Factors associated with self-reported HIV and TB morbidity among youth in South Africa

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ABSTRACT

Background: South Africa not only has the highest number of people living with HIV, but it is also one of the countries on WHO's top 30 list of countries with high-burden tuberculosis and has one of the highest incidence rates of notified tuberculosis in the world. Previous studies on HIV and TB individually and both combined but most of which are focused on the testing, treatment and the risky sexual behaviours impacting the diseases, however, there are limited studies that focuses on the socio-demographic factors. The main aim of this study was to examine the socio-demographic factors associated with self-reported HIV and TB morbidity among youth in South Africa.

Methods: The study used 2024 General Household Survey data sourced from Statistics South Africa. Three level of analysis were employed namely: (univariate analysis: frequency and percentages; Bivariate: Cross tabulation and Chi-square; multivariate: binary logistics regression).

Results: The study examined the relationship between self-reported HIV and TB and age, sex, marital status, population group, highest level of education, household wealth, household composition, main dwelling, geographic type and province using binary logistic regression. Results revealed that age, sex, population group, highest level of education, household wealth, geographic type were significant predictors of self-reported HIV. Youth age 30-34 [AOR: 5.71 95%CI: 3.86-8.44], female [AOR: 3.16 95%CI: 2.27-4.04], black (reference category), primary or lower [AOR: 1.58 95%CI: 1.08-2.31], households with poor wealth index (reference category), urban geography type (reference category) and Eastern Cape [AOR: 4.15 95%CI: 2.67-6.46], showed highest odds of self-reported HIV morbidity. While for TB the results revealed that age group, main dwelling and province are statistically associated with self-reported TB. Youth aged 30-34 [AOR: 2.15 95%CI:1.05-4.38], traditional main dwelling [AOR: 2.8 95%CI: 0.49-3.65] and Eastern Cape province [AOR: 7.22 95%CI:2.78-18.76] showed the highest odds of self-reported TB morbidity.

Conclusion: The study has identified the socio-demographic factors that are associated with self-reported HIV and TB morbidity among the youth in South Africa. As such the study calls for interventions such as having targeted education on the prevention and treatment of HIV and TB, gender-based interventions, poverty reduction and to improve the living conditions of the youth.

Keywords: HIV, TB, youth, South Africa, General Household Survey, morbidities

DECLARATION

I, Keatlegile Moatshe (Student number: 37787667) declare that this study titled "Factors associated with self-reported HIV and TB morbidity among youth in South Africa" is my original work and that it has not been submitted to any institution of higher learning before for any examination or degree. I also declare that all sources of information in this research project have been acknowledged appropriately. This study was supervised and approved for submission by my supervisor Dr. B.K.M Ngake from the department of Population Studies and Demography. This mini dissertation was submitted in partial fulfilment of the requirements for the degree Master of Social Sciences in Population Studies and Sustainable Development at the North-West University, Mafikeng Campus.

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AIDS	Acquired Immunodeficiency Syndrome
BaSSREC	Basic and Social Science Research Ethics Committee
GHS	General Household Survey
HIV	Human Immunodeficiency Virus
SDG	Sustainable Development Goals
STATA	Statistics and Data
Statssa	Statistics South Africa
TB	Tuberculosis
USA	United States of America

CHAPTER ONE: INTRODUCTION

1.1 Background

HIV and Tuberculosis are considered dual epidemics as they are closely linked diseases. HIV is an infection that attacks and weakens the immune system, particularly CD4 cells, thereby reducing the body's ability to fight opportunistic infections such as tuberculosis (World Health Organisation, 2024b). Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis, primarily affecting the lugs and TB can in a long-term damage the lungs and other organs, leading to various sequelae, complications, and comorbidities (Zhang et al., 2024). In a person infected with both, the two pathogens TB and HIV, potentiate each other, accelerating the deterioration of immunological functions and resulting in premature death if untreated (Bruchfeld et al., 2015). Beyond biological interaction, HIV and TB are increasingly conceptualized as a syndemic, in which disease clustering is driven and intensified by shared social, economic, and structural determinants such as poverty, overcrowding, food insecurity, stigma, and limited access to healthcare services (Singer et al., 2017; Tsai et al., 2014). This syndemic framing is particularly relevant in sub-Saharan Africa, where structural inequalities exacerbate vulnerability to both infections.

The substantial public health burden posed by HIV and TB has prompted strong global political commitment to their elimination. For TB, the World Health Organization has a target to end TB epidemic by 2030 which include to reduce the incidence of TB by 90% and an 80% reduction in the TB incidence rate (new cases per 100 000 population per year) compared with levels in 2015(World Health Organisation, 2023b). For HIV, they established the 95-95-95 targets: which is 95% of people living with HIV know their status, 95% of people diagnosed with HIV receive sustained, life-saving antiretroviral therapy (ART) and 95% of all people receiving ART achieve viral suppression**.** (United Nations, 2023).

It has been estimated that in 2023 there were at least 39.9 million people living with HIV world wide and 630 000 people died because of the disease (World Health Organisation, 2024c). Of those 3.1 million were young people aged 15-24 (UNAIDS, 2024).While in comparison TB had 10.8 million people falling ill from the disease in 2023 and 1.25 million people died from it, a figure which includes 161 000 who had HIV (World Health Organisation, 2024d). This made TB the second largest leading cause of death from a single infectious agent surpassing HIV (Lv et al., 2024). Of these 10.8 million people it was estimated that 3.49 million people were aged 15-34 (World Health Organisation, 2024a). For youth, many acquire HIV perinatally and from risky

sexual behaviors (Mabaso et al., 2021). Additionally, they experience stigma, discrimination and violence which are exacerbated by policy and legal barriers related to the age of consent for sex as well as selected medical interventions, further limiting access to a range of health services (Bekker & Hosek, 2015). Ages 15-24 are increasingly recognized as a key risk period for tuberculosis infection, disease and adverse outcomes (Snow et al., 2018). This is a result of them facing specific age-related challenges in accessing appropriate care as they transition between child and adult health services, particularly in tuberculosis-endemic settings where dedicated adolescent health services are usually absent (Snow et al., 2018).

Geographically, HIV is mostly prevalent in developing countries, which are mostly in sub-Saharan Africa while TB is mostly prevalent in countries with large populations and most of which are low-to-middle-class income countries. This is seen with TB being most prevalent in India (27%), China (7.1%), Indonesia (10%), Philippines (7.0%), Pakistan (5.7%), Nigeria (4.5%), Bangladesh (3.6%) and the Democratic Republic of Congo (3.0%), which all contribute to two thirds of the world TB cases (World Health Organisation, 2023a). For HIV the highest prevalence is in sub-Saharan African countries as they make up about two thirds of the worlds HIV infections, and here the leading cause of death is AIDS (Rosenberg et al., 2023).The countries in question with the highest HIV death rate here are South Africa, Eswatini, Lesotho, Nigeria and Mozambique (Kharsany & Karim, 2016).

South Africa not only has the highest number of people living with HIV but it is also one of the countries on WHO's top 30 list of countries with high-burden tuberculosis and has one of the highest incidence rates of notified tuberculosis in the world (Ayles et al., 2022). It was estimated that in 2019 there were 209 000 TB cases which were among the 7.5 million HIV cases in the country, and many of these TB cases went undiagnosed and untreated resulting in a case fatality rate of 17% (Mendelsohn et al., 2022). This all puts into question the effectiveness of TB testing and treatment as well as the treatment of HIV in the country.

1.2 Statement of the problem

Despite the global commitment to the Sustainable Development goal3.3 which is to eliminate the HIV and TB epidemics by 2030, South Africa continues to battle the dual burden of these infections. It was estimated that in 2022 the number of people living with HIV was approximately 8.45 million people with 19.6% of adults aged 15-45 adults being HIV positive (South African Government, 2023). With tuberculosis, South Africa has seen an increase in TB cases since 1990s

because of HIV and between 1990 till 2019 8.8 million people have developed TB (Kubjane et al., 2022). In 2022 the incidence rate of TB in South Africa was 468 per 100 000 and there were 54 000 deaths from TB (World Health Organisation, 2023c). In a prevalence survey it was found that the estimated prevalence of bacteriologically confirmed pulmonary TB in South Africa is 852 (95% 679–1,026) per 100,000 population among individuals 15 years and older (van de Water et al., 2022). In South Africa, the dual epidemics of tuberculosis and HIV have been posing a heavy burden to the health care provision in the country (Dlatu et al., 2023). The youth are underrepresented in routine surveillance, self-reported morbidity is often used in national surveys (e.g., DHS, GHS) .

In South Africa many HIV and TB prevention and treatment strategies have been implemented over the years but many socio-economic and demographic factors have affected an individual's ability to make use of these prevention and treatment strategies (Osman et al., 2021). Examples of such programs is the Cheka Impilo and Welcome Back campaigns which were implemented to increase awareness about tuberculosis transmission and symptoms to drive screening and testing and improve case finding (Moyo et al., 2022). It is also seen that the demographics characteristics of people with TB mirror those with HIV/AIDS (Abdool Karim & Baxter, 2022). For instance, a study has found that in South Africa some adults living in rural areas have a higher odds of having HIV and TB than those living in urban areas (Akokuwebe et al., 2024).

