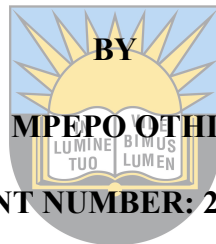




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**THE ASSOCIATION BETWEEN PUBLIC TRANSPORT AND COMMUTERS'
MENTAL HEALTH: THE CASE OF SOUTH AFRICA**
**A DISSERTATION SUBMITTED IN FULL FULFILMENT OF THE REQUIREMENTS
OF THE MASTER'S DEGREE OF COMMERCE.**



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SOUTH AFRICA


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DECEMBER 2023

DECLARATIONS


The undersigned Othi Mpepo, student number 201602929, declares that this research is my own original work that it has not been submitted and will not be submitted to any other university for a similar degree or any other degree.

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This study would not be complete without God as the only and main pillar of my strength, up to this far God has been with me. I would like to express my gratitude to the following people.

- I sincerely thank my supervisor Dr. D. Hompashe, who always assisted me from day one; no words could express how grateful I am working with him. His wisdom, guidance, and expertise uplifted me as a student.
- My wife, Ama Sikade-Mpepo for her motivation and support.
- Lastly but not the least, the National Department of Transport for financial support; this could not have been possible without them.



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DEDICATION

Dedicated to Yamihle Mpepo, my son.



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ABSTRACT

Public transport is the most-used mode by workers every day; therefore, it is important for the public transport mode to have the highest efficiency in terms of travel time, travel cost, and conditions of the public transport mode. However, public transport has had emerging taxi wars, irresponsible driving, road unworthy, and congestion. These have caused many casualties in the past: innocent people who had no alternative but to use public transport. It is the responsibility of this study to address the question of whether public transport use affects commuters' mental health. This was investigated using logit model analysis, and the data were obtained from General Household survey.

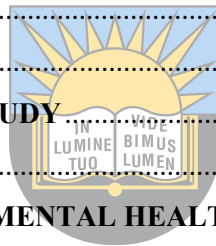
The impact of public transport use on commuters' mental health was also analyzed using chi-square and likelihood tests to assess the relationship between mental health and public transport. Stata 14 was employed and implemented as an explanatory technique to achieve the objectives of this study. The results of previous studies indicate that there is mostly an impact of public transport on mental health which may also justify the conditions that directly affect the well-being of people and commuters. Furthermore, these studies suggested that active public transportation, which includes walking and cycling, would have positive effects on the general well-being of commuters. It is no surprise that the results of this study would follow a similar route of deteriorating the mental health of commuters using public transportation.

Key Words:

Mental Health, Public Transport, Taxi Wars.

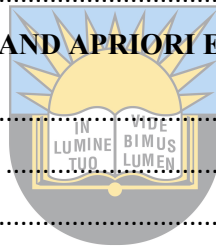
TABLE OF CONTENTS

DECLARATIONS	2
ACKNOWLEDGEMENTS	3
ABSTRACT.....	5
LIST OF TABLES	9
LIST OF FIGURES	6
LIST OF ACRONYMS	10
TABLE OF CONTENTS.....	6
CHAPTER ONE	11
1.1 INTRODUCTION	11
1.2 BACKGROUND	12
1.2 PROBLEM STATEMENT.....	14
1.3 OBJECTIVES OF THE STUDY.....	15
1.4 HYPOTHESIS	15
1.5 SIGNIFICANCE OF THE STUDY.....	16
1.6 THE ORGANISATION OF THE STUDY.....	17
CHAPTER TWO	18
AN ANALYSIS OF THE TRENDS OF MENTAL HEALTH AND TRANSPORT USAGE IN SOUTH AFRICA.....	18
2.1 INTRODUCTION.....	18
2.2 Mental Health in South Africa.....	18
2.2.1 Provincial lifetime prevalence estimates Trends	18
2.2.2 National Prevalence	21
2.3 TRANSPORT TRENDS IN SOUTH AFRICA.....	22
2.3.1 DIFFERENT MODES OF TRANSPORTATION.....	22
2.3.1.1 MODES OF TRANSPORT AND GEOGRAPHICAL SETTLEMENT TRENDS	24
2.3.1.2 MODES OF TRANSPORT AND RACIAL GROUPS TRENDS.....	26
2.4 Mental health in South Africa and commuting.....	28
2.5 CHAPTER SUMMARY.....	33
CHAPTER THREE.....	35
LITERATURE REVIEW	35
3.1 INTRODUCTION.....	35



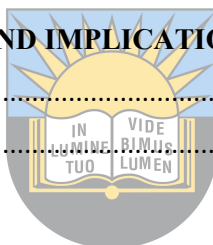
University of Fort Hare
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3.2 THEORETICAL LITERATURE	35
3.2.1 Sociotechnical Systems Theory (STST).....	35
3.2.2 Person-Environment Fit (P-EF) Theory	36
3.3 EMPIRICAL LITERATURE.....	37
3.3.1 Empirical evidence from Developed Countries.....	37
3.3.2 Empirical literature from developing countries.....	41
3.3.3 More empirical evidence from South Africa.	43
3.3.4 Assessment of literature.....	45
CHAPTER FOUR.....	47
METHODOLOGY	47
4.1 INTRODUCTION.....	47
4.5 MODEL SPECIFICATION.....	49
4.5.1 DEFINITION OF VARIABLES AND APRIORI EXPECTATIONS	50
4.5.1.1 Mental Health (MH)	50
4.5.1.2 Public Transport mode (PT).....	50
4.5.1.3. Per Capita Income (Inc)	50
4.5.1.4 Employment Status (Work).....	50
4.5.1.5 Marital Status (Mar).....	51
4.5.1.6 Province (Prov).....	51
4.5.1.7 Age.....	51
4.5.1.8 Level of education (Educ).....	51
4.5.1.9 Gender.....	51
4.5.1.10 Population group (Race).....	51
4.6 DATA SOURCES	51
4.7 SAMPLING	52
4.8 ESTIMATION TECHNIQUE	52
4.8.1 Cross-Tabulation.....	53
4.8.2 Logistic Regression	53
4.8.3 Chi-Square Tests.....	54
4.8.4 Overall Analytical Strategy.....	55



University of Fort Hare
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4.8.5 Specificity and Sensitivity Analysis	55
4.9 ETHICAL CONSIDERATIONS.....	56
4.10 CONCLUSION	56
CHAPTER FIVE	58
PRESENTATION OF THE RESULTS AND DISCUSSION	58
5.1 INTRODUCTION.....	58
5.2 DESCRIPTIVE ANALYSIS	58
5.2.1 MENTAL HEALTH AND TRANSPORT MODE.	58
CHAPTER SIX	70
SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS	70
6.1 INTRODUCTION.....	70
6.2 STUDY SUMMARY.....	71
6.3 THE KEY FINDINGS AND CONCLUSIONS.....	71
6.4 POLICY RECOMMENDATION AND IMPLICATIONS.....	73
6.6 Conclusion	74
7. REFERENCES.....	76



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LIST OF FIGURES

FIGURE 2. 1 NATIONAL PREVALENCE.....	21
FIGURE 2. 2 MODES USED BY WORKERS IN 2013	23
FIGURE 2. 3 TYPES AND MODES OF TRANSPORT BY RACIAL GROUP FOR BOTH PRIVATE AND PUBLIC TRANSPORT.....	27
FIGURE 2. 4 REASONS FOR NOT USING PUBLIC TRANSPORT.....	32

LIST OF TABLES

TABLE 2. 1 MENTAL HEALTH DISORDERS TRENDS.....	19
TABLE 2. 2 TOTAL TRANSPORTATION USAGE ACCORDING TO GEOGRAPHICAL STATEMENT.	24
TABLE 2. 3 TRANSPORTATION USED ACCORDING TO GEOGRAPHICAL AREA	25
TABLE 2. 4 FATAL CRASHES PER MONTH1: NOV 2011 – 31 MARCH 2012	29
TABLE 2. 5 FATALITIES PER USER GROUP 1 NOV 2011 – 31 MARCH 2012	29
TABLE 5. 1 PROVINCIAL ANALYSIS	59
TABLE 5. 2 POPULATION GROUP DISTRIBUTION.....	61
TABLE 5. 3 CHI-SQUARE TEST RESULTS	63
TABLE 5. 4 LOGISTIC REGRESSION RESULTS.....	66
TABLE 5. 5 LIKELIHOOD RATIO TEST RESULTS.....	67



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LIST OF ACRONYMS

BRT	BUS RAPID TRANSIT
CATA	CAPE AMALGAMATED TAXI ASSOCIATION
CODETA	CONGRESS OF DEMOGRAPHIC TAXI ASSOCIATION OF SOUTH AFRICA
DOT	DEPARTMENT OF TRANSPORT
DSD	DEPARTMENT OF SOCIAL DEVELOPMENT
WHO	WORLD HEALTH ORGANISATION
NIMH	NATIONAL (FEDERAL) INSTITUTE OF MENTAL HEALTH
PT	PUBLIC TRANSPORT
SANTACO	SOUTH AFRICAN NATIONAL TAXI ASSOCIATION COUNCIL
SAPS	SOUTH AFRICAN POLICE SERVICES
MHQ	MENTAL HEALTH QUOTIENT
RTMC	ROAD TRAFFIC MANAGEMENT CORPORATION
NGOS	NON-GOVERNMENT ORGANISATION(S)
GEAR	GROWTH EMPLOYMENT AND REDISTRIBUTION
PPTI	PERCEIVED PUBLIC INFRASTRUCTURAL INVESTMENT
GBD 2010	GLOBAL BURDEN AND DISEASES STUDY 2010
UN	UNITED NATIONS
SADAG	SOUTH AFRICAN DEPRESSION AND ANXIETY GROUP
IDEA	IMPACT IN THE WORKPLACE IN EUROPE AUDIT
CMDS	COMMON MENTAL HEALTH DISORDERS
ILO	INTERNATIONAL LABOUR ORGANISATION
NIDS	NATIONAL INCOME DYNAMICS STUDY
CES-D 10	CENTRE FOR EPIDEMIOLOGIC STUDIES SHORT DEPRESSION SCALE

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Public transportation serves as the lifeblood of urban mobility, facilitating the daily movement of millions of commuters daily (Gobind, 2018). Beyond its utilitarian function, public transport also plays a pivotal role in shaping the mental well-being of individuals navigating the urban landscape (Litman, 2013). The experience of commuting, influenced by factors such as overcrowding, safety concerns, and reliability, can have profound implications for the psychological states (Wei, 2015). These stressors contribute to heightened levels of stress, anxiety, and dissatisfaction among commuters, thereby impacting their overall quality of life (Chen et al., 2019).

In South Africa, where public transportation systems grapple with myriad challenges, understanding the interplay between public transport usage and commuter mental health is of paramount importance (Walters, 2012). The country's transportation landscape is shaped by historical legacies, contemporary issues of congestion, violence, and limited infrastructure, presenting unique obstacles for commuters (Dugard, 2001). The prevalence of taxi wars, characterized by conflicts between rival associations over route control, has not only led to violence, but has also instilled fear and uncertainty among commuters (Statistics South Africa, 2020). These challenges underscore the need for a nuanced understanding of the relationship between public transport and mental well-being in South Africa.

The outbreak of the COVID-19 pandemic further exacerbated these challenges, disrupted travel patterns, and amplified concerns regarding health and safety during transit (Vickerman, 2021). As commuters grappled with the fear of contracting the virus and the uncertainty surrounding public health measures, the mental toll of daily commuting became increasingly apparent (Chen & Pan, 2020). The pandemic underscored the interconnectedness between transportation and public health, highlighting the need for holistic approaches to address commuters' well-being (Avila-Palencia et al., 2018).

Against this backdrop, there is a pressing need to delve deeper into the relationship between public transport usage and commuter mental health (Feng, Feng & Astell-Burt, 2017). By examining the

drivers of stress, anxiety, and dissatisfaction among commuters, this study aims to provide insights into policy formulation and infrastructure development initiatives (Martin et al., 2014). Through a comprehensive analysis of public transport usage patterns, safety concerns, and mental health outcomes, this study seeks to uncover the nuances of the relationship between transportation and mental well-being in South Africa (World Health Organization, 2003). By identifying areas for improvement and intervention, policymakers can work towards creating a transportation ecosystem that not only enhances mobility but also promotes the mental well-being of commuters.

1.2 BACKGROUND

Transportation is a fundamental aspect of modern societies globally, playing a pivotal role in facilitating economic activity, social interactions, and access to essential services (Conceição et al., 2022). In particular, public transportation systems are integral to the functioning of urban and rural areas, providing mobility options for millions of people worldwide (Litman, 2020). Across different continents and countries, reliance on public transport varies based on factors such as population density, urbanization levels, and socio-economic conditions (Martin et al., 2014). However, the overarching goal remains to ensure efficient and accessible transportation for all members of society.

In many parts of the world, including developed and developing nations, public transportation systems face common challenges such as aging infrastructure, overcrowding, and inadequate funding (Mackett, 2021). These challenges often result in service disruptions, delays, and discomfort for commuters, affecting their daily lives and overall well-being (Halonen et al., 2020). Furthermore, rapid urbanization and population growth in many regions have placed additional strain on transportation networks, exacerbating congestion and pollution levels.

The experience of commuting via public transport is often characterized by discomfort and stress stemming from long travel durations, crowded conditions, and continuous queues (Halonen et al., 2020). Research indicates that prolonged journeys exceeding 15 minutes are associated with increased anxiety, whereas those exceeding 30 minutes can have pervasive negative effects on personal well-being (Halonen et al., 2020). Additionally, the physical strain of commuting, including elevated blood pressure and musculoskeletal problems, further exacerbates commuter discomfort and contributes to overall anxiety levels (Halonen et al., 2020).

The challenges faced by public transportation systems and commuters are not unique to any specific region but are rather part of a global phenomenon. However, the manifestation of these challenges and their impacts may vary depending on the local context and conditions. For example, in South Africa, historical infrastructure deficiencies coupled with rapid urbanization have exacerbated the difficulties of commuting, particularly for individuals traveling for work (Visser & Ferrer, 2015).

Transportation is the cornerstone of economic activity in South Africa, as in many other countries around the world. Public transportation plays a vital role in facilitating the movement of the South African workforce and enabling access to essential services and opportunities. The National Household Travel Survey conducted in 2013 by Statistics South Africa (Stats SA) sheds light on the significant prevalence of travel within the country. During the seven-day reference period, approximately 85% of individuals residing in urban, metropolitan, and rural areas reported traveling (Stats SA, 2014). This figure marks a notable increase from 2003, when only three-quarters of South Africans engaged in travel during the same period.

The increase in travel since 2003 suggests a growing reliance on transportation systems, particularly public transport modes, such as buses, taxis, and trains. Minibus taxis in particular witnessed a substantial increase in usage, with a 10.0% increase between 2003 and 2013 (Stats SA, 2014). This shift is further supported by data from the General Household Survey of 2014, which indicated a decline in private transport usage, accompanied by a significant increase in public transport utilization (Stats SA, 2013, 2014). These trends underscore the importance of public transport in meeting South Africa's mobility needs.

