department of Health, South Africa, 2004).

2.2.2 Diagnosing of HIV and AIDS

During the early stage of HIV infection, in many patients there are no signs of HIV infection and the only evidence of HIV infection is a positive HIV test. The HIV antibody test is the only way to know if a person is definitely HIV infected.
2.2.2.1 HIV Diagnostic Tests

According to Van Zyl (2011) the following are various methods that are used to diagnose an HIV infection namely: HIV Antibody, HIV Antigen and HIV PCR tests.

I. HIV and AIDS Antibody Test

The HIV antibody test is usually done on blood (serum) including ELISA (enzyme-linked immune-sorbent assay) and a western blot method of testing. These tests are usually done in the laboratory. With the HIV antibody test it is possible to detect antibodies in other body fluids such as saliva and urine. But the HIV antibody test does not detect the actual HIV virus. Approximately 6 weeks after infection, antibody tests usually become positive. After HIV infection and before the test becomes positive, this period is called window period (Van Zyl, 2011)). This usually lasts 6 weeks or may last 12 weeks or 6-12 months depending on different patients. During the window period, although the HIV antibody test is still negative, the person is HIV infected and the virus can be passed on to others. The antigen and the HIV PCR tests are usually positive

II. ELISA Antibody Test

The HIV ELISA antibody test which is the most popular and commonly used test and it is sufficient to make a diagnosis of HIV-infection.

III. HIV antigen and PCR tests

They are commonly known as the P24 HIV antigen and the HIV RAN PCR test. Antigen/PCR tests usually become positive within 7-14 days after HIV infection. The P24 antigen test is more likely to be positive around the sero-conversion period and in the more advanced stages of the disease, but they are expensive and usually not necessary for HIV diagnosis.
There is also a higher false positive rate in the very early stage of HIV infection. A person with AIDS will usually be dead within 1-3 years, so the prevention of AIDS should focus mainly on the prevention of HIV infection which is transmitted in different ways. Understanding of the different HIV and AIDS transmission modes is the first step in the prevention of the disease. These are discussed in detail below.

2.2.3 Transmission modes of HIV and AIDS

This sub-section has three important points related to HIV and AIDS transmission mode.

2.2.3.1 HIV and AIDS is transmitted through unsafe sex

In order to gain entry into the body, the HIV needs to bind to CD4 receptors, such as macrophages, dendritic cells and T4 lymphocytes. The receptor cells are plentiful in the lining of the genital tract and the ano-rectal area. Therefore anal and vaginal intercourse and oral sex are high risks for transmitting the HIV virus (Ncayo, 2012). Non-penetrative sex, such as sex between the thighs and masturbation, is considered safe (Ncayo, 2012).

2.2.3.2 Blood and body fluid transmission

HIV and AIDS can be transmitted by blood and certain body fluids Van Zyl (2011).

I. HIV and blood transmission.

According to Evian (2000) HIV-infected blood becomes a high risk when passed into the body in any of the following ways:
• Through a blood transfusion
• Via blood-contaminated needles, syringes, razor blades and other sharp instruments
• Through intravenous drug use (sharing of needles and syringes)
• It is also possible, but very rare, for HIV to enter the body through an open skin wound
• Nurses and healthcare professionals can become infected with HIV and AIDS through accidental exposure to HIV and AIDS-infected blood and body fluids.

II. HIV and body fluids transmission

According to Van Zyl (2011) the following body fluids can transmit HIV:

• Any body fluids containing visible blood
• Semen
• Vaginal secretions (including menstrual discharge)
• Amniotic (pregnancy) fluid
• Cerebrospinal (brain and backbone) fluid
• Peritoneal (abdomen) fluid
• Pericardial (heart) fluid
• Pleural (chest) fluid
• Synovial (joint) fluid

2.2.3.3 Mother to child HIV transmission (MTCT)

According to Van Zyl (2011) HIV can be transmitted from mother to child during pregnancy, childbirth and via breast-feeding. Individuals can protect themselves from contracting HIV in the following ways: abstaining from sex or having one partner, having safe sex, ensuring all sexually transmitted infections are treated, knowing their HIV status, never sharing needles and ensuring that precautions are taken when handling blood.
Once a patient is diagnosed with HIV infection and AIDS, the next important step in treatment is the care of the patient. In the following paragraph, the treatment of HIV and AIDS will be discussed.

### 2.2.4 The Treatment of HIV and AIDS

At present, no cure for individuals infected with HIV has been found, in spite of over two decades of intensive research. Research into a cure is on-going, but due to the nature of the virus and its capacity to mutate, vaccine and treatment are difficult to develop (Ngcakaza, 2012). There are no effective drugs that can cure the HIV and AIDS, but scientists have found a few drugs that can inhibit the HIV reproduction, thereby extending the life of the HIV infected person. Treatment is becoming more effective than before and the progression of the disease can be successfully halted. The treatment is called Antiretroviral Treatment (Van Zyl, 2011).

The South African National Department of Health have developed national guidelines for the use of ART in order to ensure optimal therapy and good clinical outcomes. There are two ART regimens for adult use in the South African Public Sector. Patients who fail both regimens are referred for individual evaluation by ART specialist (Evian, 2000).

According to Van Zyl (2011) the following are the regimens that are utilised to manage those who are infected with HIV and AIDS:

(i) Regimen 1a - (dt4 stavudine) 3TC (lamivudine) EFV (Efavirenz)
(ii) Regimen 1b – d 4T/ 3TC/ NVP (Neviripine)
(iii) Regimen 2 – AZT (zidovudine) ddl (Didanosine) Lopinavir/ ritonavir
2.2.5 HIV and AIDS prevention

Before a vaccine for HIV is developed and in the absence of any cure for HIV and AIDS, the prevention of HIV and AIDS transmission is the only way to combat the prevalence of HIV infection. There are many factors that influence the prevention and the spread of HIV and AIDS transmission. They are explored in the following paragraphs.

HIV is transmitted through certain behaviour patterns. According to Van Dyk (1992) HIV and AIDS should not be seen as an exclusive medical problem for which medical science has to find an answer. The prevention of HIV and AIDS should include behavioural issues that can be controlled through changing high-risk behaviour. WHO (1988) stated that effective education and information campaigns are the key to preventing further spread of HIV infection.

The knowledge of the prevention of HIV and AIDS transmission and behavioural intervention are the first elements of the KAP model. While this element is not in itself sufficient to reduce HIV transmission, it is an essential starting point in any HIV prevention programme (Kalichman, Nachimson, Cherry and Williams 1998 in Lahav, 2001). Therefore, having knowledge of the prevention of HIV and AIDS transmission is the starting point for the community members to prevent HIV transmission. This treatise is aimed at exploring the knowledge levels of the community members with regard Drug Resistant TB and HIV and AIDS.

Secondly, the factors that led to the rapid spread of the virus include the role of international travel. Patient Zero, who had AIDS and was a Canadian flight attendant, travelled extensively worldwide and early cases of AIDS showed a link to the flight attendant and those affected, leading to the conclusion that international travel had an effect on the transmission of the virus. Blood transfusions are also attributed to the spread of HIV and AIDS.
The routinized use of blood transfusions in the USA, as well as donors who were intravenous drug users being paid to donate blood, led to the spread of the virus. Lastly, an increase in the use and availability of heroin in the 1970s, as well as the accessibility and sharing of disposable plastic syringes, opened another route through which the virus could be spread (Ncayo, 2012).

Cornelissen (2006) stated that diseases and poverty are widespread in South Africa and these are key factors that are contributing to the rapid spread of HIV. Loss of income due to medical and funeral expenses impacts on households. The financial impact of HIV and AIDS on a household has been shown to be 30% more than deaths arising from other causes. Professional health services are not freely available and the burden of caring for those that are infected rests with the family.

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2.3 Issues related to Multi Drug Resistant Tuberculosis and Extreme Drug Resistant Tuberculosis (MDR TB and XDR TB)

This section has ten important points related to Drug Resistant Tuberculosis and Extreme Drug Resistant Tuberculosis (MDR TB and XDR TB).
2.3.1 Definition of Drug Resistant TB and its causes

Multi Drug Resistant Tuberculosis is defined as form of Tuberculosis caused by mycobacterium tuberculosis resistant in vitro to the effects of isoniazid (INH) and rifampicin (RIF) (WHO 2006a). When a strain of tuberculosis is apparently incurable in a patient using the more common anti-tuberculosis drugs, it is known as a Drug Resistant Tuberculosis. Drug Resistant TB was first reported in South Africa in 2005. MDR-TB strains are by definition resistant to the most potent first line anti-TB drugs (Isoniazid and Rifampicin) while XDR-TB strains are resistant to isoniazid and rifampicin plus any fluoronquinolone and at least one of the injectable drugs (capreomycin, kanamycin or amikacin) (WHO, 2007).

Drug resistance is caused by a genetic mutation that makes a drug ineffective against the mutant bacilli. An inadequate or poorly administered treatment regimen allows a drug resistant strain to become the dominant strain in a patient infected with tuberculosis. On-going transmission of established drug-resistant strains in a population is also a significant source of new drug-resistant cases (WHO 2006a).

Tuberculosis is an air-transmitted disease which mainly affects lungs and when this happens it is called Pulmonary Tuberculosis. It may affect other parts of the body such as brain, spine and bowel. TB is an infectious air-borne disease that is spread when infected people cough, spit, talk or sneeze. Those that are in close proximity to infected persons for long periods (Adebanjo, 2011).

The Global Project was initiated in 1994 in order to estimate the global burden of Drug-Resistant TB worldwide using standardised methodologies. The project was also begun to monitor trends in resistance, evaluate the performance of TB control programmes and to advice on drug regimens. The report is published every three years as most countries require between 12 and 18 months for completion of the drug-resistance survey (WHO, 2008a).
2.3.2 Global estimates of Multi Drug Resistant TB

It is estimated that 489,139 cases of MDR-TB emerged in 2006, and the global proportion of resistance among all incident TB cases was 4.8%. China and India are estimated to carry 50% of the global burden, with the Russian Federation carrying a further 7%. An estimate of prevalence can be made by multiplying incidence by the average duration of the disease (WHO 2008a). According WHO (2008a) several terms are used in the Global Project as follows:

1. New cases - were those patients who had never received TB treatment or who had received TB treatment for less than a month. In order to estimate the global and regional means of resistance and to examine the distribution of resistance within a region, data that had been collected since the beginning of the project were included and weighted by the population they represent to obtain the “population-weighted mean”.

2. Previously treated cases - refers to the presence of resistant isolates of mycobacterium tuberculosis in patients who in response to direct questioning, admit to having been treated for tuberculosis for one month or more or, in countries where adequate documentation is available, in a patient for whom there is evidence of such a history.

3. Combined case - refers to drug resistance in the population surveyed, regardless of the occurrence or absence of prior treatment.

In the African region, six countries have reported data since 2002. A lack of comprehensive national drug-resistance survey data from all countries in Africa is a barrier to understanding the magnitude of the prevalence and incidence of MDR-TB. The prevalence of MDR-TB remains below the levels seen in Central Europe and parts of Latin America. However, in Africa, the tragically high HIV prevalence and limited funds and infrastructure dedicated to healthcare are serious factors (Amor, Nemser, Singh, Sankin, & Schlunger, 2008).
According to the studies that were conducted by the Medical Research Council National Tuberculosis Research Programme in three provinces of South Africa revealed a rate of approximately 1% MDR-TB in new TB cases, and 4% in previously treated cases. This translates to about 2 000 new cases of MDR tuberculosis in South Africa each year (Adebanjo, 2011). A number of MDR-TB cases have been reported in Kwa-Zulu Natal. The first population-based data on MDR-TB in KwaZulu-Natal in 1996 identified 2, 1% of sputum culture-positive patients as having MDR-TB in a rural district.

The World Health Organisation Global Project on Anti-tuberculosis Drug Resistant Surveillance between 1999 and 2002 reported that in 2001 in Kwa-Zulu Natal, mono-drug resistance in new TB patients was 4% and in previously treated patients was 8%, while MDR-TB in new TB patients was 2% and in previously treated patients was 8% (Naidoo, Taylor & Jinabhal, 2007).

In America ten countries have reported data since 2002, namely Peru, Guatemala, Argentina, Paraguay, Honduras, Costa Rica, Canada, Nicaragua, Uruguay and Cuba. The population-weighted mean of MDR-TB based on all countries that have reported in the American regions is 2.2% among new cases of MDR-TB, 13.2% among previously treated TB cases and 4.0% among combined cases (WHO, 2008a).

In the Eastern Mediterranean region, the following five countries have reported data since 2002: Lebanon, Jordan, Oman, Morocco and Yemen. The population weighted mean of MDR-TB based on all countries that have reported in the Eastern Mediterranean is 2.0% among new cases of MDR-TB, 35.3% among previously treated TB cases and 5.4% among combined cases.