While extensive research exists on HIV and TB in South Africa, most studies focus on biomedical outcomes, sexual risk behaviours, or treatment cascades. There is limited evidence examining socio-demographic determinants of self-reported HIV and TB morbidity among youth, despite their disproportionate disease burden (Jooste et al., 2021; Leung Soo et al., 2023; Maja & Maposa, 2022; Mzembe et al., 2021; Oginni et al., 2014; Shamu et al., 2019). The youth is the most critical demographic in South Africa as it accounts to one third of the population of South Africa (21 million people who are youth) and plays a significant role in shaping the country's social and economic landscape (Statistics South Africa, 2025b). This also makes the youth a key demographic in breaking the transmission cycle. This study aims to fill the gap by examining the socio-demographic factors associated with HIV and TB in South Africa and focusing on the youth. The researcher also hopes that the findings of this research will help policy makers make far better policies that will eliminate the HIV and TB problem the country is facing.

1.3 Study objectives

1.3.1 Main objective

The main objective of the study is to examine the factors associated with self-reported HIV and TB morbidity among youth in South Africa

1.3.2 Specific objectives of the study

The study aims to address the following specific objectives

- To examine the prevalence of self-reported HIV and TB among youth in South Africa
- To investigate the socio-demographic factors associated with self-reported HIV and TB morbidity among youth in South Africa

1.4 Research questions

The study aims to answer the following research questions:

- What is the prevalence of self-reported HIV and TB morbidity among youth in South Africa?
- What are the socio-demographic factors associated with self-reported HIV and TB morbidity among youth in South Africa?

1.5 Significance of the study

With the ongoing public health challenges in South Africa, understanding the factors associated with HIV and Tuberculosis infections amongst the youth in South Africa is vital. The youth which is people aged 15-34 is a critical demographic due to their developmental, social and economic vulnerability. In South Africa the youth account for the most significant portions of the new HIV infections and TB infections (South African Government, 2023; van de Water et al., 2022). This study intends to highlight how factors such as age, marital status, education and sex contribute to the dual epidemic of HIV and TB among this population. By addressing these factors, this study can contribute to a more holistic understanding of the dynamics of diseases in youth and support efforts to reduce new infections and mortality.

The study can also provide support in addressing priority 1 of the priorities to achieve the goals of the 2030 vision under chapter 10 (promoting health) of the National Development plan. The

priority states that to achieve their health goals they must first address the social determinants that affect health and disease (National Planning Commission, 2012). Furthermore, the study aligns with the objectives of the South Africa's National Strategic Plan on HIV, TB and STIs (2023–2028) emphasizes the importance of targeted interventions for the youth this includes comprehensive sexuality education, economic empowerment, and accessible healthcare services (South African National AIDS Council, 2023).

Despite the commitments of these plans, there are gaps remaining in translating policy into practice. This research plans to bridge these gaps by helping policymakers identify the obstacles to effective HIV and TB prevention and treatment in the youth. It can also contributes to the existing literature by providing context-specific insights that can support interventions, in order to advance both the 2030 National Development plan and the global health objectives under the Sustainable Development Goals (SDGs), more specifically goal 3.3 (National Planning Commission, 2012; United Nations, 2023).

1.6 Definition of concepts

Youth- According to Statistics South Africa (2025) youth is a person aged 15-34.

Morbidity- is the state of having a specific illness or condition, this includes acute and chronic illness (World Health Organisation, 2019).

Self-reported morbidity- refers to an individual's report of having been diagnosed with or experiencing a specific illness, based on survey responses rather than clinical verification.

1.7 Organization of the study

The mini dissertation has 6 chapters. Chapter one comprises of the background of the study, problem statement, objectives and significance of the study. Chapter two is the literature review which also has the theoretical and conceptual framework. Chapter three is the methodology which includes the study location, data source, research design, study sample, inclusion and exclusion criteria, study variables, method of analysis, limitations, ethical approval and dissemination plan. Chapter four presents the findings of the study, these include univariate, bivariate, and multivariate analysis. Chapter five discusses the results, makes recommendations and provides the conclusion.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on reviewing the global burden of HIV and TB, followed by an overview of the two diseases in the sub-Saharan African context. It then examines existing literature on the socio-demographic factors influencing HIV and TB status. Finally, the chapter discusses the theoretical framework underpinning the study and presents the conceptual framework guiding the analysis.

2.2 A global overview of HIV and TB

The global HIV new infections have decreased since 2010 to 2021, it has decreased from 2.11 million cases in 2010 to 1.65 million in 2021 and the HIV related deaths have also decreased from 1.19 million deaths in 2010 to 718000 deaths in 2021 (Carter et al., 2024). In terms of TB 10 million people developed the disease in 2019 and of those 1.2 million deaths among people who were HIV-negative and 208, 000 deaths among people who were HIV-positive (Chakaya et al., 2021). It is seen that globally countries that are considered high income countries have the lowest incidence rate of TB for example Canada and USA who have an incidence rate of 51 cases per million in 2022 and 29 cases per million in 2023 respectfully (Rana et al., 2024). One major contributor to the TB cases in the countries is immigrants from high TB incidence countries, this is also true for other high income, immigrant receiving countries such as Japan, New Zealand, Australia and western European countries (France, Germany, the Netherlands) (Rana et al., 2024). In Latin America the TB incidence cases are much higher than North America. The three big contributors in Latin America are Peru with 115 cases per 100 000 people, Brazil with 44 cases per 100 000 and Mexico with 22 cases per 100 000 (Woodman et al., 2019).

2.2.2 HIV and TB in Sub-Saharan Africa context

In terms of global HIV infections sub-Saharan Africa has the most HIV infections. It was seen that an estimated 67% of the 38.4 million people living with HIV globally were from sub-Saharan Africa in 2021 and from the 1.5 million new infection sub-Saharan Africa accounted for about 650 000 (Moyo et al., 2023). In Sub-Saharan Africa the countries who have the greatest number of infections are South Africa, Nigeria, Uganda, Mozambique and Kenya and the countries which have experienced a decline in the HIV epidemic is Botswana, Namibia and Zambia while Lesotho, Mozambique and Eswatini are experiencing an increase in the HIV epidemic (Kharsany & Karim, 2016). In sub-Saharan Africa the main mode of transmitting HIV is through heterosexual

intercourse and children get it from vertical transmission (Kharsany & Karim, 2016). These differences reflect variations in health system capacity, prevention strategies, and socio-economic conditions across countries. In sub-Saharan Africa the two worst countries affected by TB are South Africa and Nigeria (Nachega et al., 2021). South Africa in 2019 made up 3.6% of the global new cases which is about 360 000 TB new cases, while Nigeria accounted for about 4.4% of the world's new TB infections which is about 440 0000 TB new cases (Nachega et al., 2021). These differences reflect variations in health system capacity, prevention strategies, and socio-economic conditions across countries.

2.3 Factors influencing HIV and TB infections

Age

A study in China has found that in regards to HIV there is a higher risk of getting infected by HIV if a person is in the young and middle-aged age group, most especially if they are 30 to 40 years old (Qiao et al., 2019). Other studies also found that the age-group 30-40 are the most at risk of contracting HIV amongst different age-groups (Linley et al., 2019; Martí-Pastor et al., 2015). A reason that was given for such findings is that the young and middle-aged population is living an active sexual life with risky sexual behaviours (Qiao et al., 2019). In terms of TB a study in Harare (Zimbabwe) had found that TB is most of the TB cases were from the 25-44 age-group which made up 64.5% of the total number of cases (Humayun et al., 2022). A study of sub-Saharan countries found that in most countries TB cases are highest among people 30 and below (Aliyu et al., 2018). These two findings coincide with the findings on a study where by globally there is a spike in TB cases among people aged 15-24 then slowly decreases with age afterwards (Ledesma et al., 2024). Age affects HIV and TB differently due to behavioural versus biological vulnerability.

Sex

A study on different sub-Saharan African countries has shown that in about three quarters of the 21 sub-Saharan countries that they analysed, women higher prevalence of HIV than men (Sia et al., 2016). Another study found that unlike in sub-Saharan African countries, developed countries like USA, Portugal and Spain's HIV infection are mostly attributed to males, specifically it is transmitted through a male having intercourse with another male (Govender et al., 2021). In terms of TB, a study on 28 low to middle-income countries showed that it was males that had the highest prevalence of TB (Horton et al., 2016). The study concluded that it is because males don't report the symptoms early enough, leading to late diagnosis (Horton et al., 2016). These findings are

supported by several studies who also found that males were at a higher risk of contracting TB which is due to their reluctance to get tested on time (Chee Cheong et al., 2022; Pradipta et al., 2018). These findings suggest that while biological and social vulnerabilities place women at higher risk of HIV in sub-Saharan Africa, gendered health-seeking behaviours contribute to higher TB prevalence among men.

Marital Status

A study on HIV in Nigeria has shown that in the country there is a higher prevalence of HIV among women who were formerly married (divorced or widowed) than as is the case women who were never married and currently married (Fagbamigbe et al., 2016). The researcher concluded that this result could stem from formerly married women being more poor than married women hence they cannot afford contraceptives and have access to proper health care (Fagbamigbe et al., 2016). Similar findings were found that there was lower prevalence of HIV in married couples compared to non-married couples most especially cohabitating couples and divorced people (Mapouka et al., 2025; Shisana et al., 2016). Studies have found that there is lower prevalence of TB in married people than in non-married people (Aung et al., 2015; Rajendran et al., 2020; S. K. Singh et al., 2018). The reason for this could be that non-married people lack the family support and the psychosocial stress that they face makes them more vulnerable to TB (Rodriguez & Agbo, 2015).

