



**The intersection of psychological distress and substance misuse in South Africa's youth**

**Submitted by Rikshay Ganasen**

**Student Number: 214507708**

**Thesis submitted in fulfilment of the requirements for the degree of**

**Master of Social Sciences (Clinical Psychology),**

**In the**

**DISCIPLINE OF PSYCHOLOGY**

**School of Applied Human Sciences, College of Humanities, University of KwaZulu-Natal, Pietermaritzburg, South Africa.**

**July 2024**

**Supervised by**

**Ms. Shaida Bobat  
(Supervisor)**


## DECLARATION


### THE INTERSECTION OF PSYCHOLOGICAL DISTRESS AND SUBSTANCE MISUSE IN SOUTH AFRICA'S YOUTH


This thesis was submitted as completion of the requirements for the degree of Master of Social Science (Clinical Psychology) in the Discipline of Psychology, University of KwaZulu-Natal, Pietermaritzburg, South Africa. The research reported in this thesis, except where otherwise indicated, is my original research. This research has not been previously accepted for any degree and is not currently being considered for any other degree at any other university. I declare that this Thesis contains my work except where specifically acknowledged.

Rikshay Ganasen

214507708

Signed...  ..... Date... 20 December 2023.....

Signed...  ..... Date... 29 April 2024.....

Signed...  ..... Date... 3 July 2024.....

 4 July 2024

## ABSTRACT

### THE INTERSECTION OF PSYCHOLOGICAL DISTRESS AND SUBSTANCE MISUSE IN SOUTH AFRICA'S YOUTH

Rikshay Ganasen

University of KwaZulu-Natal

**Background:** This study explored the risk factors associated with the high prevalence of psychological distress among South Africans aged 15-24. This relationship is exacerbated by alcohol and illicit drug use, particularly in vulnerable populations affected by socio-economic disparities. The research aims to identify the risk factors associated with psychological distress and substance abuse, guiding targeted, efficient, prevention-focused, and effective interventions.

**Methods:** Utilizing cross-sectional household survey data (Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey) this study focuses on a sample of 12,058 individuals (weighted to N=9 625 567) aged 15-24. The analysis employs a range of univariate regression methods to assess the relationships between demographic factors, substance use, and psychological distress, identifying key risk subpopulations within the national context.

**Results:** The findings reveal significant mediation factors such as female gender, urban residency, and lower socio-economic status. The study highlights the association between psychological distress and substance use, with notable gendered differences in the nature of distress experienced and its relation to economic factors.

**Implications and Recommendations:** The study suggests the need for comprehensive interventions addressing substance abuse, focusing on socio-economic and environmental factors predisposing youth to psychological distress. Emphasis on preventive measures, mental health support services, and tackling mental health stigma is crucial for improving social support structures and healthcare accessibility.

**Keywords:** *Mental Health, Psychological Distress, K10, AUD, Illicit Substance Use, South African Youth, SABSSM-V, Social Inequalities, Substance Abuse, Prevention-focused, Gender, Race, Unemployment, Trauma, Department of Health, Mental Health Care Act, World*

*Health Organization Mental Health Plan, Healthcare Accessibility, United Nations Sustainable Development Goals.*

Signed... [REDACTED] ..... Date... 20 December 2023.....

Signed... [REDACTED] ..... Date... 29 April 2024.....

Signed... [REDACTED] ..... Date... 3 July 2024.....

## **DEDICATION**

This work is a humble offering to all who have shaped its creation. It stands as a symbol of collective effort, a bridge between academic inquiry and societal impact. May it honour the voices that yearn to be heard and the stories that deserve to be told. Together, we move forward, embracing the challenges and opportunities that lie ahead, committed to building a more just and fair future for all South Africans

A specific mention to the youth of South Africa, whose resilience and potential are the cornerstone of our nation's future. This work is a testament to our duty to protect them.

To those grappling with the challenges of poverty, mental health challenges, substance dependence, and trauma, your experiences and struggles are acknowledged, validated, and critically reflected upon in each these pages. I extend my deepest gratitude to the community that has nurtured and moulded me. This work is not just a product of individual effort but a culmination of collective wisdom and support. Every interaction within this community has contributed to my growth, both personally and academically. Particularly with my parents, their embodiment of stability, wisdom, and humility amidst life's complexities has always been by most treasured asset.

## **ACKNOWLEDGEMENTS**

This study utilizes data collected by the Human Sciences Research Committee (HSRC) in 2017 as the Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (Simbayi et al., 2019). Acknowledgements to the HSRC's research team for the survey design, the interviewing, data collection, and recording of data. Led by Prof. Leickness Simbayi, the HSRC's project was published in collaboration with the South African Department of Health, the United Nations Children's Fund (UNICEF), The Joint United Nations Programme on HIV/AIDS (UNAIDS); the National Institute for Communicable Diseases (NICD), Centres for Disease Control and Prevention (CDC), the University of Cape Town (UCT), and the South African Medical Research Council (SAMRC), respectively (Simbayi et al., 2019). University of KwaZulu Natal supplied the software licence for IBM SPSS 27.0.

## TABLE OF CONTENTS

Dedication .....	iv
TABLE OF CONTENTS .....	vi
List of Figures .....	ix
List of Tables .....	x
List of Abbreviations Used: .....	x
Definitions of Key Terms .....	xii
<i>Stages of the Lifespan</i> .....	xii
<i>Treatment Gap</i> .....	xii
<i>Race Groups</i> .....	xii
<i>Psychological Distress</i> .....	xii
<i>Alcohol Use Disorder (or Harmful, Hazardous, or Dependant Alcohol Use)</i> .....	xii
<i>Illicit Substance Use</i> .....	xiii
CHAPTER 1: INTRODUCTION .....	1
<b>Background and Context</b> .....	<b>1</b>
<b>Significance of the Study:</b> .....	<b>5</b>
<b>Objectives of Study:</b> .....	<b>6</b>
CHAPTER 2: THEORETICAL FRAMEWORK .....	9
CHAPTER 3: LITERATURE REVIEW .....	13
<b>The Cost of Mental Health Care</b> .....	<b>13</b>
Mental Illness and Psychological Distress .....	14
Substance Use Disorder (SUD) .....	15
Alcohol Use Disorder (AUD) .....	16
<b>Risk Factors and Vulnerable/Marginalized Groups</b> .....	<b>18</b>
Biological Risk Factors: .....	20
Psychosocial risk factors .....	25
<b>The Treatment Gap</b> .....	<b>32</b>
<b>Moving Forward</b> .....	<b>34</b>
CHAPTER 4: METHODOLOGY .....	36
<b>Data Collection (Simbayi et al., 2019)</b> .....	<b>36</b>
<b>Sampling Approach (Simbayi et al., 2019)</b> .....	<b>37</b>
<b>Survey Design (Simbayi et al., 2019)</b> .....	<b>37</b>

