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DISSERTATION

INVESTIGATING CHALLENGES OF TUBERCULOSIS PREVENTION IN ZAMBIA CORRECTIONAL FACILITIES: A CASE OF MONGU CORRECTIONAL FACILITY.

BY

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A Dissertation submitted to the School of Medicine and Health Sciences of University of Lusaka in partial fulfilment for the award of Masters of Public Health

DECLARATION

Consistent with academic rules against plagiarism, I **Charity Siyanga,** do declare that the work contained herein is as a result of my findings necessitated by a lengthy period of extensive studying and consultation. I also declare that any scholarly work amalgamated in this dissertation has been duly acknowledged. I further declare that this dissertation is in conformity with copyright and academic writing rules as well as research ethics of the University of Lusaka and has never been previously submitted at any Universities or other institutions of learning.

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As Supervisor In-Charge, I recommend that this dissertation be forwarded for marking after verifying that it meets the format and standards of Research Writing principles of the University of Lusaka.

Supervisor's Name: TRESFORD SIKAZWE

Date: 30.03.2024

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DEDICATION

I dedicate this research to the memory of my late mother and brother, who have been constant sources of inspiration. Special appreciation goes to my spouse, Andrew Mubanga, for his steadfast backing and motivational encouragement. Additionally, I express gratitude to my daughter, Ketiwe Claire Mubanga, whose daily presence serves as my motivation to achieve.

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My sincere thanks go to the Mongu District Health Office and Mongu Correctional Facility for fostering a conducive and enabling environment for my work.

I also want to convey my appreciation for the constant support and encouragement from my father and siblings throughout the duration of this study.

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ACRONYMS /ABBREVIATIONS

TB: Tuberculosis

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immunodeficiency Syndrome

ART: Antiretroviral therapy

DOTS: The internationally recognised strategy for TB control

MDR: Multidrug resistant TB

MOH: Ministry of Health

WHO: World Health Organisation

NGO: Non-governmental organisation

STD: Sexually transmitted disease

VCT: Voluntary Counselling and Testin

ABSTRACT

Background

Background: Tuberculosis is one the most feared and persistent diseases in the world. Global community, especially the first world has attempted to eradicate TB but to no avail. The TB epidemic has caused negative effects on political, social and economic frontiers, especially in Africa and Latin America. Being alive to viciousness of TB, Zambia adopted internationally accepted methods of combating TB including improvements in socio-economic factors, active identification of cases, effective treatment approaches, preventive measures like chemoprophylaxis, and vaccination programs. Nonetheless, the country continues to record cases of TB, especially in correctional facilities where more TB cases are recorded compared to the outside population.

It is against this backdrop that the researcher thought to conduct a research on the challenges experienced by the Zambia Correctional Service in tuberculosis prevention using Mongu Correctional Facility in Western Province as a case study.

Methods: A mixed method (qualitative & quantitative) research approach was adopted, using case study design. Data was collected through note taking and recording of discussions during single focus group discussions, field notes, and open-ended and closed-ended questionnaires. Data was analysed using qualitative summary, content analysis and ATLAS.ti vision 8.

Results: The study unearthed that there was high prevalence of TB among inmates at Mongu Correctional Facility exacerbated by the absence of TB prevention measures. The finding was attributed to inadequate infrastructure that resulted in overcrowding among inmates, coupled with late detection and non-isolation of inmates suffering from TB. Consequently, the research recommended among others the expansion of infrastructure in correctional facilities and periodic screening of inmates.

Conclusion: Inmates in Zambian correctional facilities remained at high risk of TB infections due to unconducive environment within the facilities. The lack of effective prevention measures against TB in correctional facilities underscored lack of priorities by authorities towards combating TB in the country. It is therefore, deduced and advanced that unless authorities doubled efforts in preventing TB by introducing preventive measures in correctional facilities the vision of reducing the disease burden by 2030 would not be realised.

CHAPTER ONE
INTRODUCTION

1.0 Overview

It is widely feared and acknowledged that Tuberculosis (TB) is one of major causes of morbidity and mortality across the globe. The World Health Organisation (WHO) classifies TB as number 13th prominent cause of morbidity and mortality, and an infectious killer second after Covid-19 (WHO, 2021). The assertion by the WHO underscores the threat posed by TB, worldwide. This is evident by huge number of morbidity and mortality recorded every year, especially in developing countries, Zambia inclusive.

Being alive to a threat posed by TB, Zambia has adopted internationally accepted methods of combating TB including improvements in socio-economic factors, active identification of cases, effective treatment approaches, preventive measures like chemoprophylaxis, and vaccination programs. Nonetheless, the country continues to record cases of TB, especially in correctional facilities where more TB cases are recorded compared to outside public.

It is against this backdrop that it had become prudent to investigate challenges of tuberculosis prevention in Zambia Correctional Service, Mongu Correctional Facility being used as a case study. Hence, this chapter functions as an introductory section to the research, outlining the background context, stating the problem, and defining the research objectives. Additionally, it highlights the significance of the study and its scope.

1.2 Background to the Study

Belard and Osbak et al. (2014) as cited in Sabine (2020) defines tuberculosis as an infectious disease predominantly caused by the pathogen mycobacterium tuberculosis. It is asserted that Tuberculosis continues to stand as one of the deadliest communicable illnesses worldwide, having claimed more lives than any other infectious disease in history.

Since its discovery in 1982 by Dr. Robert Koch, TB has caused irreversible devastating social and economic consequences (WHO, 2021). Several attempts have been made to eradicate the disease but to no avail although some lives have been saved through various mitigating measures that include treatment. Some of the measures aimed at

ending TB has been commemoration of World TB Day which falls on 24 March annually. This day was designated to raise awareness against the disease by spreading messages of hope that the disease is curable. There are other intervention measures that include detection, testing and treatment which have been credited for saving many lives (WHO, 2021).

According to the WHO (2021) TB is considered as one of medical, scientific and political failure on the globe considering that the disease has continued to claim a lot of lives. This led to the global community to continue making funds available for research, detection and treatment with a view to ending TB.

Despite concerted world efforts against TB, the disease has continued claiming lives for both adults and children. According to the WHO (2020:14) Report, “tuberculosis claims over 10 000 000 lives annually out of which 59% accounts for children.” The same report estimates that 60 000 000 people have been saved from the pandemic due to treatment. The report further postulate that of 10 000 000 deaths, developing countries in Africa and West Pacific account for over 80% of morbidity and mortalities. This is because these areas have high prevalence of HIV/AIDS and Multi-Drug Resistance (MDR). Clearly, the disease is more deadly than perceived by majority people and it is counterproductive to many nations.

Considering escalating cases of TB, especially amidst Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS), world leaders through the United Nations General Assembly had on 26 September 2018 committed to end the scourge by 2035. According to the WHO (2020), ending TB would mean recording at least 10 cases per 1000 population. The declaration by world leaders led to commitment of US $13 000 000 to enhance prevention, testing and treatment with a view to realising the target of ending the disease by 2035.

In Zambia, TB has been in existence since 1980s and numerous policies and intervention measures have been employed to mitigate the negative effects of the disease. Successive governments have attached great importance towards curbing the disease as reflected in various National Development Plans (NDP). According to the NDP, TB cases had reduced in 2018 where 312 cases were recorded per 1000 population compared to 408 cases per 1000 population in 2014 (8NDP, 2022).

Despite significant progress made at national level, TB remains prevalent across the country especially in correctional facilities. This is in contradiction with the emphasis by the government on prevention, early detection and treatment. In light of this context, there is a need for research to be conducted in order to understand challenges faced by Zambia Correctional Facilities in preventing further spread of TB among inmates.

1.3 Statement of the Problem

Zambia has made substantial progress in combating cases of tuberculosis with emphasis placed on prevention of further transmission of TB cases. According to the 8NDP (2022), the country had generally recorded a reduction in the number of TB cases. The report asserted that TB cases reduced from 408 per 1000 population in 2021to 312 per 1000 in 2022. Clearly, the statistics above accentuated substantial reduction in TB epidemic although it falls short of the global target of 10 per 1000 population which was considered as ending TB.

However, Kagujje et al. (2021) discovered a disparity between the general reduction of TB cases externally and in correctional facilities. They reported that the prevalence of TB cases in correctional facilities was almost 100 times greater than that in the general population. This was a worrying finding as it was counterproductive to efforts being made by the government through the Ministry of Health to curb the disease.

Meanwhile, official statistics from Mongu District Office and Mongu Correctional Facility showed grave disparity in TB cases. Generally, there was a reduction in TB cases from 350 per 1000 population in 2020 to 240 per 1000 population in 2021 in Mongu District. To the contrary, Mongu Correctional Facility had 900 TB cases out of 1600 inmates in 2020 and 843 TB cases out of 1200 inmates in 2021.

It is against this backdrop that this researcher found it prudent to conduct a research on the challenges of tuberculosis prevention in Zambia Correctional Service using Mongu Correctional Facility as a case study.

1.3 Study Objectives

1.3.1 Aim of the Study

The study aimed at investigating challenges experienced by Zambia Correctional Service in tuberculosis prevention in Mongu Correctional Facility in Western Province.

1.3.2 Specific Objectives

1. To evaluate TB preventive measures put in place at Mongu Correctional Facility;

2. To determine the extent to which TB is prevalent among inmates in Mongu Correctional Facility; and

3. To explore challenges facing the Zambia Correctional Service in preventing TB in Mongu Correctional Facility.

1.4 Research Questions

1. What preventive measures are put in place against the spread of TB at Mongu Correctional Facility?

2. To what extent is TB prevalent among inmates in Mongu Correctional Facility? and

3. What are the challenges facing the Zambia Correctional Service in preventing TB in Mongu Correctional Facility?

1.5 Significance of the Study

Many scholars, Banda (2020) among them, widely recognize the substantial investment made by the Government of Zambian in tuberculosis prevention, testing, and treatment. However, the pattern observed in Mongu Correctional Facility seemed to be a clear opposite. Past studies on TB did not evaluate TB prevention measures, therefore, upon completing the research, its findings could potentially enhance current knowledge on the prevention of further spread of TB considering the potential inefficacy of current measures. It could also assist officials within the Ministry of Health and collaborating partners by providing potential effective measures to prevent further spread of TB in correctional facilities. The study additionally aimed to provide a source of reference material for future researchers exploring related topics.

1.6 Scope of the Study

The study's scope encompassed investigating challenges experienced by Zambia Correctional Facilities in tuberculosis prevention. The research analysed measures

put in place to halt the spread of TB, prevalence of the disease among inmates and challenges in preventing TB in Mongu Correctional Facility. The research concentrated on inmates and not the general testing and treatment of the population of Mongu because many scholars have extensively researched on them. It was limited to Mongu Correctional Facility in Mongu District of Western Province with a period of focus being 5 years from 2015 to 2020. Mongu Correctional Facility is selected because it is the biggest correctional facility in Western Province. While this may not accurately reflect all Zambia Correctional Facilities, it can provide insight into the challenges encountered in preventing TB within the Correctional Service.

1.7 Delimitation of the Study

The research adopted a case study research design due to its appropriateness for qualitative methodologies. This design involves an empirical investigation that delves deeply into a contemporary phenomenon within its authentic context. Investigating challenges experienced by Zambia Correctional Service in tuberculosis addressing prevention as a real-life issue, the case study is to be implemented. Objectives of the study were: to assess TB preventive measures put in place at Mongu Correctional Facility; to determine the extent to which TB is prevalent among inmates in Mongu Correctional Facility; and to explore challenges facing the Zambia Correctional Facility in preventing TB in Mongu Correctional Facility.