Population group

HIV and TB tend to differ among the different population groups. A study in South Africa has found that overall HIV prevalence was high among the black population for both males and female as compared to their counterparts from other races (Mabaso et al., 2019). Similar studies conducted in the USA have found that HIV is prevalent mostly among black people as compared to whites and Hispanic (Sullivan et al., 2021; Ya-lin, 2018). Black people tend to have a higher risk of HIV as a result of their unequal socio-economic status with blacks having the highest unemployment rates, high poverty levels and low education levels (Mabaso et al., 2019). A study in Brazil has found that in the south of the country black people accounted for the highest rates of TB (Viana et al., 2016). Similar studies have also found that black and Asian people have the highest prevalence of TB as compared to other races (Hayward et al., 2018; Kaur et al., 2016; Mancuso et al., 2016; Scott et al., 2015). It has been found that certain genetics found in certain races contribute to TB susceptibility (Hayward et al., 2018; Noppert et al., 2018). This means that there are genes in black people that make them even more vulnerable to contracting TB on top of other factors such as the persons socio-economic status.

Education

HIV and TB tend to also differ among people with different educational backgrounds. Studies have found that people who are illiterate or have lower education have a higher risk of having HIV as compared to those who have higher education (Legarth et al., 2014; Mabaso et al., 2018; Yaya et al., 2016). It has been hypothesised that education prepares individuals better to mount a response to the HIV epidemic and evidence also shows that individuals with a higher level of education are better equipped to change their sexual behaviour and adopt safe sexual practices (Mabaso et al., 2018). This is seen in a study showing that women who were illiterate or have lower education were less likely to be in the high score group for HIV knowledge when compared with those with high level of education (Yaya et al., 2016). The same is seen with TB as education increases awareness and increases the ability of a person to act on existing knowledge regarding healthy behaviour (Choi et al., 2023). Studies show that illiteracy and lower levels of education were significant risk factors to contracting TB (Choi et al., 2023; Kapoor et al., 2016; Nguipdop-Djomo et al., 2020). This all shows that the more health literate you are the more you are blae utilise the health services and prevention methods of both HIV and TB.

Main dwelling

The type of place a person dwell at can affect their likelihood of contracting HIV or TB. Studies have shown that in South Africa there is a higher prevalence of HIV in informal settlements as compared to formal settlements especially in urban areas (Gibbs et al., 2020; Leung Soo et al., 2023). This coincides with a study on four countries (Bangladesh, Egypt, India and Kenya) which found that in urban knowledge about HIV was low in the informal settlements, which can explain the high rates of HIV in informal settlements (Mberu et al., 2016). The informal dwellers are usually young and mobile people and this increases their risk of HIV as their lack of financial resources leads most of them and especially women to partake in risky sexual behaviours that expose them to HIV (Zerbo et al., 2020). Studies have also shown that TB also has a high prevalence in informal settlements as compared to formal settlements (Chimoyi et al., 2020; Ncayiyana et al., 2016; Ogbudebe et al., 2015). The housing conditions can affect the risk of exposure to TB through poor ventilation or through the quality of the indoor air and most informal houses have poor ventilation (Duarte et al., 2018). The studies show that people living in informal settlements have more exposure to HIV and TB and they also have access barriers to health information and services.

Household Wealth

A study in Uganda has found that wealthy households have a higher prevalence of HIV and it was explained that it is due to wealthy currently married people having a higher rate of partner change, a phenomenon associated with relative autonomy and mobility, which increases the vulnerability of such individuals to HIV(Igulot & Magadi, 2018). However, another study has found that in Uganda a higher socio-economic status is associated with a lower HIV incidence rate and this is due to having a higher socio-economic status results in a person having access in knowledge, money (for health care) which will help in preventing HIV (John S. Santelli et al., 2021). While another study found that in India higher socio-economic status is associated with high HIV prevalence as a result of young people in urban areas having separated from families, a flourishing sex trade, marriage at a late stage and availability of money from employment provide opportunity for a person to have multiple sexual partners (Joshi & Mehendale, 2019). Studies have found that TB prevalence was high in households with lower income as compared to households with higher income (Choi et al., 2023; Kapwata et al., 2024; S. Singh et al., 2018). This is due to the poor living conditions and working conditions which makes them more vulnerable to having TB (S. Singh et al., 2018). The relationship between wealth and HIV is context-specific, whereas evidence consistently shows that poverty increases vulnerability to TB due to poor living and working conditions.

Geographic type

Living in rural or urban area can sometimes affect the likelihood of a person having HIV or TB. A study on adolescents in sub-Saharan Africa found that urban males and females aged 15-24 had a HIV prevalence rate that was 1.5 times higher than their rural counterparts (Maulide Cane et al., 2021). Other studies have reported similar findings noting that urban areas gave a higher prevalence of HIV as compared to rural areas (Board et al., 2020; Priscilla Idele et al., 2014). This higher risk in urban areas can be attributed to behavioural factors most common in urban areas such as age mixing (usually young females and older males) and male circumcision which is a risk as males in urban areas tend to be circumcised and have higher-risk sexual behaviours because of lower self-perceived risk of HIV infection for circumcised men (Gao et al., 2021; Maulide Cane et al., 2021). Studies have found that TB is more prevalent in urban areas as compared to rural areas (Mutembo et al., 2019; Noviyani et al., 2021). While another study has that in the rural Eastern Cape the TB prevalence was higher than in the urban areas (McLaren et al., 2016). The

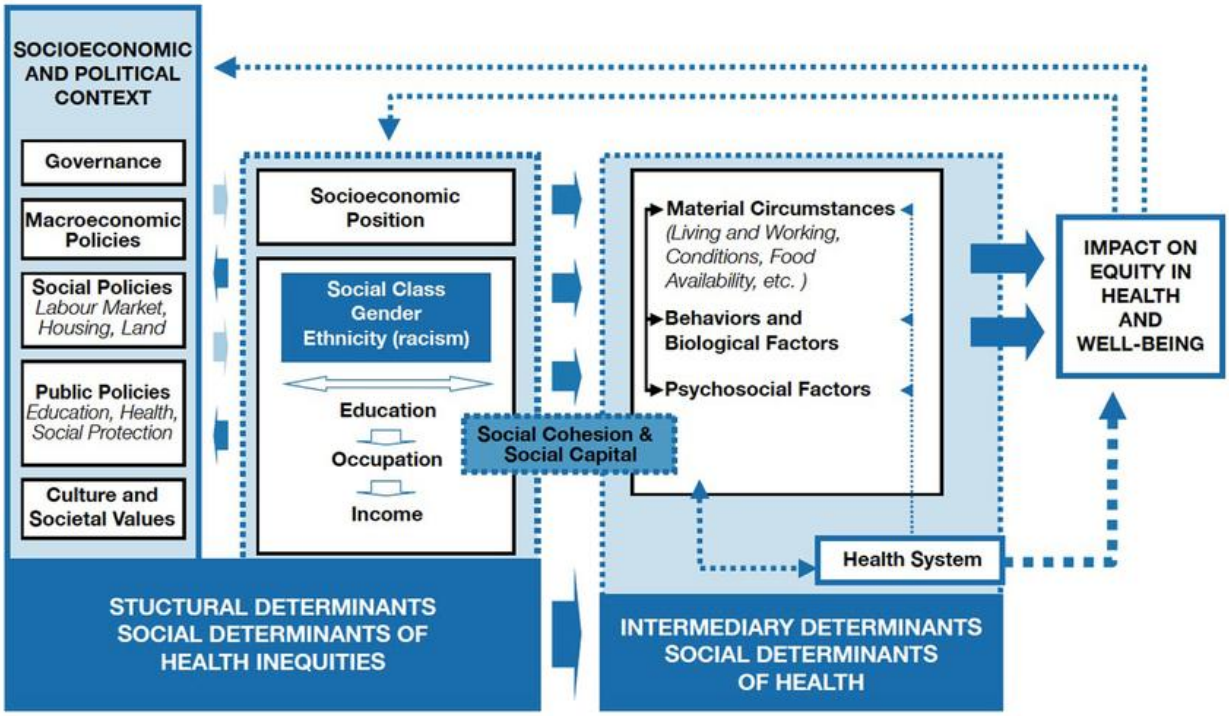
reason for this could be that in rural areas there is little access to health services and in urban areas there is overcrowding.

2.4 Theoretical framework

The Social Determinants of Health (SDH) Framework

The modern social determinants of health theory was solidified by Sir Micheal Marmot who first emphasized the social determinants of health inequalities and later chaired the WHO's Commission on the Social determinants of health (Marmot, 2005). The commission identified how health outcomes are shaped by social determinants and came up with the Social Determinants of Health theory (Marmot et al., 2008). WHO describes the social determinants of health as the conditions of which people are born, grow up, live, work, age and inequalities which can lead to health inequalities (World Health Organisation, 2025). Studies have also emphasized how important the social determinants are in health outcomes: one study found that medical care only contributed to only 10-20 percent of health outcomes while the rest of the 90-80 percent is contributed by health-related behaviors, socioeconomic factors and environmental factors (Magnan, 2017). Another study has emphasized the importance of health care practitioners taking into account social determinants of health when dealing with patients for proper diagnosis and treatment of diseases (Sciences et al., 2016). The Social Determinants of Health is categorized into two the structural determinants which are the socioeconomic and political context of the country and the person's socioeconomic position, and the intermediary determinants which are material circumstances and biopsychosocial factors as seen with figure 2.1 (Enelamah et al., 2023).