<b>Data Management</b> .....	<b>38</b>
<b>Data Analysis</b> .....	<b>39</b>
<i>Contingent Variables</i> .....	39
<i>Predictors and Covariates</i> .....	41
<i>Data Analysis Process</i> : .....	42
<b>Characteristics of the Sample Studied</b> .....	<b>45</b>
<b>Methodological rigour</b> .....	<b>50</b>
<b>Ethical Considerations</b> .....	<b>51</b>
<b>CHAPTER 5: RESULTS</b> .....	<b>54</b>
<b>Part A: The geodemographic determinants of a positive screening for Alcohol Use Disorder (AUD) in the youth of South Africa</b> .....	<b>54</b>
<i>Research Question 1a: What are the geodemographic risk-factors associated with AUD in the youth of South Africa?</i> .....	54
<i>Research Question 1b: What are the geodemographic risk factors of AUD in the youth of South Africa mediated by the recent use of illicit substances?</i> .....	55
<i>Research Question 1c: What are the geodemographic risk factors of AUD in the youth of South Africa mediated by the presence of Psychological Distress?</i> .....	56
<b>Part B: The geodemographic determinants for the self-reported use of Illicit Substances in the last 30 days in the youth of South Africa</b> .....	<b>57</b>
<i>Research Question 2a: What are the geodemographic risk-factors associated with the recent engagement with illicit substances in the South African youth?</i> .....	57
<i>Research Question 2b: What are the geodemographic risk-factors associated with the recent engagement with illicit substances for the South African youth with a positive screening for Alcohol Use Disorder?</i> .....	59
<i>Research Question 2c: What are the geodemographic risk-factors associated with the recent engagement with illicit substances for the South African youth mediated by the presence of psychological distress?</i> .....	60
<b>Part C: The geodemographic determinants of a positive screening for psychological distress in the youth of South Africa</b> .....	<b>61</b>
<i>Research Question 3a: What are the geodemographic risk-factors associated with the experience of psychological distress?</i> .....	61
<i>Research Question 3b: What are the geodemographic risk factors of symptoms of psychological distress mediated by a positive screening for Alcohol Use disorder?</i> .....	64
<i>Research Question 3c: What are the geodemographic risk factors of psychological distress symptoms mediated by the recent use of illicit substances?</i> .....	65
<i>Research Question 3d: What are the geodemographic risk-factors associated with the engagement with a positive screening for alcohol use disorder, the recent use of illicit substances, and the experience of symptoms of psychological distress respectively?</i> .....	66
<b>Part D: The relationship between AUD, illicit drug use, and psychological distress</b> .....	<b>70</b>

<i>Research Question 4: What are the relationship between recent illicit substance use, risky drinking, and psychological distress in the South African youth?</i> .....	70
CHAPTER 6: DISCUSSION.....	72
Chapter 7: Conclusion.....	79
<b>Limitations</b> .....	<b>80</b>
<b>Recommendations</b> .....	<b>81</b>
Reference List.....	85
<b>APPENDIX A</b> .....	<b>119</b>
<b>APPENDIX B</b> .....	<b>120</b>
<b>APPENDIX C</b> .....	<b>192</b>
<b>APPENDIX D</b> .....	<b>197</b>
<b>APPENDIX E</b> .....	<b>198</b>
<b>Research Question: 1a</b> .....	<b>198</b>
<i>Parameter Estimates</i> .....	198
<i>Tests of Between-Subjects Effects:</i> .....	212
<b>Research Question: 1b and 1c</b> .....	<b>213</b>
<i>Parameter Estimates</i> .....	213
<i>Tests of Between-Subjects Effects:</i> .....	224
<b>APPENDIX F</b> .....	<b>224</b>
<b>Research Question: 2a</b> .....	<b>224</b>
<i>Parameter Estimates</i> .....	224
<i>Tests of Between-Subjects Effects:</i> .....	243
<b>Research Question: 2b and 2c</b> .....	<b>244</b>
<i>Parameter Estimates</i> .....	244
<i>Tests of Between-Subjects Effects:</i> .....	253
<b>APPENDIX G</b> .....	<b>254</b>
<b>Research Question: 3a</b> .....	<b>254</b>
<i>Parameter Estimates</i> .....	254
<i>Tests of Between-Subjects Effects</i> .....	256
<b>Research Question: 3b and 3c</b> .....	<b>258</b>
<i>Tests of Between-Subjects Effects</i> .....	258
<i>Parameter Estimates</i> .....	258
<b>Research Question: 3d</b> .....	<b>272</b>
<i>Parameter Estimates</i> .....	272
<i>Tests of Between-Subjects Effects:</i> .....	280

**List of Figures**

**Figure 1** Intersectionality of factors driving vulnerability ..... 10

**Figure 2** Social Determinants, Poverty, and South African Health Care ..... 11

**Figure 3** Relationship between substance use and Psychological Distress..... 64

**Figure 4** Age and Gender Distribution of illicit drug users with Psychological Distress ..... 48

**Figure 5** Age and Gender Distribution of polysubstance users with Psychological Distress ..... 49

**Figure 6** Age and Gender Distribution of non-AUD and non-illicit drug users with Psychological Distress..... 48

**Figure 7** Age and Gender Distribution of AUD with Psychological Distress ..... 49

**Figure 9** Parameter Estimates RQ1a ..... 188

**Figure 10** Tests of Between Subjects Effects RQ1a ..... 206

**Figure 11** Parameter Estimates RQ1b & c ..... 207

**Figure 8** Correspondence indicating Permission to Dataset ..... 197

**Figure 12:** Test of Between Subjects RQ2a..... 199

**Figure 14** Test of Between Subjects RQ1b & 1c ..... 243

**Figure 13:** Parameter Estimates RQ1c & 1b..... 222

**Figure 15** Parameter Estimates RQ2b & 2c ..... 244

**Figure 16:**Test Between Subjects RQ 2b & 2c ..... 253

**Figure 17** Parameter Estimates RQ3a ..... 254

**Figure 18** Test of Between Subject Effects RQ3a ..... 257

**Figure 19** Test of Between Subject Effects RQ3b and c.....257

**Figure 20** Parameter Estimates RQ3b and 3c ..... 258

**Figure 21** *Parameter Estimates RQ3.4*.....75

**Figure 22** *Test for Between Subjects RQ3.4* ..... 258

**Figure 23** Research Questions: Venn Diagram of Proportion of Variance vs Predictor ..... 43

## List of Tables

<b>Table 1</b> <i>Sample Characteristics</i> .....	45
<b>Table 2</b> <i>Sample Characteristics: Geolocation and Province of residence</i> .....	47
<b>Table 3</b> <i>Prevalence across Racial and Gendered demographics in Adjusted Sample</i> .....	47