Based on available information, it is estimated that there were 25 475 incident MDR-TB cases in the region in 2006, with almost 60% of these cases estimated to be in Pakistan (WHO, 2008a).
In the European region 32 countries have reported data since 2002. The population-weighted mean of MDR-TB based on all countries that have reported in Central and Western Europe is 9% among new MDR-TB cases, 7.7% among previously treated TB cases and 1.5% among combined cases. The proportion of MDR-TB was significantly higher in the Eastern European and Central Asian countries with the following population-weighted means: 10.0% MDR-TB among new cases, 37.7% among previously treated TB cases and 22.6% among combined cases (WHO, 2008a).

In the Western Pacific region the following countries and two special administrative regions have reported data since 2002, including data from one province, one special administrative region and two municipalities in China, the Philippines and Vietnam. Of the countries indicated, Fiji, Guam, New Caledonia, New Zealand, the Northern Mariana Islands, Singapore, the Solomon Islands and Vanuatu reported the fewest cases, namely between 0 and 3 cases of MDR-TB per year. Australia reported 12 cases in 2005 and Macao Special Administrative Region in China reported nine cases of MDR-TB (WHO, 2008a).

Hong Kong Special Administrative Region in China reported 41 MDR-TB cases in 2005 among all cases (or 1.2%), and Japan, through its sentinel survey, reported that 1.9% of all notified cases were MDR-TB. China, the Philippines and Vietnam reported higher proportions of drug resistance. The population-weighted mean of MDR-TB based on all countries that have reported in the Western Pacific region is 3.9% among new MDR-TB cases, 21.6% among previously treated TB cases and 6.7% among combined cases. Based on available information it is estimated that there were 152 694 incident MDR-TB cases in the region in 2006, with almost 85% of these cases estimated to be in China (WHO, 2008a).

In the United States of America, HIV-positive MDR-TB cases initially had a 100% mortality rate, but with greater awareness and earlier diagnosis, an improvement in initial survival rates of up to 50% has been reported.
HIV-negative cases in the USA have had better response rates of between 56% and 69%. During an outbreak in Spain between 1991 and 1995, 47 of 48 patients infected died and during two outbreaks in London (Chelsea and Westminster Hospital, and St Thomas’s Hospital) the mortality was over 50% in HIV positive patients (Omerod, 2005). In South Africa, two-year case fatality rates are around 30% to 50% (Weyer, 1999).

### 2.3.3 Risk Factors for Drug Resistant TB

Solis, Shin, Han, Llanos, Stowell and Sloutsky (2005) stated that some of the factors that have contributed to the number of cases of Drug Resistant TB are delayed diagnosis, delayed determination of drug susceptibility, and the susceptibility of immune-suppressed individuals not only to acquiring Drug Resistant TB but to rapid disease progression, which may result in rapid transmission of the disease to other immune-compromised patients.

According to Trangle, Fallon and Awosika-Olumo (2004), resistance of tuberculosis to antibiotics is described as a man-made amplification of spontaneous mutations in the genes of the tubercle bacilli. Subsequent transmission of resistant strains from an infectious individual to other persons leads to disease that is drug-resistant from the outset, a phenomenon known as primary resistance.

Drug resistance is more common in people who do not take their TB medicine regularly or who experience mal-absorption of anti-TB drugs despite strict adherence to the treatment regimen (Sharma & Mohan, 2007). The misuse of antimicrobials in the form of incorrect dosages — overprescribing, extravagant prescribing and under-prescribing — is commonly reported in countries such as Tanzania and India. As a result of an improper spacing of dosing intervals, efficacious serum drug levels are probably not achieved, resulting to reduced drug efficiency and generation of resistance against the drugs (Atre & Mistry, 2005).
The treatment with a single drug due to irregular drug supply, inappropriate prescription or poor adherence to treatment suppresses the growth of susceptible strains to that particular drug but permits the multiplication of drug-resistant strains. This phenomenon is called acquired resistance (Adebanjo, 2011).

Experiences in the developing world have revealed that traditional healers, who have no knowledge of pharmaceuticals, drug regulations or the side effects of modern drugs, still incorporate inappropriate drugs into their traditional therapy for clients with TB. Such practices may lead to adverse drug interactions or may cause side effects. This also promotes drug resistance. Perceiving no relief also affects the patient’s psyche and makes him or her shop around for other treatments (Ndoro, 2009).

In Africa, other factors that might favour the development of Drug Resistant TB include the availability of drugs on the open market and a private sector that delivers drugs to the population in an unregulated fashion (Ndoro, 2009). Poor drug availability, the lack of clinical trials and provider inexperience had led to regimens commonly being incorrect or inadequate. Noncompliance to TB treatment could be due to poverty, gender discrimination or homelessness. Poor patients may have to cope with the economic demands of the illness by reducing expenditure on other items that are important for their health, such as food and water (Adebanjo, 2011).

Patients may also stop treatment because they cannot afford the range of costs associated with continuing treatment, even when treatment itself is provided free of charge (Ndoro, 2011). In turn, poverty leads to under nutrition which reduces drug absorption, resulting in sub-therapeutic serum drug levels and non-response to drug therapy (Atre & Mistry, 2005).

Gender issues are equally significant. A study in Russia reported “female gender” as a significant predictor of Drug Resistant TB.
In the Indian context, harassment by in-laws, a reduction in their marriage options, or dismissal from work as a result of being diagnosed with TB were reported as major barriers for women to come forward and get appropriate treatment (Atre & Mistry, 2005). For males the challenges were different from those faced by females, as head of the family they discontinued treatment because of fear of dismissal and social isolation (Atre & Mistry, 2005).

Increasing globalisation and population mobility will mean an increase in Drug Resistant TB cases (Ormerod, 2005). Migration to earn a livelihood may be associated with active transmission of drug-resistant strains of tuberculosis (Atre & Mistry, 2005). Illegal immigrants, in particular, are at risk for contracting and spreading Drug Resistant TB. Tourism and modern transport systems can spread diseases quickly from one continent to another or from one region to another. Civil wars and guerrilla wars are the reason for thousands of people being displaced from their natural environment and being placed into refugee camps. Not only does stress lower the resistance of the people but being over crowded together in (refugee camps) circumstances like these also facilitates the quick spread of the disease (Ndoro, 2011).

2.3.4 Pathogenesis and the cause of MDR-TB

Primary drug resistance is resistance to one of the first-line anti-tuberculosis agents in people who have not had previous treatment, and secondary or acquired drug resistance is resistance to one or more anti-tuberculosis agents in patients undergoing therapy (Adebanjo, 2011).

A history of inadequate treatment, past treatment with only one drug, or a previous history of defaulting on treatment followed by a return of symptoms may be considered as reasonable suspicion that one is dealing with Drug Resistant TB (ICN, 2008).
The improper management of Drug Resistant TB can result in further drug resistance. Patients with Drug Resistant TB frequently have advanced disease associated with thick walled cavities and chronic lung lesions that can be difficult for antibiotics to penetrate and therefore, they are difficult to cure and pose a substantial threat to household contacts and to TB control efforts (Mukherjee et al. 2004).

2.3.5 Case-finding and diagnosis of Drug Resistant TB

Delay in the diagnosis of Drug Resistant TB results in patients presenting with chronic disease, progressive parenchymal destruction, higher bacillary loads and continuing transmission (Mukherjee et al. 2004). Effective case finding is therefore important. A rational case-finding strategy includes accurate, timely diagnosis through quality-assured culture and drug-susceptibility testing. Programmatic strategies for the management of drug-resistant TB aim to identify patients and initiate adequate treatment for drug-resistant cases in a timely manner. Prompt identification of Drug Resistant TB and initiation of treatment provide a better chance of a cure for patients, provide the best infection-control measures and prevent the acquisition of further resistance and progression to a chronic state of permanent lung damage (WHO, 2006a).

The diagnosis of Drug Resistant TB can only be made by showing in vitro resistance to isoniazid and rifampicin. Drug Resistant TB is a laboratory diagnosis; it is only diagnosed by TB culture and susceptibility testing (Department of Health, 2004). In a study conducted in Peru it was found that conventional Drug Sensitivity Testing (DST) methods used by most programmes are time-consuming, often resulting in delays of up to three or four months, sometimes more (Adebanjo, 2011). Susceptibility to first-line drugs can be determined by the Griess method in eight to 10 days after obtaining a positive culture (indirect method), or 21 to 28 days when applied to a smear-positive sputum sample (direct method).
The rapid drug-sensitivity testing would reduce the opportunity for nosocomial transmission and the morbidity associated with delayed diagnosis of Drug Resistant TB (Solis et al., 2005).

Patients with Drug Resistant TB face the prospect of lengthy and often unpleasant treatment as well as the real possibility of premature death. Therefore, counselling and emotional support are particularly important, much as in any other chronic life-threatening illness, for example malignancies or HIV-related diseases. Proper early counselling will also help to ensure good adherence to the treatment regimen and increase the likelihood of a successful outcome. Once the patient is on treatment, further support will be required in order to maintain adherence and to help identify social and emotional problems early so that they may be addressed before they interfere with the treatment programme. If treatment has been unsuccessful and further therapy becomes futile, it becomes very important that the patient is not merely abandoned, but continues to receive sympathetic and palliative care from healthcare practitioners (South Africa, 2007).

2.3.6 Management of Drug Resistant TB

The World Health Organisation (WHO) guidelines for the programmatic management of drug-resistant tuberculosis represent the best current knowledge in the management of MDR TB and XDR TB, and offer options for tailoring diagnosis and care to different epidemiological and programmatic conditions worldwide (WHO, 2006b). These guidelines offer updated recommendations for TB control programmes and medical workers in middle- and low-income countries faced with drug-resistant forms of TB, especially MDR-TB. The guidelines aim to disseminate consistent, up-to-date recommendations for national TB control programmes and medical practitioners on the diagnosis and management of drug-resistant TB in a variety of geographical, political, economic and social settings (Adebanjo, 2011).
The guidelines can be adapted to suit diverse local circumstances because they are structured around a flexible approach, combining a consistent core of principles and requirements with various alternatives that can be tailored to the specific local situation (WHO, 2006b). The guidelines detail the recommended management protocols to enable national TB control programmes to access quality-assured, second-line anti-tuberculosis drugs, and to introduce new standards for registering, monitoring and reporting the treatment outcomes of patients with drug-resistant TB. This uniform information management system allowed systematic, consistent data collection and analysis, which played an important role in shaping future policies and recommendations (WHO, 2006b).

Treating Drug Resistant TB patients requires experience and special expertise, which are available at dedicated provincial Drug Resistant TB treatment centres. Drug Resistant TB referral centres are regarded as centres of expertise and therefore remain responsible for the overall treatment of Drug Resistant TB patients even after discharge (South African National Department of Health, 2011). According to Adebanjo (2011) these centres should be adequately staffed and equipped with appropriate infection-control interventions to prevent nosocomial spread of Drug Resistant TB. Patients with Drug Resistant TB should be admitted for at least the first six months or preferably until they have produced two consecutive monthly culture-negative sputa.

2.3.7 Prevention of Drug Resistant TB

Healthcare providers can help prevent Drug Resistant TB by diagnosing TB cases, following recommended treatment guidelines, monitoring patients’ responses to treatment and making sure that TB therapy is adhered to and completed. The World Health Organisation strongly advocates the use of Directly Observed Treatment Strategy, which was and still remained as the most cost-effective approach to detecting and curing cases, and preventing the onset and spread of drug resistance tuberculosis (WHO, 2006a).
The key actions for preventing and controlling drug-resistant TB include the use of recommended treatment regimens, a reliable supply of quality-assured first and second-line anti-TB drugs, adherence to treatment by patients, and the proper provision of treatment by healthcare providers. A needs assessment must be conducted prior to implementation, in order to determine the capacity of TB control programmes to manage the drug-resistant TB prevention strategy (WHO, 2006b).

2.3.8 Treatment of Drug Resistant TB

There are several strategies for the delivery of Drug Resistant TB treatment, including hospitalisation. Patients with Drug Resistant TB are more likely to have experienced problems with non-adherence in the past. Adherence to Drug Resistant TB therapy is particularly difficult because of its prolonged treatment regimens with large numbers of drugs that have more serious adverse effects (WHO, 2006a).

Drug Resistant TB patients are at increased risk of non-adherence to treatment due to the toxic and side effects that the drugs have on patients. Adherence is an essential element to prevent the generation of pan-resistant strains with the potential for community-wide spread and virtually no possibility of a cure for the patients; therefore, hospitalisation is necessary initially (Adebanjo, 2011).

The choice between hospitalised and ambulatory treatment depends on several factors in addition to the severity of the disease. Such factors include the availability of hospital beds, with adequate infection-control measures to prevent nosocomial transmission; the availability of trained personnel at hospitals and clinics to administer treatment and manage adverse drug reactions; the availability of a social support network to facilitate adherence to ambulatory treatment; and the presence of other clinical or social conditions in patients (WHO, 2006).
The National Tuberculosis Control Programme of the Department of Health developed a strategy to treat patients with Drug Resistant TB in South Africa. A policy was developed which recommended that Drug Resistant TB treatment be provided as part of the National Tuberculosis Control Programme in areas where the Directly Observed Treatment Strategy has been implemented successfully. In South Africa currently provides Drug Resistant TB treatment is currently provided through the National Tuberculosis Control Programme structures in all the provinces (Adebanjo, 2011).