Figure 2.1: The Social Determinants of Health (SDH) Framework

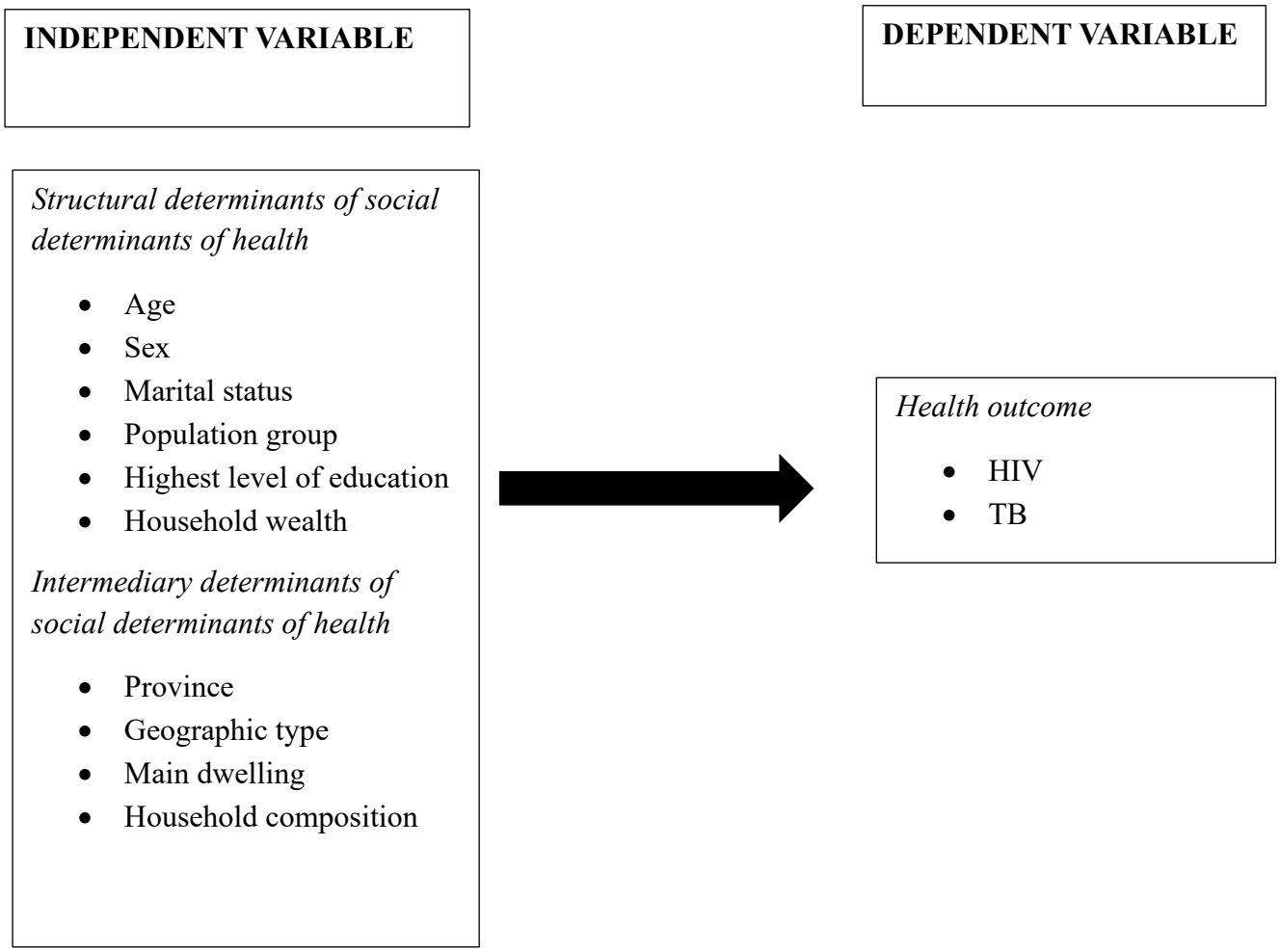


Source: (Bezo et al., 2012)

2.5 Conceptual framework

Other studies have used the social determinants of health theory as their conceptual framework (Craig et al., 2017; DeVoe et al., 2016; Walker et al., 2014). This study used the social determinants of health framework and adapt it because it best describes the variables under consideration. The study had socio-demographic factors which fall under the structural determinants of social determinants of health. These include age, sex, marital status, population group, education, wealth index (as seen with figure 2.2). They also fall under intermediary determinants of health, which include household composition, main dwelling, province and geographic type (as seen with figure 2.2). These determinants were analyzed to see if they have an impact on the health outcomes of HIV and TB. This study did not use the political context, behavior and biological factors and psychological factors of the theory as they are not the focus of this study, as this study focused only on socio-demographic factors.

Figure 2.2: Analytical framework for the study



CHAPTER THREE: METHODOLOGY

3.1 Study location

The study focused on South Africa on a national level. South Africa is a country found in the most Southern tip of Africa. As of 2022 South Africa has a population of 62 million (Statistics South Africa, 2023). This population is divided among nine provinces, namely: Limpopo, Gauteng, Mpumalanga, Kwa-Zulu Natal, Eastern Cape, Western Cape, Northern Cape, Northwest, and Free State. The population of South Africa has a diversity of cultures as seen with it having eleven official languages, namely Setswana, Sepedi, Sesotho, siSwati, isiZulu, isiNdebele, isiXhosa, Tshivenda, Xitsonga, Afrikaans and English (Pillay et al., 2021). The country has more females than males and the most dominant population group is blacks making up 81.4% of the total population followed by coloureds with 8.2% then whites with 7.3% and lastly Indians/Asians at 2.7% (Statistics South Africa, 2023).

3.2 Data source

This study used data from the General Household survey 2024. Statistics South Africa has been conducting the General Household Survey (GHS) annually since 2002. The survey replaced the October Household Survey (OHS) that took place between 1993 and 1999. The survey is an omnibus household-based instrument aimed at determining the progress of development in the country. It measures, on a regular basis, the performance of programs as well as the quality-of-service delivery in a few key service sectors in the country. Six broad areas are covered in the survey, namely education, health and social development, housing, households' access to services and facilities, food security, and agriculture (Statistics South Africa, 2025a).

3.3 Research design

The study employed a quantitative descriptive research approach. A quantitative approach is used in order to measure variables, to describe frequencies, to determine correlations and check the significance of relationships between variables (Olanrewaju et al., 2020). Descriptive research design is employed in the study. A descriptive research design involves quantitative data that can be collated in numerical form and it also aims to accurately describe a population, situation, and phenomenon and the characteristic as they are in nature (Ghanad, 2023).

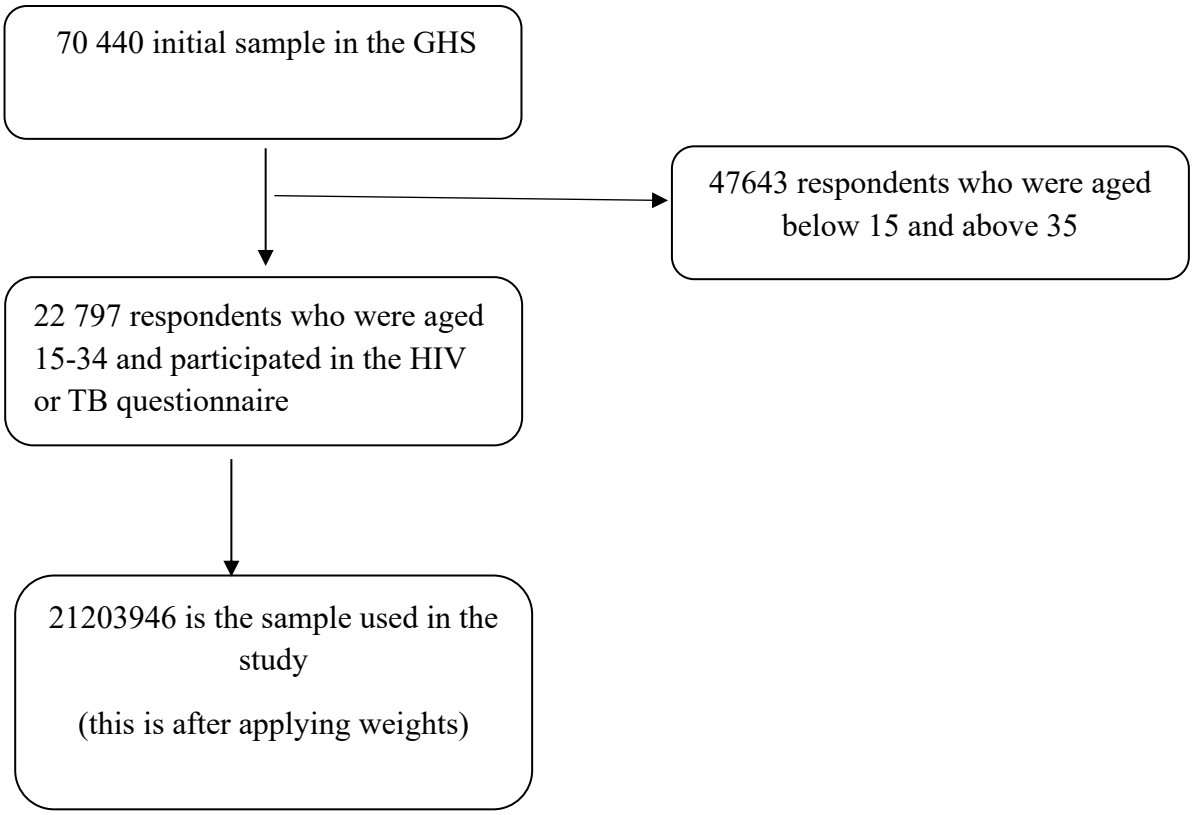
3.4 Study sample

The study utilised person-level and household-level data from the 2024 General Household Survey. The initial dataset consisted of 70,440 individuals. After excluding respondents younger than 15 years and older than 34 years, the final unweighted analytical sample comprised 22,797 youth aged 15–34 years. Sampling weights provided by Statistics South Africa were applied in all analyses to ensure national representativeness, yielding population-level estimates of approximately 21.2 million youth.

