

**Perceived strategies to minimise the development of new Tuberculosis cases  
at Collins Chabane Municipality, Vhembe District**

**By**

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**A mini dissertation submitted in partial fulfilment for the degree: Master of Public Health  
(MPH) at the University of Venda.**

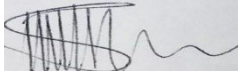
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## Declaration

I, Madzinga Debra (student no. 11593954), hereby declare that the proposal titled: “**Perceived strategies to minimise the development of new Tuberculosis cases in Collins Chabane Municipality, Vhembe District**” hereby submitted by me, has not been submitted previously for a degree at this or any other University, that it is my own work in design and in execution, and that all references material contained therein has been duly acknowledged.

Signature



Date: 17/02/2022

## Dedications

This mini dissertation is dedicated to my mother Mrs Madzinga R.B, my children Ngwana Muhuliseni and Ngwana Zamah, all my siblings and my husband Mr Ngwana V.

## **Acknowledgement**

Firstly, I would like to thank God for granting me knowledge and wisdom to carry out this project.

Thanks to Prof Tshitangano TG and Dr Raliphaswa NS for their patience and assistance in the whole project.

I would also like to thank the Department of health for giving me permission to conduct my study in the selected health facilities that are in Vhembe District.

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I would also like to thank my mother Mrs Madzinga RB for giving me psychological support when it was due.

## List of acronyms and abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BCG	Bacillus Calmette Guerin
BMI	Body Mass Index
DOT	Direct Observed Treatment
DHB	District Health Barometer
GUV	Germicidal Ultraviolet Light
HIV	Human Immune Deficiency Virus
IPT	Isoniazid Prophylactic Therapy
NSP	National Strategic Plan
SDG	Sustainable Development Goal
TB	Tuberculosis
UNAIDS	United Nations Programme on HIV and AIDS
WHO	World Health Organisation

## Abstract

Tuberculosis remains the world's most deadly infectious disease claiming more than a million lives each year and affecting millions more, with enormous impacts on families and communities. In 2019 alone, about 10 million new cases of tuberculosis infection were recorded globally. Of these new cases, South Africa contributed 322 000, with 78 000 deaths attributed to tuberculosis. Many factors are associated with the development of new tuberculosis infection cases. The aim of this study was to investigate the perceived strategies to deal with such factors so as to minimise the development of new tuberculosis cases. The study was conducted in the Collins Chabane Municipality. The Qualitative exploratory design was adopted to conduct this study. Multi-staging sampling techniques was followed to choose facilities and participants for this study. A sample of 20 patients, with a confirmed tuberculosis diagnosis, who are on treatment and 20 health care workers trained on tuberculosis management, was selected to participate in this study using non-probability purposive sampling method. Individual interviews were conducted to collect data. Data was thematically analysed. Guba and Lincon's criteria were used to ensure trustworthiness of the study findings. The ethical issues considered permission to conduct a study, informed consent, voluntary participation, confidentiality and anonymity. factors contribute to the development of new TB cases namely, Social factors (in the form of overcrowding, smocking and imprisonment), Biological factors (in the form of delay in seeking health intervention and undernutrition), and Health system factors (in the form of poor household contact training). With regard to the perceived strategies to minimise the development of new TB cases, the study discovered that triage, cough etiquette and reduction in TB diagnosis delay (administrative control); use of germicidal ultraviolet lights and good ventilation (environmental control); and training healthcare workers on respiratory measures (respiratory control) are perceived to be the strategies helping Collins Chabane to minimise the development of new TB cases. The determinants of TB disease need to be tackled through intersectoral collaboration.

**Keywords:** minimise, new TB cases, perceived, strategies.

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## CHAPTER 1

### INTRODUCTION AND BACKGROUND OF THE STUDY

#### 1.1 Introduction

Tuberculosis (TB) is an airborne disease, which is caused by the *bacillus mycobacterium tuberculosis*. In most cases it affects the lungs, but it can also affect other parts of the body (extra pulmonary TB). TB is transmitted from one person to the other when a person infected with TB coughs, sneezes or spits as they propel the TB germs into the air. According to the World Health Organisation [WHO] (2018), a person needs to inhale only a few of these germs to become infected. This section will outline the background of the study, rationale of the study, purpose of the study, significance of the study and study objectives.

#### 1.2. Background

TB remains a global health concern. In 2019, the number of TB new cases were 10, 0 million (WHO 2020). Most of the cases that occurred in 2017 were in the WHO South East Region at 44%, WHO African Region, at 25% and the WHO Western Pacific Region, at 18% (Kanabus, 2018). A smaller proportion of new TB cases occurred in the WHO Eastern Mediterranean Region, at 7, 7%; the WHO Region of the Americas 2.8% and the WHO European Region, at 2.7% (Kannabus, 2018). Since 2017 the European Region has had a decline in TB incidence rate of 4, 75 per year. The TB mortality rate also fell at a rate of 59% in the region.

Though the global incidence of TB is falling at a rate of 2% per year, there is a need to accelerate the rate to 4-5% per year, in order to reach the END TB STRATEGY targets namely, to reduce TB mortality by 90% and reduce the incidence of TB by 80% in 2030 (WHO, 2016). According to Branigan (2019), the European Region constitutes 2, 8% to the global incidence rate of TB. In 2017, the European Region had about 275 000 new cases of TB. Since 2017 the European Region has had a decline in TB incidence rate of 4, 75 per year. The TB mortality rate also fell at a rate of 59% in the region.

Africa is one of the regions with the highest burden of TB. In 2017 alone, the African Region had about 237/100 000 population. This region had 12 million people who died from TB. The African Region is the slowest in reducing the mortality rate, which was only 1.7% in 2017, compared to other Regions (WHO, 2018). According to WHO (2018), around 322 000 people fell ill with TB in South Africa in 2017. Though there was a decline in the number of incidences

when compared to the year 2011, in which the country had 500 000 cases, it is estimated that South Africa had 78 000 deaths, caused by TB, of which 22 000 were those who died from TB with a negative HIV status and 58 000 people died of HIV and TB co-infection (Kannabus, 2018). About 80% of the population who have latent TB in South Africa are aged 30 to 39 years (Kanabus, 2018). South Africa is one of the 30 highest TB burden countries and one of the 8 countries that account for two thirds of the new TB cases (Kannabus, 2018).

According to the District Health Barometer (2017/2018), Limpopo had 300, 7/100 000 incidences of TB in 2017. Furthermore, Limpopo Province had a death rate of 11,9% in 2017. A possibility of some discrepancies in the estimated incidence of TB exists, because the screening of TB was at 56% in 2017, which may mean that there are some people who are still not undiagnosed with TB because they were not screened for TB (District Health Barometer, 2017/2018). Vhembe District had 986 new TB cases in 2018, which was an increase compared to 2017, where the new TB cases numbered 666 (District Health Information System, 2019).

About one-third of the world's population has latent TB, which means people who have been infected with the TB bacteria have a 10% lifetime risk of falling ill with TB. People living with Human Immune Virus, or people who use tobacco and people working in health care settings have a much higher risk of falling ill (Rena,2018). The WHO (2018) asserts that when a person develops active TB (disease), the symptoms (cough, fever, night sweats, weight loss etc.) may be mild for many months. This can lead to delays in seeking care, and results in transmission of the bacteria to others.

According to WHO (2018), people ill with TB can infect up to 10-15 other people through close contact over the course of a year. Without proper treatment, up to two thirds of people ill with TB will die. The vast majority of TB cases can be cured when medicines are provided and taken properly. People infected by TB bacteria but who are not yet ill with the disease cannot transmit the disease.

In response to the global TB burden, the World Health Organisation provides leadership on matters critical to TB by developing evidence-based policies, monitoring the global TB situation and measuring progress in TB care, control, and financing and shaping the TB research agenda and stimulating the production, translation and dissemination of valuable knowledge.

The European region indicated that proper and fast diagnosis of TB is essential because when patients are diagnosed earlier, they can start with treatment earlier which may lead to reduction in transmission of the bacteria. The region also indicated that in order to eradicate TB, it is

important to have capacity at country level to rapidly detect drug resistance TB before it can be transmitted to other people (Who, 2019).

According to Aneke (2018), in order to reduce TB infections in Nigeria, the following were said to be the most important things to be done, namely eliminating poverty, malnutrition and improving the socioeconomic status of patients, good housing to prevent overcrowding and ensure free air circulating with natural solar UV exposure, good occupational health policy in various working places and support from both government and NGO's towards expansion and application of the directly observed treatment short course strategy. Smear positive patients receive treatment as soon as possible in order to control transmission to the next person. Use of masks and any other oral protectors is a common thing in hospitals which admits multi drug resistance patients. HIV positive individuals both adults and children are receiving isoniazid drug to prevent active TB.

South Africa introduced the GeneXpert testing machine, which diagnoses TB and issue results within few hours making, it easy to detect TB earlier and therefore initiate treatment when necessary. This also assist in reduction of transmission because if people are initiated on treatment earlier, they can't transmit the bacteria to other people. HIV positive individuals are to be started on IPT therapy for a period of 6-9 months (Kannabus, 2018).

In response to the TB burden, South Africa developed the National Tuberculosis Guideline in 2014, in order to reduce TB incidences, since TB is one of the drivers of the morbidity and mortality rate in South Africa. The guideline was developed to guide health care workers who are managing TB patients on how to screen patients for TB, initiate treatment for all types of TB, retain patients on treatment until they completed their treatment and prevent TB amongst people who are living with HIV and AIDS. In addition, the South African National Infection Prevention and Control Policy & Strategy was developed in 2007 as a guide to the South African health care system, in a joint effort to prevent and control infectious diseases in health care systems.

### **1.3. Problem statement**

Despite the national consolidated TB guidelines of 2014, the number of new TB cases is still increasing at the Collins Chabane Municipality with 129 new TB cases recorded in 2017 (District Health Barometer 2019). In 2018, Collins Chabane Municipality had 192 cases of TB, which shows an increase, compared to 2017. (District Health Information System 2019). These number of cases shows that the municipality is still behind in reaching the END TB STRATEGY target which is to reduce the mortality rate by 90% and reduce the incidence rate by 80% by

2030. This is because there is no reduction in the development of new TB cases. According to WHO (2018), if one person is infected with TB, he/she can transmit the bacteria to 10-15 people who are in close contact with him/her. The Collins Chabane Municipality will not reach the target set by the END TB STRATEGY if the municipality still has this huge number of TB cases. Therefore, the researcher saw a need to conduct this research on the perceived strategies for minimising the development of new TB cases at the Collins Chabane Municipality, Vhembe District.