2.3.8.1  Pharmacological Treatment of Drug Resistant TB

Doctors may choose a standardised approach or an individualised approach to treat Drug Resistant TB. A standardised treatment regimen is when all patients in a defined group or category receive the same treatment regimen (WHO, 2006b). The design of an individualised regimen differs from that of standardised treatment regimens in that it is based on an analysis of the resistance pattern of the infecting strain of the individual patient, in addition to the patient’s treatment history and the prevailing resistance patterns in the community (Adebanjo, 2011).

In some countries a standardised regimen for certain groups of patients may be more appropriate than an individualised regimen, while in others the converse may be best (WHO, 2006a). A Drug Resistant TB regimen consists of two phases: the first phase is the period in which a combination of injectable and oral medication is used, and the second phase occurs after the injection has been stopped and only oral medications are continued.

The recommended duration of treatment is guided by smear and culture conversion. The key actions for preventing and controlling drug-resistant TB include the use of recommended treatment regimens, a reliable supply of quality-assured first and second line anti-TB drugs, adherence to treatment by patients, and the proper provision of treatment by healthcare providers (WHO, 2006b).
Sputum smear and culture conversion is defined as two sets of consecutive negative smear and culture taken 30 days apart (WHO, 2006a). The minimal recommendation is that treatment should last for at least 18 months after smear and culture conversion. Extension to 24 months may be indicated in patients defined as “chronic cases” with extensive pulmonary damage (WHO, 2008c).

The following second-line drugs are used for treating Drug Resistant TB:

a. **Injectable anti-TB agents**

Injectable anti-TB agents include kanamycin, amikacin, and capreomycin. An injection is given to every patient in whom susceptibility is documented or suspected (WHO, 2006).

b. **Fluoroquinolones**

This group of drugs is used if the strain is susceptible. Examples of drugs in this group are ciprofloxacin, ofloxacin, levofloxacin, moxifloxacin and gatifloxacin (WHO, 2006a).

c. **Oral bacteriostatic second-line anti-TB drugs**

Oral bacteriostatic second-line anti-TB agents include ethionamide, prothionamide, cycloserine, P-aminosalycyclic acid and thiocetazone (WHO 2006a).

d. **Corticosteroid treatment**

The use of corticosteroids in MDR-TB patients can be beneficial in cases of severe respiratory insufficiency and central nervous system involvement (WHO 2006a).
e. Vitamins

Vitamin B6 (pyridoxine) should also be given to all patients receiving cycloserine or terizidone to prevent adverse neurological effects. Vitamin (especially vitamin A) and mineral supplements can be given in areas where a high proportion of the patients have deficiencies. If minerals (zinc, iron and calcium) are given, they should be administered at a different time from the fluoroquinolones, as they can interfere with the absorption of these drugs (WHO, 2006a).

Drug Resistant TB is generally curable or treatable but requires treatment up to two years using the above mentioned second line anti-TB drugs. There is also no guarantee that one will be cured after this period. These drugs are more costly than the first line drugs and they produce adverse drug reactions that are more severe but manageable. The treatment of MDR is very expensive and the prevention of MDR-TB is a serious challenge as its spread could lead to an incurable epidemic. XDR-TB is extremely resistant to the best second line drugs and XDR infected people are difficult to treat and if they are left unattended to, the disease will spread to the rest of the country and become difficult and very expensive to contain or control afterwards (WHO, 2007a).

Patients with DR-TB face the prospect of lengthy and often unpleasant treatment as well as the real possibility of premature death. Therefore, counselling and emotional support are particularly important, much as in any other chronic life-threatening illness, for example malignancies or HIV-related diseases. Proper and early counselling will also help to ensure good adherence to the treatment regimen and increase the likelihood of a successful outcome. Once the patient is on treatment, further support will be required in order to maintain adherence and to help identify social and emotional problems early so that they may be addressed before they interfere with the treatment programme.
If treatment has been unsuccessful and further therapy becomes futile, it becomes very important that the patient is not merely abandoned, but continues to receive sympathetic and palliative care from healthcare practitioners (Adebanjo, 2011).

2.3.8.2 Non Pharmacological Treatment include Surgery

The most common operative procedure in patients with pulmonary DR-TB is surgical resection (taking out part of or the entire lung). Surgical resection has been shown to be effective and safe under appropriate surgical conditions. It is considered to be an adjunct to chemotherapy and appears to be beneficial for patients when skilled thoracic surgeons and excellent postoperative care are available. Surgery is not indicated in patients with extensive bilateral disease.

Regardless of the specific procedure, surgery should be timed to offer the patient the best possibility of a cure with the lowest risk of morbidity. Thus surgery may be advised earlier in the course of the disease when the patient’s risk of morbidity and mortality is lower and when the disease is still localised to one lung or one lung lobe. Generally, at least two months of therapy should be given before surgical resection to decrease the bacterial infection in the surrounding lung tissue (WHO, 2006a).

A study conducted by Pomerantz et al. (2001) revealed that during a 17-year period, 172 patients with MDR-TB underwent 180 pulmonary resections, that is, 98 lobectomies and 82 pneumectomies. All patients had a minimum of three months of chemotherapy before surgery. Ninety-one patients were culture-positive at the time of surgery; however, after surgery, only four patients remained culture-positive.

a. Nutritional support

can be exacerbated by poor nutritional status, low body mass index and severe anaemia. Without nutritional support, patients can become enmeshed in a vicious cycle of malnutrition and disease, especially those already suffering from baseline hunger. The second-line drugs may also further decrease the appetite, making adequate nutrition a greater challenge. Nutritional support can take the form of providing free staple foods, and, whenever possible, should include a source of protein (Adebanjo, 2011).

b. DOTS-Plus strategy

DOTS-Plus for Drug Resistant TB is a comprehensive management initiative, built upon the elements of the Directly Observed Treatment Strategy. However, DOTS-Plus also takes into account specific issues such as the use of second-line anti-TB drugs. The goal of DOTS-Plus is to prevent further development and spread of Drug Resistant TB. DOTS-Plus is not intended for universal application and is not required in all settings. The aim of implementing the DOTS-Plus strategy in selected areas with significant levels of MDR-TB is to combat an emerging epidemic. The underlying principle is that the first step in controlling Drug Resistant TB is prevention by full implementation of DOTS. An effective DOTS-based TB control programme is a prerequisite for implementation of DOTS-Plus (WHO, 2004).

Health care workers in primary healthcare settings are often the first people to see patients who present with symptoms and are thus able to identify and manage suspected TB and DR TB cases. Nurses working with individuals, families, communities and other services need to understand their role in controlling this preventable disease (ICN, 2008). Nurses work closely with patients and their families; this means that they are well placed within communities to play a crucial role in providing a caring environment for all patients suffering from TB. This is essential to the success of TB control programmes, which need to offer good access to effective diagnostic and treatment facilities (ICN, 2008).
Socioeconomic problems should be addressed to enable patients and their families to adhere to Drug Resistant TB treatment. Enablers are goods or services that make it easier for patients to adhere to treatment, such as the provision of transportation vouchers and clothing. Incentives are goods or services that are used to encourage patients to adhere to therapy (WHO, 2006a).

In relation to TB, nurses promote health in order to prevent people becoming vulnerable to the disease in the first place. They prevent illness by reducing transmission of TB in the community by finding and treating active cases, they restore health by ensuring that patients receive the treatment they need, and they alleviate suffering by organising support for patients according to their individual needs (ICN, 2008).

### 2.3.9 Prevention of Transmission of Drug Resistant TB.

According to Ndoro (2009) the use of face masks in high-risk settings for drug-resistant TB is recommended for patients in order to reduce the risk of infection and the spread of the disease especially in high-prevalence HIV settings and where healthcare practitioners or workers are suspected to be HIV-infected. Respiratory protection may be used as an interim measure while selected administrative awaiting implementation.

### 2.3.10 Management of Drug Resistant TB in the South African Context

It is of utmost importance that drug-resistant TB be prevented by rigorous adherence to the principles of the National Tuberculosis Control Programme, and by patiently and consistently building partnerships with patients, their families and communities to cure TB on the first attempt. The framework for managing Drug Resistant TB includes sustained government commitment; accurate, timely diagnosis through quality-assured culture and drug susceptibility testing;
appropriate treatment utilising second-line drugs under strict supervision and an uninterrupted supply of quality-assured second-line drugs; and a standardised recording and reporting system (Adebanjo, 2011).

A person with active TB can infect an average of 10-15 people of any age each year. People with compromised immune systems are at an increased risk of contracting TB. There are, however, several drugs that can be used to cure TB (Whalem & Samba, 2001). In Africa, other factors that might favour the development of MDR and XDR-TB include the availability of drugs on the open market and a private sector that delivers drugs to the population in an unregulated fashion (Amor et al., 2008).

Non-compliance to TB treatment could be due to poverty, gender discrimination or homelessness. Patients may also stop treatment because they cannot afford the range of costs associated with continuing treatment, even when treatment itself is provided free of charge (WHO, 2005). In turn, poverty leads to under nutrition which reduces drug absorption, resulting in sub-therapeutic serum drug levels and non-response to drug therapy (Adebanjo, 2011).

### 2.4 Legal and ethical issues in management of the Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome and Drug Resistant Tuberculosis.

According to Louw (2008) the following rights are afforded to everyone:

- Right to non-discrimination
- Right to privacy and confidentiality
- Right to a healthy working environment
- Right to continuation of employment relationship
- Right to freedom of choice and movement.
In terms of section 9 of the Constitution of the Republic of South Africa, Act 108, 1996, People Living with HIV and AIDS are protected from potential discrimination. Everyone is afforded the right to equality. Discrimination on the basis of race, sex, gender, pregnancy, age, sexual orientation and disability is regarded as an unfair discrimination. Although HIV and AIDS is not included in this list, it qualifies as it is analogous to include it as the employment Equity Act (EEA) prohibits discrimination of HIV and AIDS infected people. Also in terms of the Labour Relations Act (LRA) dismissals due to HIV positive status is prohibited and therefore regarded as automatically unfair.

The Medical Schemes Act, 131 of 1998 also prohibits discrimination on provision of medical benefits due to HIV and AIDS status (Louw, 2008). In terms of section 2 of the International Labour Organisation (ILO) Code of Good Practice, HIV should not be considered as a cause of termination of employment. Infected people should be afforded an opportunity to work for as long as they are medically fit to do so in an appropriate work. Dismissal for being HIV positive is prohibited in terms of the LRA and it constitute an unfair labour practices. In terms of the LRA Code of Good Practice, reasonable accommodation should be made for the infected person. The employer should make alternative and suitable employment to accommodate the employee (Cillie, 2008).

Section 14 of the Constitution of the Republic of South Africa, Act 108 of 1996, affords everyone the right to privacy. The EEA prohibits testing for employment reasons unless such tests are justified by the Labour Court. In terms of the Common Law, people are prohibited from disclosing their patient’s health status without their consent. The code of Good Practice also states that there is no legal duty to disclose one’s status. Written consent should be given.

The South African citizens have the right to freedom of movement and choice. In terms of the Occupational Health and Safety Act employers have a legal duty to provide a safe working environment.
All necessary steps should be taken to minimise risks of occupational infections or injuries. Procedures that need to be followed should such events occur should be known and employees be assisted where possible when it comes to claiming when such exposures occur (Louw, 2008).

MDR and XDR TB are air borne diseases. In certain circumstances the above mentioned rights pose a challenge when it comes to the management of these diseases especially here in South Africa (Ndoro, 2009). Medical Practitioners find themselves in an ethical dilemma of either divulging the medical condition of their patients for the benefit of the society or keeping up to the principle of doctor patient confidentiality to the detriment of society (Van Niekerk, 2009).

Secondly part of control measures for the spread of the MDR and XDR TB is to ensure that those infected are isolated and that they get minimum contact with the other uninfected people. This have been in certain instances challenged by patients as it is an infringement in their right to freedom of movement and choice when they refuse to take treatment and ran away from hospital to their homes. For family members to take precautionary measures they need to be aware or informed of the medical condition of their relative (Ngcebetsha, 2011).

2.5 Knowledge about DR TB and HIV and AIDS

Literature reviewed revealed studies that were conducted for various population groups despite the fact that the majority of these studies were not from South Africa.

2.5.1 Tuberculosis or Drug Resistant Tuberculosis

According to a study that was conducted in India to assess the Doctors knowledge of TB Management it was found that doctors that were working in the public
sector had a better knowledge of TB than those who were from the private sector (Vandan, Prasad and Kuroiwa, 2009). Al-Maniri, Al-Rawas, Al-Amji, De Costa, Erikson and Diwan, (2008) in their study which they conducted to assess TB knowledge among General Practitioners in Oman discovered that General Practitioners had a low suspicion and poor knowledge of TB especially in areas of diagnosis, treatment, follow ups and contact screening.