## LIST OF ABBREVIATIONS USED:

ANOVA:	Analysis of Variance
AOD:	Alcohol and Other Drug
APA:	American Psychiatric Association
ASSIST:	Alcohol, Smoking, and Substance Involvement Screening Test
AUD:	Alcohol Use Disorder
AUDIT:	Alcohol Use Disorders Identification Test
GEOTYPE:	Geolocation type (Rural vs Urban)
HED:	Heavy-Episodic Drinking
HHDA use:	Hazardous, Harmful, or Dependent Alcohol Use; also known as Risky Drinking
HIV:	Human Immunodeficiency Virus
HLEA:	Highest Level Education Achieved
HPCSA:	Health Professional Council of South Africa
HSRC:	Human Sciences Research Council
IBM:	International Business Machines Corporation).
ICD-11:	11th Revision of the International Classification of Diseases
K10:	Kessler Psychological Distress Scale, psychological distress
PSU:	Polysubstance Use
PTSD:	Posttraumatic Stress Disorder
SABSSM-V:	The Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey
SACAP:	South African College of Applied Psychology
SACENDU:	South African Community Epidemiological Network on Drug Use
SADAG:	South African Depression and Anxiety Group

SAL:	Small Area Layer
SAMRC:	South African Medical Research Council
SANHREC:	South African National Health Research Ethics Council
SDGs:	Sustainable Development Goals
SES:	Socioeconomic Status
SPSS:	Statistical Product and Service Solutions
StatsSA:	Statistics South Africa
SUD:	Substance Use Disorder
UN:	United Nations
UNICEF:	United Nations Children's Fund
UNODC:	United Nations Office on Drugs and Crime
UNSDG:	United Nations Sustainable Development Goals
WHO:	World Health Organization
WMHD:	World Mental Health Day

## DEFINITIONS OF KEY TERMS

### *Stages of the Lifespan*

As defined in United Nations General Assembly (1995) the term “*youth*” refers to persons between the ages of 15 years-old and 24 years-old.

United Nations Programme on HIV/AIDS (UNAIDS) further defines “*child*” as any persons under the age of 18 years-old while an “adolescent” refers to persons between 10-years-old and 19-years-old (2021).

“*Young persons*” refers to any persons between the ages of 10 years-old and 24 years-old (UNAIDS, 2021).

### *Treatment Gap*

The term “*treatment gap*” refers to a ratio between the number of those who can obtain adequate treatment strategies” and the overall number of people sufferers of a particular illness (Kohn et al., 2004).

### *Race Groups*

The concept of “*race groups*” is associated with Apartheid regime’s racial classification system (Kagee & Price, 1995) of categorizing individuals into either *African*, *Coloured*, *Indian*, or *White* ethnic groups has had an enduring impact on the mental health of South Africans (Burns, 2015; Jackson et al., 2010; Maphumulo & Bhengu, 2019). These ethnic groups have since been socially homogenised and have developed distinct and salient group identities (Khalfani & Zuberi, 2001).

### *Psychological Distress*

This study aligns its conceptualisation of “psychological distress” with the American Psychological Association (2018); as a spectrum of symptoms associated with mental distress in the form of either emotional or physical pain experienced as a response to daily stressors (Mirowsky & Ross, 2002).

### *Alcohol Use Disorder (or Harmful, Hazardous, or Dependant Alcohol Use)*

Harmful, Hazardous, or Dependant Alcohol Use (HHDA use), or risky drinking behaviour, in this thesis is conceptualised as a positive screening for Alcohol Use Disorder (AUD) and is quantified using a questionnaire and scale derived from the Alcohol Use Disorders Identification

Test (AUDIT) (American Psychology Association, 2013; Babor et al., 2001; Saunders et al., 1993).

### ***Illicit Substance Use***

Illicit substance use is the consumption of drugs that is prohibited by local law or used in a manner that deviates from medical or social norms. They include cannabis, opioids, cocaine, amphetamines, ecstasy, hallucinogens, nyaope/whoonga (Simbayi et al., 2019) and inhalants (United Nations Office on Drugs and Crime, 2022).

## CHAPTER 1: INTRODUCTION

### Background and Context

The mental health of youths in lower- and middle-income countries (LMIC) has emerged as “a neglected yet pressing issue in global development” (Mokdad et al., 2016, p. 2383). There is a call to governments in LMICs for urgent and effective interventions to mitigate projected costs to future population health and global economic development (Mokdad et al., 2016).

The years of adolescence and early adulthood, mark a crucial period of self-discovery during which individuals tend to establish their personal identity while also forming long-term behavioural patterns (Cooper et al., 2015). It is estimated that the behavioural patterns that endure from adolescence and young adulthood can explain more than 70% of premature morbidity globally (Cooper et al., 2015). According to Statistics South Africa (StatsSA), there are almost ten million individuals in this age-demographic, accounting for almost 18% of the overall population of the country (2023). Premature lives lost and years lost due to disability attributable to substance use and/or mental illness have been increasing in South Africa (Erskine et al., 2015; Probst et al., 2017, 2018) particularly for youths (Jörns-Presentati et al., 2021; Matzopoulos et al., 2022) marking a public health care emergency (Sorsdahl et al., 2023). This crisis is further intensified for the youth of South Africa by the severe shortage of child and adolescent mental health services available to the public (Docrat et al., 2019; Sorsdahl et al., 2023), the chronic exposure to traumatic experiences (Cooper et al., 2015), and substance use (Ahmed & Jewkes, 2018). This trajectory is expected to persist and the trend of the increasing burden of mental illness and substance misuse in this age demographic is projected to continue to rise (Morar et al., 2024; Lund et al., 2018) despite various efforts by the government (Department of Health, 1997; 2002; 2003; 2012; 2013; 2017; 2023) to mitigate its influence (Sorsdahl et al., 2023). The situation is especially concerning for adolescents and children (Sorsdahl et al., 2023). It is estimated that 27% of adolescents in sub-Saharan Africa meet the diagnostic criteria for depressive disorders, 30% with anxiety disorders, and 41% with severe emotional or behavioural problems at any given time (Jörns-Presentati et al., 2021). Compared to the thirty or more child and adolescent psychiatrists practicing independently across South Africa who service the private sector, only seven centres over three provinces (Gauteng, KwaZulu-

Natal, and the Western Cape) provide public sector psychiatric services for persons under the age of 18 (Mokitimi et al., 2019).