1.8 Limitations of the Study

The primary constraint of the study was the design of the study. The case study used in this research study concentrates on a particular phenomenon within defined parameters with the findings generalised. This entails that the study did not cover entire Mongu District and this prevents the findings to be representative of the whole Correctional Service. Secondly, albeit clearance, the study was undertaken in a highly restricted area which made follow up on some matters difficult. Moreover, the study was conducted during covid-19 epidemic thereby making personal interviews unattainable.

1.9 Definitions of Key Terminologies

Tuberculosis: A potentially infectious disease that mainly affects the lungs.

Prevention: An action of stopping something from happening.

Challenge: Something that needs more effort to do it.

Correctional Facility: A penitentiary centre where inmates are confined against their will with limited freedoms.

Inmate: a person confined to a correctional facility.

1.0.1 Chapter Summary

The chapter had adequately put the topic in perspective by discussing the background of TB. It had espoused the disease's adverse effects on population, political and economic issues. The chapter further acknowledged efforts by world leaders in combating the disease.

Meanwhile, the chapter had concisely advanced a statement of the problem that explained the necessity to undertake the research on TB.

Research objectives and questions were clearly identified. Moreover, significance of the study, limitations and delimitations had equally been explained.

CHAPTER TWO
LITERATURE REVIEW

2.0 Overview

The chapter focused on the analysis of pertinent literature, encompassing both empirical and theoretical aspects. Consequently, the literature review was structured and divided into two primary sections: one dedicated to empirical literature and the other to theoretical literature reviews. The empirical literature review was further into three sub headings; TB prevention measures, TB Prevalence among inmates, and challenges of preventing TB.

2.1 Empirical Literature Review

Many scholars among them Kagujje (2021) have acknowledged that tuberculosis is a deadly disease that has affected the entire world. It is estimated that TB is the second deadliest disease after HIV/AIDS. This ultimately makes TB a major public health concern. Although TB has affected the whole world, it is more endemic in Eastern Europe, Africa and West Pacific. According to the Global Tuberculosis Report (2021), these mentioned regions are faced challenges associated with factors that facilitate the transmission of TB. These factors encompass constrained resources, elevated rates of HIV infection, and the prevalence of Multi Drug-Resistant (MDR) strains.

It is against this rationale that in 2014 and 2015 World Health Organisation (WHO) affiliated member states and the United Nations pledged to end TB epidemic. This led to the adoption of the milestones and by 2030, Sustainable Development Goals (SDGs) 5 and 6 aim to eliminate AIDS, tuberculosis, malaria, and neglected tropical diseases, while also tackling hepatitis, waterborne illnesses, and other communicable diseases. (Global Tuberculosis Report 2021:4).

In 2017 and 2018, political efforts to combat TB intensified with the convening of a WHO global ministerial conference on TB in November 2017. This event led to the adoption of the Moscow Declaration to End TB, which garnered unanimous support from Countries that participated in the World Health Assembly in May 2018. Subsequently, in September 2018, the inaugural high-level meeting on TB was convened by the UN General Assembly, with the attendance of heads of state, government officials, and other leaders. The result was a political declaration reaffirming commitments to the Sustainable Development Goals (SDGs) and the End TB Strategy. Additionally, global targets were established for the mobilization of

funding for TB prevention, care, and research, as well as for the treatment of individuals affected by TB infection and disease, marking the first time such targets had been set (Global Tuberculosis Report 2021:5).

According to Banda (2020), Zambia adopted the first TB control programme in 1993 in Direct Observed Treatment Short course (DOTS). DOTS was implemented at one tier level. In 2006 the government through the Ministry of Health adopted STOP TB which implied the provision of high quality and expanded DOTS. STOP TB was administered at four tiers namely; national, provincial, district and community levels. Meanwhile, in 2017 the country adopted National Strategic Plan for TB prevention, care, and control which envisions to end TB by 2030 (NDP, 2022).

2.1.1 TB Preventive Measures

According to the CDC (2019) report, early detection should form a cornerstone of any TB prevention programme across the globe. For instance, implementing precautions for airborne transmission and providing treatment for both suspected and confirmed cases of diagnosed TB. This is consistent with Howell (2020: 42) who opined that "early detection and isolation of suspected or verified (positive) people with transmissible TB it is advisable to reduce transmission of tuberculosis to health personnel or other persons attending health care facilities". This assertion by Howell (2020) clearly require that persons suspected to be infected by TB are screened and if confirmed sick then they should be isolated from the rest.

This is accentuated by the Global Tuberculosis Report (2021:7) which prescribes pillars and components for TB prevention as; "Timely identification of TB through comprehensive drug-susceptibility testing, systematic screening of contacts and high-risk groups, treatment for all TB cases, including drug-resistant forms, patient assistance, collaborative efforts for TB/HIV, managing comorbidities, preventive measures for high-risk individuals, and vaccination against TB are recommended". The report also stresses that there should be a commitment from political leaders accompanied by sufficient resources for tuberculosis prevention and care as well as a universal health coverage.

In tandem with global preventive measures, the continental and regional TB prevention programmes "United to End Tuberculosis in Africa: A continental Response" and "Unified Minimal Standards for Tuberculosis Prevention, Treatment, and Management

in the Region of SADC” are anchored on the early detection and treatment of TB cases (AU 2021).

For instance, Gelaw (2020:13) suggests that in 1994, a standardized TB prevention program utilizing the DOTS strategy was introduced. He elaborates that the Ethiopian national manual on TB integrated DOTS, as per WHO guidelines, with implementation guided by the country's health sector development plan and 'STOP TB strategies.' Subsequently, a community-based TB control system was implemented under the health extension program (HEP) to enhance health-seeking behaviors related to TB, active case finding, and treatment adherence. Ethiopia initiated its health sector transformation in 2015, aiming to enhance TB case detection, treatment, and access to diagnosis and treatment for MDR-TB” (Gelaw 2020).

Similarly, Ghana through the National TB Control Programme has implemented four strategic plans aimed at combating TB during the period 1994 to 2020. According to the Ghanaian Ministry of Heath National TB Strategic Plan (2021: 26) “the first strategic plan which ran from 2002 to 2006 tackled issues related to the quality of TB diagnosis and treatment in major cities such as Accra and Kumasi. The second plan, executed from 2006 to 2008, focused on regions with higher TB incidence. Simultaneously, it addressed service quality in 60 districts, with special attention given to key affected populations in prisons. This plan also extended efforts to rectify quality issues in urban areas. In contrast, the third plan, carried out from 2009 to 2013 in ten cities, aimed to enhance the quality of diagnosis and treatment in regions with low TB incidence. The fourth strategic plan implemented between 2014 and 2020, built on three foundations: Integrated, patient-centric care and prevention; assertive policies and supportive systems; and heightened research and innovation (MOH, 2021).

It is imperative to note that Ghana's fourth strategic plan for combating TB aimed to achieve a 20% reduction from the 2013 baseline TB prevalence of 286 cases per 100,000 population by the year 2020. This objective aligned with the post-2015 Global TB Control Strategy, focusing on early detection, isolation of suspected and confirmed cases, and ensuring high-quality treatment. Consequently, the plan involved the implementation of a decongestion program in correctional facilities and the establishment of a community-based directly observed treatment short-course (DOTS) approach.

Meanwhile, Zambia adopted the first TB control programme in 1993 in Direct Observed Treatment Short course (DOTS). DOTS was implemented at one tier level. In 2006 the government through the Ministry of Health adopted STOP TB which implied the provision of high quality and expanded DOTS. STOP TB was administered at four tiers namely; national, provincial, district and community levels. Meanwhile, in 2017 the country adopted National Strategic Plan for TB prevention, care, and control which envisions to end TB by 2030 (NDP, 2022). The strategy against TB emphasises the need for early detection, improved living conditions, and isolation of TB patients.

2.1.2 TB Prevalence among Inmates

It is essential for tuberculosis control programs to prioritize preventive measures among incarcerated populations, given the consistent disparities in TB prevalence between individuals in correctional facilities and the general population worldwide. According to the Global Tuberculosis Report (2021), correctional facilities are acknowledged as high-risk environments for tuberculosis. Leonardo and Warren et al. (2021) note that the global number of incarcerated individuals exceeded 11 million in 2018, marking a 24% increase from 2000 to 2018, with rises observed across various global regions. Notably, in Africa and Asia—regions grappling with the highest burdens of tuberculosis and HIV—the incarcerated population surged by 29% in Africa and 38% in Asia during this period (WHO 2020).Owing to high levels of crowding inside correctional facilities, a high prevalence of individual level determinants, and lack of access to proper health-care services including early diagnosis and treatment, tuberculosis transmission is common and inmates are generally considered to be at high risk of developing tuberculosis. Owing to overcrowding in correctional facilities, a notable prevalence of individual risk factors, and insufficient access to adequate healthcare services, including timely diagnosis and treatment, tuberculosis transmission is widespread, placing inmates at a heightened risk of contracting the disease.

In their study on tuberculosis in correctional facilities, Leonardo and Warren et al. (2021:25) suggested that "our findings indicate the importance of tuberculosis control programs prioritizing interventions among incarcerated populations, and individuals in detention should be classified as a high-risk group in global guidelines for tuberculosis screening." This recommendation was based on their discovery of a significantly elevated annual risk of TB infection among inmates in comparison to previous

estimates. For example, in 11 studies measuring TB infection incidence through tuberculin testing among inmates, the rates were notably elevated.

Correspondingly, in research conducted in Iran, Colombia, Nigeria, and Brazil, the annual risk of TB infection exceeded 15%. Notably, in four studies conducted in Brazil, the annual risk surpassed 25%, marking some of the highest rates of TB infection documented in any population. (Leonardo & Warren et.al 2021:25). Various factors such as late detection and treatment were pointed out as reasons for the high prevalence of TB in correctional facilities. “Various factors contribute to the heightened susceptibility of inmates in correctional facility settings to TB infection. Our findings indicate a statistically significant association between TB prevalence and factors such as HIV positivity, sharing cells with TB patients, and marital status” (NIH Journal 2017).

A Pakistani report revealed that at least 8% of inmates were infected with TB due to inmate’s educational attainment, smoking habits, and lengthy confinement. Research revealed that the majority of correctional facilities face numerous obstacles that impede tuberculosis control, including challenges such as limited laboratory capacity and diagnostic tools, disruptions in the supply of medications, ineffective coordination between civilian and correctional facility tuberculosis services, insufficient infection control measures, and a limited policy emphasis on prison healthcare contribute to the challenges (NIH Journal 2020).

According to the Ghanaian Ministry of Heath National TB Strategic Plan (2021: 38), there is high prevalence of TB cases among inmates as compared to the outside population. “The TB case notification rate among prisoners surpasses the general population's rate of 62 per 100,000 individuals.” The report stress that there were at least 7021 per 100,000 person population suffering from TB in correctional facility inmates. Clearly, the statistics show that there is high prevalence of TB in correctional facilities in Ghana as compared to the general population.

The Ghanaian national report attributed the high prevalence of TB among inmates to several factors that include poor nutrition. “Persons in congested settings like correctional facilities and refugee camps, face an elevated risk of contracting TB. This heightened risk is attributed to factors such as overcrowding, cramped living conditions, insufficient ventilation, limited socioeconomic status, and the subpar nutrition and health of residents” (Howell 2020).

Various studies in Ethiopian correctional facilities equally acknowledged high prevalence of TB and attributed the same to educational status, HIV, diabetes, malnutrition, alcoholism, smoking cigarettes, and poverty (WHO 2020).