In another study that was investigating the knowledge, attitudes and practices of Private Practitioners regarding management of TB in a rural district of Sindh in Pakistan, it was discovered that they lacked TB diagnosis and management knowledge. Over 40% of them did not prescribe TB treatment regimen as prescribed by the TB Directly Observed Treatment Strategy category, while only 14% of them advised sputum microscopy only for pulmonary TB diagnosis (Ahmed, Fatmi, Ahmed & Ara, 2009). The findings of this study are in line with those of a study that was conducted in Croatia where gaps in knowledge regarding TB knowledge among Physicians were discovered (Savicevic, 2009).

In a study that was conducted in Philippines to evaluate the Physicians knowledge, attitudes, practices and their approach in the diagnosis and management of pulmonary tuberculosis gaps were found in the subjects of the study. 57.5% of the respondents indicated that they will just add two (2) drugs to the regimen and re-evaluate, while 15% said that they will just add one (1) drug (Yamada et al., 1999).

In a study that was conducted in Rio de Janeiro, 43% of health care workers (HCW) were aware of the morbidity and mortality related to Drug-Resistant Tuberculosis. A study conducted in Vietnam, at a rural district basic health facility to assess the level of knowledge and practices regarding tuberculosis among health staff, found that HCW knowledge of theoretical aspects was better than knowledge related to patient management, and that even the staff members who had attended TB training courses had inadequate TB knowledge particularly
in areas of TB control and prevention (Hoa and Thornson, 2005). A study to assess the knowledge and attitudes of health care providers such as doctors and nurses in Peru discovered knowledge gaps such as failure to identify patients at high risk for TB, assessment for treatment outcome and consequences of treatment failure (Keifer, Shoa, Carasquillo, Nabeta and Seas, 2009).

In a study that was conducted to assess the factors that were driving the tuberculosis epidemic in Kwa-Zulu Natal, South Africa, it was found that poor knowledge about MDR-TB which was particularly as a result of lack of training of HCW in DR-TB, particularly its causes, modes of transmission and duration for treatment, and hence the increase in the disease (Naidoo, Taylo & Jinabhal, 2007). Inadequate knowledge and understanding by clinicians of effective tuberculosis diagnosis and treatment leads to an increase in Drug Resistant Tuberculosis (Loveday, Thomas, Chopra & Ndlela, 2008). A study conducted in 250 primary health centres throughout Iraq indicated that of the 500 health care workers who participated in the study 95.5% had a good knowledge about tuberculosis (Hasim, Kubaisy & Dulayme, 2003).

According to a study that was conducted by Long et al., (2001) it was discovered that women were more compliant to treatment than men and they experience more social problems than men as in Vietnam a female would find it difficult to get married if she is known to have suffered from tuberculosis. In a study that was conducted in Limpopo Province in South Africa it was found that females were more knowledgeable of the disease than males (Gibson, Cane, Doering & Harns, 2005).

The following are other studies that indicate respondent’s lack of awareness and knowledge about transmission, prevention and treatment of Drug Resistant tuberculosis:
According to Bennstram, Strandmark, and Diwan (2004) when someone is infected with TB, their families and friends no longer see the individual as a person, but rather TB, which is a disease within a body. Since TB is an infectious disease healthy people keep their distance or avoid close contact with those infected with TB because they fear contracting the disease and dying.

In Venda culture there is a belief that a husband and a wife cannot have intercourse while one of them is infected with TB. This usually results in family and social disharmony between the married people. It is for these reasons that TB is regarded as a social disease that presents social challenges (Edington, Sekatane & Goldstein, 2002). According to Ndoro (2009) in developing countries it is believed that TB is an incurable and dangerous disease, which only affects the poor due to their unhygienic habits. These beliefs and perceptions concerning TB bring about social blame and shame to TB patients and thereby make TB a social as well as a medical challenge.

People infected with TB in developing countries perceive infection with TB as a disgrace, as it shows that someone is poor and from a low class. TB is often associated with dirt, poverty, poor nutrition, smoking, alcohol and low living standards (Edington, Sekatane, & Goldstein, 2002).

There is a belief in some communities that TB remains contagious after completing the prescribed course of treatment. Pregnancy is believed to reactivate TB infection in Punjabi community; other cultures believe that TB is form of punishment from God, while in Vietnam most families do not allow TB patients to share facilities (Long, Johansson, Diwan & Winkvist, 2001).

In some communities it is believed that TB is an inherited genetic disease and genetic inheritance constitutes a mechanism of transmitting TB (Gibson, Cane Doering & Harms, 2005).
In rural Philippines it was commonly believed that TB can be contracted by passing, an infected person on the street, sharing food, telephone, beds, or other facilities (Yamada, Cabellero, Matsunanga, Agustin & Magana, 1999). In the rural district in the Province of Limpopo in South Africa there was a strong belief that TB was a result of breaking cultural rules, such as abortion, or lack of abstinence after the death of a family member. Community members in this community attribute TB to spiritual causes such as punishment and sin (Edginton et al, 2002).

2.5.2 Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome

According to the literature reviewed (Kelly, Parker & Oyosi, 2002; Strydom, 2002; Strydom, 2003) people are well informed or have high knowledge levels concerning the most basic facts about HIV and AIDS even though there are some gaps of information and misconceptions about the disease.

A study conducted by Coetzee (2002) to evaluate the knowledge, attitudes, practice and behaviour on HIV and AIDS indicated that on average the community members were well informed about HIV and AIDS. This study further indicated high levels of HIV and AIDS knowledge among youth while the elderly were the least knowledgeable. 35% of the respondents still held misconceptions about HIV and AIDS being caused by witchcraft, having sex with widows who have not undergone ritual cleansing or traditional healers being able to cure HIV and AIDS.

A study conducted to evaluate knowledge, attitude and behavioural perception of women in Kwa-Zulu Natal towards HIV and AIDS discovered that knowledge levels were high Abdool-Karim (2001). The study further discovered that the high levels of HIV and AIDS among women did not influence their adoption of safer
sex practices. Society thinks that AIDS is exclusively caused by wrong sexual practices. In some societies, HIV and AIDS is seen as the result of personal irresponsibility. People have become very judgmental and moralistic towards AIDS victims (Anon, 2000b). Some of the HIV negative parents prohibit their children from playing with children who are believed to have AIDS. HIV and AIDS patients are considered to be less desirable and more responsible for their ill health (Anon, 2001).

In a study conducted by Onyango (2011) 38 % of the respondents believed that there was a medical solution to the problem of HIV and AIDS and 21% believed that there was a cure for HIV and AIDS. A study conducted by Ncayo (2012) among Correctional Officers revealed that 86 % of the respondents were not aware of the fact that HIV and AIDS have no cure. This is a cause for concern as it may influence risky sexual behaviour among the respondents and negating the efforts to fight against HIV and AIDS.

Strydom (2002) respondents had high levels of knowledge regarding factual HIV and AIDS prevention and transmission knowledge but low levels of knowledge on issues that were not of general knowledge. 63% of the respondents indicated that condoms were not 100% effective in prevention of HIV and AIDS transmission. Ncayo (2012) also revealed that about 20% of the respondents did not know that one can have TB without being also infected with HIV and AIDS. More needs to be done to rectify the misconception about the association between the HIV and AIDS and TB.

Anon (2000b) is of the opinion that, regardless of research activities or regulatory government actions, education must continue to be the cornerstone of efforts to reduce the progression of the present epidemic. Only through intensive educational programmes can the fatal disease be successfully prevented. This is also supported by Stine (1993) as he emphasised that, there is no available vaccine against the HIV and AIDS, but rather effective methods for preventing it.
Tee and Huang (2009) examined the knowledge of HIV and AIDS and attitudes toward people living with HIV among the general staff of a public university in Malaysia. The result was that respondents showed a high level of HIV and AIDS knowledge, which assessed the modes of transmission. Additionally, some people were not able to differentiate HIV from AIDS. Dana et al., (2008) also explored the knowledge, attitudes, beliefs and practices related to HIV and AIDS. The findings of his study showed that respondents had a good knowledge about HIV and AIDS.

According to the reviewed literature, many of the respondents had good levels of knowledge about HIV and AIDS and generally positive attitudes towards PLWHA. However, a good basic knowledge of HIV and AIDS does not necessarily translate into positive attitudes towards PLWHA. Chiliaoutakis et al., (1996) found that the higher the level of accurate knowledge about HIV and AIDS the lower the levels of HIV and AIDS related discrimination and stigmatisation, while Pirie and Coetzee (2006) in their study they found that education was not related to reduction of AIDS-related stigma and discrimination. Furthermore, Bond and Nyblade (2006) indicate that a new disease stigma has unfolded in Sub Saharan Africa and it is known as TB-HIV and AIDS stigma, as visible signs of TB have become a signal for HIV and AIDS.

The current TB-HIV and AIDS stigma has made it more difficult to control HIV and AIDS through VCT and it had also made it difficult to control TB through DOTS program. Those infected with HIV and AIDS have a high risk of developing full blown TB and they possess higher rates of TB mortality than people that are not infected with TB (WHO, 2007a). The factors that are driving the TB-HIV and AIDS stigma have been identified to be lack of knowledge, judgemental attitudes, desire to blame and shame others.
2.6 Conclusion

In this chapter the researcher had reviewed literature pertinent to Drug Resistant Tuberculosis and HIV and AIDS. Literature about Drug Resistant TB and HIV and AIDS around the world was explored in order to get a better understanding of the extent of the problem, the methods used to prevent the spread, and how these diseases are transmitted, diagnosed and treated. The next chapter will focus on the research method that was followed in conducting this study.
CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will focus on the methodology of the study, which entails the type of research that was undertaken as well as the research design pursued. It also covers data collection techniques, construction of questionnaires, data analysis and sampling methods that have been used.

3.2 Research Design

According to Babbie and Mouton (2001) research design is a plan or blue print of how the researcher intends to conduct the research. Research design is also aimed at providing the results that are credible, and that means the extent to which the results approximate reality and are judged to be trustworthy and reasonable. In the research design, the researcher must specify as clearly as possible what he or she intends to find out and also determine the best way of doing it (Babbie & Mouton, 2001).

In quantitative research, evidence is gathered according to a specified plan, using formal instruments to collect the needed information (Somekh & Lewin, 2005). According to Burns and Grove (2005), quantitative research is the “formal, objective, systematic process in which numerical data are used to obtain information about the world”. Furthermore, this method is used to describe variables, examine relationships among variables and determine cause-effect interactions between variables.
This is currently the method of choice for scientific investigations in health care practice and requires rigorous control to identify and limit the effects of extraneous variables not under study. The researcher also controls the study by imposing conditions on the research situation so that biases are minimized (Burns & Grove, 2005).

In this study, the researcher wanted to establish or assess the DR TB and HIV and AIDS knowledge levels among community members. Secondly the researcher wanted to establish if whether there were any gender related differences in DR TB and HIV and AIDS knowledge levels among community members. Lastly the researcher wanted to establish if whether there were any age related differences in the DR TB and HIV and AIDS knowledge levels among community members. Furthermore, the researcher has used a quantitative research design. It was the best method that could be used to address the research question and the above mentioned aims and objectives as it uses numerical data and statistical analysis to make meaning of the world around us, describe variables and examine and determine relationships between variables.

### 3.3 Sampling Procedure

This section has only one important point related to sampling procedure.

#### 3.3.1 Sample and Setting

The sample for the present study was drawn from the residents of Ward 40 at Greenbushes in the Nelson Mandela Bay Municipality, Port Elizabeth. The researcher chose to conduct the research in Greenbushes because the Jose Pearson MDR and XDR TB Hospital is situated in this area. Secondly, the researcher had observed that the residents of this area are infected and admitted in this hospital and that there had been incidents of violence and ill treatment between family members and community towards people that are infected by Drug Resistant TB.
Ward 40 is situated near the ward 39, 37, 38 and 41. Ward 40 include the following areas Greenbushes, Sea view, Rocklands and St Albans and is mainly composed of farms, informal settlements and semi urban areas in the form of RDP houses. The residents are mainly living in poverty, they have low literacy levels, work in farms and surrounding firms, and others have social grants or child support grants as the main source of income.

In this study, the target population was residents who were 18 years and above. The researcher used probability sampling to draw the sample for the present study. Probability sampling refers to the process in which the subjects are drawn from a larger population in such a way that the probability of selecting each member of the population is known (Babbie & Mouton, 2004).