In the context of South Africa's, and other LMIC's, healthcare system, the World Health Organization (WHO) and the United Nations (UN) play crucial roles in guiding principles and policies. Their perspectives are particularly relevant in understanding and addressing the challenges faced by vulnerable communities. The WHO and the UN advocate for mental health care systems that go beyond just treating illnesses, stressing the importance of understanding the broader social, economic, and environmental determinants of mental health. As a result, the theoretical approaches and literature discussed have been founded on principles endorsed by WHO and UN respectively.

South Africa's historical context, characterized by systemic oppression and entrenched socioeconomic disparities (Leibbrandt et al., 2012), demonstrably shapes its current social and health landscapes (Jewkes et al., 2010; Petersen & Lund, 2014; Probst et al., 2017). These historical legacies cast a long shadow in the forms of pervasive inequalities, including limited access to essential mental health services for a significant portion of the population (Docrat et al., 2019; Harriman et al., 2021). Although formally abolished, the Apartheid regime and classification system of race groups continues to shape social, economic, and political structures, influencing access to resources and opportunities upon racial lines (Khalfani & Zuberi, 2001). This classification has been closely linked to mental health disparities (Mayosi & Benatar, 2014), with non-white populations, particularly in rural areas and informal settlements (Mngoma & Ayorinde, 2023).

Craig and colleagues (2022) estimate that more than a quarter of South Africans are currently experiencing clinically significant symptoms of psychological distress. The presence of clinically significant levels of psychological distress, a spectrum of symptoms associated with mental distress in the form of either emotional or physical pain experienced as a response to stressors (Mirowsky & Ross, 2002), across the youth of South Africa is particularly racialized (Mngoma & Ayorinde, 2023), gender-biased (Bonner et al., 2021) and concentrated in urban residential areas (Ncetakalo et al., 2023). Psychological distress is further associated with Alcohol Use Disorder (AUD) (Pengpid et al., 2021), illicit substance use (Ahmed & Jewkes, 2018), and a wide array of other risky behaviours and social determinants. Variance in AUD in youths of South Africa is estimated to account for 27.83% of the nation's inequalities in health

leading to poor healthcare adherence, effectiveness, and accessibility (Mukong et al., 2017). It is further estimated that South Africa 16.5% of adults meet diagnostic criteria for depressive disorders, anxiety disorders, or substance-related disorders within a given 12-month period and 30.3% of South Africans have a lifetime prevalence of experiencing a common mental health disorder (Jack et al., 2014).

**Problem Statement:**

Psychological distress is associated with racial differences (Harimann et al., 2021; Jackson et al., 2010), gender differences (Peltzer & Phaswana-Mafuya, 2018; Seedat et al., 2009), and geolocational disparities (Carney et al., 2017; Myers et al., 2023). Other factors that influence the presence of psychological distress in young South Africans include their particular province of residence, race group (Mngoma & Ayonrinde, 2023), gross monthly income (Mngoma & Ayonrinde, 2023), and the highest level of education achieved (Mngoma et al., 2021). There is a growing concern about the intersection of psychological distress and substance use among South African youth, a phenomenon gaining attention as a national healthcare crisis (Tindimwebwa et al., 2021). Individuals in South Africa aged 15-24 who positively screen for AUD (Probst, et al., 2018), and those who have recently engaged in illicit substance use (Wechsberg et al., 2010; Zuma et al. 2020) are more likely to experience psychological distress.

The WHO and United Nations (UN) emphasize the detrimental impact of pathologizing behaviours and conditions that stem from systemic social inequalities and injustices (WHO, 2020; UN, 2016; 2022). This approach is crucial to avoid misattributing the consequences of poverty, unemployment, and violence as individual pathologies (and the responsibility of the sufferer) rather than consequences of broader systemic problems. Although decentralizing the healthcare system might compromise direct capacity building through interventions like hospital-based psychotherapy, it could significantly increase outreach and empower a larger population by providing them with the resources and accessibility to services they need (Docrat et al., 2019). This indirect approach, while not directly addressing individual coping skills, can still be a powerful tool for vulnerability reduction by equipping individuals with the tools and resources they need to navigate life's challenges (Schneider et al., 2016). Due to poor accessibility and provision, the majority of youths fall within the nation's mental health-care's treatment-gap (Docrat et al., 2019). As a result, illicit drug use and risky alcohol consumption have become

maladaptive strategies to manage stress, anxiety, and depression, creating a vicious cycle that exacerbates mental health issues (Peltzer & Pengpid, 2015; Ramlagan et al., 2021).

The Apartheid and colonial era's institutionalized racial segregation (Kleintjes & Schneider, 2023) and economic disparities (Leibbrandt et al., 2012) have created long-lasting psychological impacts, particularly on the youth. This systemic discrimination has casted a long shadow upon the youth of South Africa, all of whom were born into a democratic nation (Bell et al., 2022). This shadow affects particularly non-white racial groups, females, and those in rural and informal residential areas who still face the consequences of historical injustices that include exposure to violent trauma, economic exploitation, and geographic displacement (Hoosen et al., 2022). Children and youth in these marginalized areas are more susceptible to interpersonal violence, emotional neglect, and poverty, with these experiences being more prevalent among African (Mngoma & Ayonrinde, 2023), Coloured, and Indian communities (Jackson et al., 2010). These factors often lead to risky behaviours like alcohol and drug use as coping mechanisms for the trauma and stress experienced (Atwoli et al., 2015). Chronic stressors and traumatic experiences are significantly more likely to occur in individuals who are poorer, are orphans, or live in urban townships (Atwoli et al., 2015). The stigma and shame associated with substance use disorders prevent the majority of sufferers from ever seeking treatment (Sorsdahl et al., 2021).