3 noted that despite correctional facilities having healthcare centres in Ethiopia, facilities offering tuberculosis diagnosis and treatment for both inmates and staff utilize referral systems to connect with external healthcare centres. The implementation of infection control measures in healthcare centres is typically substandard. A study conducted on tuberculosis infection control practices among healthcare workers in Ethiopia revealed that only 38% adhered to the control plans correctly. Additionally, laboratories are frequently insufficient, causing delays in both screening and referral systems (Kazi & Jenkins 2020). These factors exacerbate the transmission rate and serve as significant reservoirs of tuberculosis infection for both inmates and the broader community.

Meanwhile, Kagujje et al (2021) stress the need for concerted efforts to curb TB in correctional facilities. They note that despite preventive measures put in place by the government in addressing TB, inmates continue to suffer from the disease disproportionately as compared to the population living outside the facilities. According to official statistics from Zambia Correctional Facility authorities, Zambia had a total of 25 821 inmates in 2021 out of which 9 847 inmates were TB patients. Similarly, 843 TB cases out of 1200 inmates in 2021 were reported in Mongu Correctional Facility. This clearly indicates massive TB infections among inmates.

2.1.3 Challenges in preventing TB

The WHO (2021) report acknowledges challenges in preventing TB. It posits that despite the existence of a vaccine since the 1930s (BCG), its effectiveness in providing consistent protection extends only until early childhood, and its impact on TB transmission is limited. Further, the report notes that late detection, non-adherence, overcrowding, drug resistance, and difficulty to interrupt transmission as main challenges in preventing TB, especially in correctional facilities.

Secondly, the WHO (2021:17) notes that there has been no effective vaccine against TB. The absence of an effective vaccine against TB possess serious constraints in curbing the disease, especially in correctional facilities where there are several conditions acting as super spreaders. The report notes that despite BCG having been

in existence since 1930s, it offers varying levels of protection beyond early childhood, with a restricted influence on the transmission of tuberculosis. This is a more reason there are several prospective vaccines which have delayed materialising owing to non-proven efficacy. Consequently, vaccine candidates that exhibit immunogenicity in both animals and humans may not demonstrate effectiveness in providing protection against TB disease in the human population.

The study by Akese (2020:25) on Ghana TB programme posits that the notable challenge is preventing TB is that transmission of TB is difficult to interrupt. He asserts that since TB bacillus, Mycobacterium tuberculosis, is spread through aerosols, it is difficult to halt its transmission. The study concludes that interrupting TB transmission at the population level in resource-poor settings has proven challenging due to elevated rates of contact, late diagnosis and possibly other poverty related factors that increase susceptibility to infection.

Meanwhile, the research study on TB in Ethiopia highlighted five challenges that contribute to the spread of TB in correctional facilities. According to the National Library of Medicines (2017) report, correctional facilities receive TB. This assertion is premised on the fact that inmates come from populations with high rates of TB and unhealthy lifestyles. Owing to obliviousness or absence of alternatives, some inmates are likely to enter correctional facilities with untreated TB. It should also be noted that conditions of drug resistance are usually created when inmates they enter correctional facilities with partially treated diseases.

The National Library of Medicines (2017:26) report also asserts that correctional facilities concentrate TB. The report contends that factors such as overcrowding, inadequate ventilation (including the absence of windows or efforts to block cold air), and prolonged confinement within correctional facility cells contribute to the transmission of airborne infections. If a TB patient in the community can potentially infect 15 to 20 people annually, the risk of transmission increases significantly for a TB patient within a prison environment.

The report further notes that correctional facilities distribute TB. It stressed that in most countries, insufficient funding and management, along with the absence of laboratories and adequately trained staff, contribute to undetected TB cases. Individuals with undiagnosed TB can readily spread the infection within the

correctional facility system, especially as they frequently move between cells. Furthermore, the report posits that correctional facility settings make TB worse. Owing to several factors such as late diagnosis, lack of entry screening, insufficiently trained staff, overwhelming influx of prisoners into the system, inadequate infrastructure, poorly organized laboratory services, disruptions in drug supply, and frequent interruptions or incomplete treatment.

Similarly, the study on “TB in the Zambian Prisons” by Kaayunga and Maboshe et,al (2018) cites overcrowding as a serious challenge in preventing TB. They explain that most correctional facilities were beyond the holding capacity. For example, Kabwe Complex, Lusaka Central, Livingstone correctional facilities which were constructed with holding capacity of 800, 260, and 400 inmates were holding in excess of 1768, 1400, and 801 inmates respectively. Clearly this can exacerbate the spread of TB.

The report also identify disruption in treatment as another challenge negatively affecting TB prevention. According to the report, delivery and consistency of TB care face challenges within the correctional facility setting due to systemic factors. These include unanticipated releases and frequent transfers to other correctional facilities, as highlighted by Kaayunga and Maboshe in 2018. They emphasize that inadequate communication between clinics exacerbates cases of individuals being lost to follow-up. Additionally, they express the view that the inherent delay in TB culture turnaround time contributes to a delay in treatment initiation, compounded by the absence of diagnostic equipment.

2.1.4 Conclusion

Empirical literature had clearly shown that TB is a world problem and that inmates are more affected than the external population due to numerous factors. It has also shown that TB is more endemic in developing countries due to fragile health systems. Despite intervention measures at global, continental, regional and national levels, the disease burden remains prevalent due to various challenges such as overcrowding in correctional facilities and disruption of treatment.

2.2 Literature Knowledge Gap

In his study titled "Cross-Sectional Assessment of Tuberculosis and HIV Prevalence in 13 Correctional Facilities in Zambia," Kagujje et al. (2021) utilized a cross-sectional approach to determine a high prevalence of TB among inmates. However, the study did not investigate any challenges regarding the implementation of preventive

measures. Consequently, it is challenging to ascertain the underlying reasons for the elevated prevalence of the disease.

Likewise, Banda (2020) conducted a Cross-Sectional Study on Factors Correlated with Low Tuberculosis Case Notification and Treatment Success in Health Facilities of Zambia, it was found that many TB cases were being reported late to health facilities, complicating intervention efforts. However, the research was too broad to specifically address the health concerns of inmates and the effectiveness of TB preventive measures.

Considering the reviewed researches, it is evident that there is a deficiency in the existing literature concerning the prevention measures of TB in correctional facilities.

2.3 Theoretical Framework

The study was informed by Contagion Theory and Epidemiological triad Theory.

2.3.1 Contagion Theory

Thaler et al. (2019) propose that contagion theory posits the spread of disease through touch, involving infected items such as cloth, food, or contact with people. The authors recommend quarantine as the most effective defense against this mode of transmission. The theory would be suitable for the study as it explains how some diseases spread through communal use of things and how failure to isolate would further the spread of the disease.

2.3.2 Epidemiological Triad Theory

According to Gordon (1950), the theory advances that diseases can be spread through a triangular systemic consisting of an agent, host and environment. It therefore proposes the need to break at least one vertical to contain the disease failure to which the disease would spread easily.

2.4 Conceptual Framework

According to Yin (2021), a conceptual framework is a graphical or narrative explanation presented by a researcher to facilitate easy understanding of the main constructs to be studied. It involves defining crucial factors for examination and the relationships between or among them. Consequently, I have chosen to depict it in a visual format.

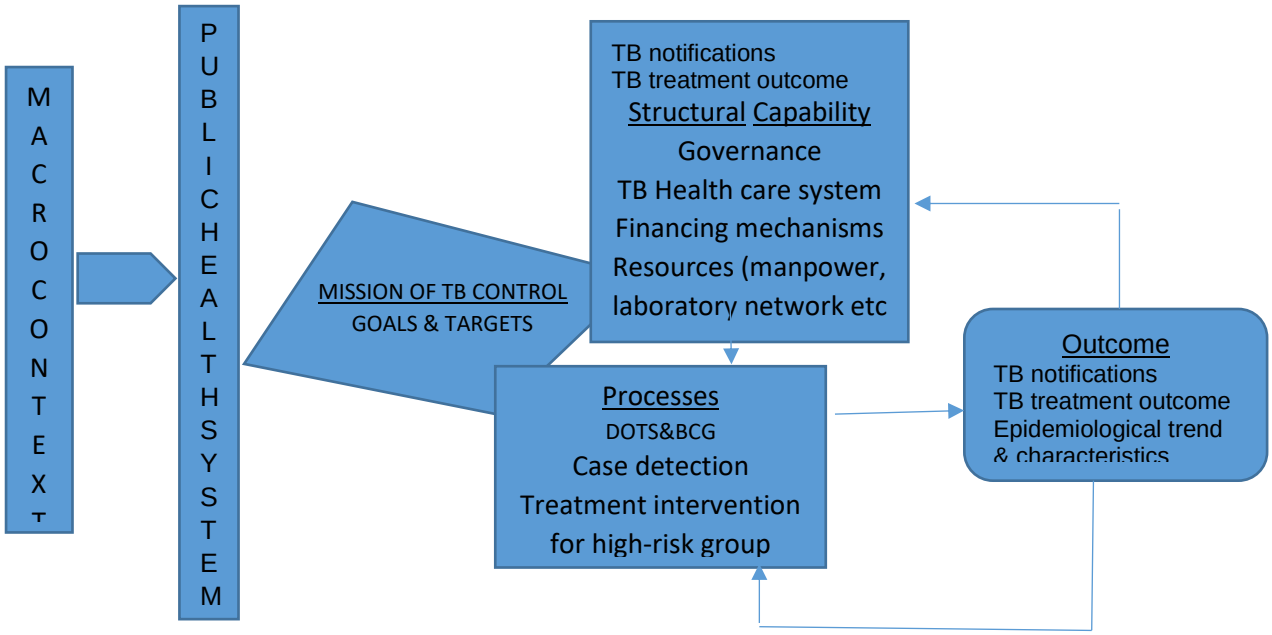

Figure 1: Conceptual Framework (Adopted from the TB Control Program in Public Health System 2011).

2.5 Chapter Summary

The chapter had avidly discussed literature related to TB, TB prevention, prevalence and challenges of preventing TB. The chapter had clearly shown that despite concerted global efforts in combating TB, the disease remained prevalent especially among inmates. Early detection and treatment, isolation of TB patients, and good diet were some of the mainly recommended measures to prevent further of TB.

Meanwhile, the study employed Contagion and Epidemiological Triad Theories to analyze the findings. It is crucial to emphasize that both theories posit the necessity of the absence of certain conditions to halt the spread of the disease.

Further, the conceptual framework depicted a scenario where the government through the Ministry of Health devise a policy on TB then adopt structural capabilities such as human resource and health facilities. These structural capabilities were then supported by a strategy like DOTS to enhance health care provision to attain results.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Overview

The foundation for any successful holiday lies in a well-thought-out plan. Similarly, the methodology serves as the plan for research. This section elucidates the procedures employed in conducting the study, with a specific emphasis on the research approach, design, study population, sample size, data collection instruments, and the methods for data analysis and presentation, along with considerations for ethical practices.

3.1 Methodology

Methodology encompasses what qualifies as a researchable problem, the formulation of testable hypotheses, strategies for framing a problem to enable investigation through specific designs and procedures, and the selection and development of suitable methods for data collection.

Mainly, the objective of the research methodology aims to clarify the research plans and approach. This entails providing a comprehensive explanation of the rationale and theoretical foundation underlying the chosen research approach, specifying the criteria for participant selection, elucidating the methods utilized for data collection and analysis, and delineating the measures taken to uphold ethical practices. Therefore, this methodology shall outline specific procedures, constraints, limitations, or boundaries of the research, as suggested by Yin (2020). Creswell and Poth (2021) further advise that the methodology should include a schedule or action plan of research, outlining each task to be undertaken and the anticipated completion times, following accepted standards or formats.