The probability sampling method that was used was random sampling. A plan of Greenbushes indicating number of units (1100) was utilized to select the houses to participate on the study. The researcher started at the first chosen house and then selected every tenth house from the list up until all 110 (one hundred and ten) houses were selected. The questionnaire was administered by the researcher. The researcher asked the different targeted population (18 years and older) who was available at that time and willing to participate in the study at the selected house to respond to the statements that were included in the questionnaire.
The biographical data on the sample is presented in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
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<tbody>
<tr>
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<td>Male</td>
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<tr>
<td>Female</td>
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<td>53%</td>
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<tr>
<td><strong>Educational level</strong></td>
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<tr>
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<td>24%</td>
</tr>
<tr>
<td>High school</td>
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<td>66%</td>
</tr>
<tr>
<td>Degree or diploma</td>
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<td>10%</td>
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<tr>
<td><strong>Race</strong></td>
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<td>57%</td>
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<tr>
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</tr>
<tr>
<td>Unemployed</td>
<td>38</td>
<td>38%</td>
</tr>
</tbody>
</table>

Table 1 show that the majority (53%) of the respondents in this study were female while 24% of the respondents had a primary school level.
Thirty eight percent of the respondents were unemployed. The majority (57%) of the respondents were Africans while 40% were coloured and 3% of the respondents were white.

Figure 1 below presents information pertaining to the age of the respondents.

Figure 1: Age of the respondents

As shown in figure 1, the findings revealed that 41% of the respondents were between the age of 18 – 30 years old and 15% of the respondents were between the 51 – 60 years of age.
Figure 2 below presents information pertaining to the home language of the respondents.

Figure 2 shows that the majority (57%) of the respondents spoke isiXhosa as a home language, 33% Afrikaans and only 10% of the respondents spoke English.

3.4 Data Collection

This section has only one important point related to data collection procedure.

3.4.1 Data collection tools

For the purpose of this study, data was collected using a three point likert scale questionnaire. It consisted of questions in which respondents were required to tick to indicate if whether they agree, disagree, or are unsure with or about the statement. The questionnaire consisted of section A which dealt with the biographical details of the participants and they pertained to age, gender, population group, home language, highest educational qualifications, and
employment status. Section B dealt with DR TB and HIV and AIDS knowledge levels. It is relatively economical, has standardized questions, can ensure anonymity and questions can be written for specific purposes (Schumacher & McMillan, 1993). It is further stated that questionnaires are instruments in which the subject responds to written questions to elicit reactions, beliefs and attitudes (See Annexure D).

The researcher used the questionnaire as a data collection tool because of the following reasons:

• Cost less in terms of time and money
• It had standardized questions
• Anonymity of respondents can be ensured
• Data can be collected to many people within a limited time period
• Have a fair degree of reliability and
• Data analysis can be easily done

According to Leedy (1997), the questionnaire is a common instrument which is used to study data beyond the physical reach of the observer. Christensen (2007) stated that a questionnaire is a technique of collecting data whereby each person from the sample provides a response to a question that is posed to the entire sample in a predetermined order. Christensen (2007) state that reliability and validity of the data collected can be affected by the manner in which the questionnaire is structured.

The researcher adapted the questionnaire through modification of the ones that were used in the studies by Mashabela and Mtaita (1998). The researcher tried to structure the questionnaire in a way that validity and reliability of the data collected become effective by making use of the following:

• By clearly stating the purpose of the research
• Completion of a pilot study that resulted in minor adjustment to the questionnaire
3.5 The Pilot Study

The questionnaire that was developed for this study was piloted on 10 participants drawn from Greenbushes. The purpose of the pilot study was for the researcher to check the time it will take to complete the questionnaire and also whether the instructions and items were clear. Pilot studies are also conducted with an aim of detecting possible flaws in the measurement procedure, to identify unclearly formulated items and allow the researcher to notice non-verbal behavior which possibly may signify discomfort about the context or wording of the questions (Christensen, 2007).

The objective of the pilot study and instructions for completing the questionnaire were provided in a cover letter (Annexure B). The feedback from pilot study resulted in minor amendments being made to the original questionnaire. After the pilot study the statements were reduced from 35 to 25 and only close ended statements were included.

3.6 Validity and Reliability

Validity refers to the extent to which a test measures what researcher actually wishes to measure, while reliability has to do with the accuracy and precision of a measurement procedure (Babbie & Mouton, 2004).

Content validity is the accuracy with which an instrument measures the factors under study, that is, the content being studied has adequate coverage of the investigative questions guiding the study (Christensen, 2007).
The researcher sought assistance from experts in research in as far as the assessment and the face validity of the study was concerned. Colleagues and other co-workers were asked to test the validity of the content of the questionnaire. A panel consisting of a Doctor, Clinical Program Coordinator and MDR and XDR TB Health Educator was used to judge how well the instrument meets the standards, as a way of determining content validity.

3.7 Data Analysis

Data collected and received were analysed by using MS Excel 2010 version and STATISTICA software due to its flexibility and excellent capacity for labeling variables. The emphasis was not for computation but to help with interpretation. In addition to the above, data from the questionnaires was analysed by using a bivariate descriptive statistical method. The data collected from the respondents were statistically analysed using Tables, pie charts and other statistical tools such as Chi-square test. The bivariate descriptive method helps to understand if two variables are in relationship. In this study, the researcher used the Chi-square test to investigate whether there was any gender and age related differences in terms of knowledge and awareness among the respondents.

Each option on the Likert scale was given a numerical value. For instance the 3-point rating scale had a rating from one to three. Consequently, a single score was calculated for each participant and this lead to the overall result. The rating was as follows: 3-point Likert scale: 1=Agree (True); 2= Disagree (False); 3=Uncertain (Unsure). For each individual item, responses were coded as correct (1); incorrect (0) and undecided (0) and missing data was coded 0 (Norman & Carr, 2003).

Each participant yielded a knowledge score of which the range was 0-25. Higher scores indicated higher levels of knowledge with regard to Drug Resistant TB and HIV and AIDS. Subsequently, the scores were dichotomized into high knowledge and that is to say respondents who scored at least more than 70 % (18 to 25) were
coded as having high knowledge levels (1) and below 69% (1 to 17) were coded as having poor knowledge.

A nominal scale was used to measure the data collected. This is the simplest and most basic type of measurement. It uses symbols such as words or numbers to classify or categorise the values of a variable into groups or types (Christensen, 2007). For the purpose of making data analysis easy in this study, the researcher proposed to group or categorize the following variables as such: gender was grouped 1 = female and 2 = male and the category of the variable age was 18-40 years and 41-60 years.

3.8 Ethical Considerations

The researcher believes that it is of utmost importance that one complies with the professional ethics when conducting a study. According to Rose and Lawton (1999), ethics can be defined as a set of principles, often defined as a code or system that acts as a guide to conduct. Researchers have an ethical obligation to participants in a research or a study that is conducted. All researchers should adhere to, namely:

- Researchers should obtain informed consent from the participants. When the consent is informed, participants know that they are taking part in a research study, and that they are doing so voluntarily.
- Participants should not be harmed in anyway by the research conducted
- Data should be treated confidentially
- Participant’s rights to privacy should be respected
- Participant’s should be debriefed

In this study, the researcher obtained ethics clearance from the NMMU RTI/Ethics Sub-Committee before conducting this study (See Annexure A).
The following ethical considerations were adhered to during the research:

### 3.8.1 Voluntary Participation

The researcher recognized the fact that the respondents were to participate at their own will. Permission to participate in the study was requested from the respondents by the researcher. The researcher informed the respondents that it was not a must that they participate in this study. The purpose of the study was clarified to the respondents so that they could be able to determine whether they were willing to participate or not. The respondents were informed that they were free to withdraw from the study when they feel like they are not comfortable to participate. This was done in writing through a consent letter (See Annexure C).

### 3.8.2 No harm to the respondents

The study did not expose respondents to any harm, be it physically, psychologically, or emotionally. The researcher made sure that the information required from the respondents was not embarrassing and did not have a potential of endangering their lives.

### 3.8.3 Anonymity and Confidentiality

The research was conducted in a manner that the participants were not in any way associated with the given responses. Secondly, no personally identifying information was asked from the respondents by the researcher. When the respondents felt uncomfortable to disclose some of the information that is viewed as sensitive by them, the researcher ensured that such responses were not forced from the respondents.
3.8.4 Deceiving the research subjects

The researcher identified himself and told the respondents about why the research was conducted. The researcher produced all the necessary documents to identify himself and explain the purpose of the study to the respondents so that the respondents could have an understanding of why the study was undertaken.

3.9 Conclusion

This chapter has covered the research methodology that was employed by the researcher. A quantitative research method was used. In this study random sampling was used to select the participants from the beneficiary list of Greenbushes RDP housing project. The researcher administered the research questionnaires to the residents of Ward 40 who were 18 years and older.
CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data collected and discusses the findings of the study. The aim of this study was to assess Drug Resistant TB and HIV and AIDS knowledge levels of the community members of Ward 40 in Greenbushes. The presentation was done through a series of Tables, charts and bivariate statistics, in accordance with the themes that were identified around the issues discussed in the literature review, which were guided by the research questions.

Data collected was analysed according to the following themes:

- Knowledge and awareness about Drug Resistant - TB and HIV and AIDS prevention.
- Knowledge and awareness about Drug Resistant- TB and HIV and AIDS transmission.
- Knowledge and awareness about Drug Resistant- TB and HIV and AIDS treatment and diagnosis.
- Gender related differences in Drug Resistant TB and HIV and AIDS knowledge levels of the respondents.
- Age related differences in Drug Resistant TB and HIV and AIDS knowledge levels of the respondents.
4.2 Data presentation

Data will be presented according to the themes namely prevention, transmission and diagnosis and treatment.

4.2.1 Knowledge and awareness about Drug Resistant TB and HIV and AIDS prevention

Table 2 below presents information pertaining to knowledge and awareness about Drug Resistant TB and HIV and AIDS prevention.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Male (N=47)</th>
<th>Female (N=53)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq. %</td>
<td>Freq. %</td>
</tr>
<tr>
<td>DR TB can be controlled by wearing of surgical mask and opening of windows.</td>
<td>32 68</td>
<td>43 81</td>
</tr>
<tr>
<td>The spread of DR TB can be minimised by avoiding or minimizing close contact with the infected person</td>
<td>25 53</td>
<td>31 58</td>
</tr>
<tr>
<td>Opening of windows and minimization of close contact with known HIV positive people and children are DR TB infection control measures</td>
<td>41 87</td>
<td>41 77</td>
</tr>
<tr>
<td>Abstaining and practising safe sex can reduce spread of HIV and AIDS</td>
<td>45 96</td>
<td>52 98</td>
</tr>
<tr>
<td>An expensive vaccine is available to prevent HIV and AIDS</td>
<td>26 55</td>
<td>39 74</td>
</tr>
</tbody>
</table>
Table 2 provides important details related to knowledge and awareness about prevention of HIV and AIDS and Drug Resistant TB. The results obtained from this study showed that 58% of the female respondents knew that the spread of the Drug Resistant TB could be minimised by avoiding close contact with the infected person compared to 53% of males.

The findings revealed that the majority (81%) of female respondents in this study knew that Drug Resistant TB can be controlled by wearing mask and opening windows compared to 68% of the male respondents. As shown in Table 2, the majority (87%) of male respondents knew that opening windows and minimizing close contact with known HIV positive and children was another method of preventing the spread of the disease, compared to 77% of the female respondents. Furthermore, the findings revealed that almost an equal number of both male (96%) and female (98%) respondents knew that abstinence and practising safe sex could reduce their chance of getting infected with HIV and AIDS. It is important to note that the majority (74%) of female respondents in this study knew that there was no expensive vaccine to cure HIV and AIDS while nearly half (55%) of the male respondents believed that such a vaccine was available.
4.2.2 Knowledge and awareness about Drug Resistant TB and HIV and AIDS Transmission

Table 3 below presents information pertaining to knowledge and awareness about Drug Resistant TB and HIV and AIDS transmission.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Male (N = 47)</th>
<th>Female (N = 53)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV and AIDS is spread through unprotected sex</td>
<td>47</td>
<td>53</td>
</tr>
<tr>
<td>Freq.</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB is spread through the air by coughing or sneezing</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Freq.</td>
<td>96</td>
<td>94</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An HIV positive person can pass the HIV virus to others people even though he or she may not have symptoms</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td>Freq.</td>
<td>81</td>
<td>87</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People from all races can be infected with HIV and AIDS.</td>
<td>43</td>
<td>50</td>
</tr>
<tr>
<td>Freq.</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV positive people are at high risk of being infected with TB</td>
<td>33</td>
<td>53</td>
</tr>
<tr>
<td>Freq.</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only poor people get infected with TB and HIV and AIDS.</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Freq.</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV positive people have more chances of developing TB than those who are HIV negative</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>Freq.</td>
<td>94</td>
<td>87</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As shown in Table 3, the findings illustrate that all the male and female respondents (100%) in this study knew that HIV and AIDS is spread through unprotected sex. The results showed that the majority (87%) of the female respondents knew that HIV positive person can infect other people even though they may not yet have sign and symptoms, compared to 83% of the male respondents.