Vulnerable, marginalized, or high-risk communities (Department of Health, 2023; Wechsberg et al., 2010) are classified through a myriad of social, geographic, demographic, and economic factors (Burton et al., 2018). These groups frequently experience psychological distress (Pillay et al., 2019) or engage in risky behaviours (Ahmed & Jewkes, 2019) due to chronic trauma (Plüddemann et al., 2023; Slone et al., 2000), poverty (Seedat et al., 2009; Mngoma et al., 2021), limited access to education (Mngoma & Ayonrinde, 2023), training, or employment, and challenges in accessing healthcare services (Maphumulo & Bhengu, 2019; Meyer et al., 2017). The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) underscore the vulnerability of the South African youth (2019; 2022), particularly those in marginalized communities (Department of Health, 2023), to either experience mental illness or engage in substance misuse respectively (Rehm et al., 2017). Despite the documented prevalence of psychological distress, centralized mental health services in South Africa fall short of adequately meeting the needs of the majority (Docrat et al., 2019) of

which many pockets of subpopulations are disproportionately at risk of mental health distress or substance use.

### **Significance of the Study:**

The World Mental Health Day (WMHD), hosted by the South African Department of Health on October 10, 2023, illuminated critical challenges in mental health care provision. The World Health Organization (WHO) national representative of South Africa attributed the primary issue to the significant disparity between the demand for mental health services and their supply (2023). Although structural issues of poverty, discrimination, and social stigma towards mental health were mentioned, it was accentuated that the core issue that challenges the National Department of Health, in its role of provision and coverage of adequate mental healthcare services, is the shortage of financial resources made available to centralized mental health care structures (WHO, 2023).

This paper is grounded in the assumption that this call for more investment into centralized services contradicts the central theme of WMHD, “mental health as a human right”. Further this call from the department of health misaligns with the foundational elements that underpin the goals of WHO’s Comprehensive Mental Health Action Plan 2013–2030 (WHO, 2019; 2023), WHO’s Mental Health Atlas, the South African National Mental Health Policy Framework and Strategic Plan 2013–2020 (Department of Health, 2013), as well as the ethos of the third United Nation’s Sustainable Development Goal (UNSDG), which advocates for national government intervention to provide proactive measures in mental well-being to pre-empt severe health emergencies as well as equitable and comprehensive health service delivery (Docrat et al., 2019). The call for more funds to be funnelled to centralized healthcare explicitly misaligns with the current state of mental healthcare service provision (Schneider et al., 2016). Docrat and colleagues (2019) have highlighted the inefficiencies of using these funds, as more than 86% of mental health care expenditure is used solely on inpatient care and more than half solely in psychiatric hospitals. Furthermore, almost 20% of all funds are used for the readmission of patients into psychiatric wards when they were discharged prematurely due to a shortage of resources (Docrat et al., 2019). The necessity of transitioning towards a decentralized model of mental health care, rooted in the biopsychosocial paradigm, is underscored by the need for early, localized intervention and supportive measures, focused primarily on vulnerable populations

(Docrat et al., 2019). Decentralizing mental health services by integrating them into community settings such as schools, workplaces, and community centres can only be possible once the high-risk groups are identified (Docrat et al., 2019). The identification of the specific vulnerable populations would eventually lead to the exploration of the demographic, economic, social, and behavioural factors are associated with a higher risk of either engaging in risky substance use or psychological distress (Sorsdahl et al., 2023). This approach will ensure that mental health support is available where it is most needed, especially for high-risk groups that may not have access to traditional healthcare settings.

### **Objectives of Study:**

This research project is committed to identifying and characterizing vulnerable communities within the young South African populace as a preliminary phase in the communal goal of the decentralization and advancement of mental health care accessibility. In this thesis, psychological distress is operationalised as a measure of mental health distress. This understanding can lead to the development of future research and community action which would be decentralized and more targeted, less stigmatizing, and more efficient interventions. This would be a result of a collaborative understanding of patterns of association between psychological distress, substance abuse, as well as the demographic, social, and behavioural factors that underpin mental distress in the South African youth. Based on data from the Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, this thesis aims to identify the subpopulations of youths in South Africa (aged 15-24) who at risk for experiencing psychological distress. These subpopulations are defined according to interactions between race, gender, geolocation, and province of residence. The subpopulations who are greater risk due to risky alcohol consumption, illicit drug use, or recent exposure to intimate partner violence are further considered. The impact of gross monthly income and education level are further both measured and controlled for. Considering a nationally representative sample of 12,058 South Africans aged 15-24 (weighted to represent a population of 9,625,567), this study, using univariate regression methods, the study aims to identify subpopulations within the country who are at increased risk for these interconnected issues.

This thesis aims to identify the factors in youth in South Africa which influence vulnerability to experience psychological distress, SUD, and AUD respectively. Further, this

thesis aims to identify the salient geodemographic groups of South Africans aged 15-24 years old who are at risk for developing AUD and engaging in recent illicit substance use (poly-substance abuse), who experience psychological distress and are at-risk to engage in risky substance use behaviour (self-medication), or are likely to experience psychological distress due to substance use and which are most likely to experience substance use disorders because of existing psychological distress (substance-related pathology). In doing so, the broader socioeconomic and geographic factors, in addition to individual demographic factors, were considered in analysis. The following research questions were answered in this paper:

Research Question 1a: *What is the geodemographic risk-factors associated with the engagement with risky alcohol use?*

Research Question 1b: *What are the geodemographic risk factors of risky alcohol use mediated by the recent use of illicit substances?*

Research Question 1c: *What are the geodemographic risk factors of risky alcohol use mediated by psychological distress?*

Research Question 2a: *What is the geodemographic risk-factors associated with the engagement with illicit substance use?*

Research Question 2b: *What are the geodemographic risk factors associated with recent illicit drugs use behaviour in the South African youth mediated by the positive screening for Alcohol Use Disorder?*

Research Question 2c: *What are the geodemographic risk factors of recent use of illicit substances mediated by psychological distress?*

Research Question 3a: *What is the geodemographic risk-factors associated with the experience of psychological distress?*

Research Question 3b: *What are the geodemographic risk factors of psychological distress mediated by risky alcohol use behaviour?*

Research Question 3c: *What are the geodemographic risk factors of psychological distress mediated by the recent use of illicit substances?*

Research Question 3d: *What is the geodemographic risk-factors associated with the engagement with risky alcohol use, illicit substance use, and the experience of psychological distress respectively?*

Research Question 4: *What is the relationship between recent illicit substance use, risky drinking, and psychological distress in the South African youth?*

**Outline of study:**

Chapter 1 includes the pages prior to this outline, which highlighted the foundational concepts, and introduced the research problems, aims, and objectives of this thesis. Chapter 2 consists of a description of the theoretical and conceptual framework which informs this piece of research. Chapter 3 is a literature review on mental health care in South Africa with a focus on risky behaviours, alcohol and other substance use, and other determinants in respect to youths. Chapter 4 is the detailed summary and report of the methodological steps followed when conducting analysis and composing this research paper. Chapter 5 entails the summary of the Results from the data analysed. Chapter 6 discussed the biological, psychological, and social interaction of determinants to predict harmful, hazardous, or dependent alcohol use and recent illicit substance use. The implications of the interaction between Harmful, Hazardous, or Dependant Alcohol Use (HHDA use) and recent illicit drug use on mental wellbeing are further discussed and a report on the study's limitations and concluding remarks in the final chapter. Psychological distress and the impact of this centralized system are discussed with possible alternatives are identified. criticized and considerations for future research are made.

