

**Exploring barriers to TB contact tracing and screening: Health service providers' perspective**



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## KEYWORDS

- Barriers
- Contact-tracing
- Diagnosis
- Eastern Cape Province
- HIV-TB coinfection
- Poverty
- Pulmonary Tuberculosis
- Screening
- South Africa
- Stigma
- TB prevention



## ACRONYMS

AMR	Antimicrobial resistance
ART	Antiretroviral therapy
BCG	Bacilli Calmette-Guérin
IGRA	Interferon-gamma release assay
INF-g	Interferon-gamma
INH	Isoniazid
MDR-TB	Multi-drug-resistant TB
NICE	National Institute for Health and Care Excellence
LTBI	Latent TB Infection
RIF	Rifampicin
RNTCP	Revised National TB Control Programme
SEM	Social-Ecological Model
TB	Tuberculosis
TST	Tuberculin Skin Test
XDR-TB	Extensively drug-resistant TB
WBPHCOT	Ward-based primary health care outreach teams
WHO	World Health Organization

## ABSTRACT

### Introduction

Tuberculosis (TB) continues to be a global public health challenge, with South Africa experiencing one of the highest TB incidence rates worldwide, exacerbated by its intertwined battle with and the emergence of drug-resistant TB strains.

### Aim

The study conducted in iBhayi Township, Eastern Cape Province, South Africa, aimed to explore and describe the barriers that impact TB contact tracing and screening efforts from the perspective of healthcare providers, the Ward-based primary health care outreach teams (WBPHCOT).

### Methodology

The study followed a qualitative descriptive exploratory design. In-depth interviews were conducted with 12 purposively selected healthcare workers, including nurses and community healthcare workers. Thematic analysis was used to analyse data. Employing the Social-Ecological Model (SEM) as a theoretical framework, this research examined various levels of influence affecting TB control.

### Results

At the individual level, healthcare providers faced multiple challenges such as insufficient training, emotional stress, limited knowledge, and language barriers, all of which hampered their ability to conduct effective contact tracing and testing. Interpersonally, issues like colleague stigma and patient mistrust strained relationships and hindered effective patient care. Organisational challenges include resource constraints, workplace pressures, and compensation issues that burden healthcare organisations and their staff. The absence of supportive policies and concerns related to data management added to these challenges. At the community level, stigma, resistance to screening efforts, lack of awareness, and the need for cultural sensitivity all played significant roles in shaping the environment in which healthcare providers operated. Structural and health systems challenges included poor resource allocation, strained healthcare systems, and inadequate public health messaging, policies, and regulations. The lack of accessibility to testing locations, especially in underserved areas, emerged as another critical structural obstacle.

## **Conclusion**

The study's findings shed light on the multifaceted barriers faced by healthcare providers in iBhayi Township, in implementing TB contact tracing and screening initiatives. The interrelated barriers span the individual, interpersonal, organisational, community, and health system levels. The evidence thus suggests the need for comprehensive and concerted strategies to improve TB contact tracing and screening efforts. Specifically, the findings suggest the need for comprehensive training, mental health support, and improved communication strategies for healthcare providers. The research also indicates the importance of addressing stigma, streamlining administrative processes, and enhancing community engagement. Adequate resource allocation and healthcare system improvements are essential for effective contact tracing and screening, with potential implications for policy and practice in public health. Further research is recommended to explore interventions to mitigate these challenges and enhance the effective implementation of TB contact tracing and screening initiatives.

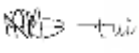


## DECLARATION

I declare that *Exploring Barriers to TB Contact Tracing and Screening: Health Service Providers' Perspective* is my work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Nqobile Mokhethi

November 2023

Signed: 



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## CHAPTER 1

### 1. INTRODUCTION

#### 1.1 Background

Tuberculosis (TB) stands as a grave and persistent global health threat. TB is the 13th leading cause of natural death globally. In 2021, 10.6 million TB cases were reported, claiming 1.6 million lives. Within the broader global context, low- and middle-income countries (LMICs) bear a substantial burden of TB cases. Sub-Saharan Africa (SSA) is responsible for a quarter of all TB cases worldwide. The region also faces particular challenges in combating this relentless disease (Mbuya *et al.*, 2023).

TB is an infectious disease, caused by the *Mycobacterium tuberculosis*, and primarily targets the lungs but can also extend its reach to other parts of the body. The transmission of TB occurs through the air, facilitated by the respiratory emissions of infected individuals when they cough, sneeze, or speak.

WHO has put forth a series of recommendations and strategies over the years to combat and control TB? In 2012, WHO released recommendations for TB contact tracing and screening of all individuals who have been in direct contact with individuals diagnosed with TB as key strategies to identify and isolate TB cases promptly and reduce the spread of infection in low and middle-income countries (WHO, 2012). TB contact tracing is a cost-effective strategy that has been demonstrated to significantly increase the detection of new TB cases, which contributes to treatment success and thus reduces the spread of new infections (Baluku *et al.*, 2021; Onuka *et al.*, 2018). The strategy helps to investigate people who have been exposed to TB through contact with a probable or confirmed case. This strategy helps with case index identification, and linking to care. The resulting timely diagnosis and initiation of treatment reduces transmission of TB. Contact tracing differs widely among countries, depending mainly on the availability of resources and guidelines (Lee-Rodriguez *et al.*, 2020; Little *et al.*, 2018; Onuka *et al.*, 2018). In resource-constrained settings a questionnaire is used for screening, and

a person presenting with one of the signs and symptoms undergo a TB investigation, which includes a sputum test and/or x-ray (WHO, 2013).

TB contact tracing and screening are known to decrease the TB-related mortality rate (Baluku *et al.*, 2021). Lee-Rodriguez *et al.* (2020) indicate that the TB mortality odd ratio decreases with the number of TB screenings done. Early detection of TB allows for initiating the treatment while the disease is at its asymptomatic stage. Early pathologic state identification results in a good prognosis of TB. TB screening reduces the cost of TB treatment by preventing vigorous management such as hospitalisation (Hussain *et al.*, 2021; MacPherson *et al.*, 2019; Sohn *et al.*, 2021). TB diagnosis and treatment have saved an estimated 66 million lives (WHO, 2022).

However, the implementation of WHO's recommended strategies faces several formidable challenges. These hurdles encompass issues like limited healthcare infrastructure, resource constraints, and disparities in access to quality healthcare services. People living in low economic status environments die disproportionately compared to people in high economic environments due to the inability to access recommended interventions for TB prevention and management (Little *et al.*, 2018). Overcoming these challenges is paramount to curtailing the impact of TB and achieving meaningful progress in global health. The number of new cases and the rate of infection have increased, and the resistance to drugs has also risen. The goal of ending TB by 2030 seems very unlikely, especially in some regions of the world where healthcare infrastructure is underdeveloped and access to essential treatments remains limited. According to the United Nations Sustainable Development Goals (SDGs), specifically SDG 3, which aims to end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases by 2030, progress towards eradicating TB has been slower than anticipated. Despite concerted global efforts, including increased funding for research and implementation of prevention and treatment strategies, challenges such as drug resistance, inadequate healthcare systems, and socioeconomic disparities continue to impede progress towards eliminating this deadly infectious disease (Heidary *et al.*, 2022).

The emergence of COVID-19 has added a new layer of complexity to the already intricate landscape of TB control. The COVID-19 pandemic disrupted services, leading to a drop in new

cases from 7.1 million in 2019 to 5.8 million in 2020. In 2021, cases rose to 6.4 million but remained below pre-pandemic levels, highlighting persistent challenges (Bagcchi, 2023). The latest report from the World Health Organization (WHO) paints a picture, revealing that the COVID-19 pandemic has exacerbated the global TB crisis. In 2021 alone, TB claimed the lives of a staggering 1.6 million people.

## 1.2 Problem statement

South Africa has one of the highest TB incidence rates in the world, primarily due to its high prevalence of HIV/AIDS and the emergence of drug-resistant TB strains (Belay *et al.*, 2015). The interplay between HIV/AIDS and TB is a significant driver of the TB epidemic in South Africa. The emergence of drug-resistant TB, including multi-drug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB), has further complicated the situation. These drug-resistant strains are particularly difficult to treat, requiring more expensive and complex treatment regimens, which strains the already resource-limited healthcare system (Sultana *et al.*, 2021). Adding to this complexity is the emergence of drug-resistant TB strains, particularly MDR-TB and XDR-TB. The management of drug-resistant TB imposes a substantial strain on South Africa's healthcare system, which is already operating with limited resources, thus impeding effective control of the TB epidemic.

The introduction of End-TB indicated government commitment to improving the TB mortality rate. The South African government is committed to screening at least 95% of people, finding at least 90% of the TB cases among the vulnerable population and 95% diagnosed to be retained on treatment by 2030 (Department of Health, 2017). Despite significant progress in TB control, South Africa continues to have a high burden of TB, with approximately 360,000 new cases reported annually (World Health Organization, 2020). One of the major challenges in TB control in South Africa is identifying and managing close contact with individuals with active TB, who are at high risk of developing TB (Engelbrecht *et al.*, 2018; Little *et al.*, 2018; MacPherson *et al.*, 2019).

Several factors still contribute to the challenges of TB contact tracing in South Africa. These factors include poor TB diagnostic, infrastructure in certain areas, lack of adequate resources and funding for TB control programs, and social and economic factors such as poverty, overcrowding, and migration (Engelbrecht *et al.*, 2018; Little *et al.*, 2018). Little *et al.* discovered that among people living with someone who was recently diagnosed with TB, there was a relatively high number of undiagnosed TB cases (3.9% or 3940 per 100,000). This rate was only slightly lower than what was found in a similar study in a busier area with more TB cases. For every 100 people diagnosed with TB, 8.5 new cases were found among their household contacts. However, in the busier area, they found 23 new cases for every 100 diagnosed (Little *et al.*, 2018).

Addressing these challenges head-on is paramount to alleviating the profound burden that TB imposes on both the healthcare system and the population of South Africa. There is an urgent need for comprehensive research efforts aimed at unraveling the intricate dynamics of TB within the context of South Africa's HIV/AIDS prevalence and the emergence of drug-resistant strains. A research-driven approach can pave the way for targeted interventions, improved screening and diagnostic methods, and more effective treatment strategies (Sultana *et al.*, 2021).

### **1.3 The Purpose of the Study**

The study was shaped by a concern about the increase in TB prevalence in South Africa, and the limited research available that looks into barriers to TB contact tracing and screening from health service providers' perspective. Therefore, it is important to understand the barriers to TB contact tracing screening and testing to reduce the spread of TB and reduce TB-related mortalities. TB remains one of the major causes of death in South Africa and effective contact tracing and screening can help identify active cases, reduce transmission, and control the spread of the disease in the population. Therefore the purpose of this study is to generate evidence about barriers encountered by healthcare providers on TB contact tracing and screening.

Conducting a study on TB contact tracing can help understand barriers to the effective implementation of these programmes, identify cost-effective and innovative strategies for

improving TB control, and reduce the burden of the disease in South Africa (Hussain et al., 2021) (Sohn *et al.*, 2021).

#### **1.4 Aim**

This study aims to explore and describe the barriers that influence TB contact tracing and screening in iBhayi Township, Eastern Cape province, South Africa.

#### **1.5 Objective**

- To explore and describe barriers to TB contact tracing
- To explore and describe barriers to TB screening
- To inform policy and practice on how to improve TB contact tracing and screening

#### **1.6 Theoretical framework**

The Social-Ecological Model (SEM), fig.1, was used to help the researcher's understanding and analysis of how various factors and systems interact to influence an individual's health and behaviours. The model recognises that people exist within multiple interconnected layers or levels of influence, and these levels affect their choices, actions, and overall well-being. The SEM is often used in various fields, including public health, psychology, and sociology, to study and address complex issues like health and behaviours (Kilanowski, 2017).



Figure 1- Adopted from Stokols, D. (1996). The Social-Ecological Model

At the core of the SEM is the individual. This level focuses on personal characteristics, including genetics, attitudes, beliefs, and behaviors. It acknowledges that individual choices and decisions are influenced by both internal factors and external factors from higher levels (Stokols *et al.*, 1996). The next level encompasses interpersonal relationships. This includes family, friends, peers, and other close connections. Interactions with these individuals shape an individual's social norms, support systems, and the exchange of information and influence (Kilanowski, 2017). Beyond personal relationships, the community level considers the immediate physical and social environment in which individuals live. Factors such as access to healthcare, educational opportunities, community resources, and neighborhood safety all play a role in influencing an individual's health and behaviour. At the Societal Level, the SEM looks at the broader societal context. It includes cultural norms, values, and socioeconomic factors that influence health and behaviours. Discrimination, cultural beliefs, and societal structures are among the factors that impact individuals within society (Stokols *et al.*, 1996).

The outermost layer of the SEM encompasses policies, laws, and governance. Public health policies, regulations, and government decisions can have a significant impact on the health and well-being of individuals and communities. Policy changes can create supportive or restrictive environments that affect health outcomes (Kilanowski, 2017)



## CHAPTER 2

### 2. LITERATURE REVIEW

#### 2.1 Introduction

The chapter presents a review of existing literature on TB prevention (contact tracing, screening, and testing) in South Africa and the Sub-Saharan Context. The review will also examine the social, economic, and cultural factors that impact TB contact tracing in South Africa and other high-burden countries.

#### 2.2. Global TB prevention

TB is particularly prevalent in low- and middle-income countries, where poverty, malnutrition, and other social determinants of health contribute to the spread of the disease (Abou Jaoude *et al.*, 2022; Jarde *et al.*, 2022). TB remains a threat worldwide, and effective TB prevention strategies are critical for reducing the global burden of this disease. One of the key strategies for TB prevention is vaccination. The Bacille Calmette-Guérin (BCG) vaccine is the most widely used TB vaccine, and it is particularly effective in preventing severe forms of TB in children. The WHO recommends the BCG vaccine for all infants in countries with a high burden of TB (World Health Organisation, 2013). The BCG vaccine is typically administered at birth or in the first few months of life as an intradermal injection on the upper arm. The live attenuated bacteria in the vaccine stimulates the immune system to develop immunity against TB. While generally safe, the BCG vaccine can cause minor side effects such as redness and swelling at the injection site, fever, and rash. Serious adverse reactions are rare but can include severe allergic reactions or disseminated BCG disease in individuals with weakened immune systems (Centers for Disease Control and Prevention, 2016).

Despite its widespread use, the BCG vaccine has limited effectiveness against pulmonary TB in adults, which is the most common form of TB. Its protective efficacy varies widely across different populations and geographic regions. The BCG vaccine is estimated to provide 50-80% protection against severe forms of TB, such as TB meningitis and disseminated TB, in children (Ahmed *et al.*, 2021; Arbeláez *et al.*, 2000). Efforts to develop new TB vaccines that

are more effective than the BCG vaccine are ongoing. These vaccines aim to provide more durable and robust protection against TB, including protection against pulmonary TB in adults (Fletcher *et al.*, 2018)

TB prophylaxis is an important strategy for preventing the progression of latent TB infection to active TB disease. The World Health Organization (WHO) recommends several regimens for TB prophylaxis, including isoniazid (INH), rifampicin (RIF), and a combination of INH and RIF. INH is the most commonly used drug for TB prophylaxis and is recommended for 6 to 9 months. RIF is recommended for 4 months in HIV-infected individuals with latent TB infection. The combination of INH and RIF is recommended for 3 months in individuals with a high risk of developing TB, such as those with HIV infection, recent contact with active TB, or immunosuppression (World Health Organization (WHO), 2015).

TB prophylaxis is highly effective in preventing the progression of latent TB infection to active TB disease. A systematic review and meta-analysis of randomised controlled trials found that INH prophylaxis reduced the risk of active TB disease by 60% to 90% in individuals with latent TB infection (Beshaw *et al.*, 2021; González Fernández *et al.*, 2020; Russom *et al.*, 2022). Similarly, RIF's prophylaxis was found to reduce the risk of active TB disease by 60% to 80% in HIV-infected individuals with latent TB infection (Kendall *et al.*, 2021). The combination of INH and RIF was found to be more effective than either drug alone (Spyridis *et al.*, 2007)

Infection control measures are also essential for TB prevention. TB is spread through the air when an infected person coughs or sneezes, so healthcare facilities and other high-risk settings must have effective infection control measures in place to prevent the spread of the disease. This includes strategies such as providing personal protective equipment (PPE) for healthcare workers, isolating infectious patients, and improving ventilation in healthcare facilities (Chughtai and Khan, 2019; Knight *et al.*, 2015).

Addressing social determinants of health is another key strategy for TB prevention. Poverty, malnutrition, and overcrowding are among the social determinants that increase the risk of TB.

Therefore, efforts to address these issues are essential for TB prevention. This may involve providing food assistance, improving housing conditions, and addressing other factors that contribute to the spread of the disease. To combat poverty's role, governments and organisations must implement poverty reduction programs, offering financial support, job training, and educational opportunities to vulnerable populations (Wingfield *et al.*, 2018). Concurrently, initiatives should target malnutrition by providing nutrition education and food assistance, particularly in underserved communities. Overcrowding, a significant driver of TB transmission, necessitates urban planning and housing improvements to decongest living spaces. Ensuring equitable access to healthcare, raising awareness through education campaigns, and empowering marginalised communities economically are vital components of a comprehensive strategy to address TB's social determinants, ultimately contributing to TB prevention and control on a broader scale. (Lönnroth *et al.*, 2009; Wingfield *et al.*, 2018).

These determinants encompass a range of socioeconomic and environmental factors that profoundly influence the risk of TB infection and disease progression. Poverty is perhaps the most potent determinant, as it intertwines with various aspects of TB transmission (Gelaw, 2016). Impoverished individuals often lack access to quality healthcare services, including TB diagnosis and treatment, leading to delayed or inadequate care (Cramm *et al.*, 2011; Nidoi *et al.*, 2021). The financial strain of poverty can also push individuals into overcrowded and unsanitary living conditions, further enhancing the risk of TB transmission within households and communities (Foster *et al.*, 2015). Malnutrition, another critical social determinant, exacerbates vulnerability to TB. Insufficient access to nutritious food weakens the immune system, making it less effective at defending against TB bacteria. People who are malnourished are not only more susceptible to TB infection but also at higher risk of developing active TB disease once infected (Balinda *et al.*, 2019).

Overcrowding is a significant contributor to TB transmission, especially in densely populated urban areas. Individuals living in cramped spaces are more likely to inhale TB bacteria expelled by someone with active TB disease. Overcrowding not only facilitates person-to-person transmission but also hinders the early detection and isolation of TB cases (Cramm *et al.*, 2011; Foster *et al.*, 2015). Furthermore, limited access to education and awareness about TB perpetuates its spread. When individuals lack information about TB symptoms, prevention

measures, and the significance of early diagnosis and treatment, they may delay seeking healthcare, allowing the disease to progress to a more advanced and contagious stage (Kigozi *et al.*, 2017).

Preventing TB requires strengthening health systems to ensure that patients receive appropriate and effective treatment (Lestari *et al.*, 2019; van der Westhuizen *et al.*, 2019). This includes improving TB diagnosis and treatment, as well as addressing the factors that contribute to the development of drug resistance, such as inadequate or incomplete treatment regimens (Espindolaa *et al.*, 2017; Fox *et al.*, 2017). Early detection and treatment are also critical for TB prevention. Countries must have robust systems in place for TB screening, diagnosis, and treatment, as well as strategies for ensuring patient adherence to treatment regimens (Espindolaa *et al.*, 2017). This includes providing free or low-cost TB drugs and addressing other barriers to treatment access, such as stigma and discrimination (van der Westhuizen *et al.*, 2019).

### **2.3 Global TB testing**

TB testing is a critical part of TB control and prevention efforts, as it allows for early detection and treatment of the disease. TB testing is an essential component of TB control efforts, as it allows for the identification of people who may be at risk for TB and the implementation of appropriate measures to prevent the spread of the disease (Engelbrecht *et al.*, 2018; Knight *et al.*, 2015; Sohn *et al.*, 2021). TB testing is important for monitoring the effectiveness of TB control efforts and evaluating the impact of interventions.

One of the most common methods of TB testing is the Tuberculin Skin Test (TST), also known as the Mantoux test (Mancuso *et al.*, 2013). The TST involves injecting a small amount of purified protein derivative (PPD) into the skin, typically on the forearm. After 48 to 72 hours, the healthcare provider will examine the injection site to look for a reaction, which can indicate the presence of TB infection. A positive TST result does not necessarily mean that a person has active TB disease, but it does indicate that they have been infected with the bacteria that cause TB (Carranza *et al.*, 2020; Mancuso *et al.*, 2013).

Another method of TB testing is the interferon-gamma release assay (IGRA). The IGRA is a blood test that detects the presence of TB infection by measuring the release of interferon-gamma (IFN-g) in response to TB antigens. The IGRA is more specific than the TST and is less likely to produce false-positive results in people who have been vaccinated with the BCG vaccine, which can sometimes cause a positive TST result (Mancuso *et al.*, 2013). In addition to these tests, chest X-rays are often used to diagnose active TB disease. Chest X-rays can reveal abnormalities in the lungs that may indicate the presence of TB disease (Centers for Disease Control and Prevention, 2016). However, chest X-rays cannot distinguish between active TB disease and latent TB infection, so they are not used to diagnose TB infection (Bommart *et al.*, 2021).

#### **2.4. Global TB contact tracing**

Contact tracing is the process of identifying and following up with people who have been in close contact with a person who has TB. Contact tracing aims to identify people who may have been infected with TB so that they can receive appropriate testing, treatment, and support (Knight *et al.*, 2015; Little *et al.*, 2018; Onuka *et al.*, 2018; WHO, 2013). It is a vital tool in preventing the further spread of TB. The first step in contact tracing is to identify the index case, the person who has been diagnosed with TB. Once the index case has been identified, the next step is to identify all of the people who have been in close contact with them. Close contact is defined as spending more than a few hours in the same room as the index case or being close to them for an extended period (WHO, 2015).

WHO recommends that TB contact tracing should be conducted for all persons who have had close contact with a TB case within the past 3 months. The contact investigation should include testing for TB infection and, if indicated, treatment for latent TB infection or active TB disease (World Health Organisation, 2013). (Sohn *et al.*, 2021) also recommends prioritising contact tracing for high-risk populations, such as healthcare workers and individuals with HIV.

The National Institute for Health and Care Excellence (NICE) guidelines are indeed used in the United Kingdom. NICE and Revised National TB Control Programme (RNTCP)

recommends that TB contact tracing should be conducted for all household contacts of a TB case, as well as other close contacts who have spent more than 8 hours in the same room as the case. The contact investigation should include testing for TB infection and, if indicated, treatment for latent TB infection or active TB disease (Khanna *et al.*, 2023; National Institute for Health and Care Excellence (NICE), 2016). NICE also recommends offering TB screening to individuals who may have been exposed to TB in congregate settings, such as schools or prisons. The RNTCP also recommends prioritising contact tracing for high-risk populations, such as healthcare workers and individuals with HIV (Khanna *et al.*, 2023).

Identified TB contacts are assessed for their risk of developing TB. This can be done through a combination of a medical history, a physical examination, and a tuberculin skin test or interferon-gamma release assay (IGRA). If the test is positive, the person may need further testing, such as a chest x-ray or sputum culture, to confirm whether they have active TB (Carranza *et al.*, 2020). Contact diagnosed with active TB will need to start treatment as soon as possible to prevent the further spread of the disease. Treatment typically involves a combination of antibiotics that must be taken for several months. It is important that the contact completes the full course of treatment to ensure that the TB bacteria are eliminated from the body (Fox *et al.*, 2017; González Fernández *et al.*, 2020; Knight *et al.*, 2015).

If the contact does not have active TB but has been infected with the bacteria, they may be offered preventive treatment to reduce their risk of developing active TB in the future. TB contact is accompanied by TB prophylaxis initiation for those who are screened negative. Contact not initiated on TB prophylaxis remains at risk of getting the infection if not initiated on TPT. Some studies show that healthcare providers lack the knowledge of TPT, which hinders TB contact tracing and screening as a TB preventative measure (Department of Health, 2017; WHO, 2015).

## 2.5 TB contact tracing, screening, and testing in Sub-Saharan Africa

In Sub-Saharan Africa, contact tracing is a critical component of TB control programs, as it helps to identify and treat TB cases early, preventing further transmission. Contact tracing is challenging in the region, where many individuals with TB live in remote or hard-to-reach areas. Many people with TB may not seek medical care due to stigma, lack of awareness, or financial barriers (Little *et al.*, 2018).

To address these challenges, TB control programs in Sub-Saharan Africa have adopted various strategies to improve contact tracing. Programs have trained community health workers to identify and refer individuals with TB symptoms for screening (Harries *et al.*, 2008). Others have established mobile clinics that can reach remote areas to provide TB screening and treatment services (Lindgren *et al.*, 2011; Schwitters *et al.*, 2015). These strategies have been successful in increasing access to TB screening and treatment services, especially in underserved communities.

Given the high prevalence of TB/HIV co-infection in sub-Saharan Africa, TB control programs in the region integrate TB and HIV services to provide comprehensive care for patients with both diseases. This includes providing antiretroviral therapy (ART) to HIV-positive TB patients, which improves their immune function and reduces the risk of TB recurrence (Harries *et al.*, 2008). In the context of HIV, TB contact tracing is particularly important due to the increased risk of TB transmission and the higher likelihood of developing active TB disease. Individuals living with HIV have a weakened immune system, which makes them more susceptible to TB infection and increases the risk of TB progression from LTBI to active TB disease. Individuals living with HIV who develop TB are at a higher risk of mortality, highlighting the need for early detection and treatment (Kigozi *et al.*, 2017).

TB screening is another critical component of TB control programs in Sub-Saharan Africa. Screening is the process of testing individuals for TB infection, even when they do not have symptoms. Screening is essential in identifying individuals with latent TB infection (LTBI), who do not have active TB disease but have the potential to develop it in the future (World

Health organization (WHO), 2015). Another strategy involves active case finding and targeted screening. Active case finding involves actively seeking out individuals with TB symptoms, such as coughing for more than two weeks and testing them for TB infection. Targeted screening involves testing individuals who are at higher risk of TB infection, such as close contact with TB patients or individuals living with HIV. TB screening is challenging in Sub-Saharan Africa due to limited resources, inadequate laboratory infrastructure, and a shortage of skilled personnel (Barter *et al.*, 2012; Saito *et al.*, 2012).

## **2.6 TB Contact tracing, screening, and testing in South Africa**

South Africa's approach to TB contact tracing and testing exemplifies a concerted effort to align with global strategies and guidelines in combating tuberculosis, a persistent public health challenge. Embracing these global standards has been instrumental in South Africa's efforts to improve TB detection, treatment, and prevention (Knight *et al.*, 2015; Little *et al.*, 2018; MacPherson *et al.*, 2019). One pivotal aspect of South Africa's response to TB has been its alignment with guidelines provided by international organisations such as the World Health Organization (WHO) and the Stop TB Partnership. These guidelines offer evidence-based recommendations for TB control programs, including strategies for effective contact tracing and testing to identify individuals at risk of TB infection or disease. By adhering to these guidelines, South Africa ensures that its TB control efforts are informed by global best practices and tailored to local contexts (Knight *et al.*, 2015; Little *et al.*, 2018).

South Africa has demonstrated adaptability in its approach to TB control, integrating new technologies and innovations into its contact tracing and testing efforts. For instance, the country has adopted molecular diagnostic tools like GeneXpert for rapid and accurate TB diagnosis, especially among high-risk populations (Lebina *et al.*, 2016). By embracing these advancements, South Africa enhances the efficiency and accuracy of its TB control programs, aligning with global trends toward more targeted and precise testing methods (Cox *et al.*, 2014)

Contact tracing is an essential part of TB control in South Africa, as it helps to identify individuals who are at high risk of developing TB and ensures that they receive appropriate



treatment. In South Africa, TB screening is often done in conjunction with contact tracing, as individuals who have had contact with someone with active TB are at high risk of TB infection, TB contact tracing in South Africa involves identifying and screening individuals who have had close contact with a TB patient, including household members, close friends, and co-workers (Knight *et al.*, 2015; Little *et al.*, 2018; MacPherson *et al.*, 2019). The screening process typically involves a symptom questionnaire that asks about the following symptoms: cough, fever, night sweats, loss of appetite, and weight loss. A chest X-ray or sputum test for those who report symptoms, the GeneXpert MTB/RIF test is used for TB testing, as it provides rapid and accurate results (Department of Health, 2017).

TB screening, testing, and treatment are available for free in public health facilities or during outreach screening programs (Cox, *et al.*, 2014). Reliable data on TB contact tracing and screening is scarce. This is due to various reasons, including the inconsistent practices in how TB cases are documented and reported across different healthcare facilities can lead to unreliable data on contact tracing and screening efforts. For instance, variations in recording methods, incomplete documentation of patient information, and discrepancies in reporting formats can all contribute to inaccuracies in TB data (Podewils,*et al.*, 2015). The lack of standardised protocols for data collection and reporting may result in underestimation or overestimation of TB cases, making it difficult to assess the true burden of the disease and track its spread accurately (Podewils, *et al.*, 2015, Murphy *et al.*, 2022). Improving data collection and reporting systems by implementing standardised protocols, providing training to healthcare staff on accurate documentation practices, and establishing mechanisms for data validation and quality assurance are essential steps to address this challenge. By ensuring consistency and reliability in data reporting, South Africa can better monitor TB transmission dynamics and tailor interventions to effectively control the spread of the disease

South Africa introduced TB guidelines as the key strategy to reduce the spread of TB, in the guideline TB contact tracing and screening is one of the priority areas as a key strategy to find contacts and missed cases. Recommendations on the guidelines state that all close contact should be traced and tested irrespective of whether the individual is present with the signs and symptoms (Department of Health, 2017). The guideline further expands its recommendation that to incorporate missed cases, all patients visiting a health facility should be screened for TB

and those representing signs and symptoms should be tested. The TB screening in the facility was made for the detection of TB while in its latent stage and connecting those to TB treatment services. Furthermore, contact tracing links contacts to prevention services. For people living with HIV, TB screening is an integral part of routine clinic visits (Knight *et al.*, 2015). Studies by Adhikari *et al.*, (2022) and Yang *et al.*, (2022) have demonstrated that people living with HIV have a high risk of being infected with TB because HIV weakens the immune system, making it harder to control latent TB infections and increasing the likelihood of TB transmission and progression to active disease (Adhikari *et al.*, 2022; Yang *et al.*, 2022)

Department of Health South Africa is collaborating with several NGOs to fight TB. NGOs mainly focus on areas with a high prevalence of TB and the communities that are living in rural areas that are hard to reach (Knight *et al.*, 2015). The contacts are traced in a non-clinical setting which includes outreach initiatives and mobile clinics (Little *et al.*, 2018). The main objective is to find index cases and link those to care. Identified cases are investigated for TB. Individuals who test positive are initiated on treatment and those who are TB negative are initiated on TB prophylaxis.

South Africa's national TB-related policies acknowledge various determinants such as socio-economic status, access to healthcare, and cultural factors. These policies recognise that these determinants can significantly impact tracing, screening, and testing efforts. For instance, socio-economic status affects access to healthcare services and may hinder individuals from seeking TB testing or treatment. Cultural factors, such as stigma surrounding TB, may also affect the willingness to participate in screening programs or disclose TB symptoms (Msoka *et al.*, 2021). South Africa's policies emphasise the importance of addressing these determinants through targeted interventions, community engagement, and healthcare system strengthening to enhance TB tracing, screening, and testing initiatives (Msoka *et al.*, 2021)..

South Africa's national guidelines recommend the use of isoniazid (INH) prophylaxis for the prevention of tuberculosis (TB) in individuals with latent TB infection. The recommended INH regimen is 6 months of daily INH (300 mg for adults and 10-15 mg/kg for children), with or without pyridoxine (vitamin B6) supplementation to reduce the risk of peripheral neuropathy.

The guidelines also recommend the use of INH prophylaxis in combination with antiretroviral therapy (ART) for individuals with HIV infection, as this has been shown to reduce the risk of TB and mortality (National Department of Health, 2020).

Rifampicin (RIF) prophylaxis is not routinely recommended in South Africa, as it is associated with a higher risk of adverse effects compared to INH. However, RIF may be considered as an alternative option for individuals who are unable to tolerate INH or who have a high risk of INH-related hepatotoxicity, such as those with underlying liver disease or those who consume alcohol regularly. The recommended RIF regimen is 4 months of daily RIF (10 mg/kg for adults and 15 mg/kg for children), with or without isoniazid (INH) for the first 2 months (National Department of Health, 2020).

## **2.7 Benefits of TB contact tracing and testing**

TB contact tracing and screening is one of the strategies employed to control the spread of TB in South Africa. Studies on TB contact tracing and screening show that benefits include early diagnosis of TB which reduces the spread and improves the prognosis of the disease (Baluku *et al.*, 2021; Lee-Rodriguez *et al.*, 2020; Onuka *et al.*, 2018).

TB contact tracing and testing improve treatment outcomes. Early detection of TB through contact tracing and testing can lead to improved treatment outcomes. Treatment can be started earlier, reducing the risk of complications and improving the chances of successful treatment (Martinson *et al.*, 2022). Improved treatment outcomes can lead to better health outcomes for individuals, reduced healthcare costs, and improved public health. TB contact tracing is not only a medical advantage for those who are case contacts but also benefits the communities, TB contact tracing and testing can also be cost-effective. TB contact tracing and testing can help to prevent the spread of TB and reduce the need for more expensive treatments and hospitalizations. Early detection and treatment can prevent complications, reducing the cost of treatment and care. TB contact tracing and testing can be a cost-effective way to control TB, reducing the overall cost of TB control programs (Chetty-Makkan *et al.*, 2021; Kaswaswa *et al.*, 2022). Despite the benefits of TB contact tracing and screening numerous cases are still

being missed (Asemahagn, 2022; Assefa *et al.*, 2019; Kakame *et al.*, 2021). Millions of cases are missed each year (World Health Organisation, 2021). Missing index cases are a missed opportunity in the prevention of the spread of the disease.

## **2.8. Barriers to TB contact tracing and screening**

TB contact tracing is an essential intervention in TB control programs for early identification and treatment of individuals with TB infection. However, there are several barriers to effective TB contact tracing that can limit its success. These include health system factors, social factors, and personal factors.

### **2.8.1 Policy/Health systems-level factors**

TB contact tracing and screening programs may fail due to weak health systems. Weak health systems can hinder the effective implementation of TB control programs, including contact tracing and screening. They can also undermine patient trust and confidence in the healthcare system, leading to decreased utilisation of services. One of the main reasons why TB contact tracing and screening fail in Sub-Saharan Africa is the lack of resources (Saito *et al.*, 2012; Schwitters *et al.*, 2015). Many countries in the region have limited resources, including inadequate funding, a lack of trained healthcare workers, and limited laboratory infrastructure. This makes it difficult to implement effective TB control programs, including contact tracing and screening (Asemahagn, 2022; Kakame *et al.*, 2021; Tesfaye *et al.*, 2020). Without adequate resources, TB control programs are unable to reach remote and underserved areas, provide appropriate testing and treatment services, and address the social and economic factors that contribute to TB transmission. Poor organisation of health programs is another underlying factor for barriers to TB contact tracing and screening. Facilities are dependent on one HCP, resulting in longer waiting times in the facilities (Musakwa *et al.*, 2021). This increases the likelihood of a patient to be reluctant to access the services. Negative perceptions about public sectors discourage clients from accessing health services, asymptomatic clients.

In South Africa, the government has made significant progress in bringing primary health clinic services close to people, but there are still communities that are struggling with access to care due to transport not being able to reach those areas (Engelbrecht *et al.*, 2018). Despite progress, people are reluctant to utilise health facilities closer to their location due to fear of being noticed by people they know and being stigmatised (Little *et al.*, 2018).

### **2.8.2 Social level factors**

Socioeconomic and cultural factors have a great influence on the decision-making process of health care facility utilisation. The study conducted in Iran found that social barriers influenced individuals' access to health services (Rahmati *et al.*, 2023). The barriers identified include stigma and discrimination in the community of people living with TB (Pantha *et al.*, 2022; Rahmati *et al.*, 2023). Stigmatisation of those diagnosed with TB is the main obstacle to TB screening and testing (Ayakaka *et al.*, 2017a). Other scholars found similar findings (De Schacht *et al.*, 2019; Tesfaye *et al.*, 2020) Stigmatisation can impede strategies that promote TB prevention, contact tracing, screening, and treatment efforts. In many segments of South Africa HIV/TB stigma remains a major issue (Pantha *et al.*, 2022).

Cultural beliefs about the causes of the disease affect the health-seeking behaviour of individuals (Tefaye *et al.*, 2020). Society believes that TB is associated with witchcraft. Culture plays a crucial role in health-seeking behaviour, it can facilitate or hinder the utilisation of health services (Abubakar *et al.*, 2013; Ayakaka *et al.*, 2017b; Thomas *et al.*, 2021). Culture contains components such as norms and shared beliefs. Many populations start seeking help from traditional healers before accessing health services. Misperceptions such as associating people with TB with HIV negatively impact the use of TB health services. In some societies, TB is associated with evil spirits. Studies show that people consult with traditional healers before seeking help from health facilities (Singhasivanon *et al.*, 2004). The use of Western medicine is associated with weakness by men from rural communities (Abubakar *et al.*, 2013; Olanrewaju *et al.*, 2019). Men across Africa are known for poor health-seeking behaviour. This behaviour leads to a poor prognosis of the disease.

In the context of South Africa, cultural beliefs play a significant role in influencing TB contact tracing and screening efforts. Cultural factors such as stigma surrounding TB, traditional healing practices, and beliefs about the causes of the disease can impact individuals' willingness to engage with healthcare services and participate in contact tracing and screening programs. For example, in some communities, TB may be associated with supernatural causes or perceived as a punishment for wrongdoing, leading to reluctance to seek medical care or disclose TB symptoms. Moreover, traditional healers often hold sway in communities, and their beliefs and treatment methods may conflict with biomedical approaches to TB management, further complicating efforts to engage with affected populations. Studies conducted in other regions such as Bangladesh (Singhasivanon et al., 2004), Kenya (Abubakar *et al.*, 2013), and Nigeria (Olanrewaju et al., 2019) underscore the importance of considering local cultural contexts when designing TB control interventions

### **2.8.3 Personal level**

In 2019, De Schacht et al. conducted a study to examine barriers to TB screening and Testing based on the patient's perspective. Personal level barriers that were found included the inability to accept the disease, limited knowledge, and consequences of being known to be diagnosed with TB. Care workers report that patients report a lack of financial resources to travel to health care (De Schacht *et al.*, 2019).

Comprehending in a language that a client understands reduces the ability to understand the healthcare worker. Linguistic obstacle causes misunderstanding and miscommunication which reduces the ability of the person to follow instructions. The attitude of health care providers influences the utilisation of health services by the community. Studies show that the majority of health facility users are not satisfied with the attitude of health service providers (Musakwa *et al.*, 2021; Rahmati *et al.*, 2023; Tesfaye *et al.*, 2020). Community health care workers reveal that attitude among staff is the barrier to contact tracing. Nurses believe contact tracing is CHW's responsibility, if there is no CHW, contact tracing is not done. Quality of care also plays a crucial role in the way health service providers are perceived.

Lack of TB knowledge from health providers delays TB diagnosis (De Schacht *et al.*, 2019). Some HCPs are not willing to test for TB if they do not believe the client has TB. This prolongs the initiation of treatment and is likely to increase the number of TB contacts. Due to the high number of TB contacts the HCP failed to reach all the contacts. Misidentification of contact also constitutes an obstacle to reaching TB contacts (Assefa *et al.*, 2019). Studies conclude that because of limited resources in health facilities, reaching all TB contacts is not feasible (Saito *et al.*, 2012; Schwitters *et al.*, 2015). Optimal history-taking enables the health providers to identify all case index contacts and prevent misidentification of contacts.

In conclusion, the review highlights the complex interplay of social, economic, and cultural factors influencing TB prevention strategies, particularly in the context of South Africa and Sub-Saharan Africa. While global efforts have focused on TB prevention through vaccination, prophylaxis, infection control, and addressing social determinants of health, the effectiveness of these strategies in high-burden regions like Sub-Saharan Africa hinges on overcoming numerous challenges. In South Africa specifically, TB contact tracing, screening, and testing face barriers rooted in health system deficiencies, social stigma, and individual-level challenges. Weak health systems, limited resources, and organisational shortcomings hamper effective implementation, while societal stigma, cultural beliefs, and personal barriers impede community engagement and healthcare utilisation. Addressing these multifaceted challenges requires comprehensive strategies that not only strengthen healthcare systems and infrastructure but also combat stigma, improve education and awareness, and foster patient-centred approaches. Collaborative efforts involving governments, healthcare providers, communities, and international organisations are essential to overcome these barriers and advance TB prevention efforts in South Africa and across Sub-Saharan Africa, ultimately working towards reducing the burden of this devastating disease.

## CHAPTER 3

### 3. METHODOLOGY

#### 3.1 Introduction

This chapter details the research design and methods, study setting, selection, and profile of participants. Furthermore, it describes how data was gathered, the tools that were used for data collection, and the techniques applied to analyse the data. The chapter wraps up by addressing the study's reliability, any limitations, and the ethical principles it adheres to.

#### 3.2 Study Design

A research design is an overall approach used to conduct a study to answer a research question. An appropriate research design is based on the research problem, the researcher's experience, and the subject matter. It provides a roadmap or detailed plan to conduct research. Research design is critical as it ensures a systemic process of conducting research (Lê & Schmid 2020). This detailed process covers how the data was collected, analysed, and interpreted to answer the research objectives.

The researcher utilised a qualitative approach to explore barriers to TB contact tracing and screening faced by healthcare providers. The qualitative approach is used to study the subjective experiences and perspectives of individuals or groups. The individual experiences are captured in their natural surroundings (Polit & Hungler, 1999). It is characterised by its focus on understanding the social and cultural context in which individuals or groups live, and the meaning that they ascribe to their experiences. In a thesis, the qualitative paradigm can be used to explore complex social phenomena, such as human behaviour, beliefs, and attitudes (Levitt et al., 2021). This approach is particularly useful when the research question involves exploring the experiences and perspectives of individuals or groups in-depth, and when there is a need to understand the social and cultural context in which these experiences occur (Flick 2022). The qualitative approach assumes that social reality is constructed by individuals and groups and that this reality is subjective and contextual (Merriam & Tisdell, 2016). It is



therefore important for researchers to understand the context in which individuals or groups live, and the meaning that they ascribe to their experiences.

The research specifically used a descriptive-exploratory design. The descriptive-exploratory design is a research methodology that is commonly used in social science research. This type of research design is used to explore and describe phenomena that have not been well studied before, to generate new ideas or hypotheses for future research (Gray, Grove & Burns 2013). The researcher used exploratory-descriptive design to gain a better understanding of barriers to TB contact tracing and screening from healthcare service providers perspective, describe the experiences of healthcare workers in detail, and identify potential patterns or trends that might be useful for future research.

### ***3.2.1 Exploratory Research Design***

Exploratory research is used to comprehend the underlying cause of a particular problem (Peterson & Gricus 2022). An exploratory study design is a preliminary investigation that seeks to identify and define research questions, hypotheses, and variables of interest. This type of study design is often used when the research area is new or has not been well-defined. The primary objective of an exploratory study is to gain a better understanding of the research problem and to generate hypotheses that can be tested in future research (Gravlee, 2022). In an exploratory study, researchers may use various research methods such as literature review, case study, focus group, or interviews to collect data. The data collected in an exploratory study is qualitative, and the analysis is often based on content analysis or grounded theory. The results of an exploratory study are descriptive and may be used to develop new theories, generate research questions, or refine existing hypotheses (Peterson & Gricus 2022). This is appropriate for this research because the researcher aimed to examine the nature of the phenomenon of TB contact tracing and screening and identify associated factors.

### ***3.2.2 Descriptive design***

In qualitative research, a descriptive study design is used to provide an in-depth, detailed, and comprehensive description of a phenomenon, group, or situation as it naturally happens Burns and Grove (2003). Descriptive research design is a type of research methodology that focuses on describing and documenting the characteristics, behaviours, or attributes of a particular phenomenon or population without manipulating it. It is often used in the early stages of research to gain a better understanding of a subject or to provide a baseline for more in-depth research (Brink *et al.*, 2018).

### 3.3 Study setting



Map of Port Elizabeth. Available from: <https://www.roomsforafrica.com/dest/south-africa/eastern-cape/port-elizabeth.jsp?tab=3>

Two clinics located in disadvantaged communities in the Eastern Cape, in the Ibhayi area, were selected. Ibhayi is characterised as a predominantly Xhosa-speaking community situated within the city of Port Elizabeth, South Africa. It covers an area of 36 km<sup>2</sup>. The population of Ibhayi was approximately 237,799 people in 2011. While the latest figures are not available, it is important to note that the numbers may have increased since then. The community is relatively young, and the median age in the Ibhayi area is 23 years. The community is also predominantly female, with women making up around 52% of the population (South African Census, 2011).

The Ibhayi area is considered to be a predominantly low-income community with a high unemployment rate. The community has limited access to basic services such as electricity, water, and sanitation, and many households live in overcrowded and poor housing conditions

(Rose & Charlton, 2002). The lack of formal employment opportunities has led to a reliance on the informal economy, with many residents engaged in small-scale trading or informal work. The community also faces challenges related to crime, substance abuse, and gang violence, which further exacerbate the socioeconomic challenges faced by residents (Fransman & Yu, 2019).

The community also faces challenges related to access to healthcare services, including a shortage of healthcare workers and inadequate healthcare infrastructure (Morris-Paxton et al., 2020). The nearest public hospital, Dora Nginza, is located in neighbouring New Brighton and serves a large catchment area. However, the hospital is often overcrowded and under-resourced, leading to long waiting times and limited access to quality healthcare service (Fransman & Yu, 2019; Morris-Paxton *et al.*, 2020). Community-based healthcare initiatives, such as mobile clinics and outreach programs, play an important role in addressing some of the health challenges faced by residents in Ibhayi. However, more support is needed to improve access to quality healthcare services and address the underlying socioeconomic factors that contribute to poor health outcomes.

### **3.4 Population and Sampling**

#### ***3.4.1 Sampling and Sampling Process***

Samples are often selected using various sampling techniques. For this study, the researcher used purposive sampling (Brink, Van der Walt & van Rensburg, 2012:134; Polit and Beck, 2015). Purposive sampling involves selecting participants who have certain characteristics or meet certain criteria that make them relevant to the research question and have an in-depth understanding of a particular phenomenon (Clearly, Horsfall & Hayfer, 2014). The study participants were nurses and community health workers affiliated with health facilities that were accessible and selected for the research. The selection of these individuals was based on their potential to possess adequate knowledge and experience in TB contact tracing and screening. Both nurses and CHWs contribute to TB screening and contact tracing efforts, their roles differ based on their training, responsibilities, and scope of practice. Nurses typically have

more advanced clinical skills and responsibilities, while CHWs focus on community outreach and support, working collaboratively to improve TB prevention, detection, and treatment outcomes.

The researcher shared detailed description of the research with the clinic managers including the inclusion criteria, they were asked to refer potential participants to the researcher for further engagement. The researcher employed a multifaceted approach to reach out to potential participants and introduce the research study. This approach included both email correspondence and in-person meetings, tailored to accommodate the preferences and availability of the participants. Initial contact was made via email, wherein I provided a detailed overview of the study, its objectives, and the importance of their participation. This initial communication served as an invitation for further engagement and discussion. Not every individual approached was necessarily willing or able to participate due to various factors such as time constraints or personal commitments.

#### *Profile of Participants*

Participant Code	Gender	Age	Education	Years of experience
Nurse 1	F	44	Diploma	13
Nurse 2	M	32	Degree	4
Nurse 3	F	50	Diploma	22
Nurse 4	F	29	Diploma	4
CHW 1	F	33	Matric	5
CHW 2	F	40	Matric	11
CHW 3	F	28	Matric	4
CHW 4	F	25	Matric	2
CHW 5	F	49	Matric	7
CHW 6	M	28	Matric	6
CHW 7	F	37	Matric	5
CHW 8	F	36	Matric	7

### ***3.4.2 Inclusion criteria***

The inclusion criteria for this study were health workers who had 2 or more years' experience in conducting TB contact tracing in healthcare facilities or the community. Participants were selected from a variety of healthcare settings to ensure a diverse sample. This study included health workers who had been directly involved in TB contact tracing in healthcare facilities or community settings. Participants were recruited from public health facilities in low- and middle-income areas. Participants must have 2 or more years' experience in conducting TB contact tracing, and they must be able to provide informed consent to participate in the study and be willing to participate in the study.

### ***3.4.3 Exclusion criteria***

Exclusion criteria serve to define certain characteristics or conditions that individuals should not possess to participate in a study (Polit & Beck, 2017). In this study, the exclusion criteria were focused on ensuring that participants had sufficient knowledge and experience in managing TB cases and programs, as well as appropriate training in TB contact tracing. Participation was voluntary, those who did not want to participate in the study were not eligible to participate in the study. These criteria were established to maintain the quality and relevance of the study by ensuring that participants were adequately qualified and willing to contribute to the research. The study excluded participants who had not conducted TB contact tracing or did not meet the inclusion criteria. The researcher ensured that all participants provided informed consent before participating in the study.

The sample size for this qualitative study was determined based on the principle of saturation, which is a widely recognised criterion for sample size determination in qualitative research. Saturation refers to the point at which data collection no longer yields new information or themes, indicating that the sample size is sufficient to answer the research questions (Hennink & Kaiser, 2022). Data saturation was achieved after conducting 12 in-depth interviews with healthcare workers, including 4 nurses and 8 community healthcare workers. The sample size was deemed adequate for the study as the data collection and analysis yielded no new themes

or information beyond the 12th participant. The sample size of 12 participants was consistent with the sample sizes of previous qualitative studies on similar topics and was deemed sufficient for achieving the study's aims and objectives. The small sample size is typical of qualitative research, as the focus is on in-depth exploration of participants' experiences, rather than numerical generalisability (Hennink & Kaiser, 2022).

### **3.5 Data collection and management**

Unlike quantitative research, where predetermined variables are studied, in qualitative research, study questions are flexible and can be expanded or altered based on emerging concepts and understandings during data collection (Creswell, et al., 2016). The method of data collection used in this study was interviewing, which involves speaking with individuals who have first-hand knowledge of the topic under investigation.

The data for this study was specifically gathered through individual, face-to-face, unstructured in-depth interviews. Unstructured interviews are ideal for sensitive and culture-related topics and allow for a free-flowing dialogue between the researcher and the participant. (Kielman, Cataldo & Seeley, 2011). The use of in-depth interviews allowed for the collection of rich and detailed data, as participants were allowed to express their thoughts and feelings in their own words. Field notes were also used to supplement the data collected from the interviews, providing additional contextual information about the research topic. The researcher was the interviewer and used probing questions for in-depth understanding and clarity. An average of 45min per interview. The interviews were held in an easily accessible and private location which was the facility boardroom. The interviews were conducted in English but respondents were allowed to answer in a local or preferred language to be able to express themselves better. Participants used either IsiXhosa or English. No translator was utilised as the interviewer is fluent in both English and IsiXhosa. The interviews were audio recorded. The interviews took two weeks to complete due to work constraints. The researcher could only interview an average of two interviews per day.

To ensure ethical considerations, participants were required to sign informed consent forms before participating in the study, and their preferred language was used during the interviews. The confidentiality of participants was maintained by using code names instead of real names, and the interviews were conducted in private spaces.

### **3.6 Data analysis**

The researcher used thematic analysis, which involves identifying themes inductively from the data as well as deductively from the adopted theoretical model. Data analysis was done manually following Braun and Clarke's (2006) six-step approach, which provides a detailed and systematic guide to conducting this method.

#### **Step 1: Familiarising oneself with the data**

The first step in the approach is to become familiar with the data by reading and re-reading it. This process involves getting a sense of the overall content, context, and nuances of the data. As you read through the data, you should make notes and jot down initial thoughts and ideas that come to mind. This will help you identify interesting patterns, themes, and ideas that may emerge from the data (Braun and Clarke, 2006). Responses were transcribed, and translated into English. Field notes and memos were also made during and after the interviews. The data were organised and stored in a secure and accessible location.

#### **Step 2: Generating initial codes**

The second step is to generate initial codes by identifying and labeling relevant parts of the text. This can be done using inductive coding, which involves coding the data without any pre-existing categories. When generating codes, it is important to be descriptive, concise, and meaningful. Codes should be grounded in the data, rather than imposed from external sources (Braun and Clarke, 2006).

#### **Step 3: Searching for themes**

The third step is to search for themes by identifying patterns and topics that capture a particular aspect of the data. This involves organizing codes into potential themes and examining how they relate to each other. Themes should be meaningful and relevant to the research question and should be grounded in the data (Braun and Clarke, 2006). In this study, themes were identified by grouping the initial codes that relate to the barriers to TB contact tracing and screening. The codes were sorted and grouped based on their similarities and differences, and common patterns of meaning were identified.

#### Step 4: Reviewing and refining themes

The fourth step is to review and refine the themes that have been identified. This involves checking that all the codes that belong to a particular theme are relevant and meaningful, considering the relationship between themes, and merging or splitting themes as necessary. It is important to be rigorous in this process to ensure that the themes accurately reflect the data (Braun and Clarke, 2006). In this step, the themes were reviewed to ensure that they accurately reflected the data. The themes were checked for consistency, coherence, and completeness. This process helped to refine the themes and ensure that they were comprehensive and inclusive of all the data.

#### Step 5: Defining and naming themes

The fifth step is to define and name the themes. A clear and concise definition for each theme should be created, which captures its essence. Additionally, a descriptive and meaningful name should be given that accurately represents its content (Braun and Clarke, 2006). In this study, the themes were defined and named based on their content and relevance to the research question.

#### Step 6: Writing up the findings

The final step is to write up the findings in a report that summarises the themes and their meanings. The report should provide an overview of the research question, the data, and the analytic approach, and should present examples from the data to support each theme and demonstrate its relevance to the research question. Clear connections between the themes and the broader research question should be made, and the implications of the findings for theory



and practice should be reflected upon (Braun and Clarke, 2006). The report presents the findings of the thematic analysis and discusses the implications for TB contact tracing and screening. The report also highlights the limitations of the study and provides recommendations for future research.

### **3.7 Rigour**

Rigor, as a concept, refers to the overall quality and soundness of the research process, including the research design, data collection, analysis, and interpretation. To guarantee rigor in qualitative research, researchers need to follow a systematic and rigorous process that includes appropriate research design and methods. Researchers used triangulation and member check-ins, to enhance rigor and validate the findings. Trustworthiness is a multifaceted concept that encompasses the credibility, transferability, dependability, and confirmability of research findings. These criteria ensure that the research process is robust and that the findings are valid and meaningful. Trustworthiness addresses the extent to which the research findings accurately reflect the reality being studied and can be considered credible and dependable (Polit & Beck 2012).

Qualitative research is a well-established approach for exploring complex social phenomena, as it enables researchers to delve into the subjective experiences and perspectives of participants (Cypress, 2017). However, the subjective nature of qualitative research necessitates rigor in the research process to ensure that the findings are trustworthy, and can inform policy and practice. An overview of the key elements of rigor and trustworthiness integrated in this qualitative research, including strategies and best practices that the researcher used to enhance the quality of research, are presented below.

#### **3.7.1 Credibility**

One significant element of establishing trustworthiness in research is credibility, which refers to the researcher's confidence in the accuracy of the study's findings from the viewpoints of the

participants, the researcher, and the readers or evaluators (Polit & Beck 2012). To be considered credible, the findings must genuinely represent the participants' actual experiences (Lincoln & Guba, 1985; Shenton, 2004). To ensure credibility in this study, the researcher employed various measures that demanded sustained engagement, such as prolonged involvement in the study area, adequate contact with the participants, and frequent in-person participant debriefing sessions. This entailed the researcher's commitment to an extended period in the research environment, including frequent visits to healthcare facilities, interactions with healthcare professionals, and observation of TB screening and contact tracing activities.

### ***3.7.2. Dependability***

Dependability refers to the reliability of the information over time and circumstances (Polit & Beck 2012). It is the degree to which the findings of a study are consistent, stable, and can be replicated over time. Dependability is concerned with the consistency of the research process. It ensures that the data gathered remains consistent throughout the study, and the findings can be verified by a third party unfamiliar with the researcher or the study. Dependability is only achieved after establishing credibility, which is the ability of the researcher to gain the trust of the participants and provide accurate and valid data (Lincoln & Guba, 1985; Shenton, 2004). In this study, dependability was achieved by collecting data from reliable sources, namely nurses and community health workers involved in TB contact tracing and screening for in-depth interviews.

### ***3.7.3. Confirmability***

Confirmability refers to the degree to which the findings of a study can be confirmed or corroborated by others (Polit & Beck 2012). Confirmability is concerned with the objectivity and neutrality of the researcher in the research process. Confirmability was demonstrated by providing detailed descriptions of the research methods and data analysis procedures used in the study. The researcher provided a clear research process, from data collection to analysis. This includes a description of the data collection process, such as how participants were

recruited and how data was collected. The researcher in this study adhered to ethical and academic guidelines by storing field notes, and audiotape recordings securely after research completion.

#### ***3.7.4. Transferability***

Transferability is the degree to which the findings of a study can be applied to other contexts or settings (Polit & Beck 2012) transferability focuses on the extent to which the findings can be generalised to other situations beyond the study (Lincoln & Guba, 1985; Shenton, 2004). To ensure transferability the researcher described the context of the study in detail, including the population and setting, and explained how the findings might be relevant to other contexts.

#### ***3.7.5. Reflexivity***

Reflexivity is a concept that is increasingly acknowledged as a crucial component of qualitative research methodology. It refers to the researcher's self-awareness and ability to reflect on their role in the research process. More specifically, reflexivity involves the researchers awareness of how their personal beliefs, values, and biases may influence the data collection, analysis, and interpretation stages of the research (Hiller & Vears, 2016). As a researcher, I recognised the importance of acknowledging my own cultural, social, economic, and political positionality in relation to the study participants. My background, beliefs, and experiences inevitably shaped my interactions and perceptions within the research setting. I was mindful of the power dynamics inherent in researcher-participant relationships and worked to mitigate potential biases or assumptions. As an outsider to the community, I continually reflected on how my perspectives and interpretations might differ from those of the participants, considering the potential impact of my positionality on the research process and findings. .

### **3.8 Ethical consideration**

Principles of Ethics include justice, non-maleficence, respect for autonomy, and beneficence (Artal & Rubinfeld, 2017). In the pursuit of these principles, the researcher implemented various measures.

### ***3.8.1. Permissions***

Ethics plays a crucial role in ensuring that the rights and welfare of research participants are protected and that the research is conducted in a manner that is consistent with ethical principles and values. Ethics in research helps to establish standards and guidelines for conducting research and to promote the integrity and validity of research findings. Ethical approvals help ensure that the research is conducted in a manner that is consistent with ethical principles and values and that the rights and welfare of the participants are protected (Newman, Guta & Black 2021). For this research ethical considerations involved obtaining ethical clearance from the University of Western Cape Biomedical Ethics Committee. Additional permissions were obtained from the National Department of Health, the District Department of Health, health facilities managers, and participants.

### ***3.8.2. Informed Consent***

Informed consent is a fundamental ethical principle in research that refers to the process of obtaining permission from individuals to participate in a study. Informed consent requires that the researcher provide the participant with clear and understandable information about the study, including its purpose, procedures, risks and benefits, and the participant's rights (Manti & Licari 2018). The participant must then voluntarily give their informed consent to participate in the study, without coercion or undue influence. Informed consent ensures that individuals are fully informed about the research in which they are participating, which allows them to make an informed decision about whether or not to participate. This is particularly important when the research involves potential risks or discomfort to participants (Haggerty & Hawkins, 2000). Furthermore, it protects the rights and dignity of participants by ensuring that they are not exploited or coerced into participating in the research. Participants have the right to know what is expected of them, what risks and benefits are involved, and to have the freedom to choose whether or not to participate. Informed consent is important for maintaining trust and transparency in the research process. It helps to establish a respectful and collaborative relationship between the researcher and the participant, which is essential for obtaining reliable

and valid data. Informed consent was obtained from participants and were free to withdraw at any time.

Prospective participants were provided with a comprehensive information sheet detailing the study's purpose, procedures, risks, and benefits, ensuring they had a clear understanding of the research. They were explicitly informed that their participation was voluntary and that they could withdraw at any time without repercussions. Participants signed a consent form to signify their willingness to participate. Their privacy was safeguarded, and ongoing communication channels were established to address questions or concerns. This ethical approach prioritised participants' autonomy, protected their rights, and maintained transparency, fostering trust and ensuring the research's integrity.

### ***3.8.3 Privacy and Confidentiality***

Privacy refers to an individual's right to control access to their personal information, including their name, address, contact details, and any other information that could be used to identify them. In the context of research, privacy means that participants have the right to control who has access to their personal information and how it is used. To protect privacy, researchers should take steps to ensure that the personal information of study participants is not disclosed to unauthorised parties (Newman, Guta & Black 2021). To ensure privacy in this research, the researcher used anonymous or pseudonymous data collection methods. Data was collected and analysed in a way that does not reveal the identity of the participant, such as using codes or pseudonyms instead of names.

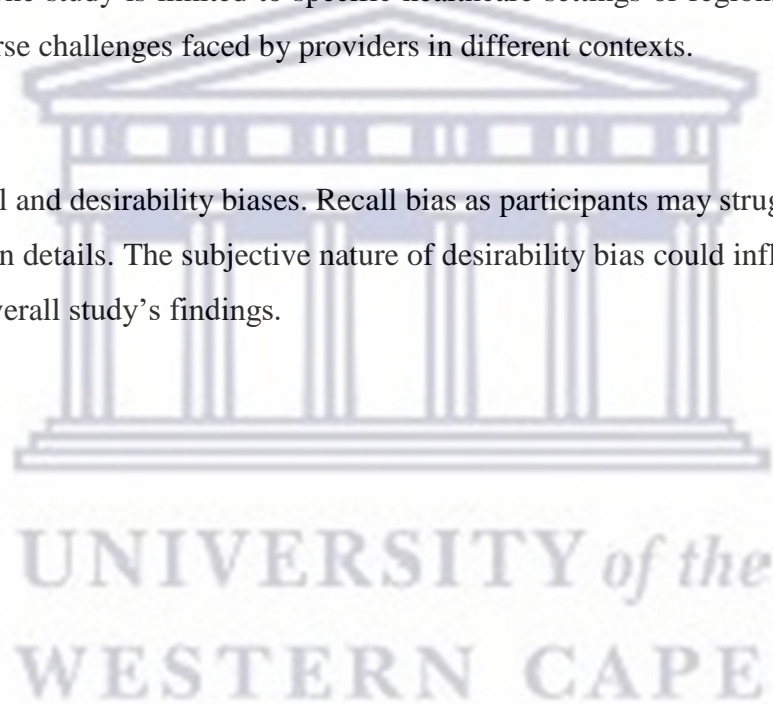
Confidentiality is an obligation of the researcher to keep information provided by study participants confidential. This means that the researcher must take steps to ensure that participant data is not disclosed to unauthorised parties, even accidentally. Confidentiality is particularly important when participants provide sensitive information, such as information about their health or personal experiences (Newman, Guta & Black 2021). To protect the confidentiality the researcher stored participant data in a secure laptop with limited access.

Researchers may also use anonymised data for analysis, which involves removing any personally identifying information from the data before conducting analysis.

### **3.9 Limitations of the study**

One of the limitations of the research is that it does not include the diversity of health cadres, and the voices of health workers, other than nurses and community health workers, are missing. However, the two categories of health workers are primarily responsible for TB contact tracing and screening. The study is limited to specific healthcare settings or regions, it might fail to capture the diverse challenges faced by providers in different contexts.

The risk of recall and desirability biases. Recall bias as participants may struggle to remember and report certain details. The subjective nature of desirability bias could influence responses, impacting the overall study's findings.



## CHAPTER 4

### 4. RESULTS: FACTORS THAT INFLUENCE TB CONTACT TRACING AND SCREENING

This chapter was guided by SEM (Social-Ecological Model) and thematic analysis, two powerful methodologies that offer distinct lenses. We explore various barriers to TB contact tracing and screening encountered by healthcare professionals and community health workers (CHWs). The study was prompted challenges in TB contact tracing and screening prompted the investigation, aiming to uncover barriers hindering effective control efforts.

Through interviews with a diverse group of participants, including CHWs and Professional Nurses (PNs), we gained insights into the individual, interpersonal, organisational, community, and policy/health system factors hindering effective TB control efforts. Thematic analysis offers a systematic approach to uncovering patterns, meanings, and themes within qualitative data. Through a meticulous process of coding, categorising, and interpreting textual or visual data, thematic analysis enables researchers to distill rich narratives, uncover implicit connections, and derive profound insights from diverse sources of information. Together, SEM and thematic analysis provided the researcher with invaluable tools to explore, thereby enhancing the depth and breadth of data analysis in the study.

The qualitative data analysis guided by the SEM and thematic analysis approach generated the following themes:

Analytical framework	Themes
Individual	<ul style="list-style-type: none"><li>• Lack of training</li><li>• Burnout</li><li>• Cultural and Language</li></ul>
Interpersonal	<ul style="list-style-type: none"><li>• Discrimination and stigmatisation</li><li>• Conflict</li><li>• Patient engagement</li></ul>
Organisational	<ul style="list-style-type: none"><li>• Workload</li><li>• Compensation</li></ul>

	<ul style="list-style-type: none"> <li>• Facility policy</li> </ul>
Community	<ul style="list-style-type: none"> <li>• Lack of community awareness and resistance</li> <li>• Crime in the Community</li> </ul>
Policy/health system	<ul style="list-style-type: none"> <li>• Overcrowding in the health system</li> <li>• Resources</li> <li>• Health system strain</li> </ul>

#### **4.1 Individual factors**

Individual factors play a crucial role in shaping the effectiveness of TB contact tracing and screening efforts. These are barriers that originate from within individual healthcare providers or community health workers. They include factors such as lack of adequate training, outdated knowledge or skills, burnout, and other personal challenges that impact their ability to effectively conduct TB contact tracing and screening.

##### *Lack of training*

Health providers often expressed concerns about their training related to contact tracing and testing procedures for infectious diseases like TB. They felt that the training they received was inadequate in preparing them for the intricacies of contact tracing, which involves identifying and notifying individuals who may have been exposed to a contagious disease.

*"I've received minimal training on TB/HIV contact tracing. I often feel ill-prepared to handle these cases effectively." CHW3*

*"The training we get is too brief as community health care works and doesn't cover all the nuances of contact tracing. It's challenging to perform this task without proper guidance." CHW7*

Some health providers felt that they were not up-to-date with the latest screening techniques for TB. Providers expressed concerns about their outdated knowledge. There are new methods



like Detection of Mycobacterium tuberculosis in urine by Xpert MTB/RIF Ultra' (Atherton et al., 2018)

*"I admit that I'm not up-to-date on the latest screening techniques. Sometimes I rely on outdated methods, which may not yield accurate results. New testing technologies are emerging, and it's tough to keep pace. Without proper training and access to updated information, we can't provide the best care." HC1*

### *Burnout*

Health providers reported an overwhelming workload, which often led to emotional stress and burnout. The emotional toll of their work was compounded by the feeling of being overburdened, with many struggling to cope with the demands of their job. They stated that the combination of high workload, emotional stress, and burnout harmed the quality of care provided to patients.

*"Dealing with TB patients can be emotionally draining. The fear of transmission, the stigma, and the constant worry about making a mistake can lead to burnout. I've seen colleagues struggle with emotional stress. It's hard to stay resilient when you're constantly exposed to the challenges of TB/HIV care." HC1*

### *Cultural and Language Barriers*

Many participants highlighted communication problems that arose from language differences between health providers and patients. This language barrier often led to misunderstandings, making it difficult to convey important health information accurately. Miscommunication has serious consequences, such as patients not following the importance of contact tracing. Health professionals and CHWs have faced some communication barriers at some point during TB contact tracing.

*"Communication breakdowns due to language differences are common. It's frustrating when we can't effectively convey the importance of contact tracing and testing." HC9*

*"Patients often struggle to understand our instructions and the significance of the tests because of language barriers. This hinders our ability to control the spread." HC1*

Health providers also shared their frustration in dealing with the diverse cultural practices and beliefs of their patients. Providers sometimes find it challenging to strike a balance between respecting patients' cultural practices and ensuring the best possible medical care. For example: Some cultures rely heavily on traditional healers or alternative medicine practices and thus do not welcome healthcare providers in their homes.

*"Cultural sensitivity is crucial in our work. However, I sometimes find it challenging to navigate diverse cultural practices, and it can affect trust-building." HC12*

#### **4.2 Interpersonal factors**

Interpersonal barriers stem from interactions between individuals within healthcare settings or communities. This can include discrimination, stigma, conflicts among healthcare providers, difficulties in communication between healthcare providers and patients, and challenges in building trust and rapport with patients or colleagues.

##### *Discrimination and Stigmatisation*

All healthcare providers reported a genuine fear of discrimination or stigmatisation from their peers and colleagues due to their close contact with TB. This fear was observed to result in social isolation and a lack of support systems within the facility. It potentially affects job satisfaction and overall mental health, possibly leading to burnout among healthcare providers.

*"I've noticed that some colleagues keep their distance from us when they know we've been in close contact with TB patients or contacts. There's this unspoken fear of stigma. It's as if we're marked by our association with these patients, and it can be isolating at times. We want to be supportive, but it's disheartening to see our peers react this way." CHW7*

*"Patients sometimes question our motives because they worry about stigma from colleagues or the community. This mistrust can make it difficult to gain their cooperation. It's challenging when patients feel they need to protect themselves from potential harm due to stigma, and it hampers our efforts to provide them with the care they need." PN3*

### *Conflicts*

Interpersonal conflicts and a lack of collaboration among healthcare providers were noted to disrupt the coordination required for effective contact tracing and testing efforts. These conflicts were among professional nurses, CHWs as well as among the same professionals. This was reported mainly by community health care workers.

*"There's a lack of teamwork sometimes. Personal conflicts among colleagues can lead to miscommunication and disruption in our tracing and testing efforts." PN1*

### *Patient Engagement*

Most participants reported that encouraging patients to disclose their contacts and participate in screening presented challenges. Patients are hesitant to share information about their contacts due to concerns about confidentiality or fear of repercussions. This impedes the contact tracing process, making it difficult to identify and test individuals who may have been exposed to infectious diseases. One participant stated that some patients verbalise that they lack trust in nurses and confidentiality.

*"Motivating patients to disclose contacts and undergo screening is a constant challenge. It requires building a rapport that can be difficult to establish." PN1*

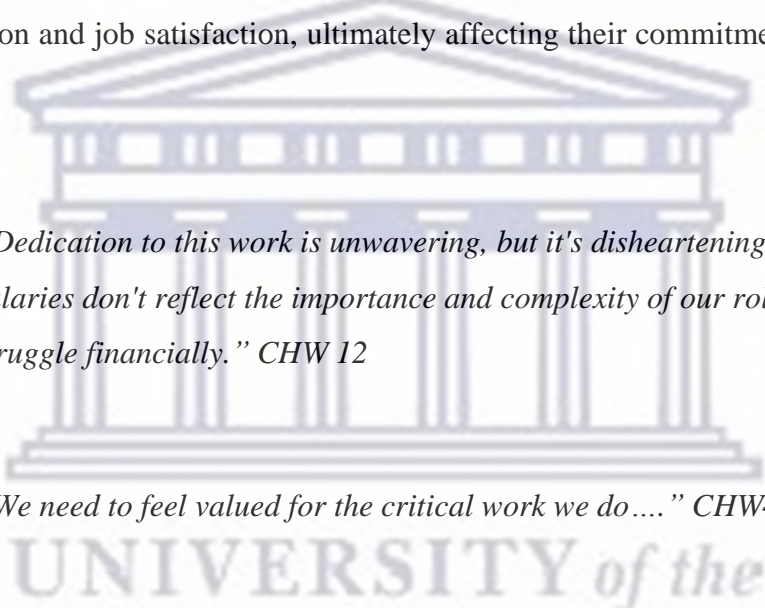
*"Patients often see us as outsiders. We need to find ways to engage them more effectively, so they understand the importance of tracing and testing." CHW6*

### **4.3 Organisational factors**

These barriers arise from the structure, policies, and practices within healthcare organisations. They encompass issues such as insufficient compensation or recognition for healthcare workers, outdated or unclear facility policies, limited access to resources (such as testing kits or transportation), and administrative burdens that detract from frontline healthcare workers' ability to focus on TB control efforts.

#### *Compensation*

Community health workers raised the issue of insufficient compensation and a lack of financial incentives for healthcare providers was raised by interviewees, which they believe can lead to reduced motivation and job satisfaction, ultimately affecting their commitment to tracing and testing activities.



*“Dedication to this work is unwavering, but it's disheartening to see that our salaries don't reflect the importance and complexity of our roles. Many of us struggle financially.” CHW 12*

*“We need to feel valued for the critical work we do....” CHW4*

*“It's not just about the money; it's about feeling appreciated and recognised for the challenging work we do. Without adequate compensation and recognition, it's challenging to maintain enthusiasm and commitment.”*

*CHW11*

#### *Facility policies*

In the interview, two participants noted the absence of clear and supportive workplace policies for contact tracing and screening. They expressed concerns that this lack of well-defined policies can create barriers and confusion. Some policies were described as outdated. Some facilities do not have new policies regarding urine testing

*“Our organisation lacks clear and comprehensive policies for contact tracing and screening. This creates confusion and inconsistency in our approach. We need guidelines that cover various scenarios. For example, what do we do if it is raining and the sister who currently using her car is not at work?” CHW2*

*“...We need clear and up-to-date policies.” CHW3*

#### **4.4. Community factors**

Community-level barriers are related to the attitudes, beliefs, and behaviors of the broader community toward TB control efforts. This includes a lack of awareness or understanding about TB, resistance to screening efforts, cultural practices or beliefs that may impede healthcare access, safety concerns such as crime or violence in certain areas, and other community-specific challenges that affect the implementation of TB control programs.

##### *Lack of Community Awareness and Resistance*

Healthcare Workers reported that they often encounter strong resistance from local communities when they try to carry out screening efforts. People in these communities sometimes oppose the screening, and there are concerns that this opposition might escalate into acts of retaliation.

*"People don't understand why it's important to check for diseases like TB and HIV."*

*CHW5*

*"...some communities resist when they try to do health community tracing for any health-related issue." CHW3*

##### *Crime in the Community*

In some communities, participants reported a pressing concern about the presence of crime, which can create significant obstacles when it comes to reaching and providing services in certain areas. The presence of criminal activities, such as drug-related incidents or gang

violence, poses serious safety risks for both community members and service providers. Due to safety concerns, it becomes challenging for community members and service providers, including both health professionals and service providers, to access and serve these high-risk areas effectively.

*"In certain areas, crime is a big problem, and this makes it difficult to offer services. Dangerous things are happening, like drugs and gangs, which put both people who live there and those trying to help at risk." CHW3*

#### **4.5. Policy/Health system factors**

These barriers originate from broader policy frameworks and structures within the healthcare system. They encompass issues such as limited availability of resources (e.g., testing kits, diagnostic tools, skilled personnel), inefficient or outdated policies related to TB control, overburdened healthcare systems leading to long waiting times and administrative burdens, and other systemic challenges that impact the delivery of TB prevention and treatment services.

##### *Resources*

In the interview, it was noted that the limited availability of testing kits, diagnostic tools, and skilled healthcare personnel could hinder the ability of healthcare organisations to conduct effective tracing and testing. Additionally, interviewees expressed concerns about the lack of transportation, which they believe adversely affects their work.

*"Our clinic faces transport issues. We currently use a nurse's vehicle which affects our ability to effectively trace and test individuals for TB. When we lack the necessary resources, it's not just frustrating; it's a matter of public health concern. We often find ourselves rationing supplies and making tough choices about whom to prioritise for testing. It's a constant struggle." PN3*

##### *Overburdened Healthcare System*

Many respondents voiced their concerns regarding the overburdened healthcare system, characterised by long waiting times and healthcare providers who are stretched thin due to high patient loads.

Most participants expressed their commitment to minimising waiting times for TB patients. They emphasised their dedication to ensuring that TB patients receive prompt attention and care, even when faced with spatial limitations.

*“People are worried about our healthcare system being very busy, causing long wait times and making it hard for healthcare workers who have too many patients to take care of.... Despite these challenges, most people [HC] involved are determined to reduce the waiting times for TB patients...They are committed to making sure TB patients get prompt care, even if there isn't a lot of space available.... Our clinic is so small that we don't even have enough space inside for administrative work. We have to wait outside until there's an open space available to plan the list of people to be traced for tuberculosis (TB). We cannot do proper administration.” CHW 12*

### *Workload*

During the interview, participants discussed how heavy workloads, administrative burdens, and limited access to patient records can hinder the efficiency and effectiveness of tracing and testing efforts within healthcare organisations.

*“Access to patient records is a significant hurdle. We often spend a considerable amount of time navigating complex record-keeping systems. Simplifying this process and improving data accessibility would allow us to focus more on our primary objective: ensuring that individuals potentially exposed to TB/HIV are identified and tested promptly” PNI*

*“There are so many administrative tasks that take away from the time we could spend on these crucial activities” CHW4*

Some recommendations made by participants:

*“Ongoing training is important. One big issue we're facing with our TB contact tracing efforts is that some staff are not well trained. This means they might not know how to effectively trace contacts, which can slow down the processes” PNI.* While initial training may provide a

foundation of knowledge and skills, continuous training is crucial to keep staff updated on the latest techniques, protocols, and best practices in contact tracing. Without proper training, staff may struggle to effectively trace contacts, leading to delays in the process and potentially compromising the effectiveness of TB control efforts.

*“... we need noticed is compensation” CHW7.* Contact tracing can be a demanding and sometimes risky job, requiring individuals to work long hours, often in challenging environments. Without appropriate compensation, there is a risk of staff burnout and turnover, which could further hinder TB control efforts.

*“One more thing that's holding us back is the fact that we don't have a dedicated vehicle for tracing. This means our contact tracing teams have a hard time getting around. I wish we had a vehicle allocated” CHW2.*

Without access to reliable transportation, contact tracing teams may face logistical challenges in reaching remote or inaccessible areas, thereby limiting their ability to conduct thorough contact tracing. Providing a dedicated vehicle would facilitate mobility and improve the efficiency of contact tracing efforts, ultimately enhancing the overall effectiveness of TB control initiatives.

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## CHAPTER 5

### 5. DISCUSSION

In this chapter, the researcher provides a summary of the key research findings about the challenges faced by healthcare professionals in their daily work, the factors contributing to these challenges, and their implications for the overall healthcare landscape.

This research employed a qualitative interview with healthcare professionals from various backgrounds and roles and generated. Comprehensive insight about the barriers and challenges they encounter in their professional lives.

#### ***5.1 Individual Level Determinants***

The study sheds light on how individual factors such as lack of training and burnout among healthcare providers impact TB control efforts. This aligns with existing literature emphasising the importance of continuous training and support for healthcare workers involved in infectious disease management. It underscores the need for ongoing professional development to ensure healthcare providers are equipped with the necessary knowledge and skills to effectively carry out their duties.

#### ***Lack of Training***

In line with our findings on lack of training, previous studies (Islam *et al.*, 2022) have shown that healthcare providers lack adequate training in TB contact tracing and testing protocols and often struggle to perform these tasks effectively. This deficit in training can lead to misdiagnoses and delayed treatment initiation. Recent studies emphasise the importance of comprehensive training for healthcare providers involved in TB contact tracing and testing (Islam *et al.*, 2022). Islam *et al.* (2022) advocate for a sustained commitment to education to maintain competence. Given the dynamic nature of TB management, ongoing training is crucial. Without it, providers risk making errors in diagnosis and treatment, potentially risking the spread of these diseases. Recent research has also highlighted the need for more specialised training modules that cater to the unique challenges of different healthcare settings and populations, ensuring that providers are equipped to adapt to changing circumstances

effectively (Crowley *et al.*, 2021; Fenta *et al.*, 2023). Lack of training contributes to limited knowledge.

Limited knowledge about the latest TB/HIV screening techniques has been identified as a significant barrier to effective testing processes (Fenta *et al.*, 2023). Inadequate knowledge can result in missed opportunities for early diagnosis and treatment. Recent research, exemplified by (Vericat-Ferrer *et al.*, 2022), highlights the dynamic nature of TB screening techniques. It emphasises that healthcare providers must continually update their knowledge and skills to keep pace with advancements in diagnostic tools. Recent developments, such as the integration of artificial intelligence and point-of-care testing, have revolutionised TB testing. Healthcare institutions need to facilitate regular training sessions, workshops, and access to current research findings to ensure that providers are well-informed (Cox, *et al.*, 2014). Moreover, multidisciplinary collaboration and information-sharing platforms can help disseminate the latest advancements effectively. By staying current with innovations, healthcare providers can maximise the accuracy of their diagnoses, minimise missed opportunities for early detection, and ultimately improve patient outcomes (An *et al.*, 2023). The study echoes previous research emphasising the necessity of continuous training and support for healthcare workers involved in infectious disease management. It highlights the consequences of inadequate training, such as misdiagnoses and delayed treatment initiation.

### *Emotional Stress*

The emotional stress experienced by healthcare providers when working with TB/HIV patients has been well-documented (Matakanye *et al.*, 2019). This stress is exacerbated when providers lack sufficient training, potentially leading to burnout and decreased job satisfaction. Recent investigations into the emotional toll on healthcare providers in TB/HIV settings, as discussed by (Fenta *et al.*, 2023), underscore the necessity of proactive strategies to address this issue. To prevent burnout and maintain job satisfaction, recent literature suggests that institutions should invest in employee assistance programs, counselling services, and peer support networks (Matakanye *et al.*, 2019). Research indicates that implementing strategies to reduce the stigma associated with TB/HIV can alleviate some of the emotional stress healthcare providers experience when working with affected individuals (Fenta *et al.*, 2023). By focusing on both individual and systemic approaches, healthcare organisations can better support their staff and

ensure that quality care is consistently provided. The study recognises the emotional stress experienced by healthcare providers, particularly in TB/HIV settings, and emphasises the need for proactive strategies to address burnout and maintain job satisfaction.

### *Cultural and language barriers*

The importance of cultural competence in healthcare delivery has been underscored in numerous studies (Naidoo, 2014; Sissolak *et al.*, 2011). Providers who struggle to understand and respect diverse cultural practices may face difficulties in building trust and ensuring informed consent. Recent literature reinforces the significance of cultural competence in healthcare delivery (Naidoo, 2014). Recent studies have shown that culturally competent care leads to increased patient satisfaction, compliance, and better health outcomes. Healthcare institutions are increasingly focusing on incorporating cultural competence training into their curricula and continuing education programs (Sissolak *et al.*, 2011). This training goes beyond understanding cultural practices; it also emphasises the importance of empathy, respect, and open communication when dealing with patients from diverse backgrounds. Recent research highlights the positive impact of cultural competence not only on patient-provider relationships but also on healthcare equity and the overall quality of care (Naidoo, 2014). As healthcare systems become more diverse, the ability to provide culturally competent care remains a critical component of effective TB/HIV management. This study underscores the importance of cultural competence and effective communication strategies in healthcare delivery, aligning with existing literature on the significance of understanding diverse cultural practices and overcoming language barriers.

Language barriers between providers and patients have been noted in the literature as hindrances to effective communication and the provision of tracing and testing information (Al Shamsi *et al.*, 2020). Overcoming these barriers is crucial for patient-provider interactions. Recent studies, such as those by (Al Shamsi *et al.*, 2020), continue to emphasise the significant impact of language barriers on healthcare outcomes. Recent advances in language translation technology have offered new tools to address these challenges, enabling real-time interpretation services and multilingual resources. Healthcare institutions are increasingly recognising the need to invest in language training programs for their staff, promoting better cross-cultural communication. Recent research also suggests the importance of using culturally

competent interpreters who understand not only the language but also the cultural nuances of patients (Naidoo, 2014). By actively working to break down language barriers, healthcare providers can foster trust, enhance patient-provider communication, and ultimately improve the quality of care delivered to linguistically diverse populations.

## ***5.2 Interpersonal Level Determinants***

The study highlights the role of interpersonal dynamics, including discrimination, stigma, and conflicts, in hindering TB control efforts. These findings resonate with literature emphasising the importance of fostering supportive work environments and addressing stigma associated with TB to enhance patient care and healthcare worker well-being. The challenges in patient engagement underscore the need for strategies to improve communication and trust between healthcare providers and patients, as emphasised in prior research.

### *Conflicts*

Interpersonal conflicts and a lack of collaboration among healthcare providers can disrupt effective tracing and testing efforts (Mohammed, 2022; Waggie & Arends, 2021). Collaborative teamwork is critical for optimal patient care. Recent research by Waggie & Arends (2021) delves into the intricacies of collaboration issues among healthcare providers during tracing and testing efforts. Interpersonal conflicts, territorial disputes, and a lack of clear communication channels can disrupt the coordination required for successful patient care (Al-Hamdan *et al.*, 2019) suggesting that healthcare institutions should prioritise interprofessional education and team-building initiatives to foster a collaborative culture. Furthermore, (Saridi *et al.*, 2021) emphasise the role of leadership in mitigating collaboration issues, highlighting the importance of strong leadership that promotes a collaborative and inclusive environment. The study acknowledges the detrimental effects of interpersonal conflicts among healthcare providers on tracing and testing efforts, aligning with research emphasizing the importance of collaborative teamwork and leadership in mitigating collaboration issues

Colleague stigma, as observed in our study, has been previously reported as a concern among healthcare providers. Fear of stigmatization or discrimination by colleagues can lead to isolation and hinder peer support. Recent literature underscores the pervasive nature of

colleague stigma in healthcare settings, particularly in the context of infectious disease tracing and testing. Nyblade *et al.*, 2019 noted that even though healthcare professionals are increasingly educated about the importance of destigmatising certain diseases, including infectious ones, many still fear being stigmatised by their colleagues. This fear can manifest in subtle ways, such as reluctance to engage in discussions about tracing and testing procedures, which ultimately hinders peer support and knowledge sharing. Moreover, Adams *et al.* (2017) found that healthcare workers who perceive stigma from colleagues are more likely to experience burnout and emotional exhaustion, which can have detrimental effects on the overall quality of care provided.

### *Patient- Health Provider Engagement*

Challenges in motivating patients to disclose contacts and engage in screening have been identified as barriers to effective tracing and testing. Strategies for improving patient (Mbuthia *et al.*, 2020) engagement are essential for successful outcomes. Recent literature, including studies by (Nyblade *et al.*, 2019) and (Nkambule *et al.*, 2019), continues to explore the challenges associated with motivating patients to actively participate in contact tracing and testing efforts. Patient engagement remains a critical aspect of successful outcomes. Nyblade *et al.* (2019) advocate for patient-centered approaches that involve patients in decision-making processes and address their concerns. Additionally, Lee *et al.* (2020) highlight the potential of technology-driven solutions, such as mobile apps and telehealth services, to enhance patient engagement by providing convenient and accessible options for tracing and testing. These recent insights emphasise the dynamic nature of patient engagement strategies and the need for ongoing adaptation to meet evolving healthcare needs. This study highlights the challenges in motivating patients to participate in tracing and testing efforts and suggests patient-centered approaches and technology-driven solutions to enhance engagement, consistent with previous literature on patient-centered care and the role of technology in healthcare

Communication difficulties between healthcare providers and patients due to stigma, discrimination, or language barriers have been acknowledged in the literature (Al Shamsi *et al.*, 2020). Effective communication is essential for trust-building and successful care delivery. In recent years, researchers like Al Shamsi *et al.*, 2020) have focused on the nuances of communication challenges in healthcare, particularly in the context of infectious disease

tracing and testing. These challenges may arise due to stigma, discrimination, or language barriers, all of which can impede effective information exchange between healthcare providers and patients. The literature highlights the need for culturally sensitive communication strategies that take into account the diverse backgrounds of both patients and providers. Additionally, (Crowley *et al.*, 2021; Sissolak *et al.*, 2011) argue that training programs that equip healthcare professionals with the skills to navigate difficult conversations related to stigma can significantly improve the quality of care provided. The study recognises communication challenges between healthcare providers and patients, especially concerning stigma and discrimination, echoing previous research advocating for culturally sensitive communication strategies and training programs for healthcare professionals

Some patient mistrust due to concerns about stigma and discrimination has been studied extensively. This mistrust can negatively affect cooperation and adherence to tracing and testing procedures. Recent studies, such as those conducted by Law *et al.* (2019) continue to shed light on the persistent issue of patient mistrust in healthcare systems. Patient mistrust stemming from concerns about stigma and discrimination can erode the patient-provider relationship, leading to lower levels of cooperation and adherence to tracing and testing procedures. Law *et al.*, (2019) emphasised that building trust with patients is an ongoing process that requires transparent communication and active efforts to address their concerns about privacy and discrimination. Failure to do so can result in patients withholding critical information or avoiding testing altogether.

#### **5.4. Organisational Level Determinants**

Organisational barriers identified in the study, such as insufficient compensation and unclear workplace policies, are consistent with existing literature on healthcare workforce challenges. Addressing these organisational factors is crucial for improving job satisfaction, retention, and overall effectiveness of TB control programs. Moreover, the study underscores the importance of streamlined policies and adequate resource allocation within healthcare organisations to support TB control efforts.

#### **Workplace Constraints**

Heavy workloads and administrative burdens within healthcare organisations have been associated with reduced efficiency in tracing and testing efforts (Umansky & Rantanen, 2016). Overcoming these constraints is crucial for optimal patient care. Ongoing research sheds light on the enduring challenges of heavy workloads and administrative burdens within healthcare organisations (Shihundla *et al.*, 2016). These constraints not only hinder the efficiency of tracing and testing efforts but also contribute to healthcare provider burnout and decreased job satisfaction. Recent literature highlights the need for streamlining administrative processes, optimizing staffing levels, and implementing innovative workflow solutions (Banda *et al.*, 2022; Payne *et al.*, 2020). Addressing workplace constraints not only improves patient care but also enhances the overall well-being of healthcare professionals. It identifies heavy workloads and administrative burdens as barriers to efficient tracing and testing efforts, in line with literature emphasizing the need for streamlined processes and innovative workflow solutions to improve patient care and provider well-being

### *Policy Gaps*

The absence of clear and supportive workplace policies for contact tracing and screening has been highlighted as a structural barrier (Adams *et al.*, 2017). Developing and implementing such policies is crucial for organisational improvement. Recent publications, such as those by (Adams *et al.*, 2017; Rodriguez *et al.*, 2017), continue to draw attention to the absence of clear and supportive workplace policies for contact tracing and screening. These policy gaps hinder the ability of healthcare organisations to establish standardised protocols and navigate legal and ethical considerations. The literature emphasises the importance of involving healthcare professionals in policy development to ensure practicality and effectiveness. Developing and implementing comprehensive policies that address privacy, consent, and data sharing is crucial for organisational improvement and patient trust (Dams *et al.*, 2017). The study underscores the importance of clear and supportive workplace policies for contact tracing and screening, consistent with research advocating for comprehensive policy frameworks developed in collaboration with healthcare professionals

The absence of clear policies and regulations related to contact tracing and screening has been recognised as a structural barrier. Developing and implementing policy frameworks is essential for program effectiveness. The absence of clear policies and regulations related to contact

tracing and screening poses a structural (Rodriguez *et al.*, 2017). Literature highlights the imperative of developing and implementing comprehensive policy frameworks. These frameworks provide clear guidance and standards for contact tracing and testing initiatives, ensuring ethical conduct and coordination among various stakeholders. Effective policies should address issues such as data privacy, consent, and information sharing while also offering guidance on legal and ethical considerations (Rodriguez *et al.*, 2017). Policymakers need to collaborate with healthcare professionals to create policies that are practical and aligned with the evolving landscape of infectious disease control.

### *Data Management Issues*

Concerns related to data accuracy, privacy, and security during contact tracing and screening are critical (Kanjee *et al.*, 2011). Ensuring robust data management practices is vital for patient confidentiality and the integrity of tracing efforts. In an increasingly digital healthcare landscape, concerns related to data accuracy, privacy, and security during contact tracing and screening persist as critical challenges. (Kanjee *et al.*, 2011; Staunton *et al.*, 2021) underscore the importance of robust data management practices. Recent literature highlights the need for healthcare organisations to invest in secure data infrastructure, implement strict privacy protocols, and provide training to staff involved in data handling. Ensuring the confidentiality and integrity of patient information is paramount for maintaining public trust and the effectiveness of tracing efforts in the digital age. The findings of this study highlight concerns related to data accuracy, privacy, and security in tracing efforts, aligning with literature emphasizing the importance of robust data management practices for patient confidentiality and the integrity of tracing initiatives

### **5.5. Community Level Determinants**

The study highlights community-level barriers, including lack of awareness, resistance to screening efforts, and safety concerns, which have been documented in previous research on TB control. Understanding and addressing community-specific challenges are essential for tailoring interventions that effectively engage communities and promote adherence to TB control measures.



### *Lack of Awareness*

Limited community awareness and understanding of the importance of TB tracing and testing services have been recognised as barriers (Fenta *et al.*, 2023). Community education and awareness campaigns are essential to address this issue. The limited community awareness and understanding of the importance of TB/HIV tracing and testing services continue to be recognised as barriers, as highlighted by (Fenta *et al.*, 2023). Recent literature highlights the critical role of community health education and awareness campaigns in addressing this issue. These campaigns should be tailored to the specific needs and cultural context of the community to effectively communicate the benefits of tracing and testing while dispelling myths and misconceptions (Fenta *et al.*, 2023). The study acknowledges limited community awareness as a barrier to TB tracing and testing efforts and suggests community health education and awareness campaigns to address this issue, consistent with research emphasizing the importance of community engagement and tailored interventions.

### *Community Stigma*

Healthcare providers' concerns about community stigma align with existing research (Chetty-Makkan *et al.*, 2021; DeSanto *et al.*, 2023). DeSanto *et al.*, 2023 reaffirm the significance of healthcare providers' concerns about community stigma in the context of tracing and testing efforts. These fears continue to impact healthcare professionals' willingness to actively engage in tracing and testing activities within the broader community. Addressing this issue requires multifaceted approaches, including community outreach and education programs that focus on reducing stigma and fostering a more supportive environment for healthcare providers. Stigma triggers resistance

Opposition and resistance from the local community to screening efforts, along with fears of retaliation or violence, have been documented. These challenges can complicate healthcare providers' work in these communities. Craig *et al.* (2017) shed light on the persistent challenges posed by community opposition and resistance to screening efforts. These challenges often stem from concerns about retaliation or violence, creating complex barriers for healthcare providers working in these communities. Kranzer *et al.* (2013) emphasises the importance of transparent communication and community involvement in the planning and execution of

tracing and testing initiatives. Building partnerships with community leaders and organisations can help mitigate resistance and promote a collaborative approach to public health. This study identifies opposition and resistance from the local community as challenges for healthcare providers and emphasises transparent communication and community involvement to mitigate resistance, in line with research advocating for collaborative approaches to public health.

Difficulties in gaining community trust and involvement in contact tracing and screening initiatives have been identified (Vanden Bossche *et al.*, 2022). Strategies to enhance community engagement are critical. Recent insights emphasise the difficulties in gaining community trust and active involvement in contact tracing and screening initiatives (Vanden Bossche *et al.*, 2022). Effective strategies to enhance community engagement are vital for the success of these efforts. Community participation in the design and implementation of tracing and testing programs, as well as culturally sensitive approaches that respect local customs and traditions, can help build trust and foster a sense of ownership within the community (Vanden Bossche *et al.*, 2022).

#### *Language and Cultural Awareness*

The need for cultural sensitivity and respect for diverse cultural practices and beliefs within the community aligns with established principles (Msoka *et al.*, 2021). Healthcare providers must navigate cultural diversity effectively. Healthcare providers must continue to navigate cultural diversity effectively, recognising that a one-size-fits-all approach may not be suitable for every community. Recent literature emphasises the importance of cultural competence training for healthcare professionals and the integration of cultural considerations into healthcare (Msoka *et al.*, 2021; Schouten *et al.*, 2020). By doing so, healthcare providers can establish rapport with diverse communities and deliver care that is respectful and tailored to individual cultural contexts.

#### **5.6. Health Systems Level Determinants**

The study identifies systemic challenges within the healthcare system, such as limited resources and overburdened healthcare systems, which have been widely documented in literature on public health infrastructure and health service delivery. Addressing these policy and health

system factors is crucial for strengthening TB control programs and improving access to care for affected populations.

### *Resource Allocation*

The consequences of inadequate resource allocation at the structural level, including equipment, have been well-documented. Adequate resourcing is essential for program effectiveness. The persistent issue of inadequate resources continues to plague public health programs. The literature underscores that adequate funding and provision of essential equipment are not just financial matters but also pivotal determinants of program effectiveness (Msoka *et al.*, 2021). Research emphasises the importance of strategic resource planning, efficient utilisation of available resources, and the need for continuous advocacy to secure the necessary funding to sustain and expand tracing and testing initiatives (Gaede & Versteeg, 2011). The findings of this study acknowledge inadequate resource allocation as a barrier to effective TB control programs and emphasises strategic resource planning and continuous advocacy for funding, consistent with literature highlighting the importance of adequate funding and provision of essential equipment.

### *Healthcare System Strain*

The strain on healthcare systems, characterised by long waiting times and overstretched providers, has been noted in the literature. Addressing system strain is crucial for improved service delivery. The strain on healthcare systems, characterised by long wait times and overburdened healthcare providers, remains a pervasive issue, and the comprehensive examination of healthcare system strain and quality of care (Maphumulo & Bhengu, 2019). The literature highlights that addressing system strain is critical for improving service delivery and ensuring that patients receive timely and effective care. There is increased capacity, streamlined processes, and enhanced workforce support, to alleviate strain and maintain quality care (Maphumulo & Bhengu, 2019). The study recognises the strain on healthcare systems and suggests increasing capacity and enhancing workforce support to alleviate strain and maintain quality care, aligning with research emphasizing the need to address system strain for improved service delivery.

### *Inadequate compensation*

The impact of low salaries and a lack of financial incentives on healthcare providers' motivation and job satisfaction is well-documented. Addressing compensation issues is essential for retaining skilled providers in this field. Research provides contemporary insights into the adverse effects of low salaries and inadequate financial incentives on healthcare providers' motivation and job satisfaction. The importance of fair compensation structures is to attract and retain skilled professionals in the field of tracing and testing (Kruk *et al.*, 2018; Maphumulo & Bhengu, 2019). This research acknowledges the impact of low salaries and lack of financial incentives on healthcare providers' motivation and job satisfaction, consistent with literature advocating for fair compensation structures to attract and retain skilled professionals in public health.



## CHAPTER 6

### 6. CONCLUSION AND RECOMMENDATIONS

#### 6.1 Conclusion

The research explored the multifaceted challenges that healthcare providers namely, nurses and community health workers confront when engaged in the essential tasks of TB contact tracing and testing. These tasks lie at the heart of public health efforts to identify, manage, and curb the spread of two highly significant infectious diseases, TB and HIV with profound implications for individuals and communities alike.

The researcher explored this by considering challenges across various interconnected levels of analysis. These levels encompassed the individual, interpersonal, organisational, community, and structures and health systems dimensions. Factors at each level were integral in shaping the landscape within which healthcare providers operate while conducting TB contact tracing and testing. Through the in-depth investigation, several challenges were discovered. At the individual level, healthcare providers grapple with issues ranging from inadequate training and emotional stress to limited knowledge and language barriers. These challenges affect their ability to conduct contact tracing and testing with precision and compassion. At the interpersonal level, various factors like colleague stigma and patient mistrust were identified. These dynamics can create gaps in healthcare-provider relationships and undermine the trust necessary for effective patient care.

At the organisational level, resource constraints, and workplace pressure issues place substantial burdens on healthcare organisations and, by extension, their providers. The absence of supportive policies and concerns related to data management also emerged as persistent challenges. Beyond the healthcare setting, the community level unveiled complexities including, community stigma, resistance to screening efforts, lack of awareness, and the need for cultural sensitivity all played pivotal roles in shaping the environment in which healthcare providers operate.

At the structural and health systems level, the research establishes the critical importance of the healthcare system strengthening including resource allocation, compensation, policies, and regulations, and the role of public health messaging. The study goes beyond description and offers a set of actionable recommendations. These recommendations are aimed at informing policy and practice in iBhayi Township and, by extension, similar settings. They include strategies to increase community awareness, enhance healthcare infrastructure, combat stigma, and improve the overall effectiveness of TB control programs.

This research reveals complex challenges that hinder the attainment of SDGs, especially those concerning good health and well-being (SDG 3), reducing inequalities (SDG 10), and fostering strong partnerships (SDG 17). These challenges span various levels, including individual, interpersonal, organisational, community, and health systems dimensions. Addressing these challenges is crucial for advancing these goals.

In the context of National Health Insurance (NHI) and Universal Health Coverage (UHC), findings emphasise the significance of overcoming systemic barriers to healthcare access and delivery. It highlights the importance of identifying and addressing challenges across different levels, ranging from individual training requirements to structural issues within the healthcare system. Enhancing training for healthcare providers, improving workplace support, and fostering trust within communities are specific interventions that can bolster efforts to implement NHI and achieve UHC. These measures aim to ensure that all individuals can access quality healthcare services without experiencing financial hardship.

## **6.2 Recommendation**

Against the foregoing evidence from the research, the researcher calls for interventions that are multilevel, multidisciplinary, and multisectoral to effectively respond to the multifaceted barriers impacting TB contact tracing and testing.

### ***Individual Level***

Healthcare departments and facilities are pivotal in providing staff training and development, ensuring healthcare providers possess the necessary skills for TB control. Healthcare institutions and organisations are responsible for offering employee assistance programs and counselling services to address the emotional well-being of healthcare workers involved in TB control efforts. Specific recommendations include:

- National department of Health to provide comprehensive and ongoing training for healthcare providers involved in TB contact tracing and testing.
- Operational managers to facilitate access to current research findings, foster multidisciplinary collaboration, and promote information-sharing platforms.
- To mitigate emotional stress, healthcare organisations should invest in employee assistance programs, counselling services, and peer support networks.

### ***Interpersonal Level***

Healthcare facilities lead in organising interprofessional education and team-building initiatives to enhance collaboration among healthcare providers. Health promoters need to put efforts into developing awareness programs and destigmatise TB and infectious diseases, promoting a supportive environment for healthcare providers. Facilities need to prioritise transparent communication with patients to build trust and address concerns, ensuring effective patient-provider interactions in TB control. Specific recommendations in this respect include:

- Operational managers to prioritise interprofessional education and team-building initiatives to create a collaborative culture among healthcare providers involved in tracing and testing.
- Operational managers to develop awareness programs to destigmatise diseases, including infectious ones, and address healthcare professionals' fears of being stigmatised by colleagues. Promote peer support and knowledge sharing to reduce the emotional toll on healthcare providers.
- Health care providers to address mistrust by transparently communicating with patients, and actively addressing their concerns about privacy and discrimination. Building trust is an ongoing process that requires active effort and engagement.

### ***Organisational Level***

Department of Health and healthcare facilities take charge of streamlining administrative processes and optimising staffing levels to improve efficiency in TB control programs. They also develop and implement workplace policies related to TB control, ensuring adherence to privacy, consent, and ethical considerations. Data capturers within healthcare institutions oversee data infrastructure and privacy protocols, safeguarding patient information and maintaining data integrity in TB control efforts. Specific recommendations include:

- The facility managers to address workplace constraints by streamlining administrative processes, optimising staffing levels, and implementing innovative workflow solutions.
- National policy makers to develop and implement comprehensive workplace policies explicitly tailored to TB control efforts. These policies should address privacy, consent, data sharing, and legal and ethical considerations relevant to TB management within healthcare settings
- National Department of health to invest in secure data infrastructure, implement strict privacy protocols, and provide training to staff involved in data handling in facilities.

### ***Community Level***

District Department of health needs to take the lead in implementing community outreach and education programs to raise awareness and foster support for healthcare providers engaged in TB control. Community leaders and health facilities collaborate in reducing stigma and creating a supportive environment for healthcare providers, promoting community engagement in TB control efforts. Furthermore, healthcare institutions and organisations partner with community stakeholders to enhance collaboration and address community-specific challenges in TB control.

- The district outreach management to implement community outreach and education programs that focus on reducing stigma and fostering a more supportive environment for healthcare providers. Building partnerships with community leaders and organisations can help mitigate resistance and promote a collaborative approach to public health.



### ***Policy/Health Systems Level***

National department of health are responsible for allocating funding and resources for TB control programs, ensuring adequate support for implementation. Also, developing compensation structures for healthcare providers, attracting and retaining skilled professionals in TB control efforts. Healthcare policymakers need to work towards increasing healthcare system capacity and improving service delivery, addressing systemic barriers and enhancing the overall effectiveness of TB control programs.

- National Department of Health to ensure adequate funding and provision of essential equipment for TB contact tracing and testing. Strategic resource planning, efficient resource utilisation, and continuous advocacy for funding are essential for program effectiveness. Main resource being transport to seek clients.
- National department of Health to address compensation issues by implementing fair compensation structures for healthcare providers involved in TB contact tracing and testing. Attracting and retaining skilled professionals in the field is critical for program sustainability
- Facility managers, with the support of district management, increase healthcare system capacity, streamline processes, and enhance workforce support to alleviate strain and improve service delivery.

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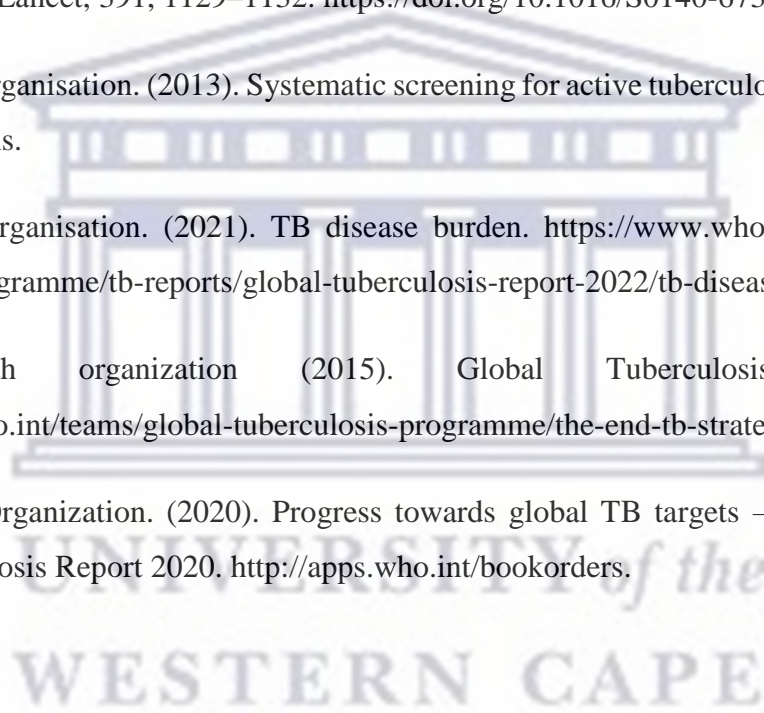
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Annexure 1a

The District Manager

DoH Nelson Mandela Bay District

Port Elizabeth

6001

Dear Sir/Madam

## REQUEST FOR PERMISSION TO CONDUCT RESEARCH

My name is Nqobile Mokhethi, and I am a master's student in the School of public health at the University of Western Cape.

I am hereby seeking your consent to approach a number of staff rendering TB tracing and screening services at Zwide Clinic and Kwazakhele Community Health centre. I have provided you with a copy of my thesis proposal which includes copies of the ethics approval as well as questionnaire and consent forms to be used.

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Prof U Lehmann

Head of Department: School of Public Health

University of the Western Cape

Private Bag X17

Bellville 7535

[ulehmann@uwc.ac.za](mailto:ulehmann@uwc.ac.za)



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Prof Anthea Rhoda

Dean: Faculty of Community and Health Sciences

University of the Western Cape

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[chs-deansoffice@uwc.ac.za](mailto:chs-deansoffice@uwc.ac.za)

This research has been approved by the University of the Western Cape's Biomedical Ethics Committee.

Biomedical Ethics Committee

University of the Western Cape

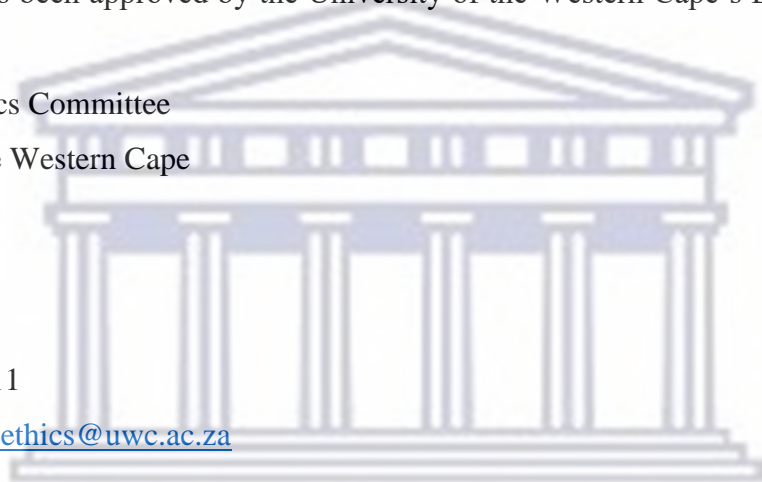
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Tel: 021 959 4111

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## Annexure 1b

To : Clinic Sub-district manager

Zwide Clinic

Zwide

6205

Dear Sir/Madam

### REQUEST FOR PERMISSION TO CONDUCT RESEARCH

My name is Nqobile Mokhethi, and I am a master's student in the School of public health at the University of Western Cape.

I am hereby seeking your consent to approach a number of staff rendering TB tracing and screening services at your facility. I have provided you with a copy of my thesis proposal which includes copies of the ethics approval, questionnaire and consent forms to be used for data collection.

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

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**Project title: Exploring barriers to TB contact tracing and screening: Health service providers' perspective**



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## Guiding questions for semi-structured interview

### 1. Demographic Information:

Age

Gender

### 2. Academic Qualifications

3. What is your position at this health institution?

4. Please describe if you are TB trained, and the training.

5. How many years of TB contact tracing and screening do you have?

6. What is the average number of TB contact do you track daily?

7. I would like you to tell me about the TB programme in this facility, in general. How would you describe it to me if I was a new employee, what can I expect?

8. Are there any TB policies or guidelines in the facility that you know of? If so, How do you feel about those policies or guidelines? How would you describe implementation of the policy into practice?

9. What are factors at the facility that could prevent the TB contact to be traced and screened? Is there sufficient resources to render the TB contact tracing and screening?

10. What are factors at home that prevent staff from rendering the TB contact tracing and screening? Please describe experiences that have prevented you from accessing client for TB contact tracing and screening?

11. What are factors within the community that prevent staff from rendering the TB contact tracing and screening? (Probe:religion and TB stigma)

12. If you could change anything in the facility regarding TB contact tracing and screening what will it be? What recommendation will you give to the facility regarding TB contact tracing and screening? What kind of support do you think you need to enhance TB contact-tracing and screening

13. Do you have any further questions or comments?



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## **Annexure 3**

### **INFORMATION SHEET**

**Project title: Exploring barriers to TB contact tracing and screening: Health service providers' perspective**

#### **What is this study about?**

This is a research project conducted by Nqobile Penelope Mokhethi at the University of the Western Cape. We are inviting you to participate in this research because as a service provider you are in a great position to share with us valuable information from a personal perspective. This research aims to engage workers in an in-depth interview to understand their views on a) identifying barriers to TB contact tracing and b) identifying barriers to TB contact screening.

#### **What will I ask to be asked to do if I agree to participate?**

You will be asked to participate in an interview that will last 45min to an hour. The interview will be conducted at your health facility. Questions regarding barriers to TB contact tracing and screening. Your participation is as a service provider and not as a service provider at the organisation.

#### **Would my participation in this study be kept confidential?**

The researcher undertakes to protect your identity and the nature of your contribution. To ensure anonymity, your name will not be included in the data collected data. To ensure your confidentiality, locked storage areas will be used to store information, using identification codes only on data forms, and using password-protected computer files.

If we write a report or article about this research project, your identity will be protected. Audiotapes of you will be part of the data collection in this project. This ensures authenticity to the study and captures greater details. The audio tape will be stored in a locked cabinet and destroyed after use



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## **What are the risks of this research?**

All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimize such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further **assistance** or intervention.

## **What are the benefits of this research?**

This research is not designed to help you personally, but the results may help the investigator learn more about the barriers to TB contact tracing and screening. We hope that, in the future, other people might benefit from this study by strengthening the capacity of health workers for health system improvement.

## **Do I have to be in this research and may I stop participating at any time?**

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

## **What type of personal information will be collected?**

Personal information that the researcher will include sex, age and race of the client for demographic purposes. The personal information collected will be kept anonymous and confidential during data collection, analysis and reporting.

## **Who at UWC is responsible for collecting and storing my personal information?**

The information collected will only be accessible and stored by Nqobile Mokhethi and the supervisor





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## **Who will have access to my personal information outside of UWC?**

The personal information collected will not be accessible to anyone outside UWC

## **How long will my personal information be stored?**

Pseudonyms will be used for this research to protect the participants personal data. Data that will be collected will be kept secure on researchers password-protected personal computer. All data related to this research will be collected will be stored for 5years.

## **How will my personal information be processed?**

Personal information will be collected for demographic purposes.

## **What if I have questions?**

This research is being conducted by Nqobile Mokhethi in the School of Public health Department at the University of the Western Cape. If you have any questions about the research study itself, please contact Nqobile Mokhethi at 0796241852, and Email: [4104308@myuwc.ac.za](mailto:4104308@myuwc.ac.za). Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

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## CONSENT FORM

**Title of Research Project: Exploring barriers to TB contact tracing and screening:  
Health services providers' perspective**

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

\_\_\_ I agree to be [videotaped/audiotaped/photographed] during my participation in this study.

\_\_\_ I do not agree to be [videotaped/audiotaped/photographed] during my participation in this study.

In terms of the requirements of the Protection of Personal Information Act (Act 4 of 2013), personal information will be collected and processed:

I hereby give consent for my personal information to be collected, stored, processed and shared as described in the information sheet.

I do not give consent for my personal information to be collected, stored, processed and shared as described in the information sheet.

**Participant's name.....**

**Participant's signature.....**

**Date.....**

## Ethical clearance



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19 January 2023

Ms NP Mokhethi  
School of Public Health  
Faculty of Community and Health Sciences

**BMREC Reference Number:** BM22/10/26

**Project Title:** Exploring barriers to TB contact tracing and screening: Health service providers' perspective.

**Approval Period:** 18 January 2023 – 17 January 2026

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above-mentioned research project.

Any further amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

**Please remember to submit a progress report annually by 30 November for the duration of the project.**

For permission to conduct research using student and/or staff data or to distribute research surveys/questionnaires please apply via: <https://sites.google.com/uwc.ac.za/permissionresearch/home>

*The permission letter must then be submitted to BMREC for record keeping purposes.*

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink, appearing to read 'P. Josias'.

*Ms Patricia Josias  
Research Ethics Committee Officer  
University of the Western Cape*

NHREC Registration Number: BMREC-130416-050

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

## National department of Health permission



Enquiries: Yvonne Gixela  
Email: [ncebqixela22@gmail.com](mailto:ncebqixela22@gmail.com)

TEL: 043 605 4540/4518

Date: 26 May 2023

**Exploring barriers to TB contact tracing and screening: Health service providers' perspective. (EC\_202305\_016)**

**Dear Ms N.P. Mokhethi**

The department would like to inform you that your application for the above mentioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Research Ethics Committee.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress update on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.


Your compliance in this regard will be highly appreciated.

**SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE**



*TOGETHER, MOVING THE HEALTH SYSTEM FORWARD*

## Nelson mandela bay district

 <b>Province of the EASTERN CAPE HEALTH</b>	<b>Office of the Clinical Governance Manager Nelson Mandela Bay Health District Private Bag X 28000, Greenacres, Port Elizabeth. 6057. REPUBLIC OF SOUTH AFRICA</b>
	<b>Our Reference: Your Reference: Date: 07 June 2023</b>
<b>Enquiries : Dr L P MAYEKISO Telephone : 041-391-8173 Facsimile : 041-391-8133 E-mail : mbasa.mayekiso@gmail.com</b>	

**MS N. P MOKHETHI**

### **REQUEST FOR PERMISSION TO CONDUCT RESEARCH ON "EXPLORING BARRIERS TO TB CONTACT TRACING AND SCREENING: HEALTH SERVICE PROVIDERS PERSPECTIVE" (EC\_202305\_016)**

In response to your application for permission to conduct the above research, permission is hereby granted with the following proviso:

- Health service delivery should not be disrupted under any circumstances.
- Timeous appointments must be with the relevant person prior to commencement of interview/ visits.
- All required data should be collected by the Researcher or a designated fieldworker (whose name should be forwarded to the relevant Sub District Coordinators prior to data collection). The Sub District Coordinators Messrs. Qabaka – 073 464 9251, Koll – 060 563 1225 and Reuters – 060 557 9732 should be contacted **before** your visit and this letter is to be presented when visiting the facilities.

The Nelson Mandela Bay Health District, as the research site, will expect a copy of the final research report when the study is completed. If the duration of the research period is required to be extended, the District Office (District Manager) should be informed accordingly.

This Office would like to wish you well in your research study.

Yours faithfully

  
\_\_\_\_\_  
**DR L P MAYEKISO  
CLINICAL GOVERNANCE MANAGER – NMBHD**