The findings revealed that all (100%) of the female respondents knew that HIV positive people are at high risk of getting infected with TB compared to 70% of the male respondents. The results further showed that the majority (68%) of female respondents knew that all people can be infected with TB and HIV/AIDS irrespective of their economic class or status compared to 51% of the male respondents. The findings illustrate that a high percentage of both male (96%) and female (94%) respondents knew that TB is spread through the air by coughing or sneezing. Furthermore, the majority (94%) of female respondents knew that people from all races can be infected with HIV and AIDS, compared to 91% of the males.

The results showed that the majority (94%) of male respondents knew that HIV positive people had more chances of developing TB than those who are HIV negative, compared to 87% of the female respondents.
4.2.3 Knowledge and awareness about Drug Resistant TB and HIV and AIDS Diagnosis and Treatment

Table 4 below presents information pertaining to knowledge and awareness about Drug Resistant TB and HIV and AIDS diagnosis and treatment.

Table 4: Knowledge and awareness about DR TB and HIV and AIDS Diagnosis and treatment

<table>
<thead>
<tr>
<th>Statements</th>
<th>Male (N = 47)</th>
<th>Female (N = 53)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>HIV and AIDS can be managed by taking antiretroviral drugs</td>
<td>37</td>
<td>79</td>
</tr>
<tr>
<td>HIV and AIDS has no cure</td>
<td>22</td>
<td>47</td>
</tr>
<tr>
<td>Antiretroviral drugs helps by reducing viral load</td>
<td>36</td>
<td>77</td>
</tr>
<tr>
<td>Antiretroviral drugs helps to increase CD4 count</td>
<td>43</td>
<td>91</td>
</tr>
<tr>
<td>TB can be cured by taking the prescribed medication</td>
<td>47</td>
<td>100</td>
</tr>
<tr>
<td>It takes long and cost more to treat MDR TB than normal TB</td>
<td>43</td>
<td>91</td>
</tr>
<tr>
<td>Drug resistant TB is caused by interruption in TB treatment</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>TB treatment outcomes are assessed through sputum test</td>
<td>30</td>
<td>64</td>
</tr>
<tr>
<td>XDR TB has no cure</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Drug Resistant TB treatment is free at designated health centres</td>
<td>31</td>
<td>66</td>
</tr>
</tbody>
</table>
HIV and AIDS makes the body so weak that it cannot fight diseases

People who are infected with HIV and AIDS can be easily identified

TB is diagnosed through sputum test

<table>
<thead>
<tr>
<th>Statement</th>
<th>Female (%)</th>
<th>Male (%)</th>
<th>Difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV and AIDS makes the body so weak that it cannot fight diseases</td>
<td>46</td>
<td>98</td>
<td>52</td>
</tr>
<tr>
<td>People who are infected with HIV and AIDS can be easily identified</td>
<td>19</td>
<td>40</td>
<td>21</td>
</tr>
<tr>
<td>TB is diagnosed through sputum test</td>
<td>33</td>
<td>70</td>
<td>37</td>
</tr>
</tbody>
</table>

As shown in Table 4, the findings revealed that the majority (92%) of the female respondents knew that antiretroviral drugs are used to manage HIV and AIDS compared to the (79%) of the male respondents. The majority (70%) of the female respondents in this study knew that there was no cure for HIV and AIDS compared to less than half (47%) of male respondents. Data illustrate that all (100%) male respondents knew that TB can be cured by taking the prescribed medication, compared to 92% of the female respondents. The results showed that the majority (91%) of the male respondents knew that antiretroviral drugs help to increase the CD4 count compared to (77%) of the female respondents.

In addition to the above findings, the researcher found that the majority (66%) of the female respondents knew that Drug resistant TB was caused by treatment interruption compared to only 34% of male respondents. The study showed that only 13% of the male respondents and 15% of female respondents knew that XDR TB was curable. The results showed that and equal number (91%) of both the males and female respondents knew that it took long and costs more to treat DR TB than normal TB. The results indicate that the majority (55%) of the female respondents knew that people infected HIV and AIDS cannot be easily identified, compared to 40% of the males.
Furthermore, the findings revealed that the majority (98%) of the female respondents knew that TB treatment outcomes were assessed through sputum test compared to 64% of males. The majority (89%) of female respondents knew that TB was diagnosed through sputum test compared to 70% of males.

4.2.4 Analysis of gender and age related differences in Drug Resistant TB and HIV and AIDS knowledge levels

This section discusses about gender and age related differences in Drug Resistant TB and HIV and AIDS knowledge levels.

4.2.4.1 Gender related differences

Table 5 below presents information pertaining to gender related differences in relation to Drug Resistant TB and HIV and AIDS knowledge levels.

Table 5: Gender related differences

<table>
<thead>
<tr>
<th>Mean F</th>
<th>Mean M</th>
<th>Pearson Chi-square Test</th>
<th>Cohen’s Distrib.</th>
<th>df</th>
<th>Std.Dev. F</th>
<th>Std.Dev M</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.85</td>
<td>22.09</td>
<td>0.0043</td>
<td>0.59</td>
<td>98</td>
<td>3.31</td>
<td>2.64</td>
</tr>
</tbody>
</table>

Table 5 above provides statistical analysis about gender related differences in knowledge levels of the respondents. The researcher then proposed to interpret the Chi-square test to see whether there was any relationship between gender and the knowledge of the respondents. The Pearson Chi-square test was used to determine in general if there was any relationship between the two variables.
In this study, the Chi-square test showed that $p=0.0043$ or $p=0.004$ was below $p=0.50$. This means that male and female respondents were statistically significant and also showed that there was a relationship between gender and knowledge levels of the respondents who agreed about the statement or responses which were correctly answered.

### 4.2.4.2 Age related differences

Table 6 below presents information pertaining to age related differences in relation to Drug Resistant TB and HIV and AIDS knowledge levels.

<table>
<thead>
<tr>
<th>Mean 18-40 Years Old</th>
<th>Mean 41-60 Years Old</th>
<th>Pearson Chi-square test</th>
<th>Cohen’s Deviat.</th>
<th>df</th>
<th>Std.Dev. 18-40 Years Old</th>
<th>Sts.Dev 41-60 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.60</td>
<td>23.88</td>
<td>0.0532</td>
<td>0.48</td>
<td>98</td>
<td>2.88</td>
<td>3.46</td>
</tr>
</tbody>
</table>

Table 6 showed that there was no relationship between age and the knowledge levels of the respondents. The Chi-square test showed that $p=0.0532$ or $p=0.053$ was above $p=0.50$. This means that the group 18-40 years old and 41-60 years old respondents were not statistically significant and also showed that there was no relationship between age and knowledge in relation to respondents who agreed about the statement or responses which were correctly answered.
4.3 Discussion of results

4.3.1 Knowledge regarding DR TB and HIV and AIDS Prevention

Table 2 showed that the respondents were knowledgeable and aware of the Drug Resistant TB and HIV and AIDS prevention strategies and methods. The above findings are in line with the findings by Strydom (2002) where it was discovered that the respondents scored high on knowledge questions that related to HIV and AIDS prevention, transmission and treatment and also in line with the findings by Ndoro (2009) and Coetzee (2006) where it was discovered that the community members were well informed about Drug Resistant Tuberculosis and HIV and AIDS.

In South Africa there have been many World Health Organisation sponsored TB and HIV and AIDS awareness campaigns that are aimed at global prevention of TB and HIV and AIDS. Such campaigns have been carried out in both rural and urban areas (WHO, 2006b).

Table 2 further indicated that female respondents were more knowledgeable and aware than male respondents of the different Drug Resistant TB and HIV and AIDS prevention strategies or methods. The above findings are consistent with the findings by Gibson et al. (2005) in which it was discovered that females were more knowledgeable of the diseases than males. The result showed that females scored high than males in four of the five questions that related prevention of Drug Resistant TB and HIV and AIDS which were the availability of vaccine and abstinence to prevent spread of HIV and AIDS, use of surgical mask and opening of windows as Drug Resistant TB prevention strategies.
Male respondents only scored higher than females in only one out of the five questions which was about minimizing of close contact with infected people to prevent spread of the drug resistant TB.

Table 2 further indicated that despite the high knowledge and awareness levels regarding HIV and AIDS and Drug Resistant TB prevention strategies and methods, there was nevertheless evidence indicating that a significant proportion of the respondents still lacked general knowledge about prevention of these diseases. The result revealed that 45% of the male and 26% of the female respondents did not know that there was no vaccine to prevent HIV and AIDS and that nearly half (47% male and 42% female) of the respondents did not know that the spread of Drug Resistant TB could be minimised by avoiding or minimising close contact with the infected person. These findings are in line with the findings by Edginton et al., (2002) in which it was discovered that some of the respondents were poorly informed about tuberculosis. One of the findings of these studies was that the respondents believed that TB was a disease for the poor and that it also as a resulting of not abstaining from sex after the death of a family member and witchcraft, while Onyango (2011) discovered that 38% of the respondents believed that there was a medical solution to the HIV and AIDS problem and 21% believed that there was a cure for HIV and AIDS.

4.3.2 Knowledge regarding DR-TB and HIV and AIDS Transmission

The results in Table 3 showed that the respondents were knowledgeable and aware of the Drug Resistant TB and HIV and AIDS transmission modes and methods. The findings in Table 3 are consistent with the findings by Strydom (2002) where it was discovered that the respondents scored high on knowledge questions that related to HIV and AIDS prevention, transmission and treatment.
and also in line with the findings by and Odebanjo (2011) where it was discovered that the community members were well informed about Drug Resistant Tuberculosis was transmitted.

Data in Table 3 further indicated that female respondents were more knowledgeable and aware than male respondents of the different Drug Resistant TB and HIV and AIDS transmission modes or methods. The above findings are consistent with the findings of the study conducted by Gibson et al. (2005) in which it was discovered that females were more knowledgeable of the diseases than males. Data in Table 3 showed that females scored high than males in four of the seven questions that were assessing knowledge Drug Resistant TB and HIV and AIDS transmission modes and methods. The statements were related to the ability to transmit HIV and AIDS even if one does not have signs and symptoms, all races can be infected, HIV positive being at risk of contracting TB, and only poor people getting infected by HIV and AIDS. Male respondents only scored higher than females in only two out of the seven questions which were about HIV positive people standing more chances of getting infected and TB being spread through the air by coughing or sneezing.

Table 3 further showed that despite the high knowledge and awareness levels regarding HIV and AIDS and Drug Resistant TB transmission modes and methods, there was nevertheless evidence indicating that a significant proportion of the respondents still lacked some important knowledge concerning transmission modes and methods of the Drug Resistant TB and HIV and AIDS. Data in Table 3 revealed that 68% of the female and 51% of male respondents knew that all people irrespective of their economic class or status could be infected by HIV and AIDS. It further showed that 30% of the male respondents new that HIV positive people were at risk of being infected with HIV and AIDS.
19% of male and 13% female respondents did not know that an HIV positive person could transmit the HIV virus to other people even if they do not have the signs and symptoms of the disease. The results also indicated that 91% of male and 94% of female respondents knew that all races can be infected with HIV and AIDS.

According to Strydom (2002) an HIV antibody test is used to ascertain the status of an individual in the form of either an ELISA test or a Polymerase Chain Reaction (PCR) test, which are both effective and reliable. Van Zyl (2011) stated that HIV positive people can infect others even if they do not have the signs and symptoms of HIV and AIDS. Symptoms that are normally associated with AIDS include weight loss, acute loss of appetite, fatigue, swollen lymph glands, persistent diarrhoea, persistent cough, brown or purple spots on the skin, white spots or coating in the mouth and impairment of the nervous system including loss of memory and dementia (Coetzee, 2006). Deacon (2005) stated that people with compromised immune systems are at an increased risk of contracting TB.

The results in Table 3 are similar to those of a study by Ndoro (2009) where it was discovered that the respondents were aware that People Living with HIV and AIDS were at risk of being infected by TB.

The results in Table 3 are in line with the findings by Onyango (2011) where it was discovered that some respondents did not know that HIV and AIDS can be transmitted by even those people who do not seem to present with the signs and symptoms but as long as one is HIV positive. The finding in Table 3 implies that there is a possibility that the respondents might engage in unprotected sex because they believe that they can protect themselves once they identify the signs and symptoms of HIV infection in the other person and that might be too late as they might be already infected by then. This finding implies that there might be some respondents who run the risk of spreading the virus due to lack of proper HIV and AIDS prevention and transmission knowledge.
Data in Table 3 shows that all the respondents knew that HIV and AIDS is spread through unprotected sex. It is interesting to note the level of knowledge about how HIV and AIDS is transmitted but care should be taken in that these findings do not actually mean that the respondents are indeed practising safe sex but rather just an indication of their knowledge about safe sex. Emphasis should then be on encouraging the respondents to practically apply their knowledge by practising safe sex. This finding is in line with the findings by Abdool-Karim (2001) where it was discovered there were high knowledge levels among respondents but however that knowledge did not influence the adoption of safe sex behaviour and practices.