## CHAPTER 2: THEORETICAL FRAMEWORK

Understanding the social determinants of health is crucial in comprehending the broader factors that lead to disparities in health, especially among young people in South Africa. The ecological biopsychosocial model (Engel, 1981; Bashmi et al., 2023) aligns with the United Nations Sustainable Development Goals (UNSDGs), particularly those focusing on health equity, quality education, and reduced inequalities. These goals emphasize the need for a multi-faceted approach to health, considering the interplay of various determinants. The World Health Organization's (WHO's) mental health guidelines (2020, 2023) reinforce the need for policies and interventions that address not only the clinical aspects of mental health but also the broader social and environmental determinants (McDowell, 2023). These guidelines advocate for inclusive, accessible, and culturally sensitive mental health services. This approach considers socioeconomic conditions, education, environment, and access to healthcare, among other factors. It emphasizes the need for universal health coverage that includes mental health services, the promotion of human rights, and the reduction of stigma and discrimination. Karoly (2012) underscored the benefit of providing preventative measures compared to project the global burden of disease and associated economic costs (Allen et al., 2022).

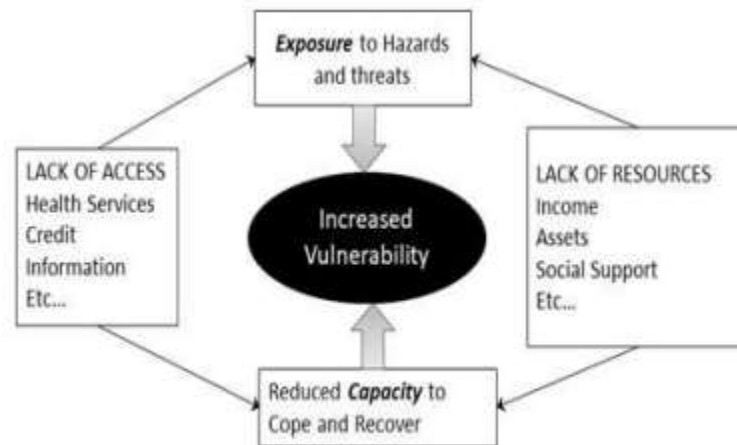
This study will attempt to delve into how demographic and socioeconomic factors such as age, gender, race, income, and education influence the relationship between psychological distress and substance use. By examining these variables, the study aims to understand better the complex interactions that contribute to the vulnerability and resilience of individuals facing psychological distress and turning to substance use, and vice versa. The social determinants of health (SDH) are the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.

According to WHO (2008), between 30 and 55% of health outcomes are informed by social factors that can be categorized into five broad areas: healthcare access and quality, education access and quality, social and community context, economic stability, and neighbourhood and built environment. As vulnerability is a construct that is dynamically shaped by the interplay between the stressors an individual faces and that individual's adaptive

capacities (Blaikie et al., 1994); within this study it is conceptualised with an emergent nature that is influenced by individual, social, and structural forces. Systemic disadvantages – including socioeconomic disparities, limited healthcare access, inadequate educational opportunities, and exposure to violence – amplify vulnerability by diminishing an individual's resources for coping with adversity (Vogel et al., 2021). Other factors that vulnerability is further amplified by are systemic disadvantages like lack of social and economic resources, poor access to healthcare and education (Blaikie et al., 1994). While these factors may not directly increase vulnerability, they reduce coping capacity and exacerbate the frequency and severity of encountered stressors throughout life. This model describing the generation of vulnerability can be examined below.

**Figure 1:**

*Intersectionality of factors driving vulnerability*



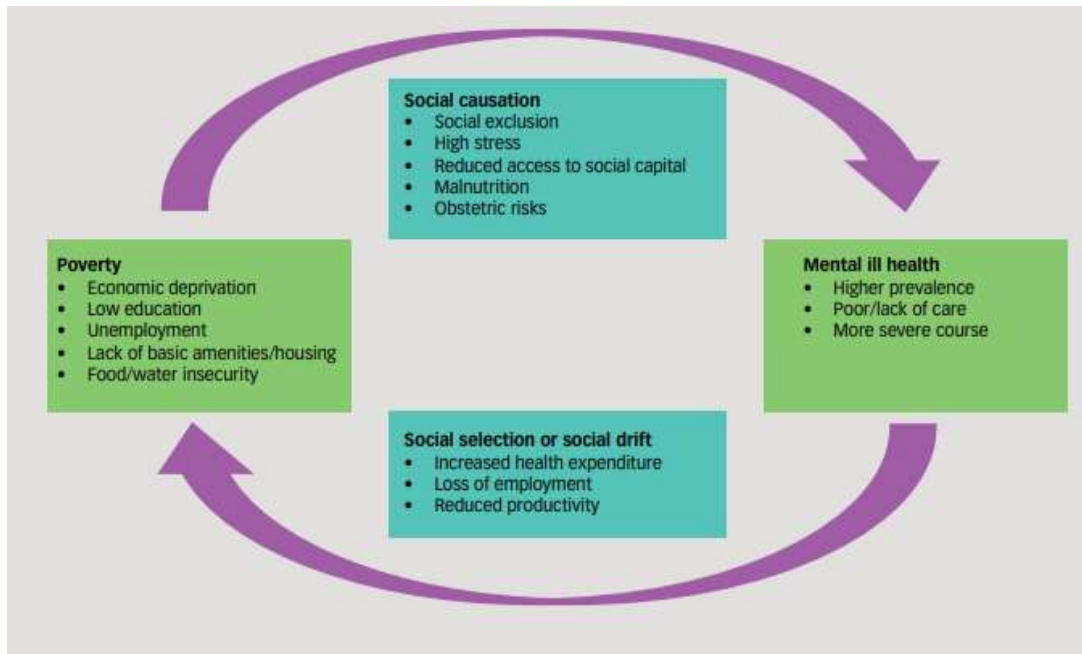
*Source: Adapted from Blaikie et al., 1994*

In reference to the Intersectionality of Factors driving Vulnerability mentioned above (see Figure 1), focusing on the connection between risky substance use and psychological distress in the youth of South Africa would still be beneficial even if the root causes of social stressors cannot be directly addressed due to structural issues, and individual coping capacity may be limited by poor healthcare resources and access. As vulnerable communities arise from the interplay between stressors individuals face and their capacity to cope with those challenges (Blaikie et al., 1994); empowerment and vulnerability reduction remain possible by tackling the issues of resource scarcity and lack of access to education and employment.