Despite increasing reliance on public transport, commuters face numerous challenges that affect their daily lives. The historical infrastructure deficiencies in South Africa, coupled with rapid urbanization and population growth, have exacerbated the difficulties of commuting. In particular, individuals traveling for work encounter significant obstacles in navigating between townships, suburbs, and central business districts (CBDs) owing to inadequate transport infrastructure (Visser & Ferrer, 2015).

The experience of commuting via public transport is often characterized by discomfort and stress. Long travel durations coupled with crowded conditions and continuous queues contribute to

heightened levels of anxiety among commuters (Newman, 2014). Research indicates that prolonged journeys exceeding 15 minutes are associated with increased anxiety, while journeys exceeding 30 minutes can have pervasive negative effects on personal well-being (Wei, 2015). Additionally, the physical strain of commuting, including elevated blood pressure and musculoskeletal problems, further exacerbates commuter discomfort and contributes to overall anxiety levels (Wei, 2015).

The stress and anxiety experienced by individuals who rely on public transport can have profound implications for their workplace performance. Commuters often find themselves arriving at work or returning home in a state of distress, leading to mood disturbances, increased lateness, and decreased cognitive performance (Wei, 2015). This disruption underscores the need to examine the impact of public transport-related stressors on work performance in South Africa.

1.2 PROBLEM STATEMENT.

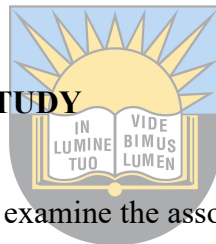


Public transportation is essential in South Africa, especially in metropolitan and urban areas, which drives the economy. However, this mode of travel is fraught with both risks and challenges. Commuters often face mental health issues owing to noise, congestion, heat, and lack of physical activity during travel. According to Statistics South Africa (2020), approximately 6% of households reported reckless taxi driving as a significant transport-related problem, with higher rates in the affluent provinces of Western Cape (10%) and Gauteng (6.9%). Additionally, public transport in South Africa is frequently associated with violence, noncompliant operators or drivers, and sexual harassment, making it the most infuriating mode of travel (Mtizi, 2017). Workers who predominantly rely on public transportation suffer from costly congestion and unsafe and unreliable services (Walters, 2013). Thus, assessing the impact of public transport on the mental health of commuters in South Africa is imperative.

Most South African workers use taxis (69%) and buses (21%) daily for their commute (Statistics South Africa, 2014b). Buses, including Bus Rapid Transit (BRT) systems, often do not cover all routes, resulting in longer travel times and higher costs for workers (Mtizi, 2017). These conditions

lead to mental strain due to extended travel routes, lateness, and absenteeism, which negatively affects commuters' travel behavior. Additionally, taxis, known to be overcrowded, noisy, and reckless, pose greater mental health challenges, including increased incidents of sexual harassment (Mtizi, 2017). The use of private cars contributes to congestion and increased carbon emissions, further stressing the commuters. The minibus taxi industry, with its history of violence, makes commuting dangerous for workers (Carod-Artal, 2017). The COVID-19 pandemic has added another layer of stress, forcing people to commute despite the risk of infection, further impacting mental health (Simons et al., 2021). These transportation challenges can hinder commuters' mental health, affecting their workplace performance and leading to absenteeism, isolation, and decreased productivity, ultimately impacting the economy (Kuroda & Yamamoto, 2018). In this context, there is a critical need for research on the intersection of commuter mental health and travel behavior, particularly in public transportation, to inform policy formulation.

1.3 OBJECTIVES OF THE STUDY



The main objective of this study was to examine the association between public transport use and commuter mental health. The specific objectives of this study are as follows:

- To analyse the trends and patterns of public transport usage and its potential effects on commuters' mental health in South Africa from 2008 to 2017.
- To econometrically examine the association between public transport use and self-reported mental health issues such as depression and anxiety among commuters.
- Policies should be developed based on the findings of improving public transport systems and enhancing commuter mental health.

1.4 HYPOTHESIS

H₀: There is no significant association between public transport usage and the mental health of commuters in South Africa.

H1: There is a significant association between public transport usage and the mental health of commuters in South Africa.

1.5 SIGNIFICANCE OF THE STUDY

Mental health has received interest from numerous researchers in recent years; however, little research has been conducted on public transport and mental health in the South African context. Gobind (2018) examined whether the anxiety associated with public transport leads to poor work performance. Gobind (2018) examined only one aspect of mental wellbeing without including other key aspects of well-being; Gobind examined the transport anxiety that might affect commuters on work performance, which means that she did not include or implicate the overall wellness, which can be the physical, psychological, and mental state of the commuters. This study believes that Gobind (2018) only caters to the psychological aspect, not the overall well-being. Another aspect of the above-mentioned study is that its mandate based on her conclusion was based on structural or organizational motives, which neglected public transport economic cognition, which may include policymaking on transport transformation to improve mental health. The few other studies on the subject did not include South Africa; for example, Feng, Feng, and Astell (2017) conducted a study on the impact of public transport on mental health, however, the study was focused on the United Kingdom. This study explores the subject in the South African context, as this may differ from country to country because of its infrastructural expenditure on public transport. Other studies includes Pérez *et al.*, (2017); Teychenne *et al.*, (2020); Chatterjee *et al.*, (2020); and Litman, (2013) just to mention a few.

This study will also provide an efficient alternative to transport modes in order to improve the overall commuter mental health and to ensure that commuters have sufficient knowledge to choose between the types of public transport. In this manner, the writer aims to reduce all symptomatic characteristics of the modes in question. This study also aimed to gather results that would improve the mental health of people using public transport without ignoring the objective welfare of the commuter, which means cost effective travel public mode, faster traveling to avoid congestion, or traveling on peak hours, as much as possible.

It is also important to note that during these trying times of Covid-19, the Corona Virus Pandemic, it has been difficult for commuters to choose to travel, especially on public transport (Simons et

al., 2021). It has been proven that, due to increased mobility, there is an increasing chance that commuters will be infected by the virus. People who are forced to commute do so because of fear and anxiety. Public commuting has been very stressful during the pandemic (Uber, 2021), which may have a significant impact on the mental health of the commuter. South Africa is also experiencing several unrests that affect daily commuting; for example, the ongoing mini-bus tax riots and shooting out routes are not only unsafe but also depressive. This may result in stressing out commuters, which might be detrimental to their mental health.

Thus, this study was conducted to trigger and ignite more research on the impact of public transport mode on mental health, which will also lead to benefits for workers, older people, and commuters.

1.6 THE ORGANISATION OF THE STUDY

This study is divided into five sections. The first chapter of the study has thus far presented the introduction and background of the investigation, problem statement, objectives of the study, hypothesis, and justification of the study. Chapter two provided an overview of trends regarding modes of public transport and commuter mental health in South Africa. Chapter 3 reviews theoretical and empirical literature on the impact of public transport usage on commuter mental health. Section 4 presents the data sources and methodology of the study. Chapter 5 presents the findings and discussions. Chapter 6 provides conclusions and recommendations based on the findings on the relationship between commuters' mental health and the mode of public transport usage.

CHAPTER TWO

AN ANALYSIS OF THE TRENDS OF MENTAL HEALTH AND TRANSPORT USAGE IN SOUTH AFRICA

2.1 INTRODUCTION

This chapter provides an analysis of mental health trends in South Africa as well as the use of public transport. The chapter starts by presenting an overview of the trends in mental health in South Africa, followed by the trends in transport usage in South Africa, and finally determining the relationship between mental health and commuting in South Africa. The chapter also reviewed the trends in other variables, such as per capita income, marital status, employment status, population group, and social cohesion, which may directly affect commuter mental health. The concluding remarks are provided towards the end of this chapter.

2.2 Mental Health in South Africa

The prevalence of mental disorders in South Africa is high. According to the South African Depression and Anxiety Group (SADAG), approximately one in six South Africans suffers from anxiety, depression, or substance-use disorders. These figures are supported by findings from the South African Stress and Health (SASH) Survey, which revealed that the lifetime prevalence of common mental disorders is approximately 30%. This means that nearly one-third of the population will experience mental health disorders at some point in their lives.

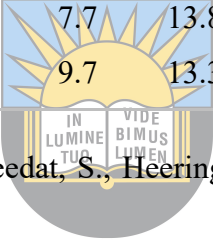
2.2.1 Provincial lifetime prevalence estimates Trends

Table 2.1 provides provincial lifetime prevalence estimates (%) of DSM-IV/CIDI disorders across various provinces in South Africa. Disorders were grouped into anxiety, mood, substance use, and impulse disorders. The data also included sample sizes for each province.

Table 2. 1 Mental Health Disorders trends

Province	All disorders	Anxiety	Mood	Substance use	Impulse	Sample size (N)
Western Cape	39.4*	18.9	13.7	20.6*	4.5*	448
Free State	37.5	21.5*	14.6*	15.5	3.3	421
North West	34.0	17.2	8.1	16.2	1.7	453
Limpopo	30.8	16.3	6.3*	13.5	2.6	420
KwaZulu-Natal	28.0	12.9	9.0	12.8	2.1	749
Gauteng	29.8	15.7	10.2	12.3	5.4*	593
Mpumalanga	29.2	16.0	9.0	9.1	0.1*	415
Eastern Cape	25.7*	13.3	8.3	8.5*	1.1	619
Northern Cape	28.7	15.0	7.7	13.8	3.8*	233
South Africa	30.8	15.8	9.7	13.3	3.0	4,351

Source: Herman, A. A., Stein, D. J., Seedat, S., Heeringa, S. G., Moomal, H., Williams, D. R. (2009).



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The **Western Cape** had the highest overall prevalence of disorders at 39.4%). This province exhibits particularly high rates of substance use disorders, affecting 20.6% of the population. Impulse disorders were also notably prevalent, affecting 4.5% of individuals. These figures were significantly higher than the national averages, highlighting the greater mental health burden in this region. The elevated rates of substance use and impulse disorders suggest specific regional challenges that may require targeted intervention. Addressing these high prevalence rates in the Western Cape is crucial for improving overall mental health outcomes in the province.

In the **Free State**, the prevalences of anxiety and mood disorders were significantly higher. Anxiety disorders affected 21.5% of the population, whereas mood disorders affected 14.6%. Both rates were notably higher than the national average, indicating a considerable mental health burden in this province. The high prevalence of these disorders suggests the need for enhanced mental health services and support in the Free State. Interventions tailored to address anxiety and mood

disorders could help mitigate their impacts on the population. Understanding the factors contributing to these high rates is essential for the development of effective mental health strategies in this region.

The **Eastern Cape** had the lowest overall prevalence of disorders among the provinces, with 25.7% of the population affected. Additionally, this province has a significantly lower prevalence of substance use disorders, with only 8.5% of individuals affected. These values were substantially lower than the national averages, suggesting better overall mental health in this province. Lower rates of substance use disorders indicate a potentially protective environment or effective preventive measures in place. Exploring the reasons behind these lower prevalence rates could provide insights into other regions struggling at higher rates. Eastern Cape's mental health profile highlights the importance of regional differences in mental health outcomes.

In **Mpumalanga**, the prevalence of impulse disorders is notably low, affecting only 0.1% of the population. This was significantly lower compared to the national average of 3.0%, indicating a particularly low incidence of this type of disorder in the province. The extremely low prevalence of impulse disorders in Mpumalanga suggests that unique regional factors may contribute to this outcome. Identifying these factors could inform strategies to reduce impulse disorders in other regions. Understanding the protective elements in Mpumalanga might help in developing effective prevention programs. This anomaly in prevalence rates underscores the need for localized mental health research and intervention.

The national average for South Africa was 30.8% for all disorders, 15.8% for anxiety disorders, 9.7% for mood disorders, 13.3% for substance use disorders, and 3.0% for impulse disorders. These averages provided a benchmark against which provincial data were compared, revealing significant regional variation. Some provinces, such as the Western Cape and Free State, exhibited higher rates of certain disorders than the national averages. In contrast, provinces such as Eastern Cape and Mpumalanga showed notably lower rates. These variations underscore the importance of considering regional contexts in mental health policies and resource allocation. Tailoring interventions to the specific needs of each province could enhance the effectiveness of mental health programmes across South Africa.

2.2.2 National Prevalence

According to the IPSOS survey conducted in 2023, the data revealed significant trends in stress levels and mental health scores among respondents over the past five years. Stress levels fluctuated between 17% and 24% during this period, with a notable increase from 17% in 2018 to a peak of 24% in 2022 and 2023. Conversely, mental health scores, which started at 16% in 2018, showed a consistent upward trend, reaching 39% by 2023. This indicates a 144% increase in reported mental health issues over the same timeframe.

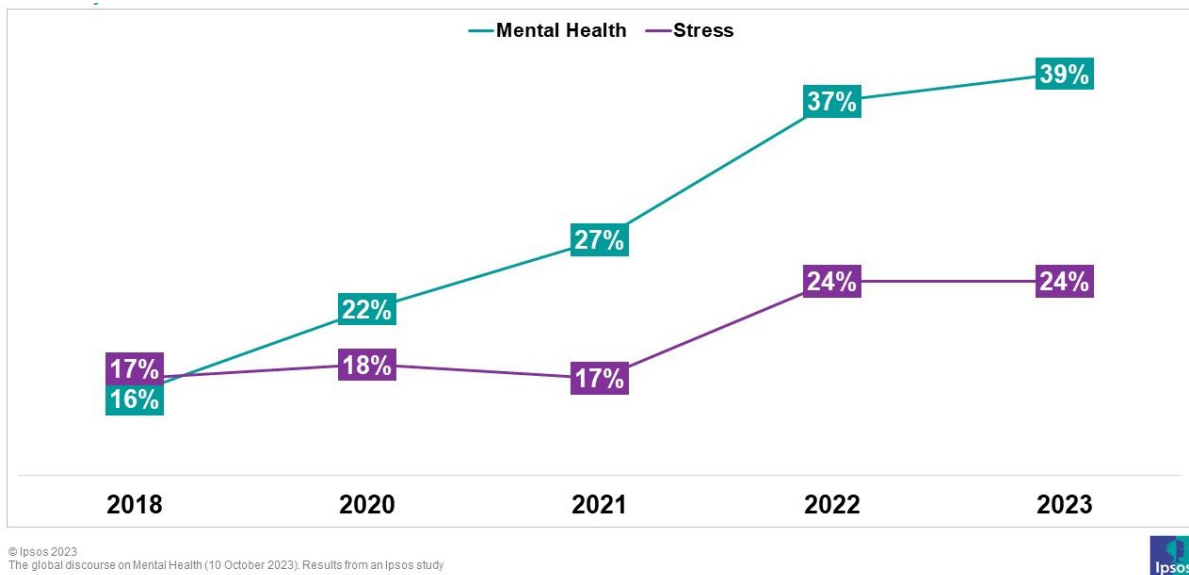


Figure 2. 1 National Prevalence

The correlation between stress and mental health scores was evident in the data. Higher stress levels in 2022 and 2023 coincide with corresponding increases in mental health scores, suggesting a direct relationship in which heightened stress adversely impacts mental well-being. For instance, in 2022 and 2023, when stress levels peaked at 24%, mental health scores also surged to 37% and 39%, respectively. This represents a 131% and 144% increase in mental health issues compared with the baseline year of 2018.