4.3.3 Knowledge regarding Drug Resistant TB and HIV and AIDS Diagnosis and Treatment

Data in Table 4 indicated that the respondents were knowledgeable and aware of the Drug Resistant TB and HIV and AIDS diagnosis and treatment methods. The results in Table 4 are similar to those of the study by Strydom (2002) where it was discovered that the respondents scored high on knowledge statements that related to HIV and AIDS prevention, transmission and treatment and also in line with the findings by and Odebanjo (2011) where it was discovered that the community members were well informed about Drug Resistant tuberculosis was diagnosed treated and also in contrast to the studies by Al-Maniri et al. (2008) and Ahmed et al., (2009) where it was discovered that the respondents lacked knowledge of TB diagnosis, treatment and management.

Data in Table 4 further indicated that female respondents were more knowledgeable and aware than male respondents of the different Drug Resistant TB and HIV and AIDS diagnostic and treatment methods.
The above findings are consistent with the findings by Gibson et al., (2005) and Abdool-Karim (2001) where it was discovered that females were more knowledgeable of the diseases than males. Data in Table 4 showed that females scored higher than males in ten of the thirteen statements that were used to assess knowledge of Drug Resistant TB and HIV and AIDS diagnostic and treatment methods. The statements were related to availability of cure for HIV and AIDS, use and effect of antiretroviral drugs, causes of Drug Resistant TB, diagnosis and treatment of TB. Male respondents only scored higher than females in only two out of the thirteen statements which were about HIV making the body so weak that it cannot fight diseases and antiretroviral drugs helping to increase CD 4 count.

Table 4 further indicated that despite the high knowledge and awareness levels regarding HIV and AIDS and Drug Resistant TB diagnostic and treatment methods, there was nevertheless evidence indicating that a significant proportion of the respondents still lacked some important knowledge concerning diagnosis and treatment methods of the Drug Resistant TB and HIV and AIDS. The results in Table 4 show that 70% of the female and only 47% of male respondents knew that HIV and AIDS had no cure. Table 4 further showed that only 40% of the male and 55% of then female respondents new that people infected with HIV and AIDS cannot be easily identified. These above results are in line with the findings by Onyango (2011) where 38% of the respondents believed that there was a medical solution to the HIV and AIDS problem and 21% believed that there was cure for this disease, while in the study by Ncayo (2012) 86% of the respondents were also not aware of the fact that there was no cure for HIV and AIDS. According to Kaplan at el., (2004) there is no cure for individuals infected with HIV and AIDS in spite of over two decades of intensive research.

It is significant to note that the belief that HIV and AIDS can be cured and that people infected with HIV and AIDS might lead to the male respondent’s
deviation, irresponsibility and taking chances by involving themselves in high risk sexual behaviour. This might also further hamper HIV and AIDS prevention efforts especially since female cannot negotiate or initiate the practice of safe sex with their male partners due to traditional masculine roles and power relations that exist between men and women.

Antiretroviral treatment (ARV) is used to manage HIV and AIDS in infected people and also on pregnant women in order to prevent mother to child transmission as there is still no cure for the disease (Van Zyl, 2011). The results in Table 4 show that the majority (91%) of female respondents knew that antiretroviral drugs helped in reducing viral load compared to (77%) of male respondents. Data in Table 4 further revealed that the majority of male respondents knew that antiretroviral drugs helped in increasing the CD 4 count compared to 77% of females. It is important to note that the belief among the male respondents in this study that HIV and AIDS can be cured might have been influenced by the availability of antiretroviral drugs which help in managing HIV and AIDS in infected people. This implies that more education about issues relating Drug Resistant and HIV and AIDS diagnosis and treatment is needed.

Adebanjo (2011) also found in his study that although the respondents had good knowledge about Drug Resistant TB, they lacked knowledge in areas relating to what constitutes Drug Resistant TB, how it was diagnosed, and what is used to treat it and the duration of such treatment. The findings in Table 4 revealed that the majority (66%) of the female respondents in this study knew that Drug Resistant TB was caused by treatment interruption compared to only (34%) of male respondents.

Data further show that the majority (98%) of the female respondents knew that treatment outcomes were assessed through sputum tests compared to 64% of the male respondents.
Drug Resistant TB is generally curable or treatable but requires treatment up to two years using second line anti-TB drugs and Patients with MDR and XDR-TB face the prospect of lengthy and often unpleasant treatment as well as the real possibility of premature death (South African National Department of Health, 2007 and WHO, 2007a). The results in Table 4 revealed that all (100%) of the male respondents in this study knew that TB could be cured by taking the prescribed medication while a few number (8%) of the female respondents did not know. The research results in Table 4 further revealed that few and almost an equal number of both male (13%) and female (15%) respondents in this study knew that XDR TB was curable.

It is also interesting to observe the contradiction between the respondents’ responses regarding these above two questions. This could be due to two pertinent explanations. The belief that XDR TB is not curable might have been influenced by the observations made by some of the respondents regarding the length of stay of the patients that are diagnosed with these strains of TB at the designated facility before the decision to decentralised and deinstitutionalise treatment of MDR and XDR TB. Secondly the time taken before people know that they are infected might be also a contributing factor to the belief that XDR TB has no cure, as some respondents might have observed or heard of people who die or might have died before they know that they were infected with MDR or XDR TB (Department of Health, 2011).

**4.3.4 Gender related differences in knowledge levels about Drug Resistant TB and HIV and AIDS**

The research findings further revealed that the female respondents were more aware and knowledgeable than the male respondents in this study. This could possibly be attributed to an exposure to health care and medical facilities.
Females on average are more likely to visit health care centres or clinics and hospitals than males. Females visit health care centres to receive contraceptives and during that process they are likely to receive information about HIV and AIDS, TB and Diabetics (Ndoro, 2009). This has been confirmed by the fact that male and female responders were statistically significant as p=0.0043 (see Table 5).

4.3.5 Age related differences in knowledge levels about Drug Resistant TB and HIV and AIDS

This finding further revealed that there were no statistically significant differences among respondents with regard to age and this meant that age was not in relationship to knowledge as p = 0.0532 (see Table 6). The above findings are however in contrast to the study by Hashim et al., (2004), where it was discovered that age was significantly associated with good knowledge.

4.4 Conclusion

In this chapter, the research results were discussed. Results indicated that the community had high levels of knowledge regarding Drug Resistant TB and HIV and AIDS. They further revealed that female respondents were more aware and knowledgeable about Drug Resistant TB and HIV and AIDS than male respondents and that the older respondents were more knowledgeable than the younger ones regarding Drug Resistant TB and HIV and AIDS. Lastly the research results revealed that gender was significantly related to knowledge while age was not significantly related to knowledge. The means for addressing areas where gaps were identified in knowledge are outlined in chapter five.
CHAPTER 5

SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter five gives a summary of this research. Conclusions of the study based on the findings are outlined. Limitations associated with this research are outlined and finally recommendations of the study are also made. Recommendations are divided into two. There are recommendations for the enhancement of the knowledge levels of the community regarding Drug Resistant TB and HIV and AIDS. The second sets of recommendations are for future research.

5.2 Key Findings of the study

The study aimed at assessing community member’s knowledge levels regarding Drug Resistant TB and HIV and AIDS. This study also intended to establish whether there were any gender and age related differences in Drug Resistant TB and HIV and AIDS knowledge levels of the community members. The study was conducted in the Eastern Cape at Ward 40 (Greenbushes area) in Nelson Mandela Metropolitan Municipality.

In order to solve the main problem as stated in chapter one the literature pertinent to HIV and AIDS and Drug Resistant Tuberculosis was reviewed. HIV and AIDS and Drug Resistant TB in South Africa, Asia and America, Africa, Pakistan, India and Afghanistan were explored. Origin, epidemiology, approaches for management and prevention and legal and ethical issues when managing these diseases were looked at, and they provided the researcher with a sound base of
information which was used in trying to establish knowledge levels of community members regarding the two diseases.

The research was conducted using a quantitative research method. A three point likert scale structured questionnaires with closed ended questions was used to collect data from 100 respondents that were randomly selected using an RDP housing beneficiary list for Greenbushes area as sample frame. Data collected were statistically analyzed using frequency Tables, chi-square test and pies. The results of the study were discussed in accordance to themes that were identified around the issues discussed in the literature review. It is important to note that the themes were grouped as follows prevention, transmission, diagnosis and treatment of HIV and AIDS and gender and age related differences in knowledge levels about the Drug Resistant TB and HIV and AIDS.

In the empirical study, the researcher aimed at assessing Drug Resistant TB and HIV and AIDS knowledge levels among community members. Concerning age and gender differences, the empirical results provided evidence that there was high Drug Resistant TB and HIV and AIDS knowledge among community members even though there were areas where gaps or limited knowledge was discovered especially among the respondents between 18-40 years old. The research results further reveals that females were more knowledgeable than males on Drug Resistant TB and HIV and AIDS issues and that the respondents between 41-60 years old possessed more knowledge regarding Drug Resistant TB and HIV and AIDS than the respondents between 18-40 years old. Lastly, the research results revealed that there were significant differences between gender and knowledge and that there were no significant differences between age and knowledge.

The results indicated that there were areas in which female respondents showed more knowledge than male respondents in statements related to Drug Resistant TB and HIV and AIDS prevention.
The statements were related to wearing of surgical mask and opening of windows as a DR-TB prevention method, the spread of DR TB can be minimized by avoiding close contact with the infected person, abstaining and practicing safe sex can reduce spread of HIV and AIDS and lastly an expensive vaccine is available to prevent HIV and AIDS. Furthermore, the results revealed that there were areas in which male respondents showed higher knowledge levels than female respondents in statements related to Drug Resistant TB and HIV and AIDS prevention. Only one statement was related to the above finding: opening of windows and minimization of close contact with known HIV positive people and children are DR TB infection control measures.

In addition to the above findings, the results indicated that there were areas in which female respondents showed more knowledge than male respondents in statements related to Drug Resistant TB and HIV and AIDS transmission. The statements were related to an HIV positive person can pass the HIV virus to others people even though he or she may not have symptoms, people from all races can be infected with HIV and AIDS, HIV positive people are at high risk of being infected with TB, and lastly only poor people get infected with TB and HIV and AIDS. Additionally, the results revealed that there were areas in which male respondents showed higher knowledge levels than female respondents in statements related to Drug Resistant TB and HIV and AIDS transmission. Two statements were related to these statements: TB is spread through the air by coughing or sneezing and HIV positive people have more chances of developing TB than those who are HIV negative. Lastly, an interesting finding was that both female and male respondents were all knowledgeable to a statement related to HIV and AIDS is spread through unprotected sex.

Furthermore, the results indicated that there were areas in which female respondents showed more knowledge than male respondents in statements related to Drug Resistant TB and HIV and AIDS diagnosis and treatment.
The statements were related to HIV and AIDS can be managed by taking antiretroviral drugs, HIV and AIDS has no cure, Antiretroviral drugs helps by reducing viral load, Drug Resistant TB is caused by interruption in TB treatment, TB treatment outcomes are assessed through sputum test, Drug Resistant TB treatment is free at designated health centres, and TB is diagnosed through sputum test. Additionally, the results revealed that there were areas in which male respondents showed higher knowledge levels than female respondents in statements related to Drug Resistant TB and HIV and AIDS diagnosis and treatment. Three statements were related to these statements: Antiretroviral drugs helps to increase CD 4 count, TB can be cured by taking the prescribed medication and HIV and AIDS makes the body so weak that it cannot fight diseases. Lastly, an interesting finding was that both female and male respondents were all knowledgeable to the same proportion as it takes long and cost more to treat MDR TB than normal TB.

The results also showed that there were areas in which both males and female showed inadequate knowledge or information with regard to Drug Resistant TB and HIV and AIDS prevention, transmission, diagnosis and treatment. The statements were related to avoidance or minimizing of close contact with people infected with Drug Resistant TB as a method to prevent the spread of the disease, TB treatment interruption as the cause of Drug Resistant TB, Extreme Drug Resistant TB having a cure, easy identification of people infected with HIV and AIDS, and lastly only poor people getting infected with TB and HIV and AIDS.

The study also indicated that there were areas where both males and females showed high knowledge levels with regard to Drug Resistant TB and HIV and AIDS prevention, transmission, diagnosis and treatment. The statements were related to abstaining and practicing safe sex as HIV and AIDS prevention strategies, HIV and AIDS being spread through unprotected sex, MDR-TB taking longer to treat than normal TB, TB being cured by taking prescribed medication, and HIV and AIDS being managed by taking antiretroviral drugs.
In brief, the study further revealed that the respondents were highly knowledgeable and aware about transmission of Drug Resistant TB and HIV and AIDS, knowledgeable about prevention and less knowledgeable about diagnosis and treatment.