Embedded in the Social Determinants of Health framework (Marmot, 2005) is the purposeful conceptual movement away from using the biomedical model in public health care

(WHO, 2008) to understanding how social concepts such as one’s level of education, income, race, gender, geolocation, or province of residence could prevent them from accessing adequate resources on the personal level but can also have systematic detriments in how access to services are restricted. This double-mechanism re-enforces vulnerability by both increasing ones exposure to threats as well as reducing their capacity to deal with said threats. This framework is useful in conceptualising and operationalizing vulnerability and vulnerable groups, however, it is reductive in that it is focused on advocating for policy. Lund and Colleagues (2012) in Figure 2 below illustrates the cyclical nature of social determinants on health in the context of South Africa; this allowed the consideration of factors such as poverty and associated social structural non-medical issues.

**Figure 1:** *Social Determinants, Poverty, and South African Health Care*



Source: Adapted from Lund et al., 2012

The ecological biopsychosocial model, as advocated by the WHO, UN, and South Africa's Department of Health, offers an approach to addressing health issues that extend beyond biomedical treatment (OHCHR, 2017; WHO, 2019). In the context of psychological distress and substance use (Bashmi et al., 2023), both these models above both illuminate how certain individuals may be more at risk due to certain social systems and biological vulnerabilities. When these individuals are exposed to environmental stressors—such as poverty, social

inequality, trauma, or chronic stress—they are more likely to experience psychological distress or turn to substance use as a coping mechanism (Atwoli et al., 2015). Recognizing that individuals respond differently to stressors based on their biological state and life experiences suggests that one-size-fits-all approaches may not be effective. Instead, policies should support interventions that are tailored to the specific needs and vulnerabilities of different groups within the population.

The ecological biopsychosocial model further aligns with the UNSDGs, particularly those focusing on health equity (Docrat et al., 2019; Goodwin & Zaman, 2023), quality education, and reduced inequalities. These goals emphasize the need for a multi-faceted approach to health, considering the interplay of various determinants (Cratsley & Mackey, 2018). WHO's Mental Health Action Plan (WHO, 2013; 2020) reinforce the need for policies and interventions that address not only the clinical aspects of mental health but also the broader social and environmental determinants.

These guidelines call for inclusive, accessible, and culturally sensitive mental health services. In conclusion, a comprehensive approach that considers the complex array of biological, psychological, and social factors, along with the critical role of social determinants of health, is essential for developing effective strategies to address the intertwined issues of substance use and psychological distress among young South Africans.

## CHAPTER 3: LITERATURE REVIEW

This literature review will begin by describing recent epidemiological findings associated with mental illness and substance use and its impact on the health care available to South African youth. Following this backdrop, the concepts of Psychological Distress, Risky Drinking, and Illicit Substance use are defined with specific prevalence rates discussed in the context of the treatment gap in South Africa. The review will then discuss the geodemographic determinants - using the biopsychosocial ecological model as a framework – where factors of vulnerability (Blaikie et al., 1994) are discussed in terms of the marginalized groups that have been identified by scholars. Lastly, the review will discuss some potential uses for identifying these segments in the population and solutions and research considerations, keeping in mind the regulations, policies, and scholarship at a national and international level.

### **The Cost of Mental Health Care**

Mental-, Neurological-, and Substance Use (MNS) Disorders represent a significant public health concern worldwide (Mahajan, 2019), with Lower- and Middle-Income Countries (LMICs) in Sub-Saharan Africa (Lund et al., 2011) bearing a disproportionate share of the global disease burden (Vos et al., 2019; World Health Organization, 2023). Within this context, South Africa faces exceptionally complex challenges in the diagnosis, treatment, and prevention of MNS disorders (Sorsdahl et al., 2023). The youth of South Africa who suffers from mental illness(es) on average have three times the Years Life Lost (YLL) – a measure of premature mortality – when compared to people who do not suffer from mental health distress (Jack et al., 2014; Rehm & Shield, 2019). These challenges in healthcare service accessibility and provision are interwoven with the country's socioeconomic landscape and historical legacies, particularly impacting the nation's youth (Docrat et al., 2019).

The South African Depression and Anxiety Group (SADAG) report that mental health is a significant burden of disease in the nation (2018). While economic factors may be the most obvious cause of the treatment gap in South Africa, however, this looked at in isolation is unhelpful and problem-focused as a solely economic solution seems impractical (Lund et al, 2011; Docrat et al., 2019). Doran and Kinchin (2017) estimated that the estimated burden of disease is planned to increase six-fold over the following three decades with regard to purely economic costs of mental health care service provision.

Sustainable development goals set out by the UN pose significant structural challenges to global governments concerning coverage of public health care (Patel et al., 2018). Notably, most of those who lack access to health care also lack access to financial resources; mental health care is inaccessible to the poorer and more disadvantaged segments of the population (Probst et al., 2018). More than 75% of the global population who need health care for Mental-, Neurological-, and Substance Use (MNS) Disorders do not have access quality and evidence-based treatment (WHO, 2023). In South Africa, 84% of South Africans with any mental health disorders, do not receive adequate treatment (SADAG, 2018).

The burden of untreated mental illness significantly compromises health outcomes across numerous domains (Rehm et al., 2017; Matzopoulos et al., 2022). For South Africans with mental health disorders, morbidity rates are twice as high when compared with the general population (Haas et al., 2020). Epidemiological data collected by the South African Medical Research Council (SAMRC) (2017; 2019; 2021) consistently highlight the dire impact of untreated MNS (Jack et al., 2023; Saban et al., 2014). These disorders increase susceptibility to both infectious and non-communicable diseases, resulting in systemic treatment challenges and additional pressure on healthcare resources. This has profound consequences for South Africa's youth, contributing to high rates of disability, premature morbidity, and mortality (Matzopoulos et al., 2022). Widespread alcohol and substance use further contributes to the crisis, reducing average life expectancy due to the strain placed upon both medical and mental health systems (Rehm & Probst, 2018; 2019).

### ***Mental Illness and Psychological Distress***

This study aligns with the American Psychological Association (APA) in conceptualizing "psychological distress" as a spectrum of anxiety and mood-related symptoms that manifest as emotional or physical pain in response to daily stressors (Mirowsky & Ross, 2002).