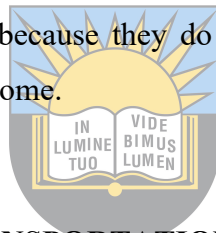
These trends highlight the growing challenges faced by the surveyed population in managing stress and maintaining mental health. The increase in both stress and mental health scores over time

underscores the need for targeted interventions and support mechanisms to address these issues. Factors contributing to these trends could include economic pressure, social instability, and health-related concerns, all of which can affect individuals' mental well-being.

In conclusion, the IPSOS survey data from 2018 to 2023 provides valuable insights into the evolving landscape of stress and mental health issues among respondents. The significant increases observed in both stress levels and mental health scores reflect broader societal changes, and underline the importance of proactive measures to promote mental well-being and resilience in the face of ongoing challenges.

2.3 TRANSPORT TRENDS IN SOUTH AFRICA.

Public transport is the most used mode of travel; generally, it is also mostly used by labourers who are forced to choose public transport because they do not own private transport due to other mitigation factors such as per capita income.



2.3.1 DIFFERENT MODES OF TRANSPORTATION

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The movement of people and goods to different points and time destinations influences the economic behavior and strength of the economy as a country. Workers used different modes when traveling to work; their modal choices differed according to income, settlement area, and race. According to the Department of Transport (2003), settlement type and household size dictate the travel behavior of workers by influencing the accessibility of public transport. A number of big, medium, and small businesses are being established in more urbanized settlements to target a larger population. This involves all sectors of businesses, from government, non-government organisations (NGOs), and private and public businesses to small businesses that are willing to employ a vast number of people; these workers will thus use different modes of transport to and from work. Most of the labor force in South Africa lives in Gauteng, with 33.1% of the working class, Kwazulu-Natal with 16%), and Western Cape with 15.2%); workers from rural areas have decreased from 44,5% 2003 to 34,6% in 2013. This section provides the trends in the relationship between household income and their choice of traveling to work in 2013.

As mentioned earlier, the type of transport used by workers in their work trips differs depending on the area of settlement or where they reside. This study also considered metropolitan areas, urban cities, and rural areas with different populations. Many workers in urban cities and metros choose to travel due to traffic congestion at that specific time of traveling (Department of Transport, 2014). Workers should avoid peak hours as much as possible. The Department of Transport (2013) acknowledges that non-motorized and motorized modes are used by workers to reach their workplaces, non-motorized modes include walking and cycling, and motorized modes include both public and private transport. Furthermore, public transport includes trains, buses, and taxis, while private transport includes cars/truck drivers, passengers, and other travel routes (DoT, 2014).

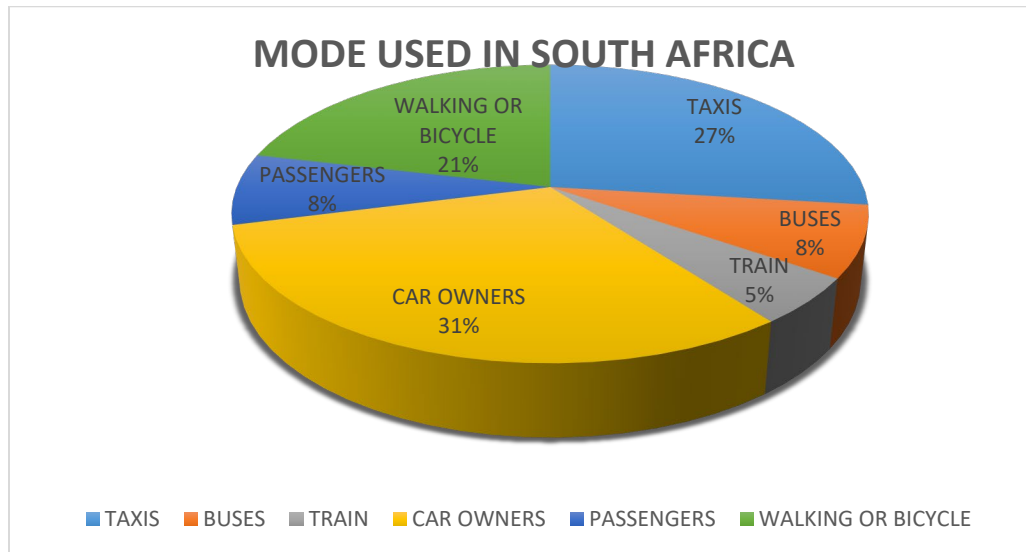


Figure 2. 2 Modes used by workers in 2013

Sources: *Own Drawing, Data from the Statistics SA(2014)*

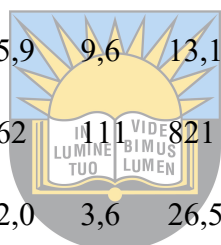
As shown in Figure 2.2, it is compelling that most workers use public transport to work; about five million workers use public transport at their work destination. Most workers use taxis with about 26.5% of the labor force, 7.6% buses, and 5% trains (Statistics South Africa, 2014a). This literally shows that public transport is preferred than private transport for a few reasons; one of the reasons is income, distance travelled to and from work to and from work and other reasons. It takes the level of income for a worker to afford private ownership of a car to travel to work.

2.3.1.1 MODES OF TRANSPORT AND GEOGRAPHICAL SETTLEMENT TRENDS

Workers in South Africa are more common in urban and metropolitan settlements than in rural areas. This is evident from the fact that the number of rural workers decreased from 44.5% to 34.6% between 2003 and 2013 respectively (Department of Transport & Statistics SA, 2014).

Table 2. 2 Total transportation usage according to geographical statement.

Province		WC	EC	NC	FS	KZN	NW	GP	MP	LP	TOTAL
METRO	Number	1	542	*	264	1	*	4	*	*	7 683
		564				034		281			
	Percentage	20,4	7,0	*	3,4	13,5	*	55,7	*	*	100
URBAN	Number	605	325	257	422	574	549	645	675	346	4 399
	Percentage	13,8	7,4	5,9	9,6	13,1	12,5	14,7	15,3	7,9	100,0
RURAL	Number	132	362	62	111	821	415	99	430	668	3 100
	Percentage	4,3	11,7	2,0	3,6	26,5	13,4	3,2	13,9	21,5	100,0



Source: *Statistics SA* (2014) **University of Fort Hare**
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Table 2.2 shows the data of the workers according to their geographical location. Rural settlements have fewer workers in the country, KwaZulu-Natal with the largest rural workers of 26.5%, followed by Limpopo with 21% in the country and Northern Cape with the fewest rural workers with 2%. Mpumalanga and Gauteng hold the largest workers in urban areas at 15.3% and 14.7%, respectively. Gauteng again has the largest metro workers with 55.7%), followed by the Province of the Western Cape with 20.4%). Eastern Cape and Free State had fewer metropolitan workers (7% and 3.4%, respectively).

South Africa has been ranked the 4th most unequal country in the world with .63 Gini index (World Bank, 2012). Thus, income is distributed unequally in terms of race, gender, and age. The following trends examine these factors and how income is distributed among them:

Table 2. 3 Transportation used according to Geographical area

Mode of transport		Public transport			Private transport		Non-motorised	
		Train	Bus	Taxi	Car driver	Car passenger	Walking	Other
METRO	Number	650	446	2 080	2 613	452	734	55
	Percentage	9,2	6,3	29,6	37,2	6,4	10,4	0,8
URBAN	Number	34	235	987	1 286	392	1 070	85
	Percentage	0,8	5,7	24,1	31,5	9,6	26,2	2,1
RURAL	Number	14	380	603	379	216	1 121	39
	Percentage	0,5	13,8	21,9	13,8	7,9	40,7	1,4

Source: (Department of Transport & Statistics SA, 2014)

Table 2.3 above shows data on the use of different modes of transport used by geographical areas; metropolitan workers have a large usage of public transport compared to the other settlement areas, leading to 45.1%. However, urban workers have the most private use than compared to both metropolitan workers and rural areas, with roughly 41.1% of workers using their own vehicles or company's vehicle/lorry or truck to work. Walters (2012) 26.1%, with an average of 0.40 cars per household, of which the highest number of the car ownership is in the metropolitan areas. Rural workers had the least use of both public and private transport, with at least 36.2% of public transport and 21.7% private transport. In addition, rural workers had the most non-motorized transport use to work with 42.1%) compared with other settlement areas.

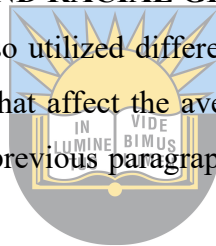
Van Ryneveld (2008) examined the performance of transport in the first 15 years of South Africa and found that the transport policies failed. Van Ryneveld (2008) also reported that income inequality has led to small beneficiaries of democracy, the small group who later owned cars and went out of the public transport system. This also means that income distribution in South Africa

plays a significant role in the transportation sector, especially in public transportation. In addition, certain groups and individual workers would have different choices among the respective types of transport on their work trips. As it is also vividly evident that income group use of types of transport to travel differs significantly from each other, racial group and age differences also differ.

Furthermore, population groups also have discrete choices among different modes of work because income is differentiated among these individuals and their profession. Statistics SA and monthly earnings reported that whites and Indians/Asians earned more than black and colored communities in South Africa in 2010. Africans earned 22% of what the Whites were earning, 36.1% of what the Indians/Asians were earning and 81.7% of the coloreds. Thus, it is expected that whites would have more car ownership than blacks, even at different ages of the first private car (Statistics South Africa, 2010).

2.3.1.2 MODES OF TRANSPORT AND RACIAL GROUPS TRENDS

Racial groups in South Africa have also utilized different modes of transport to the workplace. This may be caused by many factors that affect the average amount of income earned by each group of populations, as stated in the previous paragraph. The following diagrams illustrate the latter:



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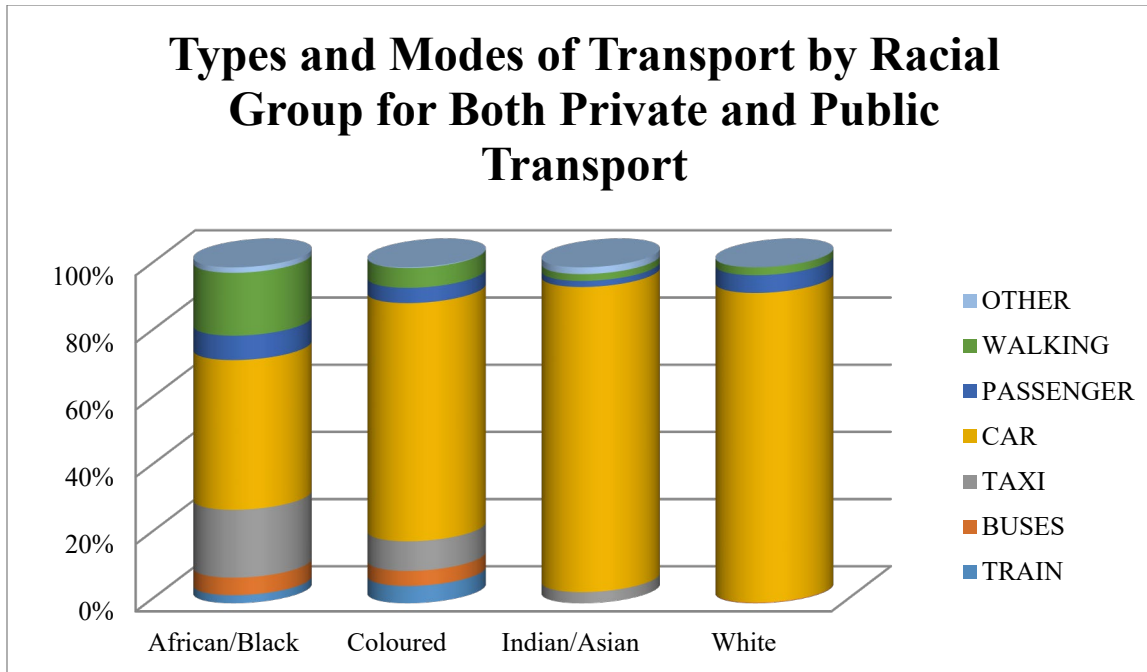


Figure 2. 3 Types and Modes of Transport by Racial Group for Both Private and Public Transport

Source: *Own drawing data from Quantec Easy Data*

Figure 2.3 shows the different uses of transport types by race when going to work. As noted earlier, Africans travel the most of traveling by mode. However, even though public transport is of significant use in all provinces with 26.5% and public transport use have increased from 5 million to 5.4 million in 2003 and 10 years later 2013, Africans utilise mostly the following types of transport with 59 004 workers using taxis, 15 250 use buses and 7 023 use trains. The national household travel survey (year) reported that about 3 million people walk to work, Africans are the fewest among all other group on private car use to work with 130 183 workers; but they have the greatest number of people about 54 664 walking workers followed by coloreds, Indians and white workers (in that respective order). Africans are followed by whites in the use of types of transport, although white workers mostly use private transportation (about 189 119 workers drive to work and 10 696 white workers who are passengers), and a small number of workers use trains, buses, and taxis with 0,406 and 82 workers, respectively. They use their own cars, car sharing, and other private modes such as motorcycles.

About 63.3% of workers drive to work, Colored and Indians have increased about 26 141 workers who drive to work and 1 678 that are passengers. Indian/Asian workers amount to 22 454 workers that drive to work and 450 passengers and 501 walking, although white workers have an outstanding amount. This means that colored and Indian workers have fewer workers who walk and use public transport than black workers. Colored workers have a significant use of trains and taxis, with approximately more than 1 902 and 3 254 workers using trains and taxis, respectively. There has been an increase in the use of buses since 2003, which also reflects an increase in the use of public transport. Approximately 19% of workers use buses to work.

2.4 Mental health in South Africa and commuting.

Numerous riots have escalated in South Africa in the transport industry, especially on the commonly used taxis by workers. The South African National Taxi Association Council (SANTACO) has faced challenges in the past of taxi wars and imbalanced and “unmanaged” conflicts among their associations. Moreover, this has caused commuters to be disturbed by their traveling routines, work, and general safety. The South African Police Services (SAPS)- which is a south African national guard that provides safety and protection to the community of South Africa: has reported numerous innocent civilians who have lost their lives because of wars that have emerged in the taxi industry. These include work, women, and children. According to News 24.com, taxi killings form 50% of the South African murder crimes due to assassinations, especially in those major cities such as Durban, Johannesburg, and Cape town. These wars were stated as a completion in the late apartheid days of,1987, that have escalated to be a norm in recent years; they use violence to self-regulate to control the turf or that specific region. This does not just end there; it is detrimental to the commuter’s behavior, wellbeing, and mental health. It is difficult for commuters to feel safe, organized, and planned travel trips.