3.5 Inclusion and exclusion criteria

The inclusion criteria comprised individuals aged 15–34 years. Respondents younger than 15 years and those aged 35 years and above were excluded from the analysis.

Figure 3.1: Diagrammatic representation of the inclusion and exclusion criteria and final sample



3.6 Study variable

3.6.1 Dependent variable

The dependent variables were self-reported HIV and tuberculosis (TB) morbidity. Respondents were asked whether a healthcare professional had ever diagnosed them with HIV or TB. Responses were recoded into binary variables where 1 indicated “Yes” and 0 indicated “No”.

Table 3.1 Description of independent variables

Independent variable	description	Coding
Age	The age of the respondent grouped in five-year age-group	1= 15-19 2=20-24 3= 25-29 4= 30-34
Sex	Is the person male or female?	1=Male 2=Female
Marital Status	What is the marital status of the person? Single are the people who answered that they were single, widowed and divorced	1= Married/cohabitating 2= single
Population group	What population group the person belongs to Other are the whites, Indians	1 = Black African 2 = Coloured 3= Other
Highest educational level	The persons highest level of education	1= primary or lower 2= secondary or higher
Household composition	It is a variable derived from relationship to household head. First, identify household members, sex specific heads and partners. Second, collapsed data to household level. Lastly, created the basic household composition variable.	1=single 2= nuclear 3=extended 4=complex
Main dwelling	What type of main dwelling the household occupies?	1=formal 2=Traditional 3=Informal
Household Wealth	The variable was made using the Principle component analysis on key housing and	1=poor 2=average

Independent variable	description	Coding
	ownership variables from the dataset. The data was first divided into urban and non-urban areas. Then several indicators of standard of living were derived. Each one of the variables were coded as binary indicators. The Principal Component Analysis was then applied separately for urban and non-urban households to produce the urban and non-urban scores. Then the scores were combined into a single composite wealth score using the regression coefficient.	3=rich
Geographic type	The type of place of residence	1 = Urban 2 = Traditional 3 = Farms
Province	The person's province of usual residence	1= Western Cape 2=Eastern Cape 3= Northern Cape 4= Free State 5= Kwa-Zulu Natal 6= North West 7= Gauteng 8= Mpumalanga 9= Limpopo

3.7 Method of analysis

Data analysis was conducted using Stata version 14. Descriptive (univariate) analysis was used to summarise the socio-demographic characteristics of the study population. Bivariate analysis using chi-square tests examined associations between self-reported HIV and TB morbidity and selected explanatory variables. Variables significant at the bivariate level ($p < 0.05$) were included in multivariable binary logistic regression models to identify factors independently associated with self-reported HIV and TB morbidity among youth. All analyses accounted for the complex survey design and sampling weights.

3.8 Limitations

The main limitation of using cross-sectional data is that: one cannot measure causation; for example, say that unemployment causes HIV and TB. The General Household Survey only has limited socio-demographic variables such as the researcher is limited to those factors. Additionally, reliance on self-reported HIV and TB status may result in underreporting due to stigma or recall bias.

3.9 Ethical considerations

The study used secondary data provided by Statistics South Africa. The data custodian, dealt with all ethical issues accordingly and the data released to the user have no identifying information like the name of the respondent or Identity number and the household number. The dataset that was used in the study is in public domain and is free of charge. The researcher applied for ethical approval and was granted by the North-West University's Basic and Social Sciences Research Ethics Committee (BaSSREC) with ethics number: NWU-00975-25-A7 as shown in the appendix.

3.10 Strategy for dissemination of findings

The findings of this study will be disseminated through at least one peer-reviewed journal article co-authored with the supervisor. The results will also be presented at academic conferences such as the Population Association of Southern Africa (PASA) and other relevant population and public health forums.

CHAPTER FOUR: FINDINGS

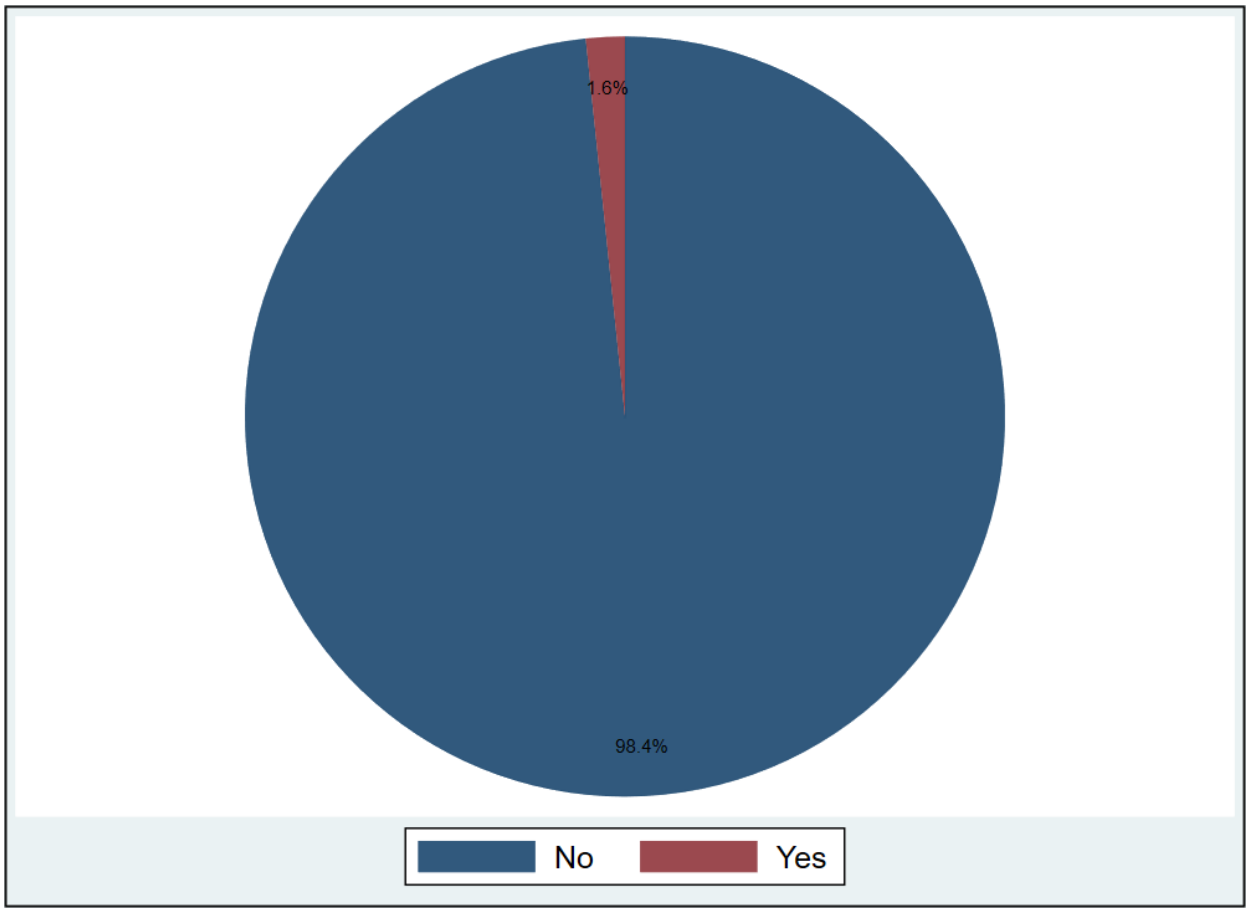
4.1 Introduction

This chapter presents the results of the study on factors associated with self-reported HIV and tuberculosis (TB) morbidity among youth in South Africa. The results are organised into three sections. First, univariate analysis describes the distribution of key study variables. Second, bivariate analysis examines associations between self-reported HIV and TB morbidity and selected socio-demographic factors using cross-tabulations and chi-square tests. Finally, multivariable binary logistic regression models identify factors independently associated with self-reported HIV and TB morbidity.