3.2 Research Approach

The research adopted a mixed method in which both qualitative and quantitative research approaches were used in one study premised on the understanding that data and results obtained using different methods have the potential to explain a phenomenon in-depth. This is in tandem with Creswell (2020: 32) who asserted that “the overarching significance of employing a mixed-methods research design is to offer an improved and more profound comprehension. This is achieved by presenting a comprehensive view that can augment the description and understanding of the

phenomena in question". Hence, the selected research approach was appropriate for the current study.

3.3 Research Design

Case study was the design of the research. Although Yin (2020) acknowledges that utilizing case studies for research purposes remains one of the most formidable challenges within the realm of social science endeavours, Creswell and Poth (2018) contend that case studies are appropriate for inquires that investigate exploring a modern occurrence thoroughly, and within its authentic real-world setting. Examining the challenges of Tuberculosis Prevention in Zambia Correctional Facilities is a real-life phenomenon. Focus group discussions and open-ended questions were employed for gathering qualitative data, while closed-ended structured questionnaires were utilized for collecting quantitative data.

3.4 Population of Study

According to Correctional Facility's authorities in Mongu District, Mongu Correctional Facility has a total of 640 inmates. Hence, the entire study population for the research comprised 640 inmates.

3.5. Sample Size

A sample of 246 respondents comprising 100 female inmates, 20 Correctional Officers (Wardens), 26 health personnel and 100 male inmates was considered using purposeful sampling. The researcher's perspective is that the chosen sample successfully reached a point of data saturation, indicating that further examination of additional subjects could not yield new information. Additionally, the Taro Yamani formula was employed to validate the sample size, as depicted below:

$$n = N/1+N\ (e)\ 2$$

N – Target Population

n- Sample Size

e – Maximum acceptable margin of error (5%)

$$n = 640/1+640(5\%)\ 2$$

$$n = 640/1+640(0.0025)$$

$$= 246.153...$$

$$= 246.$$

3.6 Sampling Technique

As per Creswell and Poth (2021), purposive sampling allows the researcher to deliberately choose cases with a specific goal, seeking information based on their informativeness. Yin (2020) similarly endorses the application of purposeful sampling in case studies, particularly when investigating challenging situations. The objective of purposeful sampling is to generalize findings to a broader population. Therefore, the researcher used purposeful sampling. The research also used stratified random sampling to collect quantitative data.

3.7 Data Collection Instruments

In gathering data, the research study utilized five focus group discussions, field notes, and 320 questionnaires. The chosen data collection instruments satisfy the mixed approach. The recommendation in case studies for employing various sources of evidence is supported by scholars like Gonzalez and Forister (2020).

3.8 Data Analysis

3.8.1 Quantitative Data Analysis: The data obtained through questionnaires underwent thorough examination for uniformity, consistency, and accuracy. This scrutiny occurred both at the questionnaire level and after completing the data entry process. The raw data underwent coding, with each questionnaire being assigned a specific number. Subsequently, the raw data was input into the Statistical Package for Social Sciences (SPSS) software. The choice of SPSS was based on its user-friendly interface and ready availability, making it a suitable tool for data analysis.

3.8.2 Analysis of Qualitative Data: The collected data underwent analysis through qualitative summary and content analysis, utilizing the ATLAS.ti vision 8 tool. ATLAS.ti is recognized as a crucial instrument that enhances researchers' capacity for well-organized, systematic, effective, and efficient data analysis in various studies (Gonzalez & Forister 2020). Simultaneously, content analysis was applied as the researcher systematically reviewed the in-depth explanations obtained from key informants, identified factors influencing the quality of healthcare services, organized them into logical and meaningful categories, established connections between and among categories, and explained the relationships between these categories.

3.9 Ethical Considerations

Ethics have emerged as a fundamental element in carrying out research that is both effective and meaningful. Consequently, the ethical conduct of individual researchers is now subject to unprecedented scrutiny (Yin 2020). The study took into account four significant ethical considerations: voluntary participation, informed consent, non-discrimination, and the assurance of confidentiality and anonymity.

Before initiating the main study, the research proposal underwent review by the University of Lusaka Ethical Committee. Subsequently, the National Health Research Authority granted ethical clearance and issued a certificate of registration for the researcher.

Moreover, approval to carry out the study was secured from the provincial and district medical health offices, along with the respective health facilities. Individual participants were also required to sign a consent form.

CHAPTER FOUR
PRESENTATION AND ANALYSIS OF RESULTS

4.0 Overview

This chapter presents and analyses the data gathered from the respondents. It is important to highlight that within the framework of a case study research design, a researcher can comprehend the behavioural conditions or a phenomenon from the perspective of the actors involved (Zaida, 2017). The purpose of the study was to investigate challenges of tuberculosis prevention in Zambia Correctional Service using Mongu Correctional Facility as a Case Study. Aligned with the set objectives, the study was systematically conducted, and this chapter unveils the outcomes derived from the study area. The data collected from the 320 respondents at Mongu Correctional Facility in Mongu District is presented and elucidated in narrative form.

4.2 Presentation of Findings and Analysis

The following are the findings on the investigating of challenges of tuberculosis prevention in Zambia Correctional Service in tandem with the respondents' perspective. It should be noted that the findings are drawn from all responses given by inmates, correctional facility officials or wardens, and health personnel in Mongu District. In this case, health and correctional facility personnel were treated as key informants. This is because they have access to verified official data on TB at the correctional facility.

4.2 Demographic data

The researcher accounted for the sex, age and education status of the respondents to increase reliability and validity of collected information. Gender was well balanced

as can be seen from the figure below:

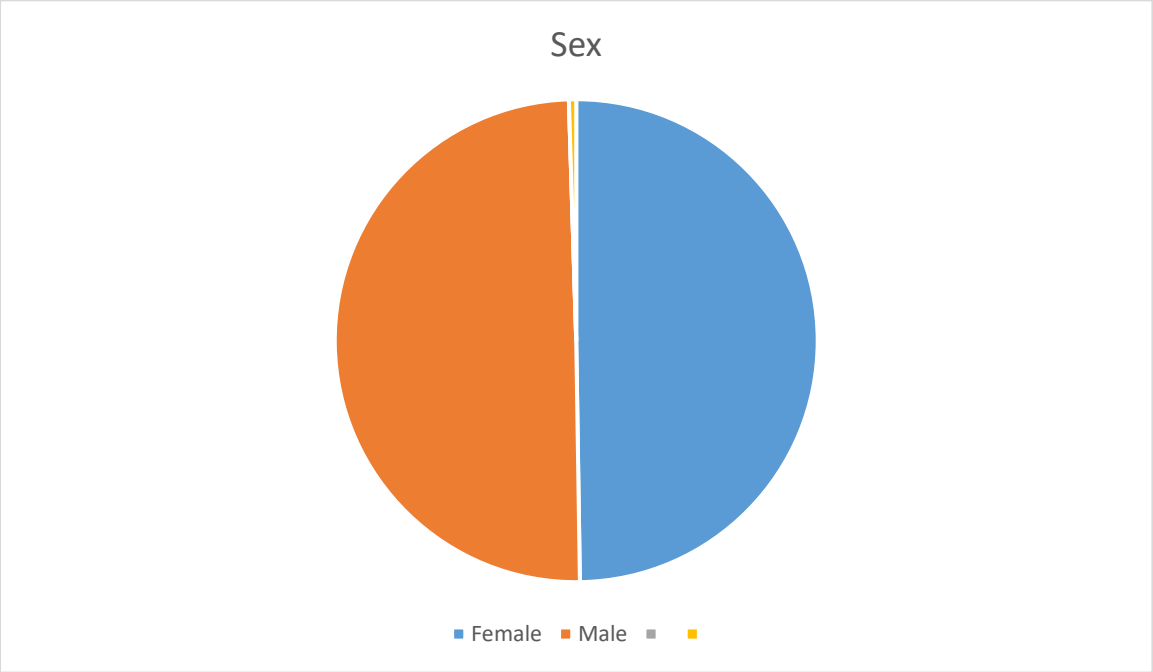

Figure 2: Sex distribution of the respondents.

Meanwhile, age distribution for the respondents was as follows:

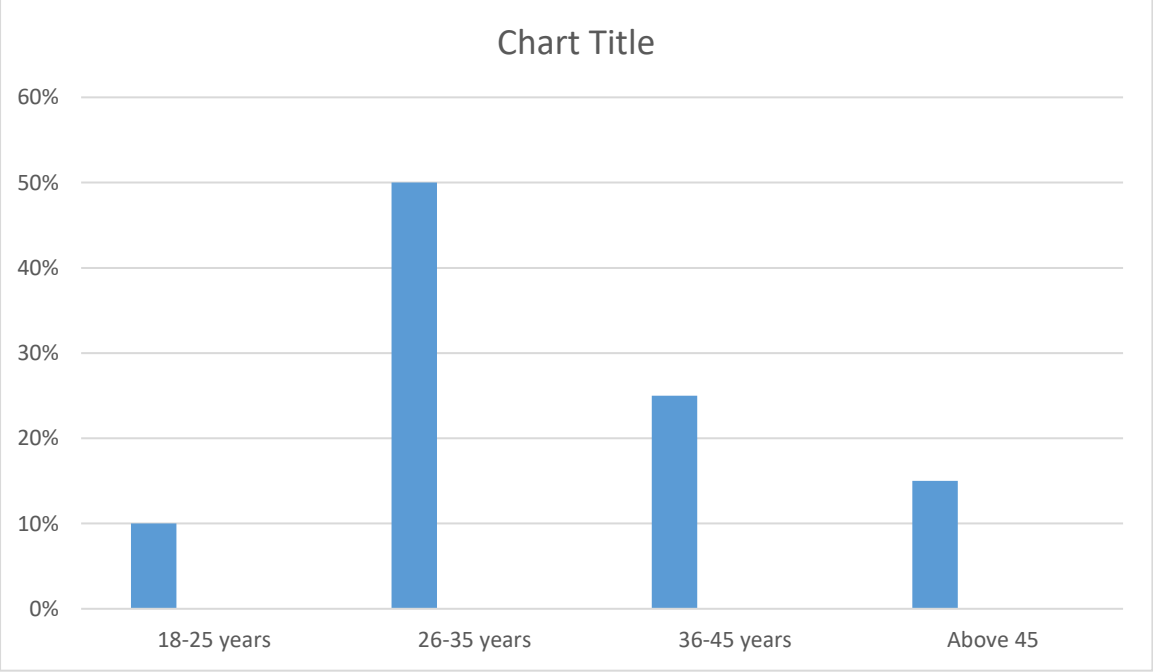

Figure 3: Age ranges for the respondents.

Clearly, all age ranges were represented with majority respondents falling in the age range 26-35 years. This was important for the increased validity and reliability of the information.

The study also ensured that education levels for the participants were ascertained. Most respondents had undergone tertiary education and this meant that they understood the topic well.