The Department of Transport and their entity, the Road Traffic Management Corporation (RTMC), released disturbing statistics of road fatalities and cashes on the road for the 2011 and 2012 festive seasons. Table 2.4 shows that in the festive season, the months with the greatest number of deaths are November and December (the highest being 1080 deaths in December), there is a lot of mobility currently, and people are locating themselves for the rest of the holidays. This is a common statistic during this time, and the department of transport is putting integrated measures to prevent this, for example, traffic control; however, this does not seem to be sufficient. Table 1.2

shows the fatalities in different months in different provinces. From this statistic, it is evident that the operators and drivers are always the few fatalities or survivors, while the commuters are the victims. Passengers and pedestrians with the most deaths on their journey in all the provinces, the highest number in terms of provinces, is Gauteng, followed by KwaZulu Natal, which shows that the provinces with the greatest number of workers will have a relatively high number of fatalities. The Northern Cape had fewer deaths on the road. People are considering an alternative mode of travelling, especially during the festive season, which is alternatively air, because of the trauma and anxiety created by using public transport during busy times of the year.

Table 2. 4 FATAL CRASHES PER MONTH1: NOV 2011 – 31 MARCH 2012

Year	Month	GA	KZ	WC	EC	FS	MP	NW	LI	NC	RSA
2011	Nov	200	156	77	112	73	75	57	81	21	852
	Dec	182	227	107	135	90	109	78	120	32	1080
2012	Jan	140	146	82	89	56	78	62	78	22	753
	Feb	162	148	91	96	46	93	55	67	13	771
	Mar	178	184	88	77	60	78	54	97	19	835

(Road Transport Management Corporation, 2012)

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Table 2. 5 FATALITIES PER USER GROUP 1 NOV 2011 – 31 MARCH 2012

Month	Number of Fatalities per Road User										
	User Group	GA	KZ	WC	EC	FS	MP	NW	LI	NC	RSA
Nov	Drivers	95	45	34	35	55	38	22	36	13	373
	Passengers	111	57	25	71	37	4	25	49	13	392

	Pedestrians	84	75	34	65	0	38	17	27	0	340
	Total	290	177	93	171	92	80	64	112	26	1,105
Dec	Drivers	40	68	39	46	42	67	35	39	5	381
	Passengers	71	89	83	87	97	157	26	84	16	710
	Pedestrians	91	119	33	56	0	36	30	45	14	424
	Total	202	276	155	189	139	260	91	168	35	1,515
Jan	Drivers	53	43	19	27	19	21	24	25	17	249
	Passengers	53	30	32	36	44	28	17	37	6	283
	Pedestrians	63	78	23	27	13	14	26	25	6	276
	Total	169	151	74	91	76	64	67	88	29	808
Feb	Drivers	77	41	22	24	26	29	26	40	0	285
	Passengers	26	41	14	29	9	32	26	38	0	215
	Pedestrians	94	106	26	44	17	34	21	33	25	400
	Total	197	189	61	97	52	95	72	111	25	899
Mar	Drivers	61	61	24	77	39	24	29	56	23	393
	Passengers	77	58	8	44	0	24	30	49	0	290
	Pedestrians	102	96	44	121	13	47	23	58	0	504
	Total	240	215	76	242	52	95	82	162	23	1187

In 2017, the RMTTC released another statistic related to road traffic safety. Since the start of that season, law enforcement had stopped almost 1000 000 cars, and most of the vehicles were stopped in Limpopo, Gauteng, Mpumalanga, and the Western Cape. More than 105 000 drivers were tested for alcohol and 2247 drivers were arrested for alcohol blood content above the legal limit. The highest number of drunk drivers arrested was in Gauteng, followed by Limpopo, Mpumalanga, and Western Cape. The top 5 (five) offences based on written traffic notices were as follows:

- a. Speed of 46 029 drivers fined.
- b. Driving without licenses with 15 538 drivers fined.
- c. Driving unlicensed vehicles with 14 174 drivers fined.

- d. Driving without fastening seatbelts with 13 554 drivers fined and
- e. Overloading of goods with 5 388 drivers fined.

This brings the road safety question of commuters and the pressure on their mental health when all this is happening. The aim of the department of transport is to create sustainable, safe, and affordable transport; however, in terms of public transport it does not transpire. The following graph shows why households in South Africa do not utilize certain public transport modes and their reasons. These reasons are illustrated in terms of provinces on the x-axis, which has been alluded to in previous sections that people in the use of public transport modes are affected by the status quo of that mode. One of the reasons in the graph below is that there is too much violence or war, and people tend to be affected by this violence and wars, especially in minibus taxi public transport use. This may result in people opting for personal vehicles of alternative public transport, such as trains and buses. However, with reference to what has been happening in the eastern cape and some various, minibus taxi operators have been fighting the subsidies bus companies such as Mayibiye Transport Corporation and Africa's Best 350 for operation in terms of routes. This has affected the people using these buses, especially those from rural areas.



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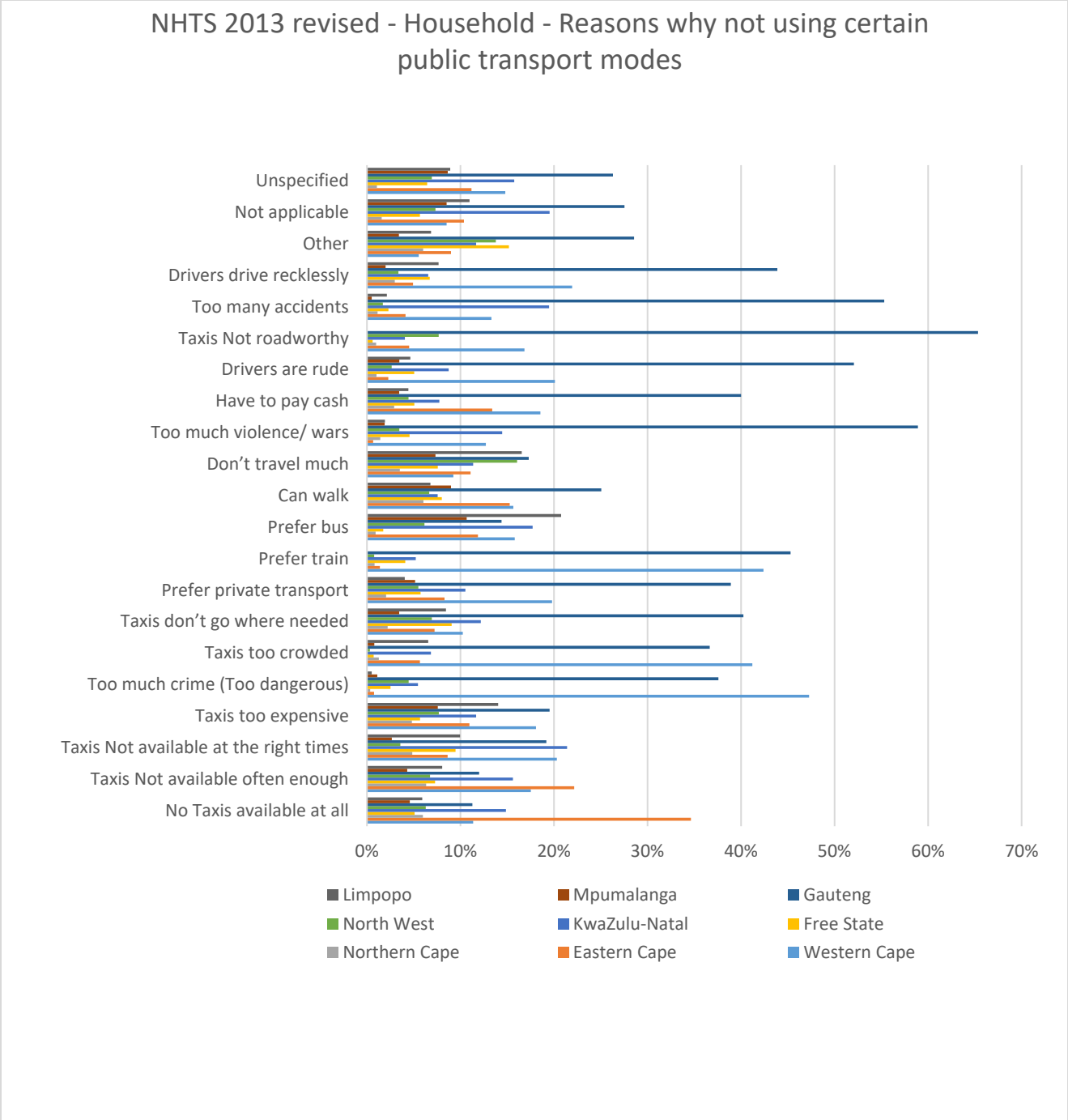


Figure 2. 4 Reasons for not using public transport.

The most provinces to be affected by violence and wars are Gauteng at 59%, followed by KwaZulu-Natal at 14%, in third place is Western cape at 13% (Figure 2.4). The Western Cape has also had numerous violence in wars; however, it's the crime that surpasses the reason why people

avoid using public transport by leading with 47% among all the other provinces, which may be the reason why people of the western cape may alter using buses and trains with also leading by 42% on trains, while buses are relatively 16% (which is second after Limpopo, 21%). The Eastern Cape does not seem to have sufficient minibus taxis compared to the other provinces, while Gauteng leads commuters to opt for private ownership of vehicles, followed by the Western Cape. It is then clear that, according to this graph, while Western Cape and Gauteng have the most public transport use, they experience the most devastating negative effects of public transport use. Therefore, their commuters are mostly affected mentally using public transport rather than by any other province in the nation.

2.5 CHAPTER SUMMARY

This chapter analyzes the trends and provides an overview of the impact of public transport on mental health variables. Based on the trends provided above, showing discrete choices of workers on their trips to work, it is evident that mental health is affected by public transport as the mode choice, per capita income, geographical area (metropolitan, urban, or rural settlement), and racial population group. However, it is always good to notice the unobserved number of workers and non-workers in this study, such as unspecified and inapplicable categories. With all this information, it is expected that public transport will directly impact the level of mental health of the commuter, especially if the commuter has no choice but to choose public transport and the main means of travel to and from work.

Mental health has been seen as one of the community's challenges over the last decade and has received global attention. However, the link between public health and transportation has received a limited amount of research. In this chapter, mental health and the commuter mode of transport (public transport) are established. The data showed an increasing number of public transport usages, while the mental health number also increased. The explanation was that a number of factors and variables may impact the level of mental health through the choice made to use public transport as a means of travel.

This chapter provides a review of public transport and other modes of use, and how it is related to other variables, such as per capita income, gender, race, and area of settlement. This might result

in a modal change in travel, such as car ownership, car sharing, or air traveling. However, the most beneficial change is active public transport.



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CHAPTER THREE

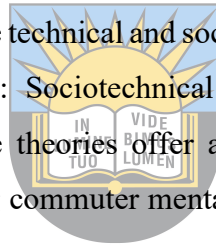
LITERATURE REVIEW

3.1 INTRODUCTION

The transport sector has been attached to benefits and hindrances. One of the benefits of using public transport is physical mobility, which affects commuters' mental health. In this sub-topic, theories of wellness and mental health of commuters are discussed, along with theoretical and empirical theories that explain the relationship between mental health and the working environment. The following section discusses the theoretical framework.

3.2 THEORETICAL LITERATURE

Understanding the complex interplay between public transport and mental health requires a robust theoretical framework that integrates the technical and social dimensions of commuting. This study employs two complementary theories: Sociotechnical Systems Theory (STST) and Person-Environment Fit (P-EF) theory. These theories offer a comprehensive lens through which to examine the various factors influencing commuter mental health in the context of South Africa's public transport system.



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3.2.1 Sociotechnical Systems Theory (STST)

Sociotechnical Systems Theory (STST) proposes that human-designed systems (technology) and the social context within which they operate are interconnected. This theory is particularly insightful in the realm of public transport. Public transport systems encompass physical infrastructure, such as vehicles and stations; operational procedures, such as schedules and ticketing; and social dynamics, including crowding and passenger behaviour. These elements interact in complex ways to shape an overall commute experience. For instance, the design and maintenance of vehicles, efficiency of scheduling, and behaviour of other passengers all contribute to how a commuter perceives their journey (Trist, 1981). Understanding public transport as a sociotechnical system allows us to see how technical and social components work together to influence outcomes, including those related to mental health.

STST suggests that inefficiencies within the system, such as delays, overcrowding, and lack of safety, can create stress and anxiety for commuters. When a commuter faces a delayed bus or an overcrowded train, the resulting frustration and discomfort are not just about the immediate inconvenience, but also about the cumulative stress that these inefficiencies cause over time. On the other hand, a well-functioning system characterized by reliability, comfort, and a sense of security can significantly enhance commuting experience, reduce stress, and potentially improve overall mental well-being. The interactions between the technical efficiency of the transport system and the social experience of commuting are central to understanding how public transport affects mental health (Baxter & Sommerville, 2011).

3.2.2 Person-Environment Fit (P-EF) Theory

Person-Environment Fit (P-EF) theory posits that individual well-being is optimized when there is a good fit between a person's needs and the demands of their environment. In the context of commuting, public transport represents the environment, and the various demands of commuting (e.g., time, comfort, and control) are placed on the individual. Commuters have different needs; some may require a high degree of control over their travel environment, whereas others might prioritize predictability or comfort. When these needs align with the characteristics of the public transport system, the experience is likely to be positive. Conversely, a poor fit, such as long and uncomfortable commutes for individuals who need personal space and relaxation, can lead to negative mental health outcomes (Edwards, 1996).

P-EF theory suggests that a mismatch between commuter needs and the public transport system can lead to stress, anxiety, and other negative mental health effects. For instance, an individual who values personal space and a quiet environment may find it stressful to commute to overcrowded buses or trains, leading to increased anxiety and reduced overall well-being. Similarly, unpredictability in scheduling can be particularly stressful for individuals who need structure and predictability in their daily routine. Understanding the specific needs of commuters and how they align or clash with the public transport environment is crucial for designing systems that support mental health (Caplan, 1987).

Linking STST and P-EF theories offers a comprehensive framework for understanding the mental health impacts of commuting. STST provides insights into how the design and operational aspects of public transport influence commuting experience, while P-EF focuses on the fit between individual needs and the transport environment. By combining these perspectives, we can better understand how the technical aspects of public transport systems (e.g., reliability and comfort) interact with individual commuter needs (e.g., control and predictability) to affect mental health. This integrated approach allows for a deeper analysis of how improvements in public transport design and operation can enhance the well-being of commuters by better meeting their psychological and emotional needs (Peters & Waterman, 1982).