4.2 Descriptive findings

Figure 4.1 presents the weighted prevalence of self-reported HIV among youth aged 15–34 years in South Africa. The results indicate that approximately 1.6% (n ≈ 339,263) of youth reported having been diagnosed with HIV, while 98.4% reported that they were HIV negative.

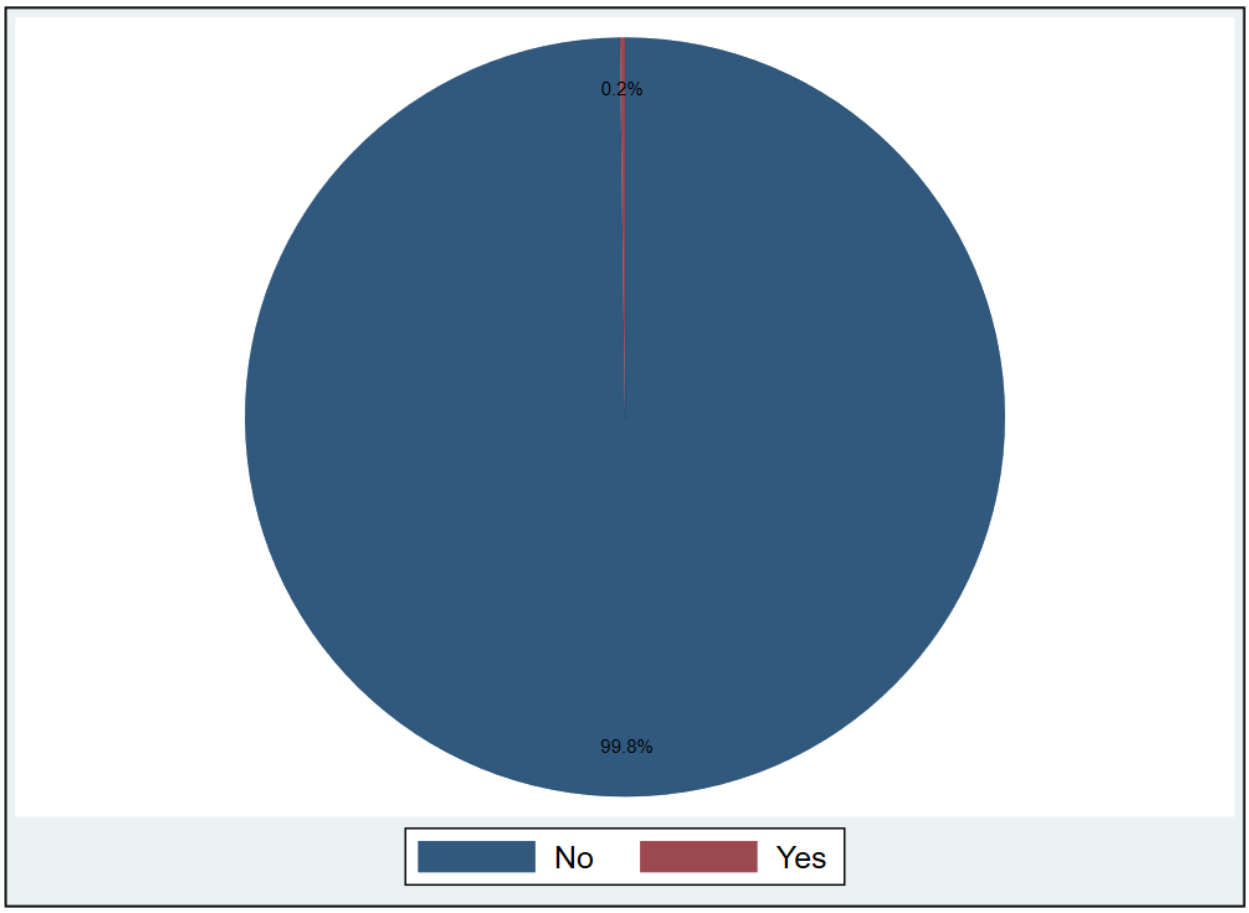
Figure 4.1: Prevalence of self-reported HIV



Source: Own computations from the GHS 2024

Figure 4.2 shows the weighted prevalence of self-reported tuberculosis among youth. Approximately 0.2% (n ≈ 42,408) reported having been diagnosed with TB, while 99.8% reported no history of TB diagnosis.

Figure 4.2: Prevalence of self-reported TB



Source: Own computations from the GHS 2024

Table 4.1 presents the distribution of the respondents by background characteristics. The results showed that there were 26.3% respondents aged 15-19 years, 22.8% aged 20-24 years, 24.3% aged 25-29 years and 26.7% aged 30-34. The results showed that females contributed to 50.1% while the males contributed to 49.9% of the respondents. The results showed that most respondents were single (82.9%) and the married were few with 17.1% being married. The results showed that the highest population group is Blacks (85.5%), followed by coloureds (8.0) then others (6.5%). The results also showed that in terms of highest education 7.6% had primary or lower while 92.4% had secondary or higher.

Regarding household composition 5.9% lived in single households, 33.5% lived in nuclear households, 56.6% lived in extended households and 4% lived in complex households. In terms

of main dwelling 86.1% lived in formal, 5.2% lived in traditional and 8.8% lived in informal. The results showed that in terms of wealth index 36.9% were poor, 19.8% were average and 43.3% were rich. In regard to geographic type most respondents live in urban areas (65.3%), followed by rural areas (30,3%) and lastly farms (4.4%). The results also showed that in regards to province 11.5% lived in Western Cape, 9.6% lived in Eastern Cape, 2.0% lived in Northern Cape, 4.7% lived in Free State, 19.6% lived in Kwa-Zulu Natal, 6.6% lived in North West, 28.5% lived in Gauteng, 7.9% lived in Mpumalanga, 9.6% lived in Limpopo.

Table 4.1 Distribution of the respondents by background characteristics

Variable	Frequency	Percentage
Age group		
15–19 years	5566813	26.3
20–24 years	4832853	22.8
25–29 years	5152971	24.3
30–34 years	5651309	26.7
Sex		
Male	10581911	49.9
Female	10622035	50.1
Marital status		
Married/Cohabiting	3631819	17.1
Single	17572128	82.9
Population group		
Black	18119936	85.5
Coloured	1701720	8.0
Other	1382290	6.5
Highest level of education		
Primary or lower	1601475	7.6
Secondary or higher	19602471	92.4
Household composition		
Single	1258701	5.9
Nuclear	7095218	33.5
Extended	12003043	56.6
Complex	846985	4
Main dwelling		
Formal	18248393	86.1
Traditional	1099825	5.2
Informal	1855728	8.8
Wealth index		
Poor	7827622	36.9
Average	4187837	19.8
Rich	9188487	43.3
Geography type		
Urban	13835858	65.3

Variable	Frequency	Percentage
Traditional	6428835	30.3
Farms	939254	4.4
Province		
Western Cape	2444907	11.5
Eastern Cape	2038123	9.6
Northern Cape	420602	2
Free State	997271	4.7
KwaZulu-Natal	4155001	19.6
North West	1389991	6.6
Gauteng	6051447	28.5
Mpumalanga	1677777	7.9
Limpopo	2028829	9.6
Total	**21203946**	**100**

Source: GHS 2024

4.3 Bivariate findings for the factors associated with self-reported HIV and TB morbidity

The results indicate statistically significant associations between self-reported HIV morbidity and age, sex, marital status, population group, educational attainment, dwelling type, household wealth, geographic type, and province ($p < 0.05$). The results show that the age with the highest prevalence of self-reported HIV is age-group 30-34 (3.4%) and the lowest was age group 15-19 (0.6%). In terms of sex females had the highest prevalence of self-reported HIV (2.5%) and males had the lowest prevalence (0.8%). Regarding marital status people who were married/cohabiting had the highest prevalence of self-reported HIV (2.6%) and those who were not married had the lowest prevalence (1.5%). The results showed that the population group with the highest prevalence of self-reported HIV was blacks (1.9%) and the lowest was other (0.2%). In terms of highest level of education those who had primary or lower had the highest prevalence of self-reported HIV (2.5%) and those who had secondary or higher had the lowest prevalence (1.6%). Regarding household composition those who lived with extended family had the highest prevalence of self-reported HIV (1.8%) and those who lived in complex households had the lowest prevalence (0.9%). In terms of main dwelling the highest prevalence of self-reported HIV was those who dwell in traditional settlements (2.9%) and the lowest prevalence was those who dwell at formal settlements (1.5%). Regarding household wealth the highest prevalence of self-reported HIV was those who come from poor households (2.7%) and the lowest prevalence was those who come from rich households (0.5%). The results show that those who live in traditional areas have the highest prevalence of self-reported HIV (2.2%) and those who live in urban areas have the lowest prevalence (1.4%). In terms of province, the province with the highest prevalence of self-

reported HIV was Kwa-Zulu Natal (3.3%) and the province with the lowest prevalence was Western Cape (0.2%).