Psychological distress is a clinically significant indicator for screening common mental illnesses and often results from socioeconomic pressures and historical trauma. According to SAMRC, nearly 20% of South African youth aged 15-24 report experiencing psychological distress within the past 12 months (2019). Within the South African adult population, approximately 16.5% meet diagnostic criteria for a common mental health disorder in a 12-month period, and 30.3% over their lifetime (Jack et al., 2014). Adolescents experience even higher rates, with estimates of 27% experiencing depressive disorders, 30% anxiety disorders, and 41% severe emotional or

behavioural problems (Jörns-Presentati et al., 2021). In contrast, the Institute for Health Metrics and Evaluation (IHME) indicate that worldwide around 12% of individuals are diagnosed with common mental health issues, or clinically significant psychological distress (2023).

Studies have associated psychological distress with the youth of South Africa in particular segments such as females (Wechsberg et al., 2010), urban residents (Bonner et al., 2021), individuals aged 15-24 (Cooper et al., 2015), those who engage in risky alcohol consumption (Probst, et al., 2018), and those who have recently engaged in illicit substance use (Wechsberg et al., 2010). Other factors that influence the presence of psychological distress in young South Africans include province of residence, race group, gross monthly income, highest level of education achieved, being HIV-positive (Ncetakalo et al., 2023), age, and exposure to chronic and/or traumatic stress (Pengpid et al., 2021; Peltzer & Phaswana-Mafuya, 2018; Peltzer et al., 2019; Probst et al., 2018). Research shows that non-white South Africans experience more psychological distress compared to their white counterparts (Harimann et al., 2021).

Studies indicate that psychological distress, often a result of socioeconomic pressures and historical trauma, can lead to increased substance use among youth as a coping mechanism in the absence of healthcare service provision (Hogarth et al., 2018). Among South African youth, it has been shown that substance use is engaged as a coping mechanism in the absence of adequate healthcare services (Seedat et al., 2009). This intersection poses a significant public health concern (UN, 2016; WHO, 2022) calling for comprehensive examination and intervention (Cosgrove & Shaughnessy, 2020; Tindimwebwa et al., 2021).

### ***Substance Use Disorder (SUD)***

Substance use disorder (SUD) is defined as chronic and multistage psychopathology in which a chronic pattern of substance use is associated with a behavioural compulsion and disturbances in both neurological function and neuroanatomy, characterized by social, cognitive, and behavioural dysfunction (APA, 2013). One in five individuals treated for SUD at the South African Community Epidemiological Network on Drug Use (SACENDU) was below 20 years old (Morojele & Ramsoomar, 2016). According to the APA, some of the most common substances of abuse are alcohol, caffeine, cannabis, hallucinogens, inhalants, opioids, sedatives, hypnotics and anxiolytics, stimulants, and tobacco (2013). The WHO World Mental Health Survey showed that only 7% of people with substance use disorders (SUD) received adequate treatment, and this percentage was even lower (1%) in low- and middle-income countries

(LMIC) (Degenhardt et al., 2017). The UNODC World Drug Report (UNODC, 2021) also revealed that only one out of eight people with substance use disorders had access to treatment and that women were vastly underrepresented in the likelihood of receiving mental healthcare when needed. More than 275 million people worldwide (5.6% of the global population aged 15–64 years) used illicit substances at least once during 2016 (UN, 2019). In sub-Saharan Africa, 41% of adolescents between 10 and 19 are estimated to be active substance users (Olawole-Isaac et al., 2017). South African Community Epidemiology Network on Drug Use (SACENDU) estimate that at least 20% of the youth in South Africa have engaged in the consumption of illicit drugs (Dada et al., 2018). Cannabis (also known as dagga) is the second most used substance in South Africa, and globally, behind alcohol. 'Tic' (methamphetamine) is the third most-used substance in the youth (Dada et al., 2021). Whoonga or nyaope (a smokable non-prescription street-made opioid which includes a mixture of low-grade heroin, cannabis tobacco, antiretroviral drugs, household cleaning detergent, pesticide agents, and a variety of other substances) is the fourth most used illicit substance in South Africa (Ngcobo & Steyn, 2019).

Recent estimates suggest that 38% of South African adolescents who are receiving mental health treatment are active substance users (Taukoor et al., 2017). Substance use was significantly associated with forensic history, history of abuse, neglect, being in an educational setting, being an in-patient, history of psychosis, and having comorbid diagnoses of PTSD or bipolar mood disorder. Substance use was further inversely related to adjustment disorder, intellectual disability, or attention-deficit hyperactivity disorder (Taukoor et al., 2017).

### ***Alcohol Use Disorder (AUD)***

More than 60% of South African youths report to have consumed alcohol in their lifetime (Dada et al., 2021), and 40% of youths report that they consume alcohol regularly (SACENDU, 2021). Almost one third of all alcohol consumed in South Africa is unrecorded, which is either illegally produced or home-brewed (Ferreira-Borges et al. 2017). The artisanal production and consumption of home-brewed alcoholic beverages are a cornerstone of many cultural segments and communities of South Africa and its negative societal impact is seldom brought into question (WHO, 2007).

Harmful, Hazardous, or Dependent Alcohol Use (HHDA use) refers to a positive screening for Alcohol Use Disorder (AUD).

South Africa has one of the highest prevalence of Alcohol Use Disorder (AUD) in the world (Mupara et al., 2022; Shield et al., 2013), with approximately 30% of the adult population living, often undiagnosed and untreated, with the disorder (WHO, 2022). Household survey data repeatedly suggest that more than 10% of South African youth meet the criteria for being diagnosed with an AUD (Morojele., 2016; Morojele et al., 2018; Peltzer et al., 2018). People with AUD have reduced self-control and inhibitory functioning leading to impulsive and risky behaviours, particularly in young people (Arian et al., 2013; Rienert & Allen, 2007). AUD is significantly prevalent among youth of South Africa (Pengpid et al., 2021), is geo-localized in urban residences (Ramsoomar and Morojele, 2012), individuals who use other substances (Peltzer & Phaswana-Mafuya, 2018), risky sexual behaviour (Morojele et al., 2021; Ngcobo, 2019), those who are NEET (not employed and neither in education nor training) or in the African race group (Mngoma & Ayonrinde, 2023), and those who are either studying or not employed (Ncetakalo et al., 2023).

Youths are less likely to engage in safe alcohol consumption and more likely to engage in binge drinking (Paus et al., 2008). Binge drinking or Heavy