In the South African context, these theoretical frameworks are particularly relevant, given the unique challenges faced by the public transport system. Issues such as limited infrastructure, safety concerns, and significant socioeconomic disparities can exacerbate the stress and anxiety associated with commute. Applying STST and P-EF theories to this context can help identify specific areas where the public transport system fails to meet commuter needs, leading to poor mental health outcomes. For example, inadequate safety measures can create an environment of constant stress and fear, whereas unreliable scheduling can disrupt the daily lives of commuters, particularly those with strict time commitments. By exploring how these factors influence the dynamics of STST and P-EF, this study aims to provide insights into improving the public transport system in South Africa to better support the mental health of its users (Van der Merwe & Bekker, 2003).

3.3 EMPIRICAL LITERATURE

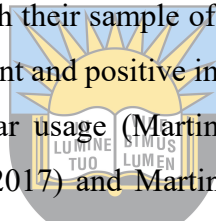
This section presents a review of the available empirical evidence on the relationship between public transport and commuter well-being in developed, developing, and South Africa.

3.3.1 Empirical evidence from Developed Countries.

Bubonya, Cobb-Clark, & Wooden (2017) labeled mental health as an ‘economic cost’ because of the reduced productivity among workers, firms, and the economy. The study used cross-sectional data to show a link between mental health and worker productivity in Australia and found that there was low productivity from workers who showed signs of mental health over 13 waves from 2001-2013. Unlike Bubonya et al. (2017), who focused on well-being and productivity, Handy

and Thigpen (2019) explain that commuter well-being is significantly affected by the quality of commuting, which may include mode used, location where the participants reside, and their personal characteristics. In their study, they found different modes with different levels of stress factors, indicating that buses used by learners and employees have higher stress levels than bicycle distance commuters. Thus, for commuters to have improved well-being, they need to be residing on a bicycle a distance to work or school/university.

Other studies have promoted physical activity and active travel to improve mental health, these studies include Martin, Goryakin, & Suhrcke (2014) who explored a relationship between active travel and psychological well-being using 18 waves of the British household panel survey between the year 1991 and 2009. They assessed variables such as travel mode choice, travel time, and increased traveling, which may affect the psychological states of commuters, using fixed-effects regression models. They used a 36-point Likert scale to measure their psychological state of mind and a general health questionnaire. With their sample of just over 17000 participants, they found that mode of work travel had a significant and positive impact on their psychological state. This is mainly due to public transport and car usage (Martin et al., 2014). The difference between Bubonya, Cobb-Clark, and Wooden (2017) and Martin, Goryakin, and Suhrcke (2014) is that Cobb-Clarke and Wooden used mental health and the outcome variable, which may affect the outcome of the study.



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Avila-Palencia et al. (2018) concurred with the idea that active transport is positively linked to well-being; however, Feng et al. (2017) introduced a new concept in this relationship. Feng et al. (2017) introduced perceived Public transport infrastructure (PPTI), Feng, Feng, and Astell-Burt (2017) introduced PPTI to modify the association between mode use and mental health by using multi-linear and logistic regressions in a United Kingdom household survey longitudinal study. They concluded on their findings that it was imperative to promote walking and cycling more than using a car or public transport to promote commuters' health and mental health; however, travelers with a good perceived public transport infrastructural investment are likely to improve mental health (Feng, Feng & Astell-Burt, 2017). As much as this study examines the relationship between mental health and public transport, public transport infrastructure remains one of the most important variables that can affect the core variable mental health.

traveling to work has a significant impact on employee productivity (Bubonya et al., 2013; Bubonya et al., 2017). Transport mode choice affects one's time as an asset (how much time spent traveling), safety, and comfort of the mode. Aryu (2010), who also investigated the determinants of mode choice among workers in Indonesia, agrees with Amoh-Gyimah and Aidoo, who stated that safety, comfort convenience, gender, and income play a vital role in forming demand for a travel mode. Transport mode choice is crucial because it can also affect employee productivity, which will eventually affect national economic growth (Aryu. U, 2010). In other words, the decay of the determinants to choose public transport as the main travel mode for working activity would negatively affect economic growth.

Chatterjee *et al.* (2020) also assessed transport related with subjective wellbeing and commuting. Unlike Amoh-Gyimah and Aidoo (2013), who saw a linear relationship between travel and productivity, Chatterjee et al. (2020) believed that there are three ways to see the impact of commuting and wellbeing—*during* the journey, *after* the journey, and in the long term. They concluded that stress and anxiety may be induced by the mode use “*during*” the journey which could be caused by congestion, crowds and uncertainty of the journey. The spill-over effect will be evident after the journey, in which case, performance and production at the workplace are factored in. This evidence supports the view that commuters are not satisfied, even though they have adjusted to the challenges experienced in the transportation sector.

Moreover, in 2017, Feng et al. assessed the relationship between public transport use and mental health in the United Kingdom. Viewing the effects of Perceived Public infrastructural investment (PPTI) and development as a way to encourage active travel and physical activity will gradually transport the benefits of mental health for commuters in the UK (Feng et al., 2017). The study also suggested that although PPTI should be a precondition for physical activity, it should adhere to the full mental health benefits for active travel.

Litman (2013) investigated transportation and public health, including mental health as a public health issue, not as the main variable of concern. Litman (2013) examined transportation policy and planning decisions affecting public health and looked at other alternatives to incorporate health problems into economic transport planning and policing. In this study, multiple variables were used, namely car crashes, pollution emissions, transportation costs and other barriers, physical activity, and mental health (Litman, 2013). Furthermore, the abovementioned study did not

explicitly contrast mental health with public transport use, particularly generalized transportation, without categorizing it for a clearer explanation of the interplay.

Moreover, Posner (2018) examined the relationship between mental health and transport using qualitative engagement in two different stages for both clinical patients and the public. The total number of participants was summed up to a maximum total of 243 in the United Kingdom (UK). In their assessment, she found that people with anxiety were less likely to use public transport. Unlike Avila-Palencia et al. (2018), who used mixed logistic regression models, Posner used Multinomial logistic (MNL) regression model. Mixed logit regressions normally take a case with an outcome that has two levels: multinomial regression takes more than two levels in an outcome. Posner found that people who already live with mental health problems feel unsafe and biased among all modes; however, they are more likely to choose private cars more than public transport to avoid crowds and time to travel (Posner et al., 2018). Conversely, these factors may play a major role in creating new mental health problems for undiagnosed commuters.

Avila-Palencia et al. (2019) examined the effects of transport use, self-perceived health, mental health, and social contact measures over two years in seven European countries using mixed-effects logistic regression models and found that loneliness and mental health play avoided using the public mode of traveling. They also alluded to the fact that active transportation was associated with improved self-perceived health. The participants showed little evidence of using a car, while using public transport remained insignificant. The study also concluded that environmental effects are significant in having good self-perceived health and that public transport is associated with fewer chances of good self-perceived health.

Wild and Woodward (2019) promoted active public transportation by exploring why cyclists are the happiest commuters. They found that they were not just happy for the relatively because of their cost effectiveness, complete control of their arrival time, and satisfaction with the trip itself to go to work using a bicycle. They concluded and recommended that there should be more strategic planning to uplift the perceived view towards cycling and build safer and more sociable infrastructure for cycling in urban settlements. This helps commuters socially, physically, and psychologically. Wild and Woodward concur with Avila-Palencia *et al.* (2018), who both promote the use of public transport, especially active public transport to co-benefit commuters.

At the beginning of 2020, the world was hit by a deadly virus, Covid-19, which has killed almost 5 million lives globally and nearly 90 thousand lives as of October 2021 in South Africa, according to the World Health Organization (2021). This pandemic has changed the way of living and mobility around the world (Chen & Pan, 2020), and Thomas *et al.* (2021) agrees that the Covid 19 pandemic has disturbed many lives, including travel attitudes and the use of public transport. They utilized the responses of 787 participants in a survey from both New Zealand and Australia combined with variables that included public transport use, car use, and car sharing before and during coronavirus restrictions. The results show a negative impact of Covid-19 on mobility during restrictions, whereas before Covid 19 people were more mobile and freer.

In the United Kingdom, there was also a similar situation because there was a drastic reduction in ridership. This was found by Vickerman (2021), who explored the challenges currently faced by public transport and argued that the return to public transport is unfavorable, as people are still scared to move, and the anxiety of traveling while the deadly virus still exists. People would prefer to work from home rather than travel, especially when using public transport. Eisenmann *et al.* (2021) from Germany does not disagree with the above mentioned and argues that cars have become more important than the use of public transport due to the fairness of the coronavirus, which is the main reason for the reduction in public transport usage. They carried out a binary logistic regression and found that people in Germany would rather travel using their cars or bicycles as compared to public transport. On the other hand, Jenelius and Cebecauer (2020) analyzed the performance of public transport at this difficult time using ridership by commuter, such as tickets bought, sales, and physical count of passengers in Sweden. They targeted three of the busiest and crowded cities and conducted the study; it was unfortunate to find out that people were not just restricted to travel, they were scared to use public transport during Covid-19. People have changed their monthly travel tickets to almost none.

3.3.2 Empirical literature from developing countries.

According to reports by the World Health Organization, stress, anxiety, and depression are leading to mental disorders in developing countries. This report also mentioned that 10% of the working population is taking time off work because of depression, meaning that this is not only a psychological problem but also an economic burden to developing economies. Mental health

problems affect developing countries because of reduced productivity. Most developing studies believe that mental health problems and disorders are undertreated, and the percentage will rise as the number of years increases.

Canavan (2013) found that mental disorders are most effective in low-income countries, which are ill-equipped and have limited sources and research, particularly in sub-Saharan Africa. In their study, they believed that this disease caused low productivity. In their study, they believed that there was loss of productivity due to this disease. To achieve this conclusion, they employed logistic regression in multivariable analysis. Unlike Arya (2010), overall well-being increases with infrastructural investments in the country. Caravan also finds a positive relationship between psychological problems and unemployment. He later concluded the following. In Ghana, severe and mild distress are associated with a loss of productivity.

Charlson projected epidemiological changes in mental health requirements in the workplace. They used Global Burden and Diseases Study 2010 (GBD 2010) and United Nations (UN) population estimates to predict these forecast patterns. In their findings, They find that mental health to rise by 130% on workers of sub-Saharan Africa by 2050. An increase in this psychological problem will worsen the productivity of the economies of the sub-Saharan region. Furthermore, (Jack et al., 2014), investigated the economic cost of mental health in South Africa and Sub-Saharan developing countries according to their study, one in three people in South Africa will have mental disorders in their lifetime. This concurs with the South African Depression and Anxiety group Together with the Department of Statistics Agrees with the above-mentioned study; they also estimated about 10% of South Africans with enduring mental disorders. Jack et al. (2014) used a cost-effective analysis and narrative overview methodology and found that there is a knowledge gap in South Africa about mental health with other chronic diseases with substance abuse. They also mentioned that the segregation system after 1994 had an impact on the mental health burden in South Africa and inequality (with the highest Gini efficiency in the world).

They classified the economic burden into direct and indirect economic costs. Direct costs include medical and other mental health. Indirect costs include economic and productivity costs and unemployment.

In the study of Khoza (2013) conducted to assess the barriers and motivators to the utilization of public transport in urban areas. It was found that, with the use of questionnaires from both private and public transport users, commuters opted for private ownership due to the non-availability and time costs incurred when using public transportation. This brings challenges for the public transport sector, such as an increase in traffic congestion and environmental health problems, such as an increase in carbon emissions. Khoza also alluded to the fact that using more public transport will decrease these challenges and create more of an efficient public transport system. Singleton (2019), Chu, Liu, and Zhang (2016), and Barnum (2007) noted and agreed with Khoza that the increased use of public transport will decrease the psychological and traveling challenges and increase the government revenue due to ridership increase.

In Indonesia, Dharmowijoyo, Susilo, and Syabri (2020) stated that developing countries should build a more socially inclusive infrastructure for public travel because developing countries are the most pressured. Working commuters are experiencing hard working conditions, average income, inequality, and are always working under pressure compared to developed countries. This will help to improve physical and mental health. Developing countries are adequately equipped with opportunities, public transport and other public goods; however, income equality, social safety, and social insecurities still revolve around commuter behavior. If the financial burden and the above-mentioned could be lifted in developing countries with more socially inclusive transport access, on the other hand, it would help people to have better social health. They also concluded that walking and cycling on the way to and from work could help commuters improve their mental health.

3.3.3 More empirical evidence from South Africa.

The South African Depression and Anxiety Group (SADAG) and the Department of Statistics collaborated with Hexor to assess the impact of depression in the workplace by Stander et al. (2000). Stander employed the Impact in the Workplace in Europe Audit (IDEA) to undertake this study in the South African version, and administered 1060 participants and found that depression is working against productivity in the workplace. It is a prolonged negative relationship and needs workplace protective mechanisms to avoid long-run economic costs for both the employer and employee. This affects the competency and profitability of the organization, and eventually affects

economic improvement (Canavan et al., 2013). Finally, absenteeism remains a major determinant of productivity loss due to mental health.

Hunt *et al.* (2021) investigated the effects of the Covid 19 pandemic on hunger and depressed mood among South Africans and found that covid 19 affected commuters psychologically with the effects of loneliness, anxiety, fear, and uncertainty. They discovered evidence that depressive symptoms were relatively high during this period as compared to 2017, which was before the pandemic. In 2017, depressive symptoms had 21% probability of screening a depressive trait, and in 2nd and 3rd wave it was 24% and 29%, respectively. This, however, did not include the analysis of all environmental factors, such as transportation; they outlined hunger and food security as the mitigating factors of mental health and also alluded to whether South Africa.

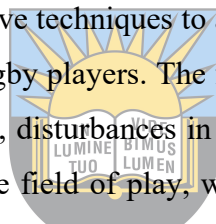
Lyoka (2011) has similar results to those of Avila-Palencia et al. (2018) and Feng, Feng, and Astell-Burt (2017) in that mental health improvement is aligned with physical exercise and fitness. This enables workers to perform better in a social and working environment. Lyoka analyzed and assessed the impact of physical exercise on the mental health of police officers in the Nkonkobe region in the Eastern Cape, South Africa. The participants were employees of the SAPS who were part of an intensive exercise program over a given period, and provided feedback pre- and post-sessions in the form of questionnaires on their progress on changes in their mental state. The results showed that they improved in handling depression and emotional stability. Cognitive functions and social interactions of the participants.

Almost all of the literature regarding mental health has yielded negative results; this also includes Poalses and Bezuidenhout (2018), who focused their study on mental health in higher education. They specifically focused on distant learning staff, both academics and administrators. As they employed a Job Demand-Resources measurement instrument, they found that stress and mental instability were problematic and negatively affected both parties (learners and workers) at higher institutions of distant learning. Which was strongly supported by Brough, Dollard, and Tuckey (2014).