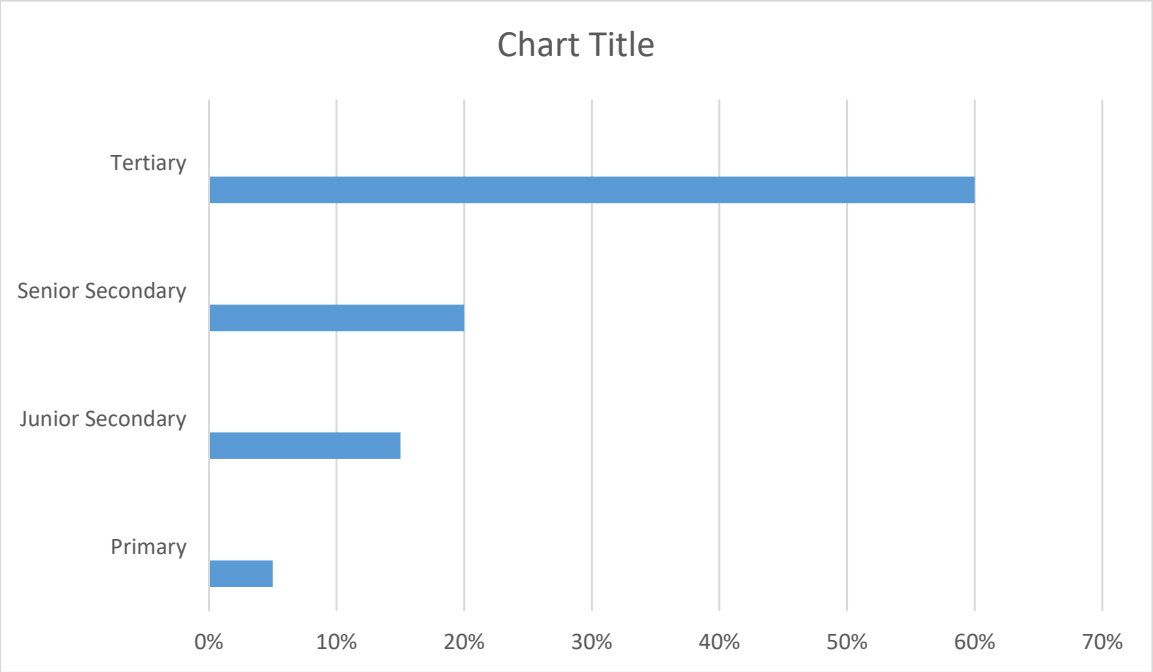

Figure4: Education levels for the respondents.

4.3 TB Preventive Measures

The first objective of the research study was to assess TB preventive measures put in place at Mongu Correctional Facility. It is imperative that preventive measures are ascertained before elucidating on challenges of preventing a disease. Therefore, respondents were asked on how often inmates were screened for TB. It was shocking that 87% of the respondents indicated that they were never screened for TB. "*There is no programme to screen inmates periodically at Mongu Correctional Facility. We have been here for an average of two years but we have never been screened",* narrated one respondent who preferred to be identified as captain.

The respondents' views were supported by officers at Mongu Correctional Facility who explained that inmates were not regularly screened for TB. "*Ideally, all inmates are supposed to undergo routine check-ups for various ailments, especially TB. However, it is difficult to implement the programme due to inadequate resources in terms of transport and testing kits*", said an Inspector who opted to be identified as Katongo.

Nonetheless, 10% of the respondents said that they were screened once a year while only 3% absconded from answering the question. It is therefore clear that inmates were not subjected to periodic screening for TB.

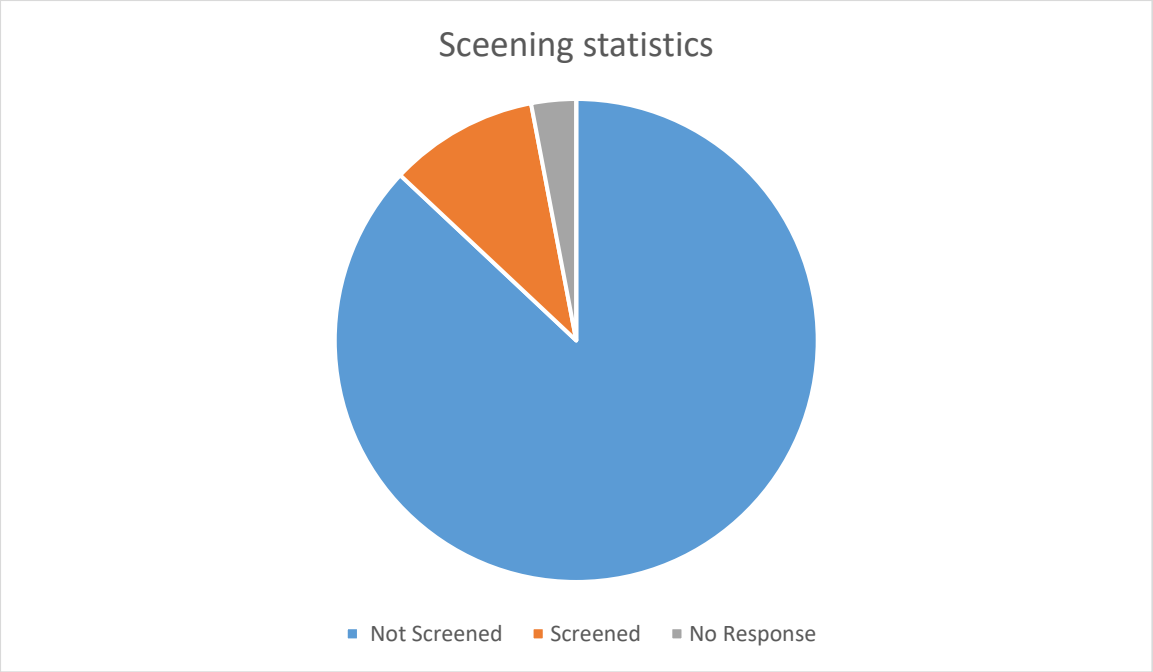

Figure 5: Showing percentages of screened, not screened inmates.

Under the umbrella of the first objective, the researcher sought to understand whether or not inmates were subjected to TB tests before being incarcerated. However, 78% of the respondents indicated that they did not get tested before being incarcerated. One inmate who identified oneself as Litebele stated that, "*no prisoner gets tested for TB before being put under custody. You are only taken to clinic when you are very sick.*" 22% of the respondents indicated that they got tested although it was established that they were only tested after complaining of not feeling well.

Key informants validated this response by stressing that the incarceration process did not begin with correctional facilities but the Zambia Police Service. He explained that usually inmates were only surrendered to correctional facilities after being convicted by the courts of law. "*Madam, it is not possible to test inmates before kubangeneza mkathi because they usually stay for a long period in police cells before being surrendered to us"*, complained an official who preferred to be called as Zedi. It is therefore vivid that inmates do not undergo tests before being incarcerated.

In a bid to ascertain available preventive measures against TB, the researcher asked respondents if cells had windows and whether or not inmates with TB were isolated. An overwhelming number of respondents representing 92% said that cells had no windows and that TB patients were not isolated from the rest due to inadequate space.

"It is common knowledge that cells do not need to have windows for fear of inmates escaping".

"It is a complicated matter when it comes to separating inmates who are TB positive because cells usually hold more inmates than their holding capacity." Said Zedi.

Zedi's responses were affirmed by 91% of the respondents who indicated that they shared cells with inmates who were sick of TB. "*When we complain that some of our friends are sick and sharing rooms with them posed a risk to us, bwanas tell us that we are not home.*" Shouted the respondents during one of the group focus meeting. They added that even if their colleague got sick of TB, they were made to share a mattress at least four per mattress.

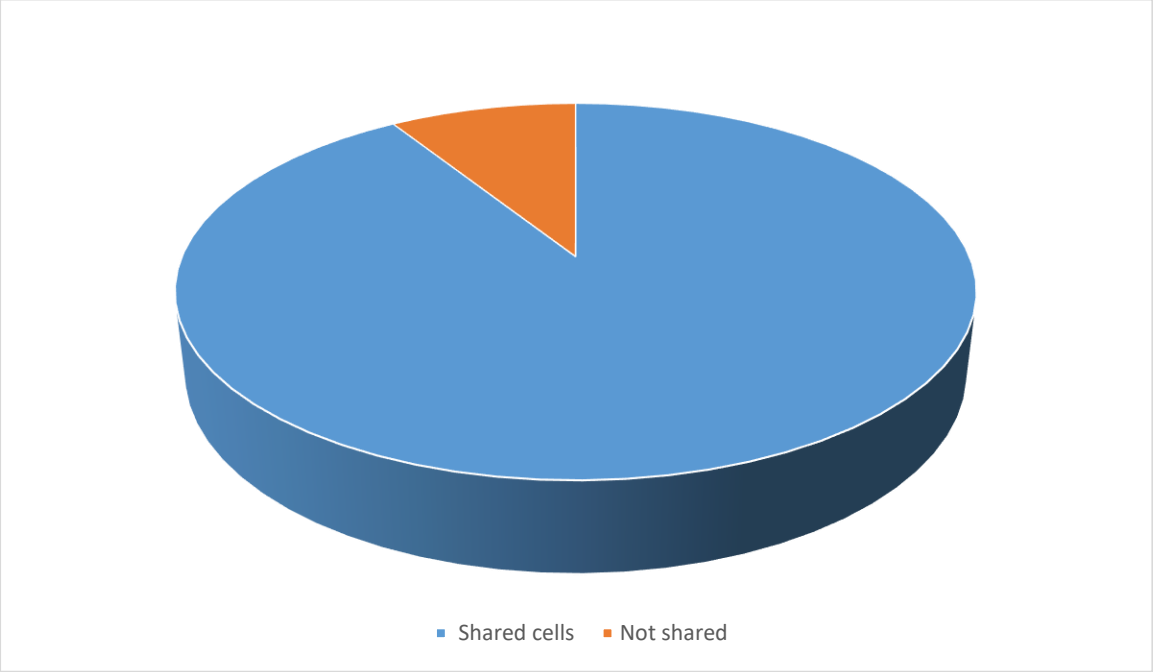

Figure 6 showing results on either shared cells or not shared cells with TB patients.

It was however established that Mongu Correctional Facility had a clinic nearby which serviced inmates and surrounding community. Moreover, it was also established that

the facility was near Lewanika General Hospital which is the highest referral centre in Western Province.

"*There is a prison clinic just behind our cells but bwanas delay to take sick inmates to the clinic. You have to be very sick to be taken to clinic.*" Lamented Gile who was supported by 72% of other respondents.

On whether or not health personnel conducted sensitization about TB, 90% of the respondents agreed that sensitization was conducted at least once a year.

4.1.2 TB Prevalence among Inmates

The researcher's second objective was to determine the extent to which TB is prevalent among inmates in Mongu Correctional Facility. To determine this, the researcher asked respondents to indicate whether or not they had suffered from TB at any point in their life. 67% of the respondents indicated that they had suffered from TB while 33% of the respondents declined. It is crucial to emphasize that of the statistic that accepted having suffered from TB, about 10% were health and correctional facility officials. The figure below illustrates the results.