With respect to self-reported TB morbidity, statistically significant associations were observed for educational level, dwelling type, and province. While age, sex, population group, household composition, household wealth and geography type were not statistically significant to self-reported TB. The results show that the age with the highest prevalence of self-reported TB is age-group 30-34 (0.3%) and the lowest was age group 20-24 (0.1%). In terms of sex both male and female have the same prevalence of self-reported TB (0.2%). In regard to marital status married/cohabitating and single have the same prevalence of self-reported TB (0.2%). The results showed that all population groups (black, coloured and other) have the equal prevalence of self-reported TB which is 0.2%. In terms of highest level of education those who had primary or lower had the highest prevalence of self-reported TB (0.4%) and those who had secondary or higher had the lowest prevalence (0.2%). Regarding household composition those who lived in single, nuclear and extended family had the highest prevalence of self-reported TB (0.2%) and those who lived in complex households had the lowest prevalence (0.1%). In terms of main dwelling the highest prevalence of self-reported TB was those who dwell in traditional settlements (0.8%) and the lowest prevalence was those who dwell at formal and informal settlements (0.2%). Regarding household wealth the highest prevalence of self-reported TB was those who come from poor households (0.3%) and the lowest prevalence was those who come from average and rich households (0.2%). The results show that those who live in farm areas have the highest prevalence of self-reported TB (0.4%) and those who live in urban and traditional areas have the lowest prevalence (0.2%). In terms of province, the province with the highest prevalence of self-reported TB was Eastern Cape (0.9%) and the province with the lowest prevalence was Western Cape, Kwa-Zulu Natal, North West, Gauteng and Limpopo (0.1%).

Table 4.2 Bivariate results of self-reported HIV and TB morbidity by socio-demographic factors

Variable	N	HIV Morbidity			TB Morbidity		
		No	Yes	Chi-square	No	Yes	Chi-square
Age group							
15–19 years	5566813	99,4	0,6	185.2***	99.8	0.2	5.6
20–24 years	4832853	99,2	0,8		99.9	0.1	
25–29 years	5152971	98,5	1,5		99.8	0.2	
30–34 years	5651309	96,6	3,4		99.7	0.3	
Sex							
Male	10581911	99,2	0,8	107.1***	99.8	0.2	0,7
Female	10622035	97,5	2,5		99.8	0.2	
Marital status							

Variable	N	HIV Morbidity			TB Morbidity		
		No	Yes	Chi-square	No	Yes	Chi-square
Married/Cohabiting	3631819	97,4	2,6	27.7***	99.8	0.2	0.1
Single	17572128	98,5	1,5		99.8	0.2	
Population group							
Black	18119936	98,1	1,9	33.1***	99.8	0.2	0.5
Coloured	1701720	99,7	0,3		99.8	0.2	
Other	1382290	99,8	0,2		99.8	0.2	
Highest level of education							
Primary or lower	1601475	97,5	2,5	7.2**	99.6	0.4	10.1**
Secondary or higher	19602471	98,4	1,6		99.8	0.2	
Household composition							
Single	1258701	98,3	1,7	6.3	99.8	0.2	0.2
Nuclear	7095218	98,5	1,5		99.8	0.2	
Extended	12003043	98,2	1,8		99.8	0.2	
Complex	846985	99,1	0,9		99.9	0.1	
Main dwelling							
Formal	18248393	98,5	1,5	17.1***	99.8	0.2	20.4***
Traditional	1099825	97,1	2,9		99.2	0.8	
Informal	1855728	97,8	2,2		99.8	0.2	
Household wealth							
Poor	7827622	97,3	2,7	97.9***	99.7	0.3	2.2
Average	4187837	97,8	2,2		99.8	0.2	
Rich	9188487	99,5	0,5		99.8	0.2	
Geography type							
Urban	13835858	98,6	1,4	9.0*	99.8	0.2	0.6
Traditional	6428835	97,8	2,2		99.8	0.2	
Farms	939254	98,2	1,8		99.6	0.4	
Province							
Western Cape	2444907	99,8	0,2	148.1***	99.9	0.1	61.6***
Eastern Cape	2038123	96,9	3,1		99.1	0.9	
Northern Cape	420602	98,9	1,1		99.8	0.2	
Free State	997271	96,9	3,1		99.4	0.6	
KwaZulu-Natal	4155001	96,7	3,3		99.9	0.1	
North West	1389991	98,6	1,4		99.9	0.1	
Gauteng	6051447	99,2	0,8		99.9	0.1	
Mpumalanga	1677777	98,8	1,2		99.8	0.2	
Limpopo	2028829	99	1		99.9	0.1	
Total	**21203946**	**98.4**	**1.6**		**99.8**	**0.2**	

Source: GHS 2024 Note: **** = p<0.001; ** = p<0.01; * = p<0.05*

4.4 Regression findings for the factors determining self-reported HIV and TB morbidity

Table 4.3 shows the logistic regression findings for the relationship between self-reported HIV morbidity and socio-demographic factors. The results showed that respondents aged 25-29 [AOR: 2.5 95%CI: 1.65-3.77] and aged 30-34 [AOR: 5.71 95%CI: 3.86-8.44] were times more likely to have incidence of self-reported HIV as compared to respondents aged 15-19. The results showed that females were 3.16 [95%CI: 2.27-4.04] times more likely to have incidence of self-reported HIV as compared to males. In terms of population group the results showed that coloured [AOR: 0.41 95%CI: 0.2-0.86] and other [AOR: 0.27 95%CI: 0.08-0.9] times less likely to have incidence of self-reported HIV as compared to black respondents.

The results showed that respondents with primary or lower were 1.58 [95%CI: 1.08-2.31] times more likely to have incidence of self-reported HIV as compared to respondents with secondary or higher education. On the other hand, the results showed that respondents from average [AOR: 0.59 95%CI: 0.42-0.83] and rich households [AOR: 0.2 95%CI: 0.13-0.31] times less likely to have incidence of self-reported HIV as compared to respondents from poor households. Furthermore, the results showed that respondents from a traditional area were 0.53 [95%CI: 0.37-0.77] times less likely to have incidence of self-reported HIV as compared to those from urban areas. Lastly, the results showed that respondents who live in Eastern Cape [AOR: 4.15 95%CI: 2.67-6.46], Free State [AOR: 3.19 95%CI: 2.35-6.52] and Kwa-Zulu Natal [AOR: 4.11 95%CI: 2.75-6.16] times more likely to have incidence of self-reported HIV as compared to Gauteng.

Table 4.3 also shows the logistic regression findings for the relationship between self-reported TB morbidity and socio-demographic factors. The results showed that respondents aged 30-34 were 2.15 [95%CI:1.05-4.38] times more likely to have incidence of self-reported TB as compared to respondents aged 15-19. Furthermore, the results showed that respondents who dwell at traditional settlement were 2.8 [95%CI: 0.49-3.65] times more likely to have incidence of self-reported TB as compared to respondents who dwell in formal. Lastly, the results show that respondents who live in Eastern Cape [AOR: 7.22 95%CI:2.78-18.76] and Free State [AOR: 4.82 95%CI: 1.33-17.45] were times more likely to have incidence of self-reported TB as compared to youth in Gauteng.

Table 2.3 Binary logistic regression findings for the relationship between socio-demographic factors and self-reported HIV and TB

Variable	HIV Morbidity		TB Morbidity	
	Odd ratio	**95% CI**	**Odd ratio**	**95% CI**
Age group				
15–19	1		1	
20–24	1.38	0.88-2.18	0.68	0.26-1.76
25–29	2.5***	1.65-3.77	1.21	0.51-2.89
30–34	5.71***	3.86-8.44	2.15*	1.05-4.38
Sex				
Male	1		1	
Female	3.16***	2.47-4.04	0.9	0.49-1.67
Marital status				
Married/Cohabiting	1.24	0.89-1.71	0.87	0.4-1.91
Not married	1		1	
Population group				
Black	1		1	
Coloured	0.41*	0.2-0.86	0.97	0.32-2.9
Other	0.27*	0.08-0.9	1.92	0.45-8.18
Highest level of education				
Primary or lower	1.58*	1.08-2.31	1.76	0.82-3.77
Secondary or higher	1		1	
Household composition				
Single	1		1	
Nuclear	1.08	0.68-1.74	1.54	0.42-5.67
Extended	1.19	0.75-1.88	1.63	0.42-6.37
Complex	0.8	0.26-2.41	1.32	0.21-8.2
Main dwelling				
Formal	1		1	
Traditional	0.78	0.5-1.24	2.8*	1.12-7.04
Informal	0.89	0.58-1.35	1.34	0.49-3.65
Household wealth				
Poor	1		1	

Variable	HIV Morbidity		TB Morbidity	
	Odd ratio	**95% CI**	**Odd ratio**	**95% CI**
Average	0.59**	0.42-0.83	1.13	0.49-2.6
Rich	0.2***	0.13-0.31	0.84	0.33-2.15
Geography type				
Urban	1		1	
Traditional	0.53***	0.001-0.77	0.64	0.25-1.63
Farms	0.51	0.089-1.11	1.28	0.32-5.09
Province				
Western Cape	0.44	0.109-1.2	0.94	0.2-4.48
Eastern Cape	4.15***	0.000-6.46	7.22***	2.78-18.76
Northern Cape	1.62	0.18-3.29	1.3	0.22-7.6
Free State	3.91***	0.000-6.52	4.82*	1.33-17.45
KwaZulu-Natal	4.11***	0.000-6.16	0.67	0.2-2.25
North West	1.63	0.173-3.3	1.16	0.22-6.22
Gauteng	1		1	
Mpumalanga	1.43	0.204-2.47	1.76	0.43-7.13
Limpopo	1.03	0.926-1.85	1.17	0.24-5.66
Constant	0	0-0.01	0	0

Source: GHS 2024 Note: **** = p<0.001; ** = p<0.01; * = p<0.05*

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMENDATION

5.1 Introduction

This chapter discusses the findings of the study on factors associated with self-reported HIV and tuberculosis (TB) morbidity among youth in South Africa. The discussion situates the study findings within existing empirical literature and relevant theoretical frameworks. The chapter concludes with key conclusions and policy-relevant recommendations aimed at addressing HIV and TB morbidity among youth.