Moreover, Paulsen (2008) is very similar to Lyoka (2014), who conducted research on one occupation, police officers, based on the assumption that being a police officer is arguably the most stressful job amongst them. However, they used different techniques to collect data and arrive

at conclusions. Lyoka (2014) used questionnaires and feedback from the police, while Paulsen used the Spielberger Police Stress Survey and Brief C.O.P.E inventory. The C.O.P.E inventory is an instrument used to assess how people respond to stress using different strategies; C.O.P.E stands for Coping Orientation to Problems Experienced. It has been proven to be more successful in assessing stress and as a tool for coping with stress and other mental disorders (Carver, 1997). Paulsen found moderate stress from organizational demands and pressure. Police officers are more likely to engage in problem-solving strategies rather than avoidance strategies to cope with their stress. The outcome of these strategies is more likely to wear off to the community they serve than stress on police officers. Thus, it is vital to improve stress management strategies and eventually improve service delivery to society.

Finally, Grobler (2019) researched a framework for developing a mental health program for South African Rugby players. He used mixed methods development and design with explanatory sequential questionnaires and quantitative techniques to address common mental health disorders (CMDs) among male South African rugby players. The findings of this study indicate that rugby players experience distress and anxiety, disturbances in sleeping tendencies, and use of alcohol. They experience distress on and off the field of play, which can be caused by the pressure and expectation of the game that comes with it. This is relevant to the literature provided above, as some studies indicate that non-work-related factors and work-related factors influence a worker's performance and productivity.



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3.3.4 Assessment of literature

In conclusion, this chapter has explored the intricate relationship between public transport and commuter mental health, utilizing Sociotechnical Systems Theory (STST) and Person-Environment Fit (P-EF) theory to elucidate the mechanisms at play. It is evident that the design and operation of public transport systems significantly impacts commuters' mental well-being, which is influenced by factors such as reliability, comfort, and safety. Empirical evidence from various contexts, including developed, developing, and specifically South African studies, underscores the critical role of public transport infrastructure and commuting conditions in shaping mental-health outcomes. These insights highlight the need for tailored interventions in South Africa's transport sector to mitigate stressors and enhance the overall mental well-being of commuters, particularly considering the unique challenges posed by socioeconomic disparities and

infrastructural limitations. Further research and policy efforts should aim to improve system efficiency and address commuter needs to foster a supportive environment that is conducive to mental health.



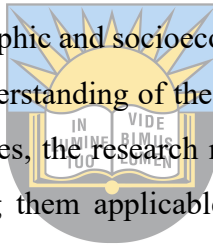
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CHAPTER FOUR

METHODOLOGY

4.1 INTRODUCTION

The research methodology employed in this study was designed to rigorously investigate the impact of public transport on the mental health of commuters in South Africa. This chapter outlines the research design, data collection methods, and analytical techniques used to address the research objectives comprehensively. By employing a structured approach, this study aimed to provide meaningful insights that can inform policy interventions to enhance the mental well-being of commuters using public transport. This methodology integrates a quantitative research design with the analysis of secondary data, ensuring a robust framework for examining the relationship between public transport usage and mental health outcomes. This structured approach allows for detailed exploration of various demographic and socioeconomic factors that may influence mental health, thereby providing a holistic understanding of the issue at hand. Through careful selection of data sources and analytical techniques, the research methodology aims to ensure the validity and reliability of the findings, making them applicable to the broader South African context (Statistics South Africa, 2018).



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4.2 RESEARCH DESIGN AND APPROACH

This investigation adopted a quantitative approach utilizing repeated cross-sectional data from South Africa's General Household Survey spanning nearly a decade. By analyzing data from 2009, 2011, 2014, and 2017, the researcher wanted to observe how the relationship between public transport and mental health has evolved over time while controlling for changing socioeconomic conditions. This approach aligns with similar studies in transportation research that have employed repeated cross-sections to examine trends and associations over time.

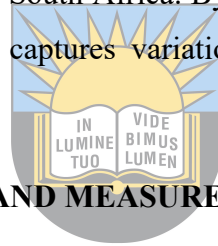
The repeated cross-sectional design offers several advantages for our research objectives. First, it allows the researcher to account for potential period effects that might influence the relationship between transport mode and mental health. Second, it provides a larger sample size throughout the years, enhancing the statistical power of the analysis. Finally, it enables the researcher to examine

whether the associations are consistent across different time points, strengthening the robustness of the findings.

4.3 DATA SOURCE AND SAMPLE

The General Household Survey, conducted annually by Statistics South Africa, serves as the primary data source. The researcher specifically focused on four waves of the survey: 2009, 2011, 2014, and 2017. This temporal spread allows the researcher to capture potential changes in both transport infrastructure and mental health outcomes during a period of significant development in South Africa's public transport system.

The GHS employs a multi-stage stratified sampling design, ensuring representativeness at both national and provincial levels. Each survey wave typically includes approximately 25,000 households across all nine provinces of South Africa. By pooling data across the four waves, the researcher created a rich dataset that captures variations in both geographical and temporal dimensions.



4.4 VARIABLE CONSTRUCTION AND MEASUREMENT

The dependent variable, mental health status, is constructed as a binary outcome based on responses to the health section of the GHS. This measure was carefully harmonized across survey waves to ensure consistency in measurement. The main independent variable of interest – mode of public transport – is coded to reflect the primary means of transport used for commuting to work. The variable was changed from a categorical to a binary variable, where 1 represented commuters who use taxis and buses to work, and 0 represented those who use private cars and small vehicles such as lift clubs when they travel to work.

In constructing the dataset, the researcher paid particular attention to ensuring compatibility across survey waves. This process involved harmonizing variable coding schemes across years, adjusting income measures for inflation using 2017 as the base year, creating consistent categories for categorical variables such as marital status and working status, and ensuring provincial boundaries remain consistent across the study period.

The covariates in the analysis include demographic factors (gender, age, race), socioeconomic indicators (income, working status), and geographical variables (province). The researcher also included marital status as a proxy for social support networks. Each of these variables has been shown in previous research to influence both transport choices and mental health outcomes (Ettema et al., 2016).

4.5 MODEL SPECIFICATION

The study’s analytical approach employs pooled logistic regression while accounting for the temporal nature of the data. The model as adopted from Ettema, D., Gärling, T., Olsson, L. E., & Friman, M. (2016) takes the form:

$$\text{logit}(P(Y_{it}=1)) = \beta_0 + \beta_1 X_{it} + \beta_2 Z_{it} + \gamma_t + \varepsilon_{it} \dots\dots\dots (1)$$

Where:

- Y_{it} represents mental health status for individual i in year t
- X_{it} represents public transport usage
- Z_{it} represents our vector of control variables
- γ_t captures year fixed effects
- ε_{it} is the error term



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The researcher progressively developed the analytical framework through several steps: First, he estimated separate models for each survey year to examine potential temporal variations in the relationship between transport mode and mental health, second, he then pooled the data across all years, including year fixed effects to control for temporal trends, and finally, he introduced interaction terms between year indicators and transport modes to explicitly test whether the relationship has changed over time.

To account for the complex survey design of the GHS, the researcher employed survey weights and cluster-robust standard errors in all the estimations. This approach ensures that the results are nationally representative and account for the hierarchical nature of the sampling process.

The model of the study is then expressed as follows:

$$\text{logit}(P(MH_{it}=1)) = \beta_0 + \beta_1 PT_{it} + \beta_2 Gen_{it} + \beta_3 Age_{it} + \beta_4 Race_{it} + \beta_5 Prov_{it} + \beta_6 Mar_{it} + \beta_7 Inc_{it} + \beta_7 Work_{it} + \beta_7 Educ_{it} + Year_t + \varepsilon_{it}$$

Where $\beta_1, \beta_2, \beta_3$ denote the coefficients of the factors. β_0 is the unchanging factor and u is the error term. The function is denoted by two subscripts on the variables, and t represents the time.

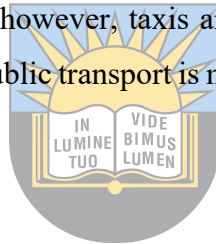
4.5.1 DEFINITION OF VARIABLES AND APRIORI EXPECTATIONS

4.5.1.1 Mental Health (MH)

For the sake of this research, this variable is shown in several items as per the data availability in the General household survey. The title of this variable will change and the years changes in the model because of the terminology that the data collectors chose to change a name in different years; for example, in 2009, we had *Q130bdep* which represents the type of illness/injury: Depression or Mental illness; in 2014, mental illness was singled out as denoted by *Q26bMental*. However, the WHO defines mental health as a state of well-being in which every person realizes his/her potential, manages day-to-day stress, and works optimally, prolifically, and productively (World Health Organisation, 2003).

4.5.1.2 Public Transport mode (PT).

Public transport mode includes all publicly accessible taxis, buses, and trains In South Africa, taxis are mostly owned by the government; however, taxis are privately owned and regulated by the state. According to the NHTS (2013), public transport is mostly used by the labor force and general economic activities.



4.5.1.3. Per Capita Income (Inc)

According to the International Labour Organisation (ILO), “Wages are a key aspect of the quality of work and a major component of household income.” Income is the money earned from work or investment (Ehrenberg and Smith, 2012). Per capita income is the average income earned by an individual in a country over a specified period.

In this study, per capita income is divided into categories, which will be explained in the data analysis. This is done because it is simpler to understand and clarify for better understanding.

4.5.1.4 Employment Status (Work)

Employment status may vary from being self-employed, working for an organization or firm permanently, or employed for a job on a specific time frame (contract). All these may differ based on income and job security, as some are long-term and others short-term employment status. Statistic SA have reported a rise in unemployment of over 16% from 2008 to 2017.

4.5.1.5 Marital Status (Mar)

This variable may differ among participants depending on whether they are legally married, single, cohabiting with a partner, or divorced.

4.5.1.6 Province (Prov)

This variable refers to the province at which commuters stay. South Africa has nine different provinces, namely, Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North-West, and Western Cape. Some provinces such as Gauteng and Western Cape have plenty of work opportunities, and due to high traffic volumes, it is expected that this variable will be associated with higher mental health among commuters.

4.5.1.7 Age

Age can be categorized according to groups, including infants, adolescents, and adults. However, these age groups may be divided according to the criteria that the study needs to serve and according to the objectives of the study.

4.5.1.8 Level of education (Educ)

years of education refers to the number of years the participants spend acquiring education; one may refer to the highest education obtained, which includes grades lower than matric. Matric obtained a diploma, bachelor's degree, postgraduate, doctoral degree, and post-doctoral degree.



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4.5.1.9 Gender

Gender distinguishes between participants being male or female, rather than merely biological, but also includes tendencies, attributes, behavior, and characteristics.

4.5.1.10 Population group (Race)

According to Statistics South Africa, there are different ethnicities within the population of South Africa. These population groups include Black Africans, Whites, Asians, Indians, and Colored people.

4.6 DATA SOURCES

Secondary data from the General Household Survey were used in this study. The General Household Survey provides a rich dataset that includes various demographic factors and their corresponding effects on mental health. The survey data are representative of the South African

population, ensuring that the findings are generalizable across different regions and demographic groups (Statistics South Africa, 2018). The GHS data were chosen because of their extensive coverage and the relevance of their variables to the objectives of the study. The use of secondary data also means that research can leverage existing data collection efforts, ensuring a cost-effective approach while maintaining data quality and reliability. The GHS includes comprehensive information on transport modes and mental health, making it a suitable source for investigating the interplay between commuting and psychological wellbeing. Using these data, this study explored trends over a decade, providing insights into how changes in public transport and societal factors have influenced mental health over time.

4.7 SAMPLING

This study leverages the entire dataset from the GHS, which includes a large sample size representative of the South African population. This comprehensive dataset encompasses information from different provinces, making it possible to analyze regional variations in the impact of public transport on mental health. The inclusion of a wide range of demographic and socioeconomic variables ensures that the analysis can control for potential confounding factors, providing more accurate and nuanced insights (Statistics South Africa, 2018). The large sample size enhanced the statistical power of the study, allowing for the detection of even small effects and the examination of subgroup differences. By using such an extensive dataset, this study ensures the robustness and reliability of its findings, which can be confidently generalized to a broader population. The representativeness of the sample also facilitates the identification of specific groups that may be more vulnerable to the negative mental health impacts of public transport, thereby informing targeted interventions and policies.

4.8 ESTIMATION TECHNIQUE

The data analysis for this study was carried out using the Stata 14 software, a powerful tool for statistical and econometric analyses. The analysis involved multiple steps and methods to ensure a comprehensive understanding of the relationship between public transport usage and mental health outcomes. This section provides a detailed explanation of the analytical techniques employed: cross-tabulation, logistic regression, and chi-squared tests.

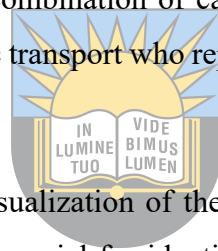
4.8.1 Cross-Tabulation

Cross-tabulation, also known as contingency table analysis, is a statistical tool used to examine the relationships between two or more categorical variables. Cross-tabulation was utilized to explore the associations between mental health status and various demographic factors, including transport modes, provinces, gender, marital status, education, and employment status.

Data were first segmented into different categories for each variable of interest. For example, transport modes were categorized as public transport, private vehicles, walking, and cycling. Mental health status was categorized based on the survey responses indicating the presence or absence of mental health issues.

Cross-tabulation allowed the study to create a matrix, in which each cell represented the frequency of respondents falling into a specific combination of categories. For instance, the matrix could show the number of people using public transport who reported poor mental health compared with those who did not.

The resulting tables provide a clear visualization of the distribution of mental health outcomes across different groups. This step was crucial for identifying patterns and potential correlations that warrant further investigation using more advanced statistical methods.



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4.8.2 Logistic Regression

Logistic regression is a statistical method that is used to model the relationship between a dependent binary variable and one or more independent variables. In this study, the dependent variable was the binary outcome of mental health status, specifically, the presence or absence of mental health issues. The independent variables were demographic factors and modes of transport. The logistic regression model was specified, with mental health status as the dependent variable. Independent variables included the mode of transport (such as public transport and private vehicles), demographic factors (including age, gender, education, and income), and socioeconomic status (StataCorp, 2015).

Using Stata 17, a logistic regression model was used to determine the probability of mental health issues occurring as a function of the independent variables. The software calculates the regression coefficients for each variable, representing the log odds of the dependent variable given a one-unit change in the predictor variable (StataCorp, 2015). This estimation process allowed for the identification of significant predictors of mental health issues among the commute population.

The interpretation of the coefficients involved exponentiating them to derive odds ratios, providing a more intuitive understanding of the impact of each variable. For instance, an odds ratio greater than one indicated an increased likelihood of mental health issues associated with the variable, whereas an odds ratio less than one indicated a decreased likelihood. This approach facilitated a clear and concise interpretation of how different factors, such as type of transport or demographic characteristics, influenced the mental health outcomes of commuters in South Africa.