5.3 Conclusions

Conclusions drawn from this study are as follows:

Greenbushes community members have high knowledge levels about Drug Resistant TB and HIV and AIDS. Male respondents had more gaps in terms of knowledge in key areas that related to Drug Resistant TB and HIV and AIDS prevention, transmission and diagnosis and treatment while females had high knowledge levels. Most of the respondents between the ages 18-40 years old were less knowledgeable compared to the respondents between the ages 41-60 years old. There were areas in which both male and female respondents showed inadequate knowledge regarding transmission, prevention and diagnosis and treatment of HIV and AIDS. The respondents were highly knowledgeable and aware about transmission of Drug Resistant TB and HIV and AIDS and less knowledgeable about diagnosis and treatment.

It is important to note that lack of knowledge has a negative effect on HIV and AIDS prevention programs. The effectiveness of strategies to control the spread of Drug Resistant TB and HIV and AIDS depends on capacitating the community members about ways by which Drug Resistant TB and HIV and AIDS can be prevented, transmitted, diagnosed and treated. Education and training to the community members are two important tools to help improve things. More health education and awareness campaigns need to be embark upon and a special emphasis should be given to rectifying myths that the community has about these diseases and providing the factual information.
Further analysis showed that there was a statistical significant difference between gender and knowledge while there was no statistical significant difference in between age and knowledge to Drug Resistant TB and HIV and AIDS. This implies that further studies will be needed to help investigate whether there are any differences between the above variables (gender and age) and knowledge.

5.4 Limitations of the study

The following section looks at the limitations of this study. The following have been identified as the limitations of this study.

- The study was conducted among community members in a limited area, namely Ward 40 in Greenbushes at Nelson Mandela Metropolitan Municipality. It would therefore be difficult to generalize the findings of this research study.

- The value of the research findings depends on the accuracy of data collected. Data quality can be compromised via unrepresentativeness of the sample. The majority of the respondents had lived for a period of 0-5 years in the area. Data collection coincided with September school holidays. It is possible that some of the respondents had just came to Greenbushes for the September school holidays and therefore have limited knowledge regarding these diseases especially Drug Resistant TB. Some community members who left their homes in the morning to go to work and returned in the evening were left out of the study. This shortcoming was further worsened by carrying out the household survey during week days when most working people were at work. Therefore some requisite respondents were lost from the study.

- Restricting the study to respondents older than 18 years limited a range of finding. Younger respondents would have added valuable insights to the study enhancing the generalizability of the findings of the study to a larger...
population. Despite having ethical considerations as the main factor influencing the selection of respondents older than 18 years old, a consultative approach could have been adopted to include minors from the age of 13 years in the study. Consultation could possibly have been made in the presence of the parents or legal guardians of minor respondents.

5.5 Recommendations

On the basis of the literature and the empirical study undertaken, the researcher would like to make the following recommendations:

- Accurate knowledge should be provided by ensuring that educational materials that are produced are appropriate for the various levels of literacy.

- To sustain the relevant knowledge about Drug Resistant TB and HIV and AIDS among community members, it is recommended that more relevant and factual information regarding these diseases be made more accessible to community members in their home languages. Emphasis should be on prevention, diagnosis and treatment of Drug Resistant TB and HIV and AIDS.

- Development of appropriate training programs and intensifying educational campaigns and extension of the coverage of outreach and health promotion programs to include churches and workplaces, and encourage changing behavior of community members by increasing awareness and ensuring that communities are well equipped especially among male and youth.

- Local people affected or those who are living with HIV and AIDS or those who have been cured with Drug Resistant TB should be involved in facilitation of health educational programs or campaigns in order for them to share with the community their experiences and expectations. This could possibly create cues to action for the adoption of positive health related behaviour against TB.
This may increase the general level of awareness people have about these diseases. Role models that have survived and are living with these diseases, should be put forward in awareness campaigns.

Future research is recommended in the following areas:

- The study should be extended to all wards in the municipality.

- A comparative study should be conducted among grade ten to twelve learners from the previously disadvantaged schools and the model C schools.

- A follow up study to evaluate the impact of Drug Resistant TB and HIV and AIDS training in reducing negative attitudes towards people infected by these diseases is necessary.

- The same study should be conducted using both qualitative and quantitative research method with in-depth interviews and focus group.

5.6 Conclusion

Chapter five gave a summary of the study. Conclusions were made based on the findings of the study. The limitations of the current research were identified. Lastly the recommendations were made by the researcher for both, those that capacitate and uplift community knowledge levels regarding Drug Resistant TB and HIV and AIDS and for future research.
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ANNEXURE A

Ref: H/12/ART/PGS-0025

10 AUGUST 2012

Mr T E Fana
8 NCAPAYI STREET
NEW BRIGHTON
PORT ELIZABETH
6200

Dear Mr Fana

DRUG RESISTANT TUBERCULOSIS AND HIV AND AIDS: KNOWLEDGE LEVELS AMONG COMMUNITY MEMBERS

Your above-entitled application for ethics approval served at the RTI Higher Degrees sub-committee of the Faculty of Arts Research, Technology and Innovation Committee.

We take pleasure in informing you that the application was approved by the Committee.

The Ethics clearance reference number is **H/12/ART/PGS-0025**, and is valid for three years, from 01 August 2012 – 01 August 2015. Please inform the RTI-HDC, via your supervisor, if any changes (particularly in the methodology) occur during this time. An annual affirmation to the effect that the protocols in use are still those for which approval was granted, will be required from you. You will be reminded timeously of this responsibility.

We wish you well with the project.

Yours sincerely

Mrs N Mngonyama
FACULTY ADMINISTRATOR

cc: Promoter/Supervisor
    HoD
    School Representative: Faculty RTI
Dear Colleague

Pilot Study: Research about Drug Resistant TB and HIV and AIDS: Knowledge Levels Among Community Members.

I am currently researching Knowledge Levels of Community members towards People Infected by drug resistant TB and HIV and AIDS. I am conducting this research to fulfil the requirements for MPA at Nelson Mandela University.

I would appreciate your assistance in completing the enclosed questionnaire. You may answer all the questions and also mark all those that are ambiguous or difficult to answer. Criticism regarding the length, layout, language and the content will be highly appreciated. You can fax the completed form back to me at 041- 372 1987 before the 30th August 2012.

Your inputs will be used to determine if whether any adaptations need to be made before the questionnaire can be used to the intended target population.

Please note the following:
Your participation is confidential and there are no right or wrong answers
All personal information that is required in Section A is only required to summarize and correlate the conclusions of the study in a proper manner

Thank you for your cooperation

TE Fana
Researcher

Professor Thoko Mayekiso
Research Supervisor
Annexure C

NELSON MANDELA METROPOLITAN UNIVERSITY
INFORMATION AND INFORMED CONSENT FORM

AN ASSESSMENT OF DRUG RESISTANT TUBERCULOSIS AND HIV AND AIDS: KNOWLEDGE LEVELS AMONG COMMUNITY MEMBERS. CONSENT FORMS TO BE COMPLETED BY PARTICIPANTS

You have been selected to participate in a research study conducted by Thanduxolo Elford Fana who is studying Masters in Public Administration from the School of Governmental and Political Studies at the Nelson Mandela Metropolitan University.

You are hereby requested to give consent for participation in the study.

1. PURPOSE OF THE STUDY
The purpose of this study is to assess Drug Resistant TB and HIV and AIDS knowledge levels among community members.

2. PROCEDURES
All community members will be informed of the research study that will be undertaken and the procedure that will be followed to select the participants. 110 out of 1100 households will be selected for the purpose of this study using random sampling method. A questionnaire which will be administered by the researcher will be used to collect data. Respondents or (community members who are 18 years and above) will be expected to answer the questions that will be asked by the researcher while he fills the answers on the questionnaire.

3. POTENTIAL RISKS AND DISCOMFORTS
There are no risks in this study as respondents are expected to answer the questionnaire only.
4. POTENTIAL BENEFITS TO THE RESEARCH SUBJECTS OR SOCIETY
No direct benefit will be gained by participating in this study except the fact that respondents will have an opportunity of doing reality regarding their Drug Resistant TB and HIV AND AIDS knowledge levels, attitudes.

5. PAYMENT FOR PARTICIPATION
There will be no financial rewards for participating in this research.

6. CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential, and will only be disclosed only with your permission or as required by the law. Confidentiality will be maintained by means of alpha numerical coding which will be used. Secondly there will be no personally identifiable information that will be asked or required on the questionnaires. Data will be stored electronically on the computer and also in a memory stick once questionnaires are filled and collected. This information will be locked in a safe in which only the researcher will have access to. The information collected will only be released through a written report after proper analysis is done in a form of a research report or theses.

7. PARTICIPATION AND WITHDRAWAL
The participants have a choice to participate in the study or not to participate. The participant can refuse to answer any question that they don’t want to answer and still remain in the study. The participant can immediately withdraw from participating in the study anytime should she or he feel uncomfortable participating on it. The researcher can also ask the participant to withdraw from the study should his or her conduct be unsatisfactory.
8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact

The researcher: Mr Thanduxolo Fana
8 Ncapayi Street
New Brighton
Port Elizabeth
Cell Number : 0732301771
Work number : 041 3728000/6
Fax number : 041 372 1987 or 8007
Email address : 0760654543@vodamail.co.za

The Research Supervisor: Professor Thoko Mayekiso
Deputy Vice Chancellor: Research and Engagement
Nelson Mandela Metropolitan University
P. O. Box 77000
Summer stand
Port Elizabeth
Contact Number : 041 5042016/7
Fax Number : 041 5042885
Email address : thoko.mayekiso@nmmu.ac.za or nozuko.ngcukana@nmmu.ac.za

9. RIGHTS OF THE RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact the Division of Research Development at NMMU.
SIGNATURE OF RESEARCH SUBJECT

The information above was described to me by Thanduxolo Fana in English and Xhosa and I am in good command of these languages. I was also given the opportunity to ask questions and these questions were answered to my satisfaction.

I hereby consent to participating in this study. I have received (been given) a copy of this form

............................................
Name of the participant

............................................
Signature of participant

............................................
Date

SIGNATURE OF THE RESEARCHER

I, Thanduxolo Fana declare that I have explained the information contained (given) in this document to the research subject or participant. I have encouraged and gave him or her ample time to ask me any questions with regard to the above. This conversation was conducted in English and Xhosa and no translator was used.

............................................
Signature of the researcher

............................................
Date
Annexure D  QUESTIONNAIRE

SECTION A: BIOGRAPHICAL – INFORMATION

Please answer all the questions by ticking in the appropriate box

1. Gender
   
   Male   Female

2. Age
   
   18 - 30   31 - 40   41 - 50   51 - 60

3. Racial group
   
   African   Coloured   White   Other

4. Home language
   
   Xhosa   Afrikaans   English   Other

5. Are you currently employed?
   
   Yes   No

6. What is your highest educational qualification?
   
   Primary   High school   Diploma/Degree   Honours   Masters

7. How long have you stayed in this area?
   
   0 to 5 years   More than 5 to 10 years   More than 10 to 15 years   More than 15 to 20 years
### SECTION B: DRUG RESISTANT TB AND HIV AND AIDS KNOWLEDGE

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<th>Uncertain</th>
<th>False</th>
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<tr>
<td>2. The spread of DR TB can be minimised by avoiding or minimizing close contact with the infected person</td>
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<tr>
<td>3. Opening of windows and minimization of close contact with known HIV positive people and children are DR TB infection control measures</td>
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<td>4. Abstaining and practising safe sex can reduce spread of HIV and AIDS</td>
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<td>5. An expensive vaccine is available to prevent HIV and AIDS</td>
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<table>
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<th>Uncertain</th>
<th>False</th>
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<tr>
<td>2. TB is spread through the air by coughing or sneezing</td>
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<td>3. An HIV positive person can pass the HIV virus to others people even though he or she may not have symptoms</td>
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<td>4. People from all races can be infected with HIV and AIDS.</td>
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<td>5. HIV positive people are at high risk of being infected with TB</td>
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<td>6. Only poor people get infected with TB and HIV and AIDS</td>
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<td>7. HIV positive people have more chances of developing TB than those who are HIV negative</td>
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<tr>
<td>1. HIV and AIDS can be managed by taking antiretroviral drugs</td>
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<td>3. Antiretroviral drugs helps by reducing viral load</td>
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<td>4. Antiretroviral drugs helps to increase CD 4 count</td>
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<td>5. TB can be cured by taking the prescribed medication</td>
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<td>6. It takes long and cost more to treat MDR TB than normal TB</td>
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<td>7. Drug resistant TB is caused by interruption in TB treatment</td>
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<td>8. TB treatment outcomes are assessed through sputum test</td>
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<td>9. XDR TB has no cure</td>
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<td>10. Drug Resistant TB treatment is free at designated health centres</td>
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<td>11. HIV and AIDS makes the body so weak that it cannot fight diseases</td>
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<td>12. People who are infected with HIV and AIDS can be easily identified</td>
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<td>13. TB is diagnosed through sputum test</td>
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**THANK YOU FOR TAKING TIME TO PARTICIPATE IN THIS STUDY**

**RESEARCHER: MR THANDUXOLO FANA**