5.2 Discussion

This study examined the association between selected socio-demographic factors and self-reported HIV and TB morbidity among youth aged 15–34 years in South Africa. The variables considered included age, sex, marital status, population group, educational attainment, household composition, dwelling type, household wealth, geographic type, and province of residence. The findings indicate that age, sex, population group, educational attainment, household wealth, geographic type, and province were significantly associated with self-reported HIV morbidity, while age group, dwelling type, and province were significantly associated with self-reported TB morbidity.

The findings show that age, sex, population group, highest level of education, household wealth, geographic type and province were significantly associated with self-reported HIV morbidity among youth in South Africa. The age groups with the highest odds of reporting HIV were the age groups 25-29 and 30-34 as compared to the age group 15-19. This pattern is consistent with previous studies that demonstrate increasing HIV risk with age due to prolonged exposure to sexual activity and cumulative engagement in risky sexual behaviours (Linley et al., 2019; Qiao et al., 2019). The older youth are usually in long term relationships or that they are cohabitating which can reduce the use of condoms and increase the vulnerability to contracting HIV.

Sex differences in HIV morbidity were also evident, with female youth reporting significantly higher odds of HIV compared to males. These findings are consistent with previous studies which show that there is feminization of the HIV epidemic in South Africa (P. Idele et al., 2014; Mabaso et al., 2019). The heightened vulnerability of young women to HIV is due to the gender power imbalance and the economic dependency. This result further supports the Social Determinants of health framework which states that the structural inequalities such as gender and social position can shape health outcomes. The results also found that black youth have a higher odds of reporting HIV as compared to other population groups. Mabaso et.al (2019) noted that the historical and

structural marginalization of black people limited their access to good education, health care and employment, all which are found to be the key determinants of HIV morbidity. This result also shows the socio-economic inequalities that continue to influence the epidemiology of HIV in South Africa.

Highest level of education was also found to be associated with self-reported HIV morbidity among youth in South Africa. Youth with primary or lower education had higher odds of reporting HIV morbidity as compared to youth with secondary or higher education. This finding is aligned with other studies which emphasized that education attainment enhances a person's HIV awareness of the prevention methods and can change their behaviours (Legarth et al., 2014; Yaya et al., 2016). Primary or lower education attainment also results in higher chances of unemployment which can result in a person not being able to afford to have good access to health care services further making them susceptible to HIV morbidity. In terms of household wealth, the results showed that youth that come from poor households had higher odds of reporting HIV morbidity as compared to the youth coming from average and rich households. This finding aligns with other studies which found that poverty increases a person's vulnerability to HIV morbidity through transactional sex, limited access to good education and health care (Igulot & Magadi, 2018; J. S. Santelli et al., 2021). The finding also aligns with the Social Determinants of Health in terms of how economic disparities can cause health disparities.

Geographic disparities were also evident, with youth residing in urban areas exhibiting higher odds of reporting HIV compared to those in traditional areas. Similar findings have been reported in previous studies, which attribute higher urban HIV prevalence to population density, increased mobility, and higher levels of risky sexual behaviour (Board et al., 2020; Maulide-Cane et al., 2021). In addition, urban informal settlements are often characterised by poor living conditions and limited access to healthcare services, which may exacerbate HIV transmission.

Provincial variations in HIV morbidity were pronounced. Youth residing in KwaZulu-Natal, Eastern Cape, and Free State had significantly higher odds of reporting HIV compared to those in Gauteng. This finding is consistent with national surveillance data indicating persistently high HIV prevalence in KwaZulu-Natal and parts of the Eastern Cape (South African National AIDS Council, 2019). These provincial disparities likely reflect differences in socio-economic conditions, healthcare infrastructure, and the effectiveness of HIV prevention and treatment programmes.

The findings revealed that age group, main dwelling and province have a statistical association with self-reported TB morbidity among youth in South Africa. The age group with the highest

odds of reporting TB morbidity is age group 30-34. This finding is supported by other studies that found that during early adulthood the TB morbidity tends to peak (Aliyu et al., 2018; Ledesma et al., 2024). This could be as a result of older youth experiencing more exposure to TB due to working at crowed or poorly ventilated working environments such as mines and they tend to delay seeking health care.

Moreover, the regression showed that the youth who lived at traditional settlements had higher odds of reporting TB morbidity as compared to those who live in formal settlement. Chimoyi et al. (2020) and Ncayiyan et al. (2016) noted that in informal settlements there is poor ventilation, overcrowding and inadequate sanitation all which can increase the transmission of TB. Traditional settlements can be seen as a form of informal settlement as they share the same traits as informal settlements regarding this. This shows how the living conditions of a person as the intermediary social determinants of health can directly shape TB morbidity. Lastly regarding province, the binary logistic regression showed that the youth in Gauteng had lower odds of reporting TB morbidity as compared to the youth in Eastern Cape and Free State. Eastern Cape and Free State have a history of high poverty levels and limited heath care services which can increase the vulnerability to TB morbidity. McLaren et al. (2016) and Mutembo et al. (2019) noted that the provincial socio-economic inequalities have an influence on the TB outcomes.

5.3. Conclusion

This study identified key socio-demographic factors associated with self-reported HIV and TB morbidity among youth in South Africa. The findings indicate that HIV morbidity among youth is significantly associated with age, sex, population group, educational attainment, household wealth, geographic type, and province of residence. In contrast, TB morbidity was significantly associated with age group, dwelling type, and province. Overall, the results demonstrate that socio-economic and spatial inequalities continue to shape HIV and TB outcomes among youth in South Africa. Addressing these inequalities through integrated, multi-sectoral interventions is essential if the country is to achieve national and global HIV and TB targets by 2030.

5.4 Recommendations

Considering the findings of the study these are the recommendations that have been made to address the self-reported HIV and TB morbidities among the youth in South Africa:

1. **Strengthen targeted health education:**
   HIV prevention efforts should reinforce comprehensive sexual and reproductive health education in schools and communities, with particular focus on youth aged 25–34 years.

These interventions should promote safer sexual behaviours and regular HIV testing. TB prevention and treatment education should similarly target youth aged 30–34 years.

2. **Implement gender-responsive interventions:**
   Given the disproportionate burden of HIV among young women, targeted interventions should address gender-based vulnerabilities through economic empowerment programmes, improved access to sexual and reproductive health services, and initiatives aimed at strengthening women's autonomy and negotiating power.
3. **Improve housing and living conditions:**
   Housing programmes in traditional and underserved settlements should prioritise reducing overcrowding and improving ventilation to mitigate TB transmission risk.
4. **Integrate poverty reduction with health programmes:**
   Poverty reduction and youth employment initiatives should be integrated into HIV and TB programmes to address the structural determinants that increase vulnerability to disease

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APPENDICES

Figure A1: Ethics Approval Letter 1

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Basic and Social Sciences Research Ethics Committee (BaSSREC)

Faculty of Humanities Ethics Office for Research, Training and Support
Tel: 018 285 2457

Email: Erhabor.Idemudia@nwu.ac.za

Senate Committee for Research Ethics
Tel: 016 103 4446
Email: Feziwe.Mseleni@nwu.ac.za

29 September 2025

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Basic and Social Sciences Research Ethics Committee (BaSSREC)** on **02/09/2025**, the Basic and Social Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-SERC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Factors associated with self-reported HIV and TB morbidity among youth in South Africa.

Study Leader/Supervisor (Principal Investigator)/Researcher: Dr. B.K.M. Ngake

Student/Research Team: K. Moatshe (37787667)

Ethics number:

N	W	U	-	0	0	9	7	5	-	2	5	-	A	7
Institution				Study Number						Year			Status	

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single study

Commencement date: 02/09/2025 **Risk:** **No risk**

Expiry date: 02/09/2026

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

General conditions:

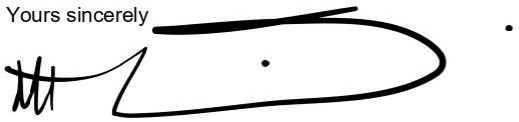
While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principal investigator)/researcher must report in the prescribed format to the BaSSREC:*
  - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*

- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the BaSSREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*
- *In the interest of ethical responsibility, the NWU-SCRE and BaSSREC reserves the right to:*
  - *request access to any information or data at any time during the course or after completion of the study;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the study are revealed or suspected;*
    - *it becomes apparent that any relevant information was withheld from the BaSSREC or that information has been false or misrepresented;*
    - *submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or*
    - *new institutional rules, national legislation or international conventions deem it necessary.*
- *BaSSREC can be contacted for further information or any report templates via* BaSSREC-Admin@nwu.ac.za.

The BaSSREC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the BaSSREC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely



Prof. E. Idemudia

Chairperson NWU Basic and Social Sciences Research Ethics Committee

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8 November 2018

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