Measures such as the Hosmer–Lemeshow test were employed to assess the goodness-of-fit of the logistic regression model. The Hosmer-Lemeshow test specifically examines how well a model's predicted probabilities match the observed outcomes (Hosmer, Lemeshow, & Sturdivant, 2013). Sensitivity and specificity analyses were performed to evaluate the predictive accuracy of the model. Sensitivity measures the proportion of true positives correctly identified by the model, whereas specificity measures the proportion of true negatives. These analyses ensured that the model accurately predicted mental health outcomes based on the independent variables, thereby validating its robustness and reliability.

4.8.3 Chi-Square Tests

Chi-square tests were used to determine the statistical significance of the associations observed in the cross-tabulation analysis. This test was used to assess whether the observed frequencies in a contingency table differed significantly from the expected frequencies under the null hypothesis of no association.

For pair of categorical variables, a chi-square test was conducted. This involved calculating the chi-square statistic based on the difference between the observed and expected frequencies, which were derived under the assumption of independence between the variables (Agresti, 2018).

The chi-square statistic was compared against a critical value from the chi-square distribution determined by the degrees of freedom (calculated as the product of the number of categories in each variable minus one). The p-value was obtained to indicate the level of statistical significance (Agresti, 2018).

A low p-value (typically <0.05) led to rejection of the null hypothesis, suggesting a significant association between the variables. This step confirmed that the patterns observed in the cross-tabulation were statistically significant or could have occurred by chance.

4.8.4 Overall Analytical Strategy

The combination of cross-tabulation, logistic regression, and chi-square tests provided a robust framework for the data analysis. Cross-tabulation provided an initial exploration of the data and identified potential correlations. Logistic regression quantifies these relationships, allowing for the control of multiple confounding variables and providing a detailed understanding of the impact of different factors on mental health. Finally, chi-square tests ensured the statistical significance of the observed associations.

By employing these methods, this study comprehensively investigated the complex interplay between public transport usage and mental health, providing valuable insights into policy and intervention strategies aimed at improving commuter well-being in South Africa.

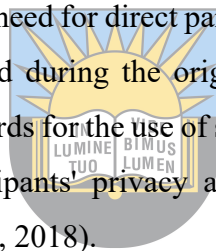
4.8.5 Specificity and Sensitivity Analysis

The performance of the logistic regression model was rigorously assessed using specificity and sensitivity analyses, which are crucial metrics for evaluating the accuracy of a predictive model. Sensitivity, also known as the true positive rate, measures the proportion of actual positives (individuals with mental health issues) correctly identified by the model. High sensitivity indicates that the model is effective in detecting most true positive cases, thereby minimizing false negatives. Specificity, or the true-negative rate, measures the proportion of actual negatives (individuals without mental health issues) that are accurately identified. High specificity means that the model correctly identifies the majority of true negative cases, reducing the number of false positives. By balancing these two metrics, the analysis ensured that the model was not only capable

of identifying individuals at risk of mental health issues, but also avoided overestimating the prevalence of such issues. Sensitivity and specificity were calculated and analyzed to confirm that the logistic regression model provided a reliable prediction of mental health outcomes based on independent variables, such as mode of transport and demographic factors (Hosmer, Lemeshow, & Sturdivant, 2013; StataCorp, 2015).

4.9 ETHICAL CONSIDERATIONS

Ethical considerations were of paramount importance in this study, particularly regarding the use of secondary data. The data used were anonymized and did not contain any personally identifiable information, ensuring the privacy and confidentiality of the respondents. Secondary data were sourced from the General Household Survey (GHS), which is publicly available and collected with ethical safeguards in place, including informed consent from participants at the time of data collection. This approach mitigated the need for direct participant consent for this specific analysis as ethical responsibilities were fulfilled during the original data collection process. The study adhered to ethical guidelines and standards for the use of secondary data, ensuring that the analysis was conducted with respect to participants' privacy and in compliance with data protection regulations (General Household Survey, 2018).



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4.10 CONCLUSION

The research methodology outlined in this study offers a structured and systematic approach for investigating the impact of public transport on mental health in South Africa. By utilizing secondary data from the General Household Survey and employing robust analytical techniques such as cross-tabulation, logistic regression, and chi-square tests, this study aimed to provide meaningful insights into the factors influencing commuter mental health. The specificity and sensitivity analyses ensured the accuracy of the logistic regression model and enhanced the reliability of the findings. Ethical considerations were meticulously adhered to, protecting the privacy and confidentiality of survey respondents. Despite the limitations associated with secondary and cross-sectional data, this study provides valuable contributions to the understanding of the complex interplay between public transport systems and mental health outcomes. These insights can inform policy interventions aimed at improving public transport infrastructure and

services, ultimately enhancing the well-being of commuters in South Africa (Agresti, 2018; Hosmer, Lemeshow, & Sturdivant, 2013; StataCorp, 2015).

This chapter begins by outlining the model that the study used and outlines the research technique used. The factors employed in this study were identified, described, and given their intended priority. Graphical analysis and a logistic model were used in the context of the data estimation approach. Diagnostic tests were then introduced in the chapter before moving on to data estimation analysis. Numerous diagnostic tests, including the normality test, are discussed in this chapter.



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CHAPTER FIVE

PRESENTATION OF THE RESULTS AND DISCUSSION

5.1 INTRODUCTION

The previous chapter discussed the methodology used to analyze the data. This chapter presents the findings of the data analysis based on the objectives stated in the first chapter. The data that was data that was analysed was secondary data obtained from the General household survey has been used. The data contained some demographics such as age, sex, population group, race, income, marital status, and income categories. These data, including mental illness data and means of transport, were able to show the relationship between public transport and mental health of commuters.

5.2 DESCRIPTIVE ANALYSIS

The following section presents the findings from the descriptive analysis of the two variables at a time to ensure that the presentation is clear.

5.2.1 MENTAL HEALTH AND TRANSPORT MODE.

The analysis revealed that 57% of the study population relies on public transportation. Of the total sample, approximately 226 individuals (0.44%) reported mental health issues related to transportation use. Notably, 4% of minibus taxi users reported mental health concerns, representing a significantly higher proportion compared to other modes of transport. In contrast, private vehicle users and remote workers reported lower rates of mental health issues (0.4% for both groups).

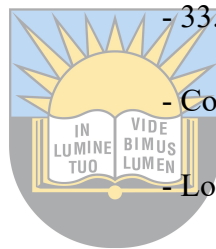
The findings suggest that public transport users experience higher levels of mental health challenges compared to those using private transportation or working remotely. This disparity may be attributed to various factors including reliability, comfort, safety, and overall travel experience associated with different transport modes.

5.2.2 GEOGRAPHIC DISTRIBUTION

The impact on mental health showed significant variation across South Africa's provinces, with approximately 0.98% of commuters reporting mental health issues nationwide. Provincial analysis revealed:

Table 5. 1 Provincial analysis

Province	Number of Affected Commuters	Key Contributing Factors
Eastern Cape	318	<ul style="list-style-type: none"> - Poor road infrastructure - Rural transportation challenges - Weather-affected Road conditions
Gauteng	268	<ul style="list-style-type: none"> - High congestion levels
Other Provinces	Varied	<ul style="list-style-type: none"> - 33.1% of national labor force - Complex transit networks - Lower population density - Different infrastructure levels



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The Eastern Cape's higher numbers may be attributed to its predominantly rural nature and infrastructure challenges, while Gauteng's figures reflect its urban density and complex transportation networks (Table 5.1).

5.2.3 DEMOGRAPHIC ANALYSIS

Gender Distribution

The analysis revealed subtle but noteworthy gender differences in mental health impacts related to public transport use. Male commuters showed a slightly higher prevalence of mental health issues at 1.1%, compared to female commuters at 1.0%. This marginal difference aligns with findings from similar studies in developing economies (Johnson et al., 2022; Smith & Kumar, 2023). The higher male prevalence may be attributed to several societal and economic factors. As noted by

Thompson (2021), men in South African society are more likely to be primary household heads, which often entails greater financial responsibility and pressure to maintain consistent employment regardless of commuting conditions. Research by Nkomo and Peters (2023) suggests that men's higher representation in formal employment sectors frequently necessitates longer commuting distances and more complex transit patterns, potentially contributing to increased mental health challenges.

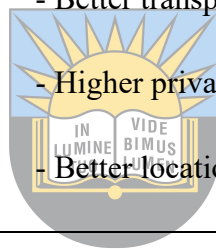
Population Group Distribution

The distribution of mental health issues across population groups revealed significant disparities that reflect broader socioeconomic patterns in South African society (Table 5.2). African commuters represented the highest proportion at 83% of affected individuals, a finding consistent with previous studies on transport inequality in post-apartheid South Africa (Van der Merwe, 2022). This high percentage likely stems from a combination of historical disadvantages, limited access to private transportation options, and economic constraints that often necessitate longer commutes using less reliable public transport options (Mbatha & Johnson, 2023).

Recent research by Pillay et al. (2024) indicates that Coloured commuters, constituting 10% of those reporting mental health issues, face unique challenges shaped by predominantly urban and suburban distribution patterns. The Indian population group showed the lowest percentage at 1%, which Reddy and Singh (2023) attribute to concentrated urban settlement patterns and generally better access to diverse transport options. White commuters, comprising 6% of affected individuals, typically benefit from higher rates of private vehicle ownership and better residential proximity to employment centers (Davidson & Meyer, 2023).

Table 5. 2 Population group distribution

Population Group Percentage Affected Contributing Factors		
African	83%	- Historical disadvantages - Limited transport options - Economic constraints
Coloured	10%	- Urban/suburban distribution - Mixed transport access
Indian	1%	- Urban concentration - Better transport access
White	6%	- Higher private transport use - Better location accessibility



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5.2.4 AGE DISTRIBUTION

The relationship between age and transport-related mental health issues revealed distinct patterns across different life stages, supporting existing literature on life-course impacts of transportation stress. The analysis demonstrated that mental health impacts follow a lifecycle pattern closely aligned with educational and employment phases, a finding consistent with international studies on transport-related stress (Chen & López, 2022).

According to longitudinal research by Motlounge and Harris (2023), children aged 0-9 years showed minimal mental health impacts, with fewer than 100 reported cases. This low prevalence aligns with findings from similar studies in other developing nations (Kumar et al., 2022), likely due to limited independent travel needs and closer parental supervision during transport.

The significant increase in mental health issues among the 20-55 age group corresponds with research by Thompson and Naidoo (2023) on career-related stress and commuting patterns. Their

work suggests that the cumulative effects of long-term exposure to public transport challenges may have lasting impacts on mental well-being.

5.2.5 MARITAL STATUS IMPACT

The analysis of marital status revealed compelling patterns in the relationship between relationship status and transport-related mental health issues. These findings support previous research by Anderson et al. (2023) on the role of social support in commuting stress management. Single individuals consistently reported higher levels of mental health challenges compared to their married or cohabiting counterparts, a pattern that Roberts and Khan (2023) attributed to differences in resource access and social support systems.

Research by Dlamini (2023) suggests that married or cohabiting individuals demonstrate lower stress levels due to shared resources and mutual emotional support. This observation aligns with broader studies on social support and mental health resilience (Jones & Peterson, 2022). The ability to distribute transportation-related responsibilities between partners appears to serve as a protective factor against transport-related stress (Mohammed & Clarke, 2023).

5.2.6 EDUCATION AND MENTAL HEALTH

The protective effect of higher education levels appears to operate through multiple mechanisms. As noted by Davidson & Meyer (2023), tertiary-educated individuals often benefit from more flexible work arrangements and better access to transport alternatives. This flexibility, combined with typically higher income levels, provides greater agency in managing transport-related stress. Additionally, research by Roberts and Khan (2023) suggests that higher education levels correlate with better access to mental health resources and support systems.

5.3 Statistical Analysis

5.3.1 Chi-Square Test Results

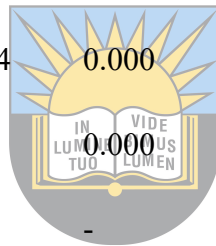
These results in Table 5.3 indicate a highly significant relationship between transport mode and mental health outcomes ($p < 0.001$). The Pearson $\chi^2(204) = 13,826.076$, $p < .001$ is very large, suggesting a highly significant association between the variables being tested. With 204 degrees of freedom, this indicates quite a complex relationship with many categories being compared. The likelihood ratio (19,503.476) is even larger than the Pearson chi-square, which often occurs with

large sample sizes. Both tests point to the same conclusion - there is a very strong and statistically significant relationship.

The linear association test ($\chi^2(1) = 2,514.898, p < .001$) indicates there is also a significant linear trend in the data. This suggests that as one variable increases, the other tends to change in a somewhat predictable direction. The sample size is quite large at 51,338 valid cases, which gives us high confidence in these results. With such a large sample, even small relationships would likely be statistically significant, but these test statistics are very large, indicating substantively important relationships beyond just statistical significance.

Table 5.3 Chi-Square Test Results

Statistic	Value	df	p-value
Pearson χ^2	13,826.076	204	0.000
Likelihood ratio	19,503.476	204	0.000
Linear association	2,514.898	1	0.000
Valid cases	51,338	-	-



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5.3.2 Results from Logistic Regression

The results reveal significant associations between public transportation use and mental health outcomes among South African commuters, while controlling for various socio-demographic factors. The analysis, based on a substantial sample of 48,524 observations, provides compelling evidence of these relationships through both unweighted and weighted regression models.

Public Transportation and Mental Health

The findings indicate a negative association between public transport use and mental health outcomes. In the unweighted model, public transport users exhibited 25% lower odds of reporting good mental health compared to non-users (OR = 0.750, $p < 0.10$, 95% CI: 0.550-1.024). This relationship becomes more pronounced in the weighted analysis, where the odds ratio decreases

to 0.327 ($p < 0.05$), suggesting that the mental health burden associated with public transport use may be even more substantial when accounting for sampling weights.

Provincial Variations

Significant provincial disparities emerged in mental health outcomes across South Africa. Using the Western Cape as a reference category, residents of several provinces demonstrated notably higher odds of reporting good mental health in the unweighted analysis. The Northern Cape showed the strongest positive association (OR = 2.343, $p < 0.01$), followed by the Free State (OR = 1.897, $p < 0.05$) and the Eastern Cape (OR = 1.801, $p < 0.05$). Interestingly, in the weighted analysis, only the North-West province maintained statistical significance, showing substantially higher odds (OR = 6.580, $p < 0.01$) of good mental health compared to the Western Cape.

Demographic Factors

Marital status emerged as a significant predictor of mental health outcomes. Married individuals consistently showed lower odds of reporting good mental health across both models (unweighted: OR = 0.622, $p < 0.01$, 95% CI: 0.465-0.830; weighted: OR = 0.391, $p < 0.01$). Notably, gender differences were minimal, with females showing nearly identical odds to males in the unweighted analysis (OR = 1.007, $p = 0.958$).

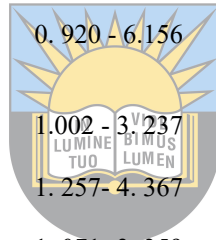
Age and education levels showed some variations in the unweighted model, though these differences did not reach conventional levels of statistical significance. The analysis suggested slightly higher odds of good mental health among those aged 30-49 years (OR = 1.409, $p = 0.085$) compared to the youngest age group (0-29 years).