#### **1.4 Rationale of the study**

There are many studies which have been conducted in Vhembe District on TB for example, Sukumani (2012) focused on the experiences of family members caring for TB patients at home in Vhembe District; Tshitangano (2013) focused on the environmental TB control measures at resource-limited hospitals in Vhembe District, while Tshitangano (2015) focused on factors that influence health care workers; implementation of ineffective tuberculosis control measures. However, there is no study that was found focusing on perceived strategies for minimising the development of new TB cases in Vhembe District.

#### **1.5 Significance of the study**

The findings of the study may help Policy makers in reviewing the existing infection prevention and control policy and come up with revised policies. The findings may also assist the Department of Health strengthening health talks. The results of the study may also assist health care workers in acquiring knowledge on how they can prevent the transmission of TB in health care settings. The findings of the study may assist the b community in acquiring knowledge on how TB can be transmitted and how they can prevent the transmission of TB.

#### **1.6. PURPOSE OF THE STUDY**

To investigate the perceived strategies to minimise the development of new TB cases in the Collins Chabane Municipality.

### 1.7. Research questions

- What are the perceived factors contributing to new TB cases in the Collins Chabane Municipality?.
- What are perceived strategies for minimising the development of new TB cases in the Collins Chabane Municipality?

### 1.8. Objectives of the study

- To explore the perceived factors contributing to new TB cases in the Collins Chabane Municipality.
- To describe the perceived strategies for minimising the development of new TB cases in the Collins Chabane Municipality.

### 1.9. Definition of concepts

**Strategies** mean measures of effectively implementing existing health promotion and disease prevention interventions (Rubens 2015). In the current study a strategy is the overall plan of minimising development of new TB infection.

**Minimise** means the disease prevention aim to minimize the burden of disease and its associated risk factors (WHO, 2015). In the current study minimising means reducing the incidence or the number of new TB cases.

**New TB cases** means a definite TB on a full course of TB treatment (WHO, 2010). In the current, new TB cases means all individuals with a confirmed diagnosis of TB who are currently on treatment.

**Perception** involves the way one sees the world (Macdonald,2011). In the current study, perception means individuals' opinion on how TB can be prevented and how the development of new TB can be minimized.

### 1.10. Summary

This chapter discussed the introduction and background, problem statement, rationale, significance, research question and objectives. The chapter to follow focuses on the literature search in detail.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1. Introduction

Literature review is a critical summary of research on a topic of interest, often prepared to put a research problem in context (Polit & Beck 2016). This section discuss the findings of different studies in relation to the objectives of the study.

#### 2.2. Programmes that are currently being implemented globally as a way of minimising the development of tuberculosis.

##### 2.2.1. *The global end TB strategy*

The END TB STRATEGY was adopted by the World Health Organisation in 2015 and has an overall goal of ending the global TB epidemics. The strategy has developed the milestones for 2025, which is 75% reduction in TB death, 50% reduction in TB incidence rate and no affected families facing catastrophic costs due to TB. The strategy has targets sets for 2035, which is 95% reduction in mortality rate, 90% reduction in TB incidence and no affected families facing catastrophic costs due to TB. The END TB STRATEGY is aligned with the SUSTAINABLE DEVELOPMENT Goals. The following sustainable development targets are aligned with the END TB STRATEGY:

- SDG 1 which says end poverty in all its forms everywhere;
- SDG 2 which says end hunger, achieve food security and improved nutrition and promote sustainable agriculture;
- SDG 3, which says ensure healthy lives and promote well-being for all at all ages;
- SDG 5 which says achieve gender quality and empower all women and girls;
- SDG 7 says ensure access to affordable, reliable, sustainable and modern energy for all;
- SDG 8 says promote inclusive and sustainable economic growth, employment and decent work for all;
- SDG 10 says reduce inequality within and among countries; and
- SDG 11 which says make cities and human settlements inclusive, safe, resilient and sustainable.

In order to reach the targets sets for 2035, the END TB STRATEGY has pillars which are supposed to be followed, namely



## **Pillar 1 integrated, patient-centred care and prevention**

The following are entailed in this pillar:

### ***A. Early diagnosis of tuberculosis including Universal drug susceptibility testing and system screening of contacts and high-risk groups where,***

Health education should be provided in all individual so that they may know the signs and symptoms Of TB so that when experiencing the signs and symptoms of TB they may visit the nearest health facility for TB screening. Patients with negative bacteriology and the signs and symptoms that persist should be screened for TB by radiography. Radiography is also essential in screening for extra pulmonary TB.

Treatment of all people with tuberculosis including drug resistant TB and patient support.

All forms of drug susceptible TB must be treated. TB strategy aim to ensure adequate treatment of TB for all types of TB and all ages.

Preventive treatment of persons at high risk and vaccination against TB.

Expand preventive treatment of people with high risk of TB. Tuberculin skin test is essential in diagnosing Latent TB, though it can't indicate whether a person will develop active TB or not. Isoniazid therapy is recommended in treating latent TB and also effective in children who are exposed to a TB case.

Continue BCG vaccination because it prevents disseminated diseases including TB, which are associated with high mortality infants and young children.

## **Pillar 2: Bold policies and supportive system The**

following are entailed in this pillar:

***A. Political commitment with adequate resources for TB care and prevention where,*** Countries are expected to:

1. Develop national strategic plans because sustainable interventions for TB care and prevention require high level political commitment along with adequate financial and human resources. A national strategic plan should have 5 distinct sub plans: a core plan, a budget plan, a monitoring and evaluation plan, an operational plan and a technical assistance plan.

2. Mobilize adequate resources because expansion of TB care and prevention across and beyond the health sectors will be possible only if adequate funding is provided.

*B. Engagement of communities, civil society organizations and all public and private care providers with the belief is that*

Involving the communities and society organizations is crucial in ending the TB epidemics. Informing communities about the signs and symptoms of TB may help in reducing the incidence of TB because if they know the signs and symptoms, they will refer anyone who might be having the signs and symptoms of TB. Early referrals in health facilities assist in early detection of the TB infection.

*B. Social protection, poverty alleviation and actions on other determinants of TB*

Relieve the economic burden related with TB. A large proportion of people with TB face a catastrophic economic burden related to the direct and indirect costs of illness and health care. Social consequences may include stigma, isolation, and loss of employment or divorce.

Address poverty and related risks-poverty is a major risk factor for developing TB. Poverty results in overcrowding and poor ventilation, under-nutrition and poor working conditions. Tackling poverty may assist in reducing the development of new TB infections and also help in reducing the transmission of TB infection.

### **Pillar 3: Intensified research and innovation**

*A. Discovery development and rapid uptake of new tools, interventions and strategies.*

Develop a point of care rapid diagnostic test for TB-Despite different diagnostic approaches that are in place, a research is needed in transforming the existing diagnostic approaches into robust, accurate and affordable point of care platforms.

Develop new drugs and regimens for the treatment of all forms of TB-Research is needed so that new drugs can be developed, and the drugs should have short duration of TB treatment.

#### **2.2.2. Increase BCG vaccination uptake**

BCG is said to be vital in preventing TB infection in children. According to the Department of Health in England, BCG is given to certain populations like populations of areas with high incidence of TB or an assessment of individuals at risk. Strengthening of BCG vaccinations in

infants and individuals at risk should be done as an ongoing process. Improving BCG uptake include identifying individuals who are at risk of developing TB and offer a shot to them.

### **2.2.3. Ensure comprehensive contact tracing.**

Ensure comprehensive contact means tracing all people who are exposed to an active TB case. It is essential for early diagnosis of active TB and early treatment initiation which reduces transmission of the bacteria. TB contact strengthening need to be done through the help of community health workers who can do door to door visit to patients diagnosed with TB to see if they have households contacts or not.

### **2.2.4. Systematically implement new entrant latent TB in England**

Majority of patients who are having active TB had latent TB infection. Latent TB infection progress to active TB if a person is immune compromised. The treatment of latent TB is essential in decreasing TB infections. Latent TB screening is supposed to be done to all individuals who enters England coming from sub-Saharan Africa or any country with high incidence of TB and those who arrived to the England in the past five years should be screened also. The England government recommends that authorities need to work together in raising awareness of latent TB. A policy about latent TB screening should be implemented in highrisk populations like people who are immune compromised.

### **2.2.5. Tackle TB in underserved populations**

People in underserved communities have lots of diseases that are not screened or treated. Incidences of TB increases in people who lives in areas that are hard to reach but they are not screened, diagnosed and treated. Lack of treatment results in high chances of transmitting the TB infection to close contacts. The England government has emphasised that commissioners and service providers should follow people living in hard-to-reach areas for screening, diagnosis and treatment. Ensuring that illegal migrants are supported to complete the treatment is also essential in England. Homeless people who are infected with TB should be provided with shelter on the duration of their treatment. Patients with TB infections in prisons and immigration centres should be identified and provided with care and treatment they need.

### **2.2.6. 90-90-90 Strategy for TB (Kannabus 2018)**

The global plan is about improving the reach and quality of medical treatment for TB. The global plan to end TB has come up with the targets which need to be reached in 2025.

*Target number 1: Reach 90% of all people with TB.*

This involves screening of 90% of people to ensure early diagnosis and initiation of treatment to 90% of people with TB. It also requires the preventative treatment is provided to 90% of those who require it. Preventative therapy means treatment of latent TB to prevent disease progression to active TB.

*Target number 2: As part of this approach reach at least 90% of the key populations.*

The purpose of this goal is to provide treatment and care through affordable programmes that protect patients and their families from the catastrophic costs associated with TB. Key population refers to individuals at risk and individuals in hard-to-reach areas. The global plan recommend that each national TB programme should work with communities affected by the burden of TB to define its key populations, to plan and implement appropriate services and to measure progress towards reaching these populations.

*Target number 3: Achieve at least 90% treatment success for all people diagnosed with TB.*

The correct treatment should be provided to individuals infected with TB. Individuals with TB and are taking treatment needs to be supported so that they may complete their treatment with good outcomes.

### **2.2.7. National strategic plans in South Africa (Kanabus, 2018)**

The overall goal of National Strategic Plan (NSP) is to end the HIV, TB and STI'S epidemics by 2030. The key populations for eliminating TB, HIV and STI burden is people living with HIV, health workers, prisoners, miners, pregnant women, household contacts of TB patients and children below 5 years of age. The NSP has two specific objectives, which are:

Reducing new TB infections-The NSP target is to reduce the TB incidence by 30% from 450 000 in 2015 to 315 000 in 2022. According to NSP, HIV positive population constitutes 63% of new TB incidence.

Reducing morbidity and mortality from TB by providing treatment, care and adherence support for all. Many people have delayed diagnosis because they delay in seeking medical attention which also results in delayed treatment initiation. Some people have difficulty in completing treatment and they end up being the lost to follow. Lowering the number of lost to follow is also important in reaching the targets sets for 2022.

### **2.3. Factors contributing to the development of tuberculosis.**

These factors include socio demographic, health system and biological factors as detailed below.

#### **2.3.1 Socio demographic factors contributing to development of TB smoking**

Khaliq et al (2015) revealed that active smoking was found to significantly increase the risk of infection. He revealed that active and passive smoking changes the structural and immunological host defence system, which increases the risk of the infection. Smoking weakens the immune system thereby making it easier for the TB bacteria to invade the human body. Zerihun (2014) in a study conducted in Ethiopia also supports the findings of Khaliq by indicating that smoking is a significant factor which contribute to development of TB. Sola et el (2016)found that 1,3 million people who consume tobacco live in underdeveloped/developing countries where the TB rates are also higher. The role that smoking cigarette plays in the pathogenesis of TB is related to ciliary dysfunction to a reduced immune response. The greatest impact of smoking in terms of public health issues related to infection is probably the increase in risk of TB.

#### *Alcohol consumption*

Imtiaz et al (2017), Alcohol consumption was also estimated to have caused 169 721 TB death. Liberia, Angola, South Africa, Lesotho, Namibia and Nigeria and all other countries that belong to the Africa Region were the countries that had tuberculosis mortality rate which was five times higher than the global average. According to Mario & Vladimir (2017), relationship between alcohol consumption and TB was established. Denise et el (2018) also discovered that approximately 10% of all TB cases are attributable to alcohol use. Alcohol use leads to development of TB and also affect the treatment outcome of TB medication.

### *Overcrowding*

Khaliq (2015) revealed that in poorly leaving conditions such as closed house types, houses with few windows or rooms and houses that were built with poor materials such as houses built on mud than houses that was built on cement are at risk of developing TB. The risk of TB infection was believed to increase in people living in a setting of increased number of people living in a small size of the house. Risk of TB transmission was observed to have increased with people using biofuels were used as cooking source as compared to people who use electric stoves for cooking (Khaliq 2015). UNAIDS (2018) support the findings of Khaliq, which says overcrowding is a factor leading to development of TB. If people stay in a house which have small number of rooms, if one person develop TB, he/she can transmit the TB bacteria to their close contact (UNAIDS, 2018).

### *TB in prisoners*

UNAIDS (2018) indicated that lack of sunlight, overcrowding, and poor ventilation in prisons facilitates fast transmission of TB infections in closed settings. Individuals in prisons sometimes don't get the correct nutrition, which may assist in strengthening immune system thereby reducing the chances of being infected with TB. The incidence of TB in prisons is 20 times higher than in communities. Prisons also have large numbers of people who are HIV infected, which expose them to TB. Zeruhin (2014) indicated that long stay in prisons may lead to the development of TB because prisons are overcrowded and have poor ventilation. Kompala et al (2013) also indicated that prisoners and prison staff suffer extremely high burden of TB worldwide. According to Kompala et al (2013), prison setting makes it easier for the TB bacteria to spread due to poor ventilation and overcrowding.

### *Gender*

According to UNAIDS (2018), gender related factors that fuel TB and HIV risk and the create carries to services assume many forms. Overall men face a higher risk of developing TB than women and men are more likely than women to die of TB. The male specific risk factors are related specially to work in high risk setting such as mining or blasting with exposure to dust and to economic migration, which also increases the risk of treatment interruption. The use of tobacco alcohol and drugs and poor health seeking behaviours are also associated with high risk of TB infection. Men are less likely to have their TB detected and reported compared to women. Women may have limited access to TB services than men, due to domestic

responsibilities or if they have to seek permission from male family members to attend health care services or if their health is considered less important than that of male family friends. Study done by Khaliq (2015) gender was found to have be associated with increasing risk of TB infection.

### **2.3.2. Health system factors that contribute to the development of new TB cases**

Health care workers who spend more than eight hours with patients who are diagnosed with TB are at risk of contracting TB (Carrie & Martie, 2016). Carrie & Martie, 2016 said that, duration of time spent with patients who are infected with TB is one of the risk factors of developing active TB for health care workers. The study also revealed that health care workers have high incidence of TB compared to the general population where the study was conducted. According to UNAIDS (2018), health care workers have great risk of developing TB than the general population. Health workers who are HIV positive and spent quality time with patients who are infected with TB are susceptible to developing TB. Tshitangano (2014) indicated that poor isolation of patients who are infected with TB may contribute to transmission of TB to other patients admitted within the same ward with the patients who have confirmed TB. Kompala et el (2013) indicated that some hospitals may also results in transmission of TB bacteria because they are poorly ventilated, whereas some hospitals serve a large population, resulting in overcrowding of the hospital. Overcrowding is said to be one the reasons TB can be easily transmitted. Health care workers can also develop TB due to prolonged stay with the patients who are diagnosed with TB (Kompala, 2013). Poor infection control plays a major role in transmitting TB bacteria and end up in causing new TB infection. Patients who are diagnosed with TB and are not separated from patients who are not having TB may transmit the bacteria to other patients with poor immune system. If a TB patient is not utilising mask, he/she may transmit the TB bacteria to other patients. Health workers may also get the TB bacteria from patients if he/she is not using the required mask (Kompala, 2013)

### **2.3.3. Biological factors that contribute to the development of new TB cases.**

#### *HIV and AIDS*

People living with HIV are at greater (21 times) risk of developing TB than the rest of the population. In support of this notion, Khaliq (2015), indicated that HIV is the strongest independent risk factor for active TB disease. HIV positive people who are having latent TB infection are 30 times at risk of developing active TB compared with people without HIV

infection. In support of this notion, Carrie & Martie (2016) discovered that HIV is the risk factor of TB disease especially in person with latent TB. TB outcomes of people with HIV infections is worse than the TB outcomes of people who are not infected with HIV (UNAIDS 2018).

Pregnant women who are HIV positive are 10 times more likely to develop TB disease than women who are not pregnant but don't have HIV and have poor TB outcomes. Pregnant women who are HIV positive and develop TB they have greater risk of maternal mortality (UNAIDS 2018).

### *Diabetes mellitus*

People co-infected with diabetes or other immune compromised respiratory infectious disease are at a higher risk of the TB disease. Studies reveals that there is association between diabetes and tuberculosis and indicate that people with diabetes are 2, 5 times more likely to develop TB particularly in underdeveloped / developing countries (Khaliq 2015).

According to WHO (2016), in 2014 About 15% of people who were infected with TB in 2014 were suffering from diabetes globally. People with immune compromised conditions are more likely to move from latent TB to active TB. Diabetic patients have triple risk of developing TB.

### *Malnutrition*

Khaliq et al (2015) found malnutrition to be another risk factor for TB. The disease progression increases rapidly in malnourished people. These findings were also supported by the UNAIDS (2018) which said protein energy malnutrition and micronutrient deficiency increases the risk of developing TB. If poverty and food insecurities co-exist, TB development become a threat and if a person with malnutrition happen to develop TB, treatment outcomes is delayed than in well-nourished individuals. UNAIDS (2018) also indicated that HIV positive individuals who are undernourished have greater chances of being infected with TB. According to Philips (2017), people who are not well nourished and living in poorly ventilated houses with someone who is having TB infection were found to be having 10-year risk of TB approaching one in three.

### *Silicosis*

Silicosis is an occupational lung disease caused by inhaling silicon dioxide in crystalline forms such as miners. Silica impairs the alveolar macrophages, thus weakening the lung's defence



mechanism against mycobacterium tuberculosis. Miners living with HIV have fivefold chances of developing active TB than miners who are HIV negative. HIV and silicosis exposes miners in TB infections. Exposure to dust on daily basis exposes miners to TB infections. Most of the miners are individuals who comes from remote areas and can't even lodge a complaint about the working conditions therefore exposure in poor working conditions exposes miners in TB infections (UNAIDS 2018).

## **2.4. Perceived strategies for minimising the development of new TB infections**

### *2.4.1. Administrative control*

According to Paul and Allyn (2018), administrative controls are applicable to healthcare settings. In health care setting, one healthcare worker should be assigned for infection control of TB responsible for the following:

Development and implementation of infection control policy, which ensure early detection, initiating treatment and continue ongoing enforcement of the policy.

Ensure disinfection of equipment on daily basis.

Advice health workers on the HIV screening so that if they test positive for HIV will have limited contact with patients who are infected with TB.

Patients who are infected with TB should be isolated from patients with immune compromised immune system.

Continue isolation of TB patients who are highly infectious until they are no longer infectious. Patients with TB should be taught about the coughing etiquette and the use of a tissue when coughing and throw it in a bin.

Patients with TB should be offered a surgical mask to avoid cross infection to the other.

Also support that administrative measures should be followed in preventing TB transmission or control which involves triaging people with TB infections, separating infectious patients and minimize time spent in healthcare facilities. Kanabus (2018) also indicated that a package of prevention and care intervention for health care workers need to be provided. The package must include HIV prevention, ARV'S isoniazid prevention therapy for HIV positive health care workers.

Kyung (2017), Patients needs to triage in all healthcare settings so that people who are TB suspects will be separated from other TB patients.

Patients with drug resistant TB should be separated from patients who are not having TB and from those with TB which is drug sensitive.

#### *2.4.2. Environmental control*

Environmental strategies consist of measures that prevent the spread and reduce the concentration of infectious droplets nuclei in ambient air (Paul & Allyn, 2018). Thus, health facilities should have separate rooms which are meant for TB patients. Proper ventilation is essential in healthcare settings for preventing the transmission of TB and other airborne infections whilst patients are in waiting rooms, sputum collection areas. Ultraviolet germicidal irradiation should be used in clinical setting. Primary environmental control includes controlling the source of infection by using local exhaust ventilation. It involves diluting and removing the contaminated air by using general ventilation. Secondary environmental controls involve controlling the airflow to prevent contaminated air in areas adjacent to the airborne source (Kanabus, 2018). Kompala et al (2013), also supports that UV light fixtures that disinfect a patient's space have long been considered an infection control tool. UV light irradiation presents an opportunity to sanitise sizeable air volumes with large potential benefit for little cost.

#### *2.4.3. Respiratory control care*

Use of N95 mask by health care professionals is essential in preventing TB transmission and use of surgical mask by patients is essential in reducing the number of infectious particles. Kanabus (2018) indicated that training health care workers on correct use of respiratory mask is important in addressing TB transmission. Patients need to be taught about the coughing etiquette procedure and use of tissues when coughing and throwing the used tissues in the bin. Paul (2018) also indicated that all health care professionals should wear N95 mask when caring for TB patients because N95 mask filters >95% of particles than surgical spirit which only filter 50% particles, therefore surgical mask should not be used by health care professionals in place of N95 mask. Kompala et al (2013) indicated that respirators are essential for minimising transmission of TB. The use of respirators worn by patients may help in reducing transmission in health care setting.

## 2.5. Summary

This chapter has covered the global programmes that are being implemented to minimise the development of TB. It has covered the factors that contribute to the development of TB and the strategies to minimise the development of TB. Chapter 3 focused on the research methodology adopted in this study including its design, sampling, data collection and management.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1. Introduction

This section outlined the following: study design, study setting, study population and sampling, measurement instrument, pre-test. In addition, trustworthiness, plans for data collection, plans for data analysis, ethical considerations, limitations of the study and plans for dissemination of results.

#### 3.2. Research approach and design

A research design is the overall plan for obtaining answers to the research question (Nettina, 2012). A study design refers to the overall plan for addressing a research question, including specifications for enhancing the study's integrity. The qualitative approach was adopted in this study to investigate the perceived strategies for minimising the development of new TB cases at the Collins Chabane Local Municipality. A qualitative approach refers to the investigation of a phenomena, typically in an in-depth and holistic fashion, through the collection of rich narrative materials using a flexible research design (Polit & Beck, 2017). The qualitative research was adopted because the researcher would like to explore the ideas of participants with regard to the research problem of which the ideas was used throughout process. The objectives of the study were to describe the perceived strategies for minimising the development of new TB cases, and to explore the factors contributing to the development of new TB cases. These objectives cannot be fulfilled using the quantitative approach because the quantitative approach only investigate the phenomena that lend themselves to precise measurement and quantification (Polit & Beck 2017). An exploratory design was used in this study to investigate the problem. An exploratory design is defined as a research used to investigate a problem which is not clearly defined. Exploratory design is used where the researcher seeks to have a better understanding o f a problem.

#### 3.3. Study setting

Study setting refers to a population set of persons or objects that possess some common characteristics that is of interest to the researcher (Brink, 2011). The setting of the study was Collins Chabane Municipality. Collins Chabane Municipality is one of the four local

municipalities in Vhembe District. Collins Chabane is situated on the eastern side of Vhembe district, bordered by Mopani District on the southern part and Kruger National Park, towards Mozambique. Poverty is one of the determinants of TB, some people are still living in poverty leading to overcrowding and poor ventilated living conditions thereby making them to be more prone to TB bacteria. Most of the people are unemployed. People around Collins Chabane live in formal houses. Farming is one of their daily duties. It has an estimated population of 91936 (Cogta, 2020). The economic sectors around Collins Chabane are agriculture, community services, transport and trade. The municipality consists of 6.8% of people who are graduates and has 91 936 households. About 78% of the people in the Collins Chabane live in formal household's dwellings and 22% live in informal houses (Cogta, 2020). The sub district has 30 fixed clinics, three community health centres, five mobile clinics and one district hospital. The local municipality is predominantly rural.

### 3.4. Study population

Brink, Van de Walt and Van Rensburg (2018), described population as the entire group of persons that meet the criteria that the researcher is interested to study. In the current study the population were all health care workers and all TB patients in the Collins Chabane Municipality.

#### 3.4.1. Target population

The target population of the study will be all patients with confirmed TB diagnoses and health care workers who are trained on TB management. The table below shows the details of the population.

**Table.1:** Population frame

Names of local areas	Number of clinics per local area	Number of patients with confirmed cases of TB	Number of health care workers trained on TB management	Number of health centres per local area
Bungeni	6	52	39	1
Tiyani	6	50	36	1
Mphambo	6	40	38	1
Mhinga	6	26	20	0
Shingwedzi	6	24	22	0

Total	30	192	155	3
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Source: DHIS 2018

### 3.4.2 Sampling procedure

A sample is a part or fraction of a whole, or a subset of a larger set, selected by the researcher to participate in a research study (Brink, et, al. 2018). In the current study, non-probability purposive sampling was used to select-participants of the study. Purposive sampling is a type of sampling in which the researcher selected participants based on personal judgement and about which one will be informative Brink, et, al, 2018). Purposive sampling was selected because the researcher wanted participants who were well informed about TB, as participants who are not well informed about TB will not provide in-depth information. Multi-staging technique were used because the study setting has several groups.

#### *Sampling of local areas*

Bungeni ,Mphambo and Tiyani local areas were purposively selected because they have high incidences of patients with confirmed TB cases in Collins Chabane Municipality.

#### *Sampling of clinics and health centres*

All three health centres were purposively selected to participate in the study because the health centres have many patients with TB cases which made it easy for the researcher to purposively select the participants who were included in the study.

In each local area, the four clinics with high percentage of TB cases as indicated in DHIS 2018 were purposively selected to participate in the study. From Mphambo local area mphambo health centre was purposively selected to form part of the study because it has high percentage of TB cases. From Bungeni local area, Bungeni health centre and Mashau clinic were purposively selected to participate in the study. From Tiyani local area,Masakona clinic ,Tshimbupfe clinic and Tiyani health centre were purposively selected to participate in the study because they have high rate of TB cases.

#### *Sampling of participants*

In each health centre, two participants with a confirmed case of TB were purposively selected to participate in the study. The researcher requested the DOT supporters or healthcare

workers to assist in selecting participants who can give information during interviews because they know the patients better than the researcher. Those participants were found in the clinics TB registers and were selected from the register. Two health care workers, who are focal persons or who are trained on TB management, were purposively selected to participate in the study based on their knowledge. The manager of the health facility was requested to assist in selecting health care workers who are trained on TB management and who are informative with regard to TB. This is because those who are trained in TB management can give detailed information than those who are not trained on TB management. In each clinic selected to be part of the study, two patients with a confirmed diagnosis of TB and two healthcare workers trained on TB management were selected to be part of the study.

#### *3.4.3. Sample size*

The study has twenty patients with a confirmed TB case and who are on treatment and twenty health care professionals who were trained on TB management; the sample size were determined by the number of health facilities within Collins Chabane Municipality. The study has 40 participants. However, the sample size was determined by data saturation.

#### *3.4.4 Criteria of inclusion*

Patients with confirmed diagnoses of TB who are aged of 18-65 years, as well as health care workers who have working experience on TB management and have exposure to the health facility, were included in the study. Both genders were included in the study.

### **3.5. Data collection method**

Data were collected using unstructured interviews. One central question was asked to all health care workers “*(what do you think could be done to reduce the risk of TB?)* and one central question will be asked to all participants with confirmed TB cases *(What do you think could be done to reduce TB?)*. Probing was guided by the participants response to the central question. The central question were developed in English and later translated to Tshivenda and Xitsonga.

### **3.6. Pre-test**

A pre-test is the trial administration of a newly developed instrument to identify problems (Polit & Beck 2017). In the current study pre-testing was conducted in clinics that are found in the Collins Chabane Municipality. A pre-test was conducted on four health care professionals who are trained on TB management and four patients who have a confirmed diagnosis of TB and are currently on treatment. The four participants that were included in the pre-test were not part of the main study. A pre-test was conducted so that the researcher can check if the central question is clear or not. The results of the pre-test helped the researcher in rephrasing the central question for clarity. Findings of a pre-test that were found to be useful in the study were included in the final results of the study.

### **3.7. Measures to ensure trustworthiness of study findings**

Trustworthiness will be ensured using the Lincoln and Guba's (1985) criteria

#### *3.7.1 Credibility*

Credibility refers to the confidence in the truth of the data and interpretations of them (Polit & Beck, 2017). Data collected were recorded in the tape recorder. The observation data that were collected were recorded in field notes. Member checking was done by giving participants a chance to look at the data that were captured to check if it reflects what the participants have said. The researcher achieved credibility by allocating one to one hour thirty minutes for collecting information about the perceived strategies to minimise the development of new TB cases at Collins Chabane district through individual interviews.

#### *3.7.2. Transferability*

Refers to the potential for extrapolation; that is, the extent to which findings can be transferred to or have applicability in other settings or groups (Polit & Beck 2017). The researcher ensured that the study findings apply to other settings, not only Collins Chabane. The researcher provided a thick description of the study findings so that the reader is able to apply the findings in other setting. The researcher provided information on how data was collected, the length of data collection sessions and the period of time over which data were accumulated. The study design, study setting and how data were analysed was outlined



### *3.7.3. Dependability*

Dependability refers to a thick description of the research method used in the study (Brink, et., al. 2018) The researcher described the research method and allow the supervisor to examine the process to ensure the research results are correlating with the collected data. Recordings that were used to record data during data collection was kept as evidence.

### *3.7.4. Conformability*

Conformability refers to the objectivity that is the potential for congruence between two or more independent people about data accuracy, relevance or meaning (Polit & Beck 2017). The researcher re-visited the field notes and the tape recorder to check if objectives of the study were met. A literature review were conducted to check if the findings of the study are supported by the literature.

## **3.8. Plans for data collection**

The clinic managers and health centres managers were visited to request a permission to conduct the study. Arrangements were made with the managers on the most convenient time for conducting interviews in the selected health facilities. Furthermore, the managers of the facilities were requested to give a list of those who are trained on TB management and the researcher was able to recruit participants based on the list. Patients with confirmed TB case and are on treatment were found on the TB register in the health facilities selected for the study.

The details on the information sheet was explained to health care workers on the same day in which the researcher met with the managers of the clinics to request permission to conduct a study to those who were available at the same time of requesting permission. Those health care workers who were requested to participate in the study and were not available, the researcher asked the manager to give her the day that they were available. The researcher went there and explain the details on the information sheet. Participants who agreed to participate in the study were requested to sign a consent form.

The researcher selected participants who are diagnosed with TB and are on treatment in the clinic TB register. The Direct observed therapy supporter of a patient was requested to help in locating the homes of patients with confirmed TB case who participated in the study. Participants were given a detailed explanation of the content on the information sheet, and they decided to participate in the study or not. Those who agreed to participate, were requested to sign the consent forms.

The researcher negotiated with the patients who have a confirmed diagnosis of TB on the most convenient time for interviews to be conducted. Individual interviews were conducted in the patients' home on the date that was agreed upon with the participants. Interviews with health care workers trained on TB management were conducted at the agreed time and date. Permission was requested from participants on the use of a tape recorder to record conversation of interviews and the information was captured correctly. Field notes were made to record the non-verbal cues that was observed during the interviews such as nodding and sighs. Field notes were also made on the conversations during the interviews and served as a back-up in case the tape recorder has distractions. Data were collected until saturated.

### **3.9. Data analysis and management**

The researcher listened to the voice recordings and transcribe them verbatim. The field notes was typed and saved. The researcher made backup copies of all data and kept it in a secure place under lock and key. Each participant was provided with a codename that was used throughout the study while discussing data to ensure anonymity. Data was analysed using thematic analysis, as suggested by Braun and Clarke (2013).

#### *3.9.1. Familiarising yourself with the data*

The researcher played back the tape recorder used for recording interviews several times and be familiarised with the data and data was transcribed. After the researcher was familiarised with the data, the researcher started to mark ideas for data coding. The researcher re-listened to the tape recorder against the transcribed notes, and determined the accuracy of the data.

#### *3.9.2. Generating initial codes*

The researcher coded the entire transcribed data manually. The researcher developed theme and then code the data according to the categories.

#### *3.9.3. Searching for ideas*

The different codes generated were sorted to develop themes. The researcher analysed the codes developed and try to categorise them to check if they can form themes.

#### *3.9.4. Reviewing themes*

The researcher checked each theme and align data to each theme and determine if the data correlates with the theme assigned to the data.

#### *3.9.5. Defining and naming themes*

The researcher defined the themes developed during the previous steps of data analysis and analyse data according to those themes. The researcher went back to the coded data and extracts information for each theme. Themes were named, and sub-themes were developed. Before writing the final report, the researcher allowed the supervisor to re-look the process of data analysis and check if it was done correctly.

#### *3.9.6. Producing the report*

The report will be written in mini dissertation form, and it will have themes and sub-themes.

### **3.10. Ethical considerations**

Ethics refers to a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligations to the study participants (Polit & Beck 2017). The following ethics was taken into account confidentiality, anonymity, informed consent and voluntary participation:

#### *3.10.1. Permission to conduct a study*

The proposal was presented to the Department of Public Health and the School Higher Degrees Committee for quality assessment. Proposal approval was obtained from the University Higher Degrees Committee. Ethical clearance was obtained from the University of Venda Research Ethics Committee. Permission to conduct the study in the clinics and community health centres was requested from the Limpopo provincial Department of Health.

#### *3.10.2. Informed consent*

Informed consent refers to an ethical principle that requires researchers to obtain the voluntary participation of subjects, after informing them of possible risks and benefits (Polit & Beck 2017). Informed consent was given in writing. An information sheet was provided so that

participants have a full description of the study and decide if they wanted to participate in the study or not. The information sheet was provided for participants in order for them to understand purpose of the study, the significance of the study. Participants was also informed of what is required from them. Participants was informed that they can withdraw from the study at any time even after signing the consent form and after commencement of data collection. The information sheet (appendix c) informed participants that there is no remuneration for participating in the study. Participants was also informed about the foreseeable risks if any. Those who agree to participate in a study, were given an informed consent (appendix d) form to sign.

### *3.10.3. Voluntary participation*

Before data collection, participants was informed that their participation is voluntarily and that they can withdraw at any time if they no longer want to participate in the study. An informed consent was signed by those who were willing to participate in the study.

### *3.10.4. Confidentiality*

Confidentiality refers to the protection of study participants, so that their identifying information is never publicly divulged (Burns & Grove 2017). Data collected were kept on the tape recorder and field notes, both of which were kept in a locked locker, for reference purposes. The tape recorder and field notes used for storing data was not made available to people who are not part of the study.

### *3.10.5. Anonymity*

This refers to not linking participants with the data (Burns & Grove 2017). In the current study anonymity was ensured by informing participants not to mention their names during the interviews, so that the information provided cannot be linked to them.

## **3.11. Plans for dissemination of results**

- A soft copy will be sent to the University of Venda library for future use.
- Research findings will be published on the Department of Health database and a hard copy will be sent to the Vhembe Department of Health.

- The study findings will also be published in peer reviewed journals
- The study findings will also be presented at conferences and workshops.

### **3.12. Summary**

The chapter discussed study design, study setting, study population and sampling, measurement instrument, pre-test. In addition, trustworthiness, plans for data collection, plans for data analysis, ethical considerations, limitations of the study and plans for dissemination of results were included. The next chapter will focused on the presentation of the study findings were emerged themes and sub-themes will be fully explained.

## CHAPTER 4

### PRESENTATION AND DISCUSSION OF STUDY FINDINGS

#### 4.1 Introduction

The main focus of the chapter is to present and discuss the study findings resulting from the analysis of qualitative data gathered from healthcare workers and people who were currently on TB treatment. Literature review was also done to support the findings of the study and compare the results with those that were accumulated on previous research. The purpose of the study was to investigate the perceived strategies to minimise the development of new TB cases in Collins Chabane Municipality, Vhembe district. The objectives of the study were to:

- Explore the perceived factors contributing to new TB cases in Collins Chabane Municipality, Vhembe district.
- Describe the perceived strategies for minimising the development the development of new TB cases in the Collins Chabane Municipality, Vhembe district.

#### 4.2 Study findings

A total of 16 healthcare workers trained on TB management were interviewed. One central question was asked to stimulate the interview. The central question was “what do you think can be done to reduce the risk of TB?” though other probing questions followed based on what participants were stating during the interview. Data was collected using unstructured interviews. A total of 12 patients who were currently on TB treatment during data collection were also interviewed. One central question was asked to commence the interview. The question was “what do you think could be done to reduce TB?” Data was collected using unstructured interviews as a data collection method.

##### 4.2.1 Profile of healthcare workers

This section outlines the biographical information of health care workers found in Collins Chabane Municipality which is situated in Vhembe District who are involved in the study. The biographical information of healthcare workers is presented in a table which have the age, gender, qualification, name of health facility and years of experience. The information will be presented in Table 2.

**Table 2: Biographical information of healthcare workers**

<b>Participants</b>	<b>Gender</b>	<b>Age</b>	<b>Rank</b>	<b>Level of education</b>	<b>Years of experience</b>
1	Female	45	Professional nurse	Degree	16
2	Female	52	Professional nurse	Degree	21
3	Female	41	Professional nurse	Diploma	15
4	Female	30	Professional nurse	Degree	06
5	Female	38	Enrolled nurse	Diploma	12
6	Female	27	Professional nurse	Degree	04
7	Female	54	Professional nurse	Diploma	24
8	Female	36	Enrolled nurse	Diploma	13
9	Male	40	Enrolled nurse	Diploma	15
10	Male	25	Professional nurse	Degree	04
11	Male	30	Professional nurse	Degree	09
12	Male	32	Professional nurse	Degree	11
13	Male	23	Professional nurse	Degree	02
14	Male	28	Professional nurse	Degree	07
15	Male	30	Professional nurse	Degree	09

16	Male	32	Professional nurse	Degree	11
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#### 4.2.2 Profile of TB patients who were on treatment during data collection.

This section outlines the biographical information of patients who were having TB during data collection and are situated in Collins Chabane Municipality, Vhembe district. The biographic information will be presented in a form of table which consist of age, gender, level of education, type of house and employment status. It is presented in table 3.

**Table 3: Biographic information of TB patients on treatment**

Participants	Gender	Age	Level of education	Type of house	Employment status
1	Male	42	Secondary level	Formal	Unemployed
2	Male	25	Diploma	Formal	Unemployed
3	Female	39	Secondary level	Formal	Unemployed
4	Female	40	Certificate	Formal	Employed
5	Female	28	Diploma	Formal	Employed
6	Male	50	Secondary	Formal	Employed
7	Male	47	secondary	Formal	Unemployed
8	Male	35	Certificate	Formal	Employed
9	Female	26	Certificate	Formal	Unemployed
10	Female	37	Diploma	Formal	Employed
11	Female	20	Secondary	Formal	Unemployed
12	Female	19	Secondary	Formal	Unemployed

**4.2.3. Summary of findings from patient with confirmed case of TB on treatment.** Table 4.3 below shows the themes and sub-themes that came from data provided by TB patients on treatment, who were interviewed regarding the contributing factors of TB. Three



(3) major themes of factors that contribute to TB and their sub-themes emerged.

**Table 4.3: Themes and sub themes emerging from findings from TB patients who were on treatment during the study.**

Theme	Sub-theme
Social factors	Overcrowding
	Smoking Imprisonment
Biological factors	Delay in seeking health intervention Under-nutrition
Health system factors	Poor household-contact screening

#### **4.2.3.1. Theme 1: Perceived social factors contributing to development of new TB cases**

*(a) Sub-theme 1: Overcrowding as a perceived factor contributing to new cases of TB.*

The study revealed that people who stays in a large family were at greater risk of transmitting TB to their family members. This might be due to the fact that that they share a room which makes it easier for the bacteria to circulate in the room therefore get transmitted to the next person. The study also revealed that people from a large family who enjoys spending quality time together are more likely to get the TB infection. Participants (p) discussed the subject as follows:

*“In my family we a thirteen in numbers and we stay in a four roomed house. Most of us share a room and in the evening, we watch television in one room together. I think this might be the reason why I got TB because I had a brother who works at a mine who was having TB and he came back home after being diagnosed with TB. The two of us share a room” (p2).*

Another participant (p1) said *“I think being many in the family can results in new TB cases. I am saying this because we have a big house which accommodates all of us, but we gather in sitting every evening to watch television. I think this how my niece got the TB transmission from me because she likes to sit next to me when we watch television”.*

Another participant (p8) said *“I was a prisoner for six months; I came back with TB from prison. I think is because that area is fully packed. But I heard that it is easier to acquire TB in prison”.*

The study findings are consistent with that of Alemu et al (2020), who revealed that individuals from large family were at greater risk compared to those from a smaller family. He indicated that this could be due to overcrowding which increases the transmission of TB. A study by Tesema et al (2015) also indicated that household family size also had an impact on risk of transmitting pulmonary TB. The study further revealed that people living with more than four family members per house were three times more likely to develop pulmonary TB than those living with fewer than four family members per household”.

#### **(b) Sub-theme 2: Smoking & imprisonment as a perceived social contributing factor for new TB cases**

Finding of the study revealed that majority of participants understand that smoking cigarette damages the lungs, which can then cause TB because pulmonary TB affects the lungs. Some of the participants said the following:

*“I have been smoking cigarette for years now and I always have persistence cough which did not respond to any cough mixture that I took. I know the cough is a result of prolonged smoking. This time around it has resulted in TB infection, I can say it with no doubt that I’m having TB because of my smoking behaviour” (p7).*

Another participant (p6) said *“Smoking is said to be dangerous for human beings just that people don’t listen. I am on TB treatment for the second time now. I am struggling to stop smoking, but I really want to quit smoking. I know it is delaying even my healing process because I’m still smoking even now just that I have reduced the number of cigarettes I used to smoke in a day”.*

Another participant (p1) said, *“I don’t know how I got this TB disease, but I heard on radios and at the clinic that smoking can damage your lungs and cause TB”.*

Alemu et al (2016) revealed that smoking induces immune impairment and damages ciliary clearance, indicating that smoking is an independent cause of TB.

#### **4.2.3.2. Theme 2 Perceived biological factors that contribute to new TB infections**

##### **(a) Sub-theme 1: Delay in seeking health intervention as a perceived factor that contribute to new TB infections**

Study revealed that participants associated late seeking clinical interventions late with the development of TB. This might be due to the fact that people who get diagnosed with HIV late have more impaired immune system. This people with weak immune system is prone to different infections. Participants believes that if people seeking medical attention when they are bedridden, and their test results are often coming back positive for TB.

Some of the participants said the following:

*“People in this community believe that if someone goes to the clinic being immobile and is coughing, they believe it might be related to TB and HIV. I also have a sister who died because she fell seek for a long time and didn’t want to go to the clinic. The day she was forced to go to the clinic she was transferred to the nearest hospital where they ran all test only to find that she has TB and HIV. By that time, it was late for her to recover” (p3).*

Another participant (p11) said, *“I heard that if somebody is HIV positive and is critically ill or is ill that everybody can notice, that person is more likely to have TB because TB and HIV goes hand in hand”.*

This is consistent with a study done by Ahmed et al (2017) who discovered that individuals with advanced clinical stage 3 and 4 have 7 more times of developing TB than HIV patients who are at WHO clinical stage 1 and 2. Melkamu et al (2013) indicated that individuals who are at stage 3 and 4 were about 2 times more likely to develop TB compared with those in Who clinical stage 1 and 2. Once the patient get in those stages ,the immunity protective capacity will be minimal which makes them prone to TB infection.

#### **(b)Sub-theme 2: Under-nutrition as a perceived factor that contribute to new TB infections.**

Majority of participants revealed that lack of essential vitamins and nutrients can cause TB infection because the immune system won’t be strong enough to protect the body against diseases. Thus, people who are underweight can tends to have an impaired immune system which makes the body to be prone to infection.

Some of the participants stated the following:

*“I read a pamphlet from the clinic, which was talking about nutrition. It indicated that individuals without essential vitamins are more likely to get attached by infectious diseases. But I don’t know how this is because the pamphlet didn’t explain further” (p4).*

Another participant (p9) said *“I once heard a conversation among nurses of which they were saying let’s go to eat to boost our immune system since we will be working with different patients. Since that day I believed that nutrition is essential in the prevention of diseases”.*

Another participant (p5) said *“People who are underweight the easily get diseases. Maybe thus because their boy is weak. You can see even when the person is walking that this person’s body is very weak”*

Similar to the findings are the results of Melkamu et al, (2018) who revealed that undernutrition is associated with TB infection. This might be due to the fact that under nutrition weakens the immunity level that increases the reaction of latent TB. Ausmen et al, (2017) stated that individuals who are underweight were 2,53 times at higher risk of developing TB compared with individuals of a BMI of more than 18,5.

#### **4.2.3.3. Theme 3: Perceived health system factors that contributes to new TB cases.**

##### **(a) Sub-theme 1: Poor household contact screening as a perceived factor that contribute to new TB cases.**

The study revealed that the majority of participants indicated that households contacts were not carefully screened for TB especially those who were above 5 years of age. Majority of participants said that the healthcare workers only asked them if there is a household contact with TB signs and if there is a contact below the age of 18. Participants further indicated that if the answer is no for a household contact with TB signs, the health care workers usually leave it like that without proper screening. Participants said they believe that if proper screening was done it could prevent some cases of TB. Participants said the following:

*“I was diagnosed with TB 3 months ago. The healthcare workers asked if there is a kid below the age of 5 years in my household and I said no. He asked about other household members above the age of 5 and I said yes, there are 4 including my own mother who shares a room with me. It ended there. My mother never visited the clinic and the healthcare worker never made a follow up on that. As I am talking to you now, me and my mother are currently on TB treatment”. I believe if proper management was done on my mother as a household contact who shares a room with me, my mother wouldn’t be in this situation” (p12).*

Another participant (p10) said *“I was taking care of my sick mother who was suffering from TB. I asked the healthcare worker if there is something that they are going to give me to prevent TB? The healthcare worker in question said no, I’m not going to give you any medication as long as you are not coughing you are fine. My mother completed her treatment and same year of her completion of treatment I had TB also”.*

Shelby et al (2018) revealed that many contacts that were referred for evaluation during contact investigations, never visited the clinic and some of these patients ended up being diagnosed with TB at a later stage. The findings of the study are consistent with those of Tesema et al (2015) who revealed that people who had a history of contact with TB patients had a 2-fold increased risk of contracting TB than those with no contact history.

#### 4.2.4 Summary of findings from healthcare workers trained on management of TB

The table below shows themes and sub-themes that emerged from data analysis of raw data. It is presented in table 4.3. About 3 themes emerged and their subthemes. These are the results from healthcare workers trained on TB management and TB patients who were currently on treatment during the period of data collection.

**Table 5: Themes and sub themes emerged from findings generated from healthcare workers.**

Themes	Sub-themes
Administrative control	Triage  Cough etiquette  Reduction in delay in diagnostic measures
Environmental control	Use of germicidal ultraviolet  Good ventilation
Respiratory control	Training of healthcare workers on respiratory measures.

##### 4.2.4.1. Theme 1: Perceptions of health workers towards administrative infection control measures that can reduce the development of new TB cases

###### *(a) Sub-theme 1: Perception of healthcare workers towards triage as a perceived strategy to minimise the development of new tuberculosis cases*

Findings of the study revealed that if suspected TB patients can be identified, separated from other patients and attended to first to avoid prolonged time spent in the facility can also assist in reducing the development of new TB cases. The study also revealed that those who have already tested positive for TB should be attended to first in order to avoid transmission of the

bacteria to other patients who are in the queue. Healthcare workers (h) said the following statements during interview:

*“In this health facility due to high number of cases we decided to screen patients before we attended to them so that we can be able to identify suspects, isolate them from other patients and attended to them to avoid time spent in facility these has assisted in reducing the TB cases that we usually” (h12).*

Another participant (h1) said. *“Though sometimes we fail to triage the patients and separate them accordingly due to shortage of staff, but most of the days we do it and it has assisted a lot. I remember a certain day when the clinic was fully packed, and the operational manager delegated a nursing assistant to do the screening because she heard that there is a person with a persistent cough of which she did, and that patient was attended to immediately and went home. His TB results didn't delay. The results came back indicating that the patient had multi-drug resistance TB. We were just glad that we managed to identify him and triage accordingly, because what would have happened if we didn't attend to him quickly and he remained in the facility for a long time that day, we would have transmitted the bacteria to many people”.*

Another participant (h5) said, *“in this facility, we use to have more cases of TB in the whole local area, so we opted to benchmark on clinics that have low cases of TB so that we can reduce number of cases in our facility also. That is where we learnt that in the morning the help desk nurse tries to identify patients who are having cough and separate them from other patients so that they can be attended to first. This strategy helps because if ever a TB suspect test positive for TB, we would have done justice to other patients by preventing the transmission of the bacteria. Before applying this strategy, we use to have a new case every two weeks”.*

A study by Tshitangano TG (2014) also indicated that TB suspects who are attended to immediately after suspecting them doesn't have many chances of transmitting the TB bacteria. Also indicated that if only the healthcare workers were giving priority to TB suspects who are seriously ill, TB transmission could be reduced.

***(b) Sub-theme 2: Perceptions of healthcare workers towards cough etiquette as a strategy to minimise TB***

Cough etiquette is a correct way of handling cough as a way of reducing the transmission of diseases pathogen one person to the other. This cough etiquette is usually explained in a form of a picture, which is usually pasted in waiting areas. Findings in the study revealed that

coughing etiquette is one of the strategies that can be used in order to reduce the transmission of TB from one person to the other.

One healthcare worker (h9) said, *“coughing on your elbow/tissue assist in preventing the spread of TB because if a healthcare worker is having latent TB and cough without following the coughing etiquette the health care worker can easily spread the bacteria to patients, he/she is attending to on daily basis. He further said that we attend to many patients a day, you can just imagine the number of patients we could infect. The same applies to patients. They need to be taught the coughing etiquette in order to prevent the transmission of TB pathogens to other patients or healthcare workers. A lot can occur in the waiting area if the coughing etiquette is not being followed”*

“Another healthcare worker (h2) said: *“coughing etiquette is the best for TB control. I mean we have people who cough on the palm of their hands and don’t wash their hands afterwards. What if the person is infected with TB? The bacteria could easily be spread during handshake. If our patients and healthcare workers follow the coughing etiquette, we can win this battle. Ever since I came to work in this clinic, it has never had zero (0) cases of TB”*

Another healthcare worker (h3) said *“though people will tell you that you can’t teach us how to cough, the is no procedure for coughing. But deep down I know cough etiquette should remain in practice to avoid transmission and should be followed by good hand hygiene”.*

### ***(c) Sub-theme 3: Perceptions of healthcare workers towards reduction in delay in diagnostic measures.***

Healthcare workers revealed that TB is increasing because patients are not diagnosed in time. Therefore, they don’t commence treatment in time, which leads to transmission of the bacteria. They also revealed that sometimes there is a delay in the laboratory which leads to prolonged turnaround time of more than 48 hours. They further indicated that sometimes healthcare workers can delay in collecting the relevant specimen for TB diagnosis. Findings of these study revealed that if a patient delay in being diagnosed with TB he/she may transmit the TB bacteria to other people because he/she won’t be knowing that he has an infectious condition, therefore he can continue to engage with friends and family as usual. By the time the patients get diagnosed he/she would have infected lots of people unintentionally. Below is how the healthcare workers discussed the issue:

Healthcare worker (p4) said *“During weekends and holidays there is no laboratory car which transport specimens from our clinic to the nearest laboratory, therefore we don’t collect specimens on weekends and holidays. Imagine if it’s a long weekend, these suspects can*

*transmit the bacteria amongst their families and friends, because he/she will be waiting for diagnosis so that treatment can be commenced if necessary”*

*“We have patients who test negative but have all the signs of TB These patients can be delayed in terms of diagnosis because he/she will have to go to hospital for chest x-ray which can delay also due to lack of transport money to hospital” (p6).*

*Another healthcare worker (p15) said “Since TB is mostly diagnosed with sputum, we have nurses who don’t like collecting sputum because they usually say it’s disgusting to see other people’s sputum. Even in this facility we have one nurse who will never collect sputum no matter the circumstances but will rather send patients who are eligible for sputum collection to a community health care worker. So, what happens if the community health care workers are not available in the facility? It ends up delaying the patient’s diagnoses. Delay in diagnosing can mean delay in commencement of treatment therefore allowing the patient to easily spread the TB bacteria”.*

*Another healthcare worker (p13) said “Sometimes these patients are difficult, a person will tell you I don’t have sputum before you even ask for it, just because he/she doesn’t want to produce sputum. So, what am I supposed to do in such kind of a situation except to just let the patient go?”*

A study conducted by Tshitangano TG (2014) also revealed that if patients are delayed in being diagnosed by 24 hours, they can spread the bacteria to between 10 and 30 people if test results come back positive.

***(d) Sub-theme 4: Use of Isoniazid Preventive therapy (IPT) as a perceived strategy to minimise the development of new TB infection.***

Results of the study revealed that if people are given IPT according to criteria stipulated in the guidelines, TB infections can be reduced. That is because majority of participants said they have never seen a patient who is on IPT getting TB infection. Although some participants said they tend to forget that they have to give IPT. It was also said that household contacts under the age of 5 years who are given IPT for six months don’t develop active TB. Other participants said giving out IPT to HIV positive patient also prevent them from getting TB infection. Some participants said the following:

*“We give IPT to all children who are contacts of people with active TB. The drug is given to these children for 6 months. I have never seen a kid who was given IPT coming back to the clinic at a later stage with TB. I can easily say IPT is effective in prevention of TB” (h4).*

*Another healthcare worker (h7) said, “All newly diagnosed HIV positive patients in our facility are given IPT for six months which is initiated two weeks after initiation of ART. This patient*



*responds well to that treatment and never comes back to report any side effect of IPT. The IPT protects them from getting the TB bacteria. Some patients who are literate would remind you of IPT if you forgot to give them to show that they understand the use of IPT’.*

According to WHO (2019), contacts below the age of five years who are contacts of people with confirmed pulmonary TB and who are found not to be having active TB on appropriate clinical evaluation according to national guideline should be given IPT. Study findings are similar to those of Ayele et al (2015) who revealed that IPT was generally efficacious to prevent TB disease in HIV positive patients who are on ART’S.

***(e) Sub-theme 5: Perceptions of healthcare workers towards screening as another means of reducing TB infections.***

Study revealed that daily screening of all patients who visit the clinic must be conducted within the health facilities. It can be conducted at any station within the clinic. These strategies assist in early detection of TB signs and symptoms. Screening can be conducted using a standardised TB screening tool. These allows the health workers to collect the correct specimen meant for detection of mycobacterium tuberculosis. Some participants said the following:

*“We screen our patients daily before they get to any consulting room. This allows us to collect the relevant specimen for detection of TB when necessary. It is also crucial for prevention of TB transmission if the screening patient with symptoms is having TB” (h8).*

Another healthcare worker (h2) said *“In our facility we delegate a nurse to screen patients at the gate when they are entering the clinic premises. This person is the one responsible for sputum collection, when the patients get to a consulting room you will see a laboratory sticker to show that the patient have TB signs and sputum was collected already”*

Another healthcare worker (h16) said, *“In our facility you will never see a patient with TB signs in a queue with other patients. That is because we screen them daily and those patient with TB signs are removed from the queue and be attended to first to avoid transmission of the TB infection of, they are having it”.*

According to WHO (2020), screening of TB disease using signs and symptoms of TB disease has multiple advantages. It can rule out TB if none of the clinical manifestations are present. It is a straightforward intervention inherent to any clinical encounter and can be repeated as often as necessary without special equipment. It was further indicated that people living with HIV should be screened for TB according to a clinical algorithm. Those who don’t report any signs are unlikely to have TB.

#### **4.2.4.2. Theme 2: Perceptions of health care workers towards environmental control measures for reducing the development of new TB cases.**

Findings of the study revealed certain environmental control measures that can be followed which reduces the transmission of TB bacteria in healthcare facilities/households. Majority of participants revealed that good ventilation can also reduce the transmission of TB. Majority of participants also stated that use of ultraviolet lights can reduce TB. This is how the participants discussed the matter.

A study by Zinatsa et al (2018) indicated that a queue marshal should be appointed to ensure that doors and windows remained opened during the day and also explain the importance of natural ventilation to patients which will definitely reduce the transmission of the TB bacteria.

##### **(a)Sub-theme 1: Perception of healthcare workers towards Use of germicidal ultraviolet lights as a strategy to minimise the development of new TB cases.**

Study revealed that use of germicidal ultraviolet light in health care settings can reduce the transmission of the TB bacteria from being transmitted from one person to the other. This might be due to the fact that the light traps the bacteria making it difficult to be transmitted to other people. Although most of the GUV lights were not functioning but majority of participants believed that if it's working it has a good impact on the reduction of TB cases. Participants said:

*“When the ultraviolet lights are functional, we have noticed a reduction in new TB cases, but it doesn't last long because the lights are poorly maintained” (h13).*

*Another health care worker (h3) said “Our health facilities have ultraviolet lights which assist in trapping the TB bacteria, but sometimes they become useless because of poor maintenance. It can take more than 5 years for them to be maintained. If only the responsible people were making sure that the lights are serviced every year, it can assist a lot in TB reduction”*

WHO (2019) indicated that use of ultraviolet light kills the microorganisms that are airborne. Low pressure mercury vapour lamps emit UVC. It was further indicated that upper room germicidal ultraviolet systems are recommended to reduce M tuberculosis to healthcare workers and any person attending the health facility.

**(b) Sub-theme 2: Perceptions of healthcare workers towards good ventilation as a strategy to minimise TB.**

Findings of the study revealed that good ventilation can reduce the transmission of the M tuberculosis because the bacteria will have a good space for moving unlike when windows are closed, and the M tuberculosis have to roam in that room only. The study noticed that healthcare settings have their windows opened, which was observed as a good act. Some of the participants said that opening of windows even in our homes can reduce the transmission of TB especially in people who stays in large family.

Another healthcare worker (h12) said *“Opening of windows in our consultation rooms can also assist in TB reduction. In our facility the cleaner always open windows when she does her morning cleaning routine. It becomes a challenge during cold weathers because I have noticed that we close windows when busy attending to patient’s needs. These simply mean that since we don’t even have TB room, all patients who comes to the clinic on that day will be attended to in one room. These patients include the TB positive patients”*

*“I know opening windows in the facility can allow airflow, but sometimes it becomes difficult due to infrastructure which is too small to accommodate all the clinic necessities. Some of the rooms don’t have enough space” (p6)*

The findings of the study are similar to what WHO (2019) recommended. It was said that ventilation system including natural mixed-mode, mechanical ventilation and re circulated air though HEPA filters are recommended for healthcare workers/person attending healthcare facilities.

**4.2.4.3. Theme 3: Perception of healthcare workers towards respiratory control measures.**

**(a) Sub-theme 1: Perceptions of healthcare workers towards training of healthcare workers on respiratory measures.**

The study revealed that training of healthcare workers on respiratory techniques can have a huge impact on reducing the new cases of TB. Study revealed that training healthcare workers on this aspect allow them to generate knowledge about the use of respirators when caring for patients in health care settings. It will reduce the TB infections because health workers will be having knowledge on when to put on respirators, how to remove them and when to change. By doing this Tb infections can be reduced. It was further revealed that if healthcare workers are trained on the policy about infection control, they can easily ensure that the policy is carried out. This how participants discussed the subject:

*“In our facility we do conduct in-service training on the use of respirators. We teach each other when and how we should wear a mask. We further teach each other how to dispose respiratory equipment. This knowledge assist in reducing the number of new TB cases because whenever I’m attending to a TB suspect or TB patient, I will know that I have to put respirators on” (h7).* Another healthcare worker (h11) participant said, *“being trained on use of respirators made us realise that one of the reasons healthcare workers were getting TB infection was because they were not having essential; knowledge on how to dispose respirators that were used”.* Another healthcare worker (h15) participant said, *“I think the government should make it a priority on training healthcare workers on use of respirators because I’m new here but I have never received any training on such and I’m attending to TB patients daily. I believe these trainings can reduce the transmission rate of TB”.*

The study results are supported by Tshitangano et al (2014) who revealed that majority of healthcare workers under study were not aware about the respiratory techniques that they have to follow in the ward which resulted in transmission of the bacteria. Zinatsa et al, (2018) revealed that by providing disposable N95 respirators and fit test training or education we can reduce the new cases of TB.

### **4.3. Summary**

This chapter presented the findings about the strategies to minimise the development of new TB cases at Collins Chabane, which was collected on 16 healthcare workers and 12 TB patients. The next chapter dealt with conclusions, limitations, summary and recommendations.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1. Introduction

This chapter presents the conclusions, limitations and recommendations regarding perceived strategies to minimise the development of new TB cases at Collins Chabane Municipality, Vhembe District. The recommendations are directed to policy makers, Department of Health, health care workers and the community.

#### 5.2. Summary of the study

The study investigated the perceived strategies to minimise the development of new TB cases in Collins Chabane municipality in order to achieve the following objectives:

- To explore the perceived factors contributing to new TB cases in Collins Chabane municipality.
- To describe the perceived strategies for minimising the development of new TB cases in Collins Chabane municipality.

#### 5.3. Limitations of the study

The sample size was small due to qualitative nature of the study, it is assumed that if the target population was all people who had history of confirmed TB case, it would have yielded more results. The study was also limited because the target population for healthcare workers was those trained on TB management of which if the target population was healthcare workers trained on TB management and have experience of TB management it would have brought more results. Since the study took place only in Cholins Chabane municipality, the findings cannot be generalised to all other municipalities of the district as well as the province of Limpopo, as their context may be different.

#### 5.4. Recommendations

##### 5.4.1. Recommendations for policy makers

- Policy makers should provide policies, which will protect people attending to patient with confirmed case of TB.
- An ACT or policy should be drawn, which will protect household members caring for those with confirmed

#### 5.4.2. Recommendations for Department of health

- The health department should provide more training on use of respiratory control measures.
- The health department should train all professional nurses on management of TB.
- Enough funding should be allocated for management of TB.
- Resources for TB management must always be available in all health facilities.
- Utilisation of radio platforms to provide awareness on TB management must be done weekly to create awareness to the community.

#### 5.4.3. Recommendations for healthcare workers.

- All healthcare workers trained on TB management must attend to TB patients for them to gain experience in that
- Attending updates is very crucial in managing TB patients accordingly.
- Health talk about TB must be given throughout the day.
- Screening of all contacts must be done appropriately
- All people diagnosed with TB must be initiated on treatment as soon as possible.

#### 5.4.4. Recommendations for community members

- The researcher recommends that community members must listen to health talks that are given on radio platforms follow it.
- Also recommend that those who experience signs of TB must seek medical attention.
- Household contacts must visit the clinic for proper screening of TB.

#### 5.5. Conclusions

With regard to perceived factors contributing to the development of new TB cases, the study discovered that in Collins Chabane only three categories of factors contribute to the development of new TB cases namely, **Social factors** (in the form of overcrowding, smocking and imprisonment), **Biological factors** (in the form of delay in seeking health intervention and undernutrition), and **Health system factors** (in the form of poor household contact training).

With regard to the perceived strategies to minimise the development of new TB cases, the study discovered that **triage, cough etiquette and reduction in TB diagnosis delay** (administrative control); **use of germicidal ultraviolet lights and good ventilation**

(environmental control); and **training healthcare workers on respiratory measures** (respiratory control) are perceived to be the strategies helping Collins Chabane to minimise the development of new TB cases.

In **conclusion**, this chapter highlighted the summary and conclusion of the whole study, limitations and recommendations.

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## Appendices

### Appendix A: Informed Consent Template

#### **Title of the Research Study:**

Perceived strategies for minimising the development of new Tuberculosis cases at Collins Chabane Municipality, Vhembe District.

**Principal Investigator/s/ researcher:** Madzinga Debra

**Brief Introduction and Purpose of the Study:** TB remains a global health concern. In 2017 TB number of cases numbered 10, 0 million. Most of the cases that occurred in 2017 were in the WHO South East Region, at 44%, WHO African Region, at 25%, and the WHO Western Pacific Region, at 18%. Smaller proportion of number of cases occurred in the WHO Eastern Mediterranean Region, at 7, 7%, the WHO Region of the Americas 2.8% and the WHO 2.7% (Kanabus, 2018).

**The purpose of the study** is to investigate the perceived strategies for minimising the development of new TB cases at Collins Chabane local municipality.

**Procedures:** A qualitative approach will be adopted, and data will be collected during the individual interviews, which will be recorded in a tape recorder and field notes. Ethical principles of research, such as permission to conduct a study, voluntary participation, anonymity, confidentiality, will be considered. Data will be analysed using the thematic analysis. The findings will help in coming up with some recommendations.

**Risks or Discomforts to the Participant:** There are no risks that will be involved in the study

**Benefits:** Participating in the study may help you gain knowledge about TB prevention.

**Reason/s why the Participant May Be Withdrawn from the Study:** If you are no longer willing to participate in the study for any reasons, you can withdraw at any stage of the study.

**Remuneration:** You will not receive money or any other forms of remuneration by choosing to participate in this study.

**Costs of the Study:** You will not be expected to cover any costs related to the study.

**Confidentiality:** Data collected will be kept on tape recorder and field notes which will be kept under a locked locker for 5 years for reference purposes. The tape recorder and field notes used for storing data will not be made available to people who are not part of the study

**Research-related Injury:** There are no foreseeable research-related injury in this study.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Ms Madzinga D (072 417 8247), my supervisor Prof Tshitangano TG (082 448 4111) or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za

## Appendix B: Informed consent

Statement of agreement to participate in the research study:

I hereby confirm that I have been informed by the researcher, Madzinga Debra, about the nature, conduct, benefits and risks of this study-Research Ethics clearance number

I have also received, read and understood the above written information (participant letter of information) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis, will be anonymously processed into a study report.

In view of the requirements of the research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

I may, at any stage, without prejudice, withdraw my consent and participation in the study

I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

I understand that the significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full names of participant	Date	Time
I, .....	.....	.....

**(Madzinga Debra)** hereby confirm that the above participants has been fully informed about the nature, conduct and risks of the above study.

Full Names of the Researcher

Madzinga Debra  
Signature..... Date.....

Full names of witness (if applicable)  
Date..... Signature.....

## Appendix C: DATA COLLECTION TOOL

### Section A: Demography of participants

#### 1. Gender

Male
Female

#### 2. Level of education

None
Primary
Secondary
Tertiary

#### 3. Type of household

Formal house
Shack
RDP house

#### 4. Occupation

Unemployed
Self-employed
Employed

## Appendix D: Permission to conduct a study

University of Venda

P/Bag x 5050

Thohoyandou

0950

The Manager

Private Bag x5006

Thohoyandou

0950

DEAR SIR/MADAM

RE: Permission to conduct a study at selected health facilities in the Collins Chabane Municipality on the perceived strategies for minimising the development of new TB cases at the Collins Chabane Municipality. I, Madzinga Debra, a master's degree student at the University of Venda will be the one to collect the required data. I am expected to conduct a study in order to fulfil some of the requirements for the degree that I have registered for. In addition, tuberculosis is a major public health concern, and the purpose of the study is to investigate the perceived strategies to minimise the development of new tuberculosis cases. Data will be collected through individual interviews. The findings of the study will be made available to the Health Department.

Your permission will be highly appreciated.

Yours faithfully

Madzinga D (student)

Cell number: 0724178247



## Appendix E: Ethical Clearance

**RESEARCH AND INNOVATION  
OFFICE OF THE DIRECTOR**

**NAME OF RESEARCHER/INVESTIGATOR:  
Ms D Madzinga**

**STUDENT NO:  
11593954**

**PROJECT TITLE: Perceived strategies to minimise the development  
of new Tuberculosis cases at Collins Chabane Municipality,  
Vhembe District.**

**PROJECT NO: SHS/20/PDC/35/1111**

**SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS**

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr TG Tshilangano	University of Venda	Supervisor
Dr NS Raliphaswa	University of Venda	Co - Supervisor
Ms D Madzinga	University of Venda	Investigator - Student

Type: **Masters Research**  
Risk: **Minimal risk to humans, animals or environment**  
Approval Period: **October 2020 – October 2022**

The Human and Clinical Trials Research Ethics Committee (HCTREC) hereby approves your project as indicated above.

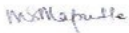
**General Conditions**

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principal investigator) must report in the prescribed format to the REC:
  - Actually (or as otherwise requested) on the progress of the project, and upon completion of the project.
  - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
  - Annually a number of projects may be randomly selected for an external audit.
- The approval confers priority to the protocol as stipulated in the application form. Should any changes to the protocol be deemed necessary during the course of the project, the project leader must notify for approval of those changes at the REC. Should there be deviations from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Should the project have to continue after the expiry date, a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
  - Request access to any information or data at any time during the course or after completion of the project,
  - To ask further questions. Seek additional information; Request further modification or monitor the conduct of your research or the informed consent process.
  - Withdraw or postpone approval if:
    - Any unethical principles or provisions of the project are revealed or suspected.
    - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented.
    - The required annual report and reporting of adverse events was not done timely and accurately.
  - New institutions rules, national legislation or international conventions deem it necessary.

**ISSUED BY:  
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE  
Date Considered: October 2020**

Name of the HCTREC Chairperson of the Committee: Prof MS Maputle

Signature: 

**UNIVERSITY OF VENDA**  
OFFICE OF THE DIRECTOR  
RESEARCH AND INNOVATION  
2020 -11- 11  
Private Bag X5050  
Thohoyandou 0950

UNIVERSITY OF VENDA  
P.O. BOX 370, TLOKENG, VENDA PROVINCE, SOUTH AFRICA  
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WWW.UOV.VA

## Appendix F: Provincial Permission



**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

### Department of Health

Ref : LP\_2021-04-015  
Enquires : Ms PF Mahlokwane  
Tel : 015-293 6028  
Email : [Phoebe.Mahlokwane@dhsd.limpopo.gov.za](mailto:Phoebe.Mahlokwane@dhsd.limpopo.gov.za)

Debra Madzinga

#### **PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES**

Your Study Topic as indicated below;

Perceived strategies to minimise the development of new Tuberculosis cases at Collins Chabane Municipality, Vhembe District

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
  - a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
  - b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
  - c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
  - d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
  - e. The approval is only valid for a 1-year period.
  - f. If the proposal has been amended, a new approval should be sought from the Department of Health
  - g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated



Head of Department

18/05/2021

Date

Private Bag X9302 Polokwane  
Fidel Castro Ruz House, 18 College Street, Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.  
Website: <http://www.limpopo.gov.za>

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