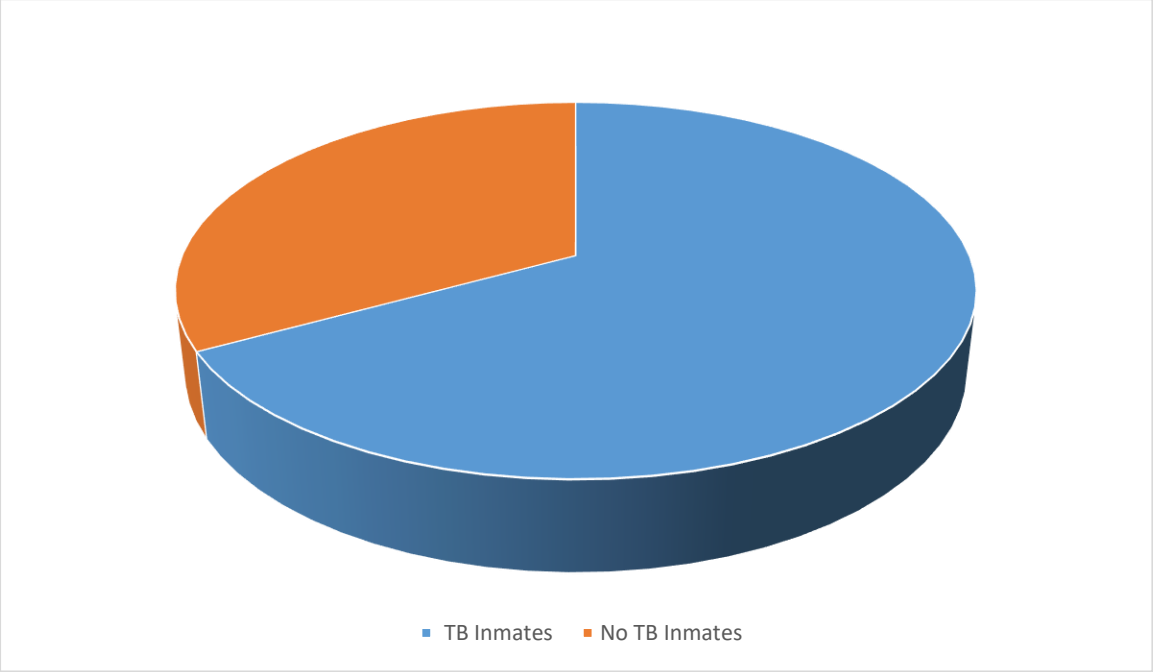

Figure 7 showing results by respondents on whether or not TB Inmates were isolated.

"*I got TB from here because when I came I was not sick. I am still taking medication.*" Lamented one inmate who sought anonymity. The information was authenticated by

key informants from health who asserted that over 60% of inmates were on TB treatment. A TB clinician stated that "*TB is rampant at Mongu Correctional Facility such that even members of staff contract it during the course of duty. Luckily, most of them do recover except for a few with underlying conditions who fail to survive.*"

The clinician expressed concern that most of the inmates were usually taken for medical attention when it was quite late. Therefore, it was unearthed that inmates and members of staff at large were directly affected by TB but that inmates delayed to be diagnosed as compared to members of staff.

"*I became very sick with a lot of sweating at night but later I was told at the clinic that I had TB.*" Said an inmate who spoke on condition of anonymity.

"*There are quite many inmates who are living with TB at Mongu Correctional Facility. Although many are on treatment, there are also some inmates who are scared of going to hospital.*" Said a TB specialist. This assertion was supported by some inmates including Tolo who stressed that, *"it is true there are many persons in cells who are sick of TB and some are not yet on treatment."*

In order to consolidate the researcher's understanding of the prevalence of TB at Mongu Correctional Facility, it was the researcher's considered view to understand whether or not TB inmates were isolated from the rest of the inmates' population. To that end, the respondents were asked to state where inmates with TB were sleeping.

83% of respondents stated that inmates who were sick of TB were not isolated but shared facilities with their uninfected counterparts. *"When you are found with TB authorities do not give you a different room but you continue staying with the rest of others. They even tell us not to discriminate against those who are sick alleging that they cannot transmit TB to us as long as they are on medication."* Said an inmate who identified himself by a pseudo name of Kelvin.

17% of the respondents stated that inmates who were diagnosed with TB were isolated. They contended that sick inmates remained at hospital and only retained after they recovered. *"When you are found with TB you remain at the hospital until you get fine."* Said Yuka.

However, key informants indicated that there was no isolation of inmates with TB from their colleagues. Nonetheless, doctors and clinicians usually admit inmates when one is diagnosed with severe TB and shows signs of weakness.

"*We rarely admit inmates who diagnosed with TB due to security reasons unless in instances when the disease is life threatening.*" Said TB specialist at Lewanika Hospital. It is therefore gaudy that inmates who are diagnosed with TB are not isolated from others and this acts as a super spreader.

With regards to whether inmates were sensitized on how to protect themselves from TB, it was established that they were well sensitized. 85% of the respondents answered affirmatively that they knew how to protect themselves against TB. Only 15% of the respondents said that they were not aware. Understandably, the 15% comprised inmates who took advantage of the interview with the researcher to express themselves. Key informants authenticated the views of the 85% of the respondents by stressing that correctional facility officials usually engaged health personnel to conduct health sensitizations. The key informants, however, stated that such initiatives usually did not positive results as cells were congested for anyone to take necessary precautions.

"*All inmates are sensitized on how to take care of themselves, especially with regards to TB. The only challenge is that cells are congested for them to exercise precautions.*" Said a health practitioner from Prison's Clinic.

4.1.3 Challenges of TB Prevention

In tandem with objective three, the third inquiry aimed to gather the experiences and viewpoints of respondents concerning the challenges encountered by the Zambia Correctional Service in preventing TB in Mongu Correctional Facility. 89% of the respondents indicated that they faced numerous challenges regarding TB prevention.

"*We are too many in the cells and bwanas do not care how we sleep. There is congestion in these cells such that when it is sleeping time, we sleep on each other's body.*" Stated Captain who was applauded by many other respondents for advancing the point. The information was validated by key informants whose official records indicated that the facility was holding more inmates than the initial capacity.

"The first challenge is that cells were holding more inmates beyond their holding capacity. For example, Mongu correctional facility was meant to accommodate 180

inmates but that it was holding 640 inmates." Stated an officer who preferred to be called as Inspector Ear.

Inspector Ear was supported by the TB specialist who observed that congestion in cells was negatively affecting the prevention of TB among inmates.

"Mongu Correctional Facility is highly congested a situation that has made TB prevention among inmates very difficult." Said a Nurse from Prison's Clinic.

"We have been advising colleagues at the correctional facility to decongest the cells to avoid further spread of TB among inmates but to no avail. Imagine a facility which is supposed to accommodate 180 inmates but it is holding over 600 inmates. It is a disaster." Added another health person who did not identify herself by any name.

However, 11% of the respondents said that there were no challenges. "*There are no challenges in fighting TB because we have a clinic nearby.*" Argued an officer at the correctional facility. The figure below illustrates responses from the respondents.

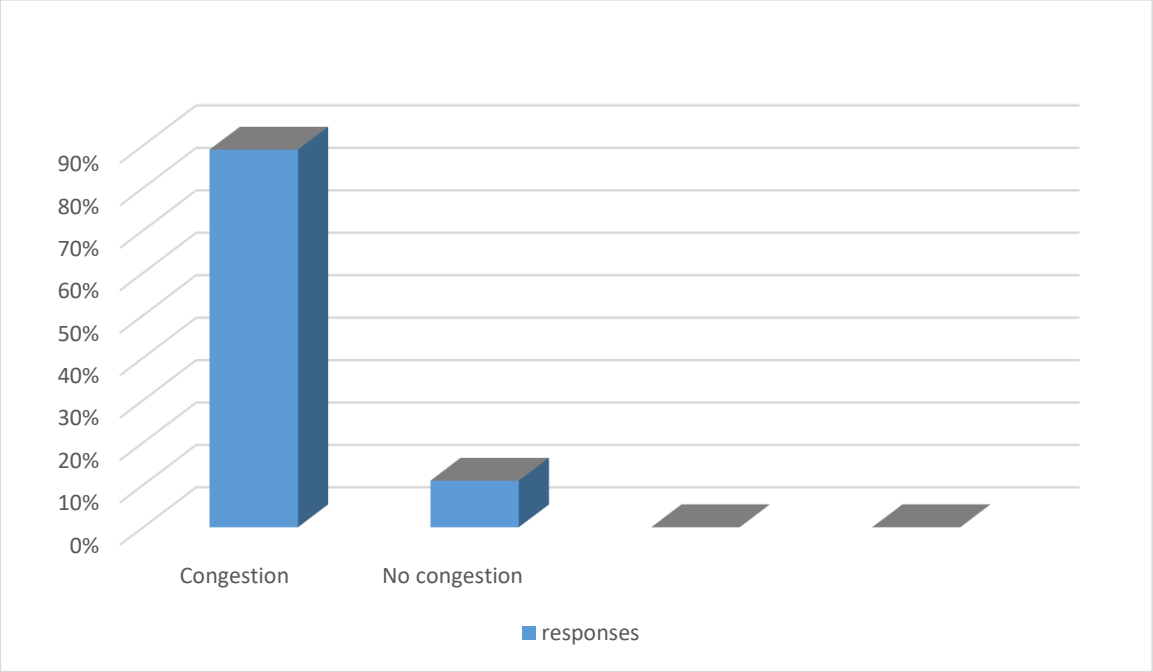

Figure 8 showing results for levels of congestion in cells.

The researcher also sought to find out if new inmates who were on TB medication carried their medication into the correctional facility upon being convicted. 70% of the respondents said that they did not carry due to abrupt nature of some convictions.

“Most convicts do not carry their medication and only resume treatment after correctional facility officers discover their condition.” Explained Correctional Officer.

25% of the respondents indicated that inmates carried medication into the correctional facility and that those who did not were quickly put on medication upon discovery.

“We usually ask inmates if they have any medical condition before admitting them in the facility. At this point we identify those who are either TB or HIV positive but have no drugs and put them on medication. There is however a problem with those who hide their conditions due to stigma as we only get to know about their medical conditions when they become very sick.” Explained the Officer In-Charge for the facility. Only 5% of the respondents did not give their answers.

On whether or not correctional facility authorities handed over inmates who are TB patients to health personnel after being released, 56% of the respondents indicated that they did while 44% of the respondents said there was no handover.

“*Yes, we usually handover such cases to health personnel for continued monitoring of former inmates. We have people who facilitate that process.*” Said a Sergeant who did not want to be identified by any name.

However, 44% of the respondents, mostly inmates, declined that there was no handovers. “*No, there is no handover of sick inmates to health people unless one is very sick at the time of completion of the jail sentence.*” narrated an inmate who only remained with three weeks before being set free.

With regards to diet while in detention, the 77% of the respondents agreed that they mostly had beans and cabbage except for 23% of the respondents who indicated kapenta and rice.

“*We usually eat beans and cabbage*” said Zed who was supported by other 76% of the respondents. “*Mostly they give us kapenta and rice*” said another inmate who sought anonymity and was supported by the other 22% of the respondents.

However, key informants explained that inmates usually fed on beans, rice and cabbage but sometimes they were fed on fish and kapenta.

"*Food for inmates was highly dependent on resources but mostly they do eat cabbage, beans and rice. We also give them fish since we now grow fish.*" Explained the Officer in-Charge of inmates' Food.

4.2 Respondents' Recommendations

Bearing in mind of the TB prevalence, prevention measures and challenges in curbing TB as elucidated by the respondents, the researcher enquired from respondents on how they thought conditions can be improved in correctional facilities.

95% of the respondents recommended expansion of infrastructure in correctional facilities. This recommendation which attracted massive support from key informants was premised on the fact that expanding of infrastructures would enable authorities to isolate inmates with TB from their counterparts.

"*We want the government to build more cells so that people who are sick of TB cannot be sleeping in the same room as those without TB.*" Said an inmate who was supported by 94% of other respondents.

"Expanding of infrastructure at correctional facilities would enable us to isolate inmates with different ailments from other inmates. Once this is implemented, we should be able to record a reduction in TB cases in Correctional facilities." Explained Officer Katongo.

CHAPTER FIVE:
DISCUSSION OF FINDINGS

5.1 Overview

After presenting the research study's findings in the preceding section of Chapter Four, this part now engages in a discussion of the results in alignment with the literature review presented in Chapter Two.

5.1.1 TB Preventive Measures

The first objective of the research study was to assess TB preventive measures put in place at Mongu Correctional Facility. Consistent with the first objective and question, the study unearthed that Mongu Correctional Facility had no adequate preventive measures against TB. The study discovered that although the facility had a clinic, inmates were not screened for TB prior to incarceration. The study also brought to light the lack of a comprehensive programme to periodically screen inmates whilst in detention. It was further discovered that inmates suffering from TB were not isolated from other inmates.

The findings in respect of objective one are in total contradiction of Howell (2020) and Kagujje et al. (2021) on preventing further spread of TB. Howell (2020: 42) opined that “early detection and to minimize the transmission of tuberculosis to healthcare workers or other individuals within healthcare facilities, it is recommended to isolate individuals with suspected or confirmed infectious TB”. This assertion by Howell (2020) clearly require that persons suspected to be infected by TB are screened and if confirmed sick then they should be isolated from the rest.

Similarly, the CDC (2019) report, recommends early detection as a cornerstone of any TB prevention programme across the globe. For example, airborne precautions and treatment of both suspected and confirmed diagnosed TB cases. This is accentuated by the Global Tuberculosis Report (2021:7) which prescribes pillars and components for TB prevention as; “Prompt identification of tuberculosis, which encompasses comprehensive drug-susceptibility testing, systematic screening of contacts and high-risk groups, as well as the isolation and treatment of all individuals with tuberculosis, including those with drug-resistant strains.”

Meanwhile, the research findings in line with objective one reaffirms the fears espoused by contagion theory (Thaler et al. 2019) on the spread of some diseases. According to contagion theory, TB is one of the diseases that can be spread by touch,

whether of infected cloth or food or people, and recommended quarantine as the best defence. From the findings, it can therefore be concluded that Mongu Correctional Facility is a super spreader of TB because there are no adequate preventive measures against TB. The fact that inmates suffering from TB are not isolated from others underscore how the disease spread at the spread of light among inmates. It is also paramount to note that the study established that TB cases were being reported late to health authorities. This finding is in tandem with Banda (2020) who discovered that many TB cases were being reported late to health facilities and this complicated intervention. The findings also are in total violation of preventive measures advanced by Gordon (1950) as cited by Kagujje et al. (2021) through the epidemiological triad theory. Epidemiological theory asserts that for a disease such as TB to be contained, at least one vertical needs to be broken.

Similarly, the finding on late detection of TB resonates with Zaman (2020) who noted that despite correctional facilities having healthcare centres that provide diagnosis and treatment of TB for both inmates and staffs in Ethiopia, the services are provided through referral systems to outside healthcare centres. It is therefore clear that the high TB prevalence at Mongu Correctional Facility was due to failure to successfully implement TB control and prevention programmes.

5.1.2 TB Prevalence among Inmates

The second objective of the study was to determine the extent to which TB is prevalent among inmates in Mongu Correctional Facility. It is a painful revelation that the study established that there was high prevalence of TB among inmates at the facility. 380 inmates out of a total of 640 inmates who were in detention at the time of the research study were TB patients. The research study also established that most inmates who had TB had contracted the disease whilst in detention.

The findings support the contagion theory's assertion that a disease is likely to spread faster when identified sick persons are not quarantined (Thaler et al. (2019).

Moreover, the findings validate the epidemiological triad theory (Gordon 1950) as cited in Kagujje et al. (2021) that when a pathogen, host and conducive environment are not separated, a disease spreads easily. The failure to isolate TB infected inmates coupled with congestion and the existence of the pathogen exacerbate the spread of TB among inmates.

The findings also supported official statistics from Mongu District Office and Mongu Correctional Facility which showed grave disparity in TB cases between inmates and the outside population. Generally, there has been a reduction in TB cases from 350 per 1000 population in 2020 to 240 per 1000 population in 2021 in Mongu District. To the contrary, Mongu Correctional Facility had 900 TB cases out of 1600 inmates in 2020 and 843 TB cases out of 1200 inmates in 2021.

It is also true that the findings are consistent with the Global Tuberculosis Report (2021) which recognises correctional facilities as high-risk environments for tuberculosis. Leonardo and Warren et al. (2021) referenced Africa and Asia as regions bearing the greatest worldwide burden of tuberculosis and HIV. The population of incarcerated individuals witnessed a significant increase, rising by 29% in Africa and 38% in Asia during this period. with at least half of the incarcerated suffering from TB (WHO 2020).

Meanwhile, the findings at Mongu Correctional Facility expose failure by authorities to operationalize Leonardo and Warren et.al (2021:25) who opined that tuberculosis control programs should give priority to interventions within incarcerated populations. Individuals in detention should be recognized as a high-risk population in global guidelines for tuberculosis screening. Their recommendation was premised on their findings to the effect that there was a significantly higher annual risk of TB infection among inmates compared to previous estimates.

5.1.3 Challenges of TB Prevention

The third objective of the study was to establish challenges facing the Zambia Correctional Service in preventing TB in Mongu Correctional Facility. The study unearthed that the main challenge in preventing TB among inmates was overcrowding. The second challenge was late detection and treatment of TB cases among inmates. The study also found that disruption of treatment was another challenge in combating TB among inmates.

The findings are consistent with the WHO (2021) report which acknowledges late detection, non-adherence, overcrowding, drug resistance, and difficulty to interrupt transmission as main challenges in preventing TB, especially in correctional facilities.

The findings are equally in tandem with the findings contained in a research study on TB in Ethiopia which highlighted five challenges that contribute to the spread of TB in

correctional facilities. According to the National Library of Medicines (2017) report, correctional facilities receive TB. This assertion is premised on the fact that inmates come from populations with high rates of TB and unhealthy lifestyles. Owing to obliviousness or absence of alternatives, some inmates are likely to enter correctional facilities with untreated TB. It should also be noted that conditions of drug resistance are usually created when inmates enter correctional facilities with partially treated diseases.

The findings are also in support of the WHO (2021:17) the absence of an effective vaccine against TB possess serious constraints in curbing the disease, especially in correctional facilities where there are several conditions acting as super spreaders.

Meanwhile, the study findings confirm findings of the study by Akese (2020:25) on Ghana TB programme who posited that the notable challenge is preventing TB is that transmission of TB is difficult to interrupt. He asserts that since TB bacillus, Mycobacterium tuberculosis, is spread through aerosols, it is difficult to halt its transmission. The study concludes that TB transmission has been difficult to interrupt at the population level in resource-poor settings, because of high contact rates, late diagnosis and possibly other poverty related factors that increase susceptibility to infection.

Further, the findings expose failure to adhere to prescriptions by both Epidemiological triad and contagion theories on curbing diseases. The National Library of Medicines (2017:26) report also asserts that correctional facilities concentrate TB. The report argues that.

5.2 Chapter Summary

This chapter has systematically presented and discussed the study's findings in conjunction with the empirical and theoretical literature reviewed in Chapter Two. In accordance with these findings, the study revealed a high prevalence of tuberculosis among inmates at Mongu Correctional Facility. It was also unearthed that the facility had no adequate preventive measures against TB. Meanwhile, Zambia Correctional Service had challenges in terms of overcrowding of inmates, late detection and Treatment of TB cases among others.

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5.3 Conclusion

The research has realised its objectives as all research questions were adequately answered. It is however worth note that most findings were in tandem with existing literature and previous studies.

CHAPTER SIX
RECOMMENDATIONS AND CONCLUSIONS

6.0 Overview

This chapter provides a condensed overview of the study's findings, conclusions, and recommendations. It serves as a concise summary of the entire study, consolidating the research findings. The conclusion emphasizes the most significant points, and the recommendations aim to advise stakeholders, particularly the Ministry of Health and the Zambia Correctional Service on the matters relating to prevention of TB in correctional facilities.

6.1 Summary of the Findings

The aim of the study was to investigate challenges experienced by the Zambia Correctional Service in tuberculosis prevention in Mongu Correctional Facility in Western Province. Consistent with the objectives, the following were the research questions:

i. What preventive measures are put in place against the spread of TB at Mongu Correctional Facility?
ii. To what extent is TB prevalent among inmates in Mongu Correctional Facility?
iii. What are the challenges facing the Zambia correctional Service in preventing TB in Mongu Correctional Facility?

In order to promote coherent and scholarly data analysis, the study adopted contagion and epidemiological triad theories.

The general finding of the study was that Mongu Correctional Facility had no preventive measures against TB. This had left inmates susceptible to contracting TB whilst in detention, especially that there were no isolation facilities. This meant that the facility was a serious super spreader for TB as isolation was one of the main recommended measures to prevent further spread of TB.

The study unearthed that lack of prevention measures against TB was exacerbated by absence of periodic screening of inmates for TB. Since inmates were not being screened for opportunist infections, it meant that inmates interacted with each other freely thereby spreading TB amongst themselves.

The research also unearthed that inmates were not screened prior to incarceration. This was despite the Correctional facility having a dedicated clinic. This was a recipe

for uncontrolled spread of TB among inmates as correctional authorities did not know the status of new inmates with regards to TB infections. This finding also underscored lack of dedication to duty by health personnel as they failed to implement a preventive programme.

The other prominent finding of the study was the high prevalence of TB among inmates at the facility. 380 out of a total of 640 inmates who were in detention at the time of the study were suffering from TB. The number of the inmates who were suffering from TB was astronomical and underscored the lack of TP preventive measures at the facility.

The research study also established that most inmates who had TB had contracted the disease whilst in detention. The discovery is not surprising considering the conditions that characterised the correctional facility such as the absence of ventilation and isolation facilities.

The other significant finding was that overcrowding was the main challenge in preventing TB among inmates. It was established that the facility's holding capacity was 180 but there were 640 inmates at the time the study was being conducted. This in itself was a super spreader of TB.

In line with the findings, the other challenge was late detection and treatment of TB cases among inmates. It should be noted that correctional facilities in Zambia lack proper ventilation. This coupled with congestion in cells act as catalysts for the spread of infections, especially TB. The study also found that disruption of treatment was another challenge in combating TB among inmates.

6.2 Conclusion

Inmates in Zambian correctional facilities remained at high risk of TB infections due to unconducive environment within the facilities. The lack of effective prevention measures against TB in correctional facilities underscored lack of priorities by authorities towards combating TB in the country. It is therefore, deduced and advanced that unless authorities doubled efforts in preventing TB by introducing preventive measures in correctional facilities the vision of reducing the disease burden by 2030 would not be realised.

6.3 Recommendations

Having considered the findings of the study, the researcher advanced the following recommendations for possible consideration by stakeholders in pursuit of improving prevention of TB among inmates:

i. The Ministry of Home Affairs and Internal Security should consider expanding infrastructure in correctional facilities. This would increase space in terms of holding capacity for facilities thereby providing the much needed isolation space and proper ventilation;
ii. The Zambia Correctional Service in partnership with the Ministry of Health should introduce a policy to incarcerate inmates with TB in isolated cells;
iii. The Zambia Correctional Service in partnership with the Ministry of Health should as a matter of policy start screening incoming inmates so that those with TB are isolated before interacting with their colleagues;
iv. The Zambia Correctional Service in partnership with the Ministry of Health should implement periodic screening of inmates and enforce adherence to treatment;
v. The Ministry of Home Affairs and Internal Security should increase funding to correctional facilities so that resources such as transport to take ailing inmates to health facilities can be made available; and
vi. The Ministry of Health should consider exploring short period treatment for TB.

6.4 Suggested Areas for future Research

1. Future research should be conducted on the challenges in TB prevention by the Zambia Correctional Service in other parts of the country.
2. Assessing factors that necessitated the change of the name from Prisons to Correctional Facilities.

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APPENDIX 1: Consent form for inmates

THE UNIVERSITY OF LUSAKA

SCHOOL OF POST - GRADUATE STUDIES

MASTER OF SCIENCE IN PUBLIC HEALTH

TOPIC: INVESTIGATING CHALLENGES OF TUBERCULOSIS PREVENTION IN ZAMBIA CORRECTIONAL SERVICE: A CASE OF MONGU CORRECTIONAL FACILITY.

Dear Respondent,

My Name is Charity Siyanga, a Student of Master of Science in Public Health Programme at the University of Lusaka and this interview is part of the process of generating data for my dissertation. The information I will get from you is purely for academic purposes and will not be used for other reasons. Kindly read and sign the consent form as an agreement that you voluntarily participated in this research study.

Thank you.

Consent to take part in a Research Study

All participants willing to take part in this research titled "Investigating Challenges of Tuberculosis Prevention in Zambia Correctional Service: A Case of Mongu Correctional Facility" MUST sign this form.

- I …… voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences against me.
- I understand that I can withdraw permission to use data from my interview within 1 week from the date of interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me and I had an opportunity to ask questions.
- I understand that participation means sharing information that I know about the topic of study.

- I fully understand that I will not directly benefit from participating in this research study.
- I agree to interview being, verbal, written and audio recorded.
- I agree that all the information I provide in this research will be treated confidentially.
- I understand that in any report on the results, my identity will remain anonymous.
- I understand that disguised extracts from my interview may be quoted in a dissertation and presentations.
- I understand that signed consent forms and audio recordings will be destroyed at the end of the study.
- I understand that I am free to contact any person involved in the research to seek for further clarification and information.
- I understand that the researcher has been granted authority to conduct this study by a competent authority.
- I fully understand that the researcher is not pseudo having verified her details from the University of Lusaka Student Identity Card and introductory letter.

Signature of Research Participant

…….. *Date:* …….

Signature of Researcher

I strongly believe that the participant is giving informed consent to participate in the study.

…… *Date:* …….

Date of Interview:.....

Code of Interviewee:.....

SECTION A: Background Information

1. Gender

A. Male [ ] B. Female [ ]

2. What is your age range?

A. 18 - 25 years [ ] B. 26 - 35 years [ ] C. 36 - 45 years [ ]

D. 46 years and above [ ]

3. What is your current marital Status?

A. Single [ ] B. Married [ ] C. Separated [ ] D. Divorced [ ] E. Widowed [ ]

4. What is the highest level of education that you attained?

A. Primary [ ] B. Junior Secondary School (Grade 8-9) [ ]

C. Senior Secondary School (Grade 10-12) [ ] D. Tertiary Education [ ]

SECTION B: TB Prevention Measures

1. How often do you get screened for TB?
   A. Weekly [ ] B. Monthly [ ] C. Biannually [ ] D. Annually [ ]

2. Do you get tested for TB before being incarcerated?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
3. How many are you in a cell? .....
4. Do the cells have windows?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
5. How many inmates sleep on one mattress?
   A. 5 [ ] B. 2 [ ] C. 4 [ ] D. 1 [ ]
6. Do TB patients sleep in the same cells with those who are not sick?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
7. Do you have flushable toilets?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
8. Do health personnel conduct sensitizations about TB?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
9. Are TB patients taken to clinic or hospital?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
10. Does the correctional facility have a clinic or hospital?
    A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]

SECTION C: TB Prevalence at Mongu Correctional Facility

1. Have you suffered from TB?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
2. If the answer to C (1) is yes, how did you know that you had TB?
   A. Diagnosis B. persistent sickness C. Friend
3. Are there fellow inmates whom you know that they have TB?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
4. If the answer to C(3) is yes, are they on treatment?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
5. Where are Inmates with TB sleep?
   A. Same cells with non-patients
   B. In isolated cells
   C. At the hospital D. I don't know
6. Do you know how a person can contract TB?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
7. Kindly tell me who a person can protect oneself from contracting TB?
   …….
8. How many inmates do you think are sick of TB?
   A. 10 [ ] B. 20 [ ] C. 50 [ ] D. Over 70 [ ]

SECTION D: Challenges of Preventing TB

1. How congested are your cells?
   A. Very B. Fairly C. Not congested
2. Do new inmates who are on treatment come with drugs?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
3. If the answer to D (2) is no, how does it take for them to resume treatment?
   ……
4. What is the holding capacity for the correctional facility in question?
   …….
5. How many inmates are currently held in the facility as at now?
   ……..
6. Do correctional facility authorities hand over inmates who are TB patients to health personnel when they get released?

A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]

7. How many times do you eat in a day?
   A. Once [ ] B. Twice [ ] C. Thrice [ ] D. None of above [ ]
8. Kindly tell me what you know about challenges in preventing TB among inmates. …….
   …….
9. What type of foods do you eat?
   A. Fish B. Nshima C. Beans D. All the three

APPENDIX 1: Consent form for Health Personnel and Warders

THE UNIVERSITY OF LUSAKA

SCHOOL OF POST - GRADUATE STUDIES

MASTER OF SCIENCE IN PUBLIC HEALTH

TOPIC: INVESTIGATING CHALLENGES OF TUBERCULOSIS PREVENTION IN ZAMBIA CORRECTIONAL SERVICE: A CASE OF MONGU CORRECTIONAL FACILITY.

Dear Respondent,

My Name is Charity Siyanga, a Student of Master of Science in Public Health Programme at the University of Lusaka and this interview is part of the process of generating data for my dissertation. The information I will get from you is purely for academic purposes and will not be used for other reasons. Kindly read and sign the consent form as an agreement that you voluntarily participated in this research study.

Thank you.

Consent to take part in a Research Study

All participants willing to take part in this research titled "Investigating Challenges of Tuberculosis Prevention in Zambia Correctional Service: A Case of Mongu Correctional Facility" MUST sign this form.

- I …… voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences against me.
- I understand that I can withdraw permission to use data from my interview within 1 week from the date of interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me and I had an opportunity to ask questions.
- I understand that participation means sharing information that I know about the topic of study.
- I fully understand that I will not directly benefit from participating in this research study.
- I agree to interview being, verbal, written and audio recorded.
- I agree that all the information I provide in this research will be treated confidentially.
- I understand that in any report on the results, my identity will remain anonymous.
- I understand that disguised extracts from my interview may be quoted in a dissertation and presentations.
- I understand that signed consent forms and audio recordings will be destroyed at the end of the study.
- I understand that I am free to contact any person involved in the research to seek for further clarification and information.
- I understand that the researcher has been granted authority to conduct this study by a competent authority.
- I fully understand that the researcher is not pseudo having verified her details from the University of Lusaka Student Identity Card and introductory letter.

Signature of Research Participant

…….. *Date:* ……

Signature of Researcher

I strongly believe that the participant is giving informed consent to participate in the study.

…… *Date:* …….

Date of Interview:.....

Code of Interviewee:.....

SECTION A: Background Information

1. Gender

A. Male [ ] B. Female [ ]

2. What is your age range?

A. 18 - 25 years [ ] B. 26 - 35 years [ ] C. 36 - 45 years [ ]

D. 46 years and above [ ]

3. What is your current marital Status?

A. Single [ ] B. Married [ ] C. Separated [ ] D. Divorced [ ] E. Widowed [ ]

4. What is the highest level of education that you attained?

A. Primary [ ] B. Junior Secondary School (Grade 8-9) [ ]

C. Senior Secondary School (Grade 10-12) [ ] D. Tertiary Education [ ]

SECTION B: TB Prevention, Prevalence and Challenges

1. How often do inmates get screened for TB?
   B. Weekly [ ] B. Monthly [ ] C. Biannually [ ] D. Annually [ ]

2. Do you test inmates for TB before incarcerating them?
   B. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]

3. How many inmates are in each cell?
   .....
4. Are the cells well ventilated?
   B. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
5. How many inmates sleep on one mattress?
   B. 5 [ ] B. 2 [ ] C. 4 [ ] D. 1 [ ]
6. Do TB patients sleep in the same cells with those who are not sick?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
7. Do health personnel conduct sensitizations about TB?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
8. Are TB patients taken to clinic or hospital?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
9. Does the correctional facility have a clinic or hospital?
   B. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
10. Where are Inmates with TB sleep?
   D. Same cells with non-patients
   E. In isolated cells
   F. At the hospital D. I don't know
11. Kindly tell me how a person can protect oneself from contracting TB?
   …….
12. How many inmates do you think are sick of TB?
   A. 10 [ ] B. 20 [ ] C. 50 [ ] D. Over 70 [ ]
13. How congested are your cells?
   B. Very B. Fairly C. Not congested
14. Do new inmates who are on treatment come with drugs?
   A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]
15. If the answer to 14 is no, how long does it take for them to resume treatment?
   ……
16. What is the holding capacity for the correctional facility in question?
   …….
17. How many inmates are currently held in the facility as at now?
   ……..
18. Do correctional facility authorities hand over inmates who are TB patients to health personnel when they get released?

A. Yes [ ] B. No [ ] C. I don't know [ ] D. None of above [ ]

19. How is the diet for inmates based on the food you give them?

    ……

20. Kindly tell me what you know about challenges in preventing TB among inmates. …….

    …….

Merci.

APPENDIX 1: Consent form for Focus Group Discussion

THE UNIVERSITY OF LUSAKA

SCHOOL OF POST - GRADUATE STUDIES

MASTER OF SCIENCE IN PUBLIC HEALTH

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- I fully understand that I will not directly benefit from participating in this research study.
- I agree to interview being, verbal, written and audio recorded.
- I agree that all the information I provide in this research will be treated confidentially.
- I understand that in any report on the results, my identity will remain anonymous.
- I understand that disguised extracts from my interview may be quoted in a dissertation and presentations.
- I understand that signed consent forms and audio recordings will be destroyed at the end of the study.
- I understand that I am free to contact any person involved in the research to seek for further clarification and information.
- I understand that the researcher has been granted authority to conduct this study by a competent authority.
- I fully understand that the researcher is not pseudo having verified her details from the University of Lusaka Student Identity Card and introductory letter.

Signature of Research Participants

…….. *Date:* …….

…….. *Date:* …….

…….. *Date:* …….

…….. *Date:* …….

Signature of Researcher

I strongly believe that the participant is giving informed consent to participate in the study.

…… *Date:* …….

Date of Interview:.....

Code of Interviewee:.....

SECTION A: Background Information

1. How many men are in this facility? ……..
2. How many women are in this facility? ……

SECTION B: TB Prevention Measures

1. Can you describe the TB prevention measures that are being implemented in this facility?
   ……
   ……..
2. Kindly describe how ventilated of cells are?
   .....
   .....
3. Tell me briefly how mattresses are allocated and shared among inmates?
   ……
   ……..
4. Kindly tell me how are TB patients separated in the cells from those who are not sick?
   ……
   ……
5. I want you to think back to the time you or a fellow inmate had TB. Briefly explain to us what happened and what did you/inmate do about it?
   .....
   .....

SECTION C: TB Prevalence at Mongu Correctional Facility

1. Can you describe the prevalence of TB in this Correctional facility?
   ……
   ……..
2. What are the signs and symptoms of TB that you know?
   ……
   ……
3. Kindly describe how TB is transmitted?
   .....
   .....
   .....
4. Kindly tell me how can person can protect oneself from contracting TB?

……
……

SECTION D: Challenges of Preventing TB

1. In your own words can you describe the holding capacity of the cells in comparison to the actual number of people in the cells?
   .....
   .....
2. Can you describe how TB patients are handed over to health personnel by correctional facility authorities when they get released?
   ……
   …….
3. Kindly tell me what are the challenges in preventing TB among inmates?
   ……..

…….

4. Can you describe in general how the diet in this facility is?
   ……
   ……

Merci.