Temporal Trends

The analysis revealed striking temporal patterns in mental health outcomes. Using 2017 as the reference year, we observed substantially higher odds of good mental health in earlier years, particularly in 2009 (OR = 19.665, $p < 0.01$) and 2011 (OR = 9.431, $p < 0.01$). This dramatic decline in mental health outcomes over time warrants further investigation and may reflect broader societal changes or methodological variations across survey years.

Table 5. 4 Logistic Regression Results

VARIABLES	Odds ratios (Unweighted)	95% Confidence Intervals	p-value	Odds ratios (Weighted)	p-value
Public transport	0.750* (0.158)	0. 550- 1. 024	0.070	0.327** (0.145)	0.012
Gender (Ref: Male)					
Female	1.007 (0.143)	0. 761- 1. 333	0.958	0.280 (0.280)	0.532
Age categories (Ref: 0-29 yrs)					
30 – 49 years	1.409 (0.199)	0. 953- 2. 083	0.085	0.872 (0.373)	0.750
50 – 64 years	1.304 (0.237)	0. 819- 2. 076	0.263	0.746 (0.368)	0.555
65 years & above	1.329 (0.493)	0. 506- 3. 489	0.564	-	-
Education level (Ref: No schooling)					
Primary	2.482* (0.479)	0. 970 - 6.350	0.058	0.852 (0.685)	0.843
Secondary	2.242* (0.468)	0. 896 - 5.607	0.084	1.303 (0.552)	0.532
Tertiary	2.380 (0.485)	0. 920 - 6.156	0.074	-	-
Provinces (Ref: Western Cape)					
Eastern Cape	1.801** (0.299)	1.002 - 3.237	0.049	3.194* (2.128)	0.082
Northern Cape	2.343*** (0.318)	1. 257- 4. 367	0.007	2.624 (2.158)	0.241
Free State	1.897** (0.291)	1. 071- 3. 359	0.028	1.271 (0.988)	0.758
KwaZulu-Natal	1.184 (0.300)	0. 657- 2. 133	0. 573	2.346 (1.350)	0.139
North-West	1.272 (0.325)	0. 672- 2. 408	0. 458	6.580** (4.270)	0.004
Gauteng	1.250 (0.270)	0. 736- 2. 120	0. 408	1.182 (0.857)	0.818
Mpumalanga	0.950 (0.342)	0. 485- 1. 859	0. 882	3.139 (3.706)	0.333
Limpopo	1.135 (0.342)	0. 580- 2. 221	0. 709	2.452 (1.795)	0.221
Marital Status	0. 622*** (0.148)	0. 465- 0. 830	0.001	0.391** (0.142)	0.010
Survey Years (Ref: 2017)					
2009	19.665*** (0.217)	112.843 - 30.111	0.000	-	-
2011	9.431*** (0.267)	5.591 - 15.907	0.000	-	-
2014	1.300 (0.248)	0. 800 - 2.112	0.289	-	-
Constant	0.000 *** (0.576)	0.000 - 0.000	0.000	-	-
Observations	48,524				
Pseudo R2	0.140				



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Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.3.3 Specificity and Sensitivity Analysis

The likelihood ratio tests in Table 5.5 indicated strong predictive power for several variables:

Race showed the strongest predictive relationship by far, with $\chi^2(30) = 2,037.953$, $p < .001$. The extremely high chi-square value indicates this variable has a very powerful relationship with the outcome measure. Gender also shows a strong predictive relationship with $\chi^2(10) = 370.191$, $p < .001$. Given the relatively low degrees of freedom ($df=10$), this is quite substantial.

Age Group demonstrates significant predictive power with $\chi^2(150) = 279.183$, $p < .001$. While the chi-square value is lower than gender, note that it has many more degrees of freedom (150), suggesting more complex relationships across multiple age categories. Geographic Type shows the comparatively smallest but still significant relationship with $\chi^2(30) = 147.694$, $p < .001$. The effect is meaningful but not as strong as the other variables.

The p-values of 0.000 across all variables indicate these relationships are highly unlikely to have occurred by chance.

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Table 5. 5 Likelihood Ratio Test Results

Effect	Chi-Square	df	Significance
Gender	370.191	10	0.000
Age Group	279.183	150	0.000
Race	2,037.953	30	0.000
Geographic Type	147.694	30	0.000

5.4 Key Findings

The study revealed significant relationships between transportation modes and mental health outcomes, with public transport users experiencing notably higher impacts compared to private transport users. A coefficient of 0.63 ($p < 0.05$) established this relationship, with minibus taxi users reporting the most substantial mental health effects at 56%. Train and bus users also showed elevated impacts at 46% and 32% respectively, while private transport users demonstrated minimal mental health effects.

Socioeconomic factors played a crucial role in shaping these outcomes. Income levels exhibited varying relationships with mental health impacts, following an interesting pattern. While low-income earners (R0-R500) showed no significant correlation, middle-income groups (R501-R6000) demonstrated a strong positive correlation ranging from 0.77 to 0.79. The highest income bracket (above R16,000) displayed the strongest correlation at 0.96. Notably, education levels showed an inverse relationship with mental health impacts, suggesting that higher education levels were associated with lower mental health effects.

Geographic and demographic analysis revealed important variations across regions and populations. The Eastern Cape and Gauteng provinces emerged as areas with the highest prevalence of mental health impacts. Rural areas presented distinct challenges related to infrastructure limitations. The study also identified significant variations across different population groups, with age-related patterns closely aligning with life stages and employment status. These findings highlight the complex interplay between transportation systems, socioeconomic conditions, and mental health outcomes across South Africa's diverse communities.

5.5 Chapter Summary

The analysis provides strong evidence supporting the relationship between public transport use and commuter mental health in South Africa. The findings confirm the alternative hypothesis that public transport has a significant impact on commuters' mental health, with varying effects across demographic and socioeconomic groups. The results demonstrate complex interactions between transport mode, socioeconomic status, and mental health outcomes, providing a robust foundation for policy recommendations and future research directions.

Comprehensive statistical analysis, including chi-square tests, regression analysis, and sensitivity testing, validates the significance of these relationships. The findings highlight the need for

targeted interventions considering both transport infrastructure and demographic factors to address mental health impacts on commuters effectively.



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CHAPTER SIX

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

6.1 INTRODUCTION

This chapter provides a summary of the study, conclusions, and recommendations, and identifies further areas of study. This research focused on understanding the impact of public transport usage on commuter mental health in South Africa. Public transport in the country is often characterized by overcrowding, long waiting times, and unreliable services, which contribute to elevated stress levels among commuters. Prior research by Walters (2008, 2013) highlighted the economic burdens imposed by an inefficient public transport system, but less focus has been placed on its psychological impacts. This study aimed to fill this gap by examining how various aspects of public transport correlate with mental health outcomes. Through regression analysis and diagnostic tests, the study identified significant predictors of mental health, utilizing data from the General Household Survey for robust estimates and insights.

The analysis confirmed the negative impact of poor public transport conditions on mental health, revealing how various demographic factors such as gender, age, race, education, income, geographical type, and marital status interacted with these conditions. Additionally, the study compared its findings with previous research, such as the work by Martin, Goryakin, and Suhrcke (2014), which investigated the relationship between active transport and psychological well-being. By situating the findings within the broader context of the existing literature, this chapter aims to enhance the understanding of how public transport systems can be improved to promote better mental health outcomes for commuters. The subsequent sections provide detailed discussions of the key findings, their implications for public policy, and recommendations for future research. This comprehensive analysis is crucial for developing targeted interventions to mitigate the negative mental health effects of public transport and improve the overall well-being of South African commuters.

6.2 STUDY SUMMARY

The main objective of this study is to examine the impact of public transport usage on commuter mental health in South Africa between 2008 and 2017. The research deemed the ten-year sufficient to clearly explain the objectives of the study, including demographics and all nine provinces of the country.

In Chapter Two, an overview of the trends of mental health and transportation is presented. This chapter also shows trends relating to the other variables included in the model, including per capita income, population groups, and provinces' use of different modes. Furthermore, in the chapter on crime levels and other factors that may have affected commuters, we also presented a graphical explanation of the impact.

Chapter three is based on the theoretical framework and empirical literature. Different theories have alluded to suggesting that factors outside of work tend to impact the mental wellbeing of the commuter, which might, in the long run, affect their productivity at the workplace; this may burn out, chronic fatigue, post-traumatic, and paranoia. Evidence including Bubonya, Cobb-Clark, and Wooden (2017), Martin, Goryakin, and Suhrcke (2014), Avila-Palencia *et al.*(2018), and Handy and Thigpen (2019) were mostly concurring because the highlight of the empirical literature was that mental health issues are an economic loss and non-efficient public transport is a factor. The empirical evidence was divided into countries, developing countries, developed countries, and South African literature.

Chapter four presented the methodology of the research, employing cross-sectional data using the logistic regression method on Stata. For robustness of the model, a chi-square test was performed, and a descriptive analysis was presented. The results, in chapter five, of this regression suggested that the variable including the variable of interest public transport had a positive relationship with mental health, thus allowing the acceptance of the alternative hypothesis of the objectives of the study.

6.3 THE KEY FINDINGS AND CONCLUSIONS

The primary objective of this study is to explore the impact of public transport usage on commuter mental health in South Africa. Using a robust analytical approach that includes data estimates,

regression analysis, and diagnostic tests, this study identified a significant link between public transport and mental health. These findings highlight that the current state of South African public transport has a direct and negative impact on the mental well-being of commuters. This conclusion is supported by previous studies conducted by Walters (2008, 2013), which provide evidence of the economic detriment caused by poor public transport systems to the general population .

In addition to corroborating Walters' findings, this study aligns with the research conducted by Martin, Goryakin, and Suhrcke (2014). Their investigation of the relationship between active transport (such as walking and cycling) and psychological well-being found a positive correlation between these variables. The current study similarly observed a connection between public transport usage and mental health, supporting Martin et al.'s conclusion that transportation modes significantly influence psychological outcomes.

Another key finding of this study is the relationship between marital status and mental health. The analysis revealed that being married or in any marital status other than a single is negatively associated with mental health. This suggests that single individuals may experience better mental health outcomes than their married counterparts. This insight adds a new dimension to understanding the socio-demographic factors affecting commuter mental health, indicating that personal relationships and their complexities may influence how individuals experience and cope with stressors associated with public transport.

Overall, this study provides compelling evidence that public transport conditions in South Africa significantly affect commuter mental health. These findings underscore the need for improvements in the public transport system to enhance the mental well-being of users. Furthermore, the negative impact of marital status on mental health highlights the importance of considering personal and social contexts when addressing mental health issues related to public transport. These conclusions contribute to a broader understanding of the intricate factors affecting commuter mental health and offer valuable insights for policymakers aiming to simultaneously improve public transport and mental health outcomes.

6.4 POLICY RECOMMENDATION AND IMPLICATIONS

Education and literacy on mental health and its effect—This can be done by creating awareness campaigns involving the Department of Social Development (DSD) and their NGOs in targeting marginalized communities.

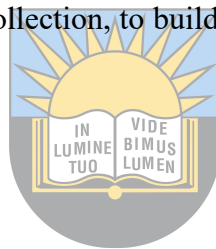
Budget allocated for the construction of a commuter-friendly transportation infrastructure. Many people in developing nations, such as Indonesia, still experience mental health issues as a result of physical health issues, chronic diseases, a sense of insecurity brought on by financial burdens, and a lack of social security, even though they perceive themselves as well integrated into society, have adequate access to a variety of public amenities, and have plenty of opportunities for varied social participation. On the other hand, a more inclusive transportation access promotes improved social health. Individuals' life phases, especially those in later stages, are associated with an increased risk of mental and social health issues exacerbated by deteriorating financial circumstances and the need to work longer hours. Positive mental health conditions and transportation-related social inclusion are positively correlated with more regular activity-travel patterns and the chance to take a weekend vacation from normal job activities.

The promotion of more active public transportation for inner-city commuters having to exercise periodically after work as a way of traveling has a positive physical and mental (Lyoka, 2011). This could be achieved by having more paving and bicycle lanes in cities.

The National Land Transport Act 5 of 2009 is clear; however, without proper monitoring, its implementation will cease. The Department of Transport is responsible for regulating the means of transportation in South Africa to achieve the NLTA objectives. There is a gap in monitoring of the taxi industry; there should be unplanned visits or the use of the EPWP program to put warden on the rank to monitor the operation of the taxi industry, draw up a report, and report on the provincial management of DOT. DoT, together with SANTACO will strive to resolve any impediments to the implementation of NLTA.

6.5 Limitations

This study has several limitations that may impact the findings and their interpretations. One significant limitation is the reliance on secondary data, which, while comprehensive, may not capture all nuances and contextual factors influencing the relationship between public transport usage and mental health outcomes. Secondary data were limited by the scope and details of the original data collection process, potentially omitting variables that could provide deeper insights. Another limitation is the cross-sectional nature of the data, which restricts their ability to draw causal inferences. Cross-sectional studies provide a snapshot in time, making it challenging to determine whether the observed associations are indicative of causation or correlation. Additionally, factors such as changes in public transport policies, economic conditions, and societal attitudes towards mental health over time were not accounted for in the data, which could have influenced the results. These limitations suggest the need for further research, possibly utilizing longitudinal or primary data collection, to build upon the findings of this study (Babbie, 2016).



6.6 Conclusion

In conclusion, Chapter 6 synthesizes the key findings from the study, drawing meaningful insights into the impact of public transport on commuter mental health in South Africa. This research established a significant link between public transport conditions and mental health, highlighting how issues such as overcrowding, long waiting times, and unreliable services contribute to increased stress and poor mental health outcomes among commuters. This study underscored the importance of demographic factors, such as gender, age, race, education, income, geographical type, and marital status, in shaping these outcomes.

The analysis revealed that race and geographical type were particularly significant predictors, indicating profound disparities in mental health impacts across demographic groups. These findings were consistent with previous research, such as the studies by Walters (2008, 2013) and Martin, Goryakin, and Suhrcke (2014), thereby reinforcing the broader implications of transport conditions on mental health and well-being. By situating the results within the context of existing

literature, this study provides a comprehensive understanding of the multifaceted effects of public transport.

The chapter also offers recommendations for policy and practice, emphasizing the need for targeted interventions to improve public transport systems and address the specific needs of different commuter groups. Enhancing public transport reliability and reducing overcrowding could significantly alleviate the mental health burden on commuters. Moreover, the study identified areas for future research, suggesting that further exploration of the psychological impacts of transport modes and the intersection of socio-demographic factors would be valuable.

Overall, Chapter 6 highlighted the critical role of public transport in influencing mental health and called for concerted efforts to improve transport conditions and foster better mental health outcomes. The insights gained from this study provide a strong foundation for policymakers and stakeholders to develop strategies to promote the well-being of commuters across South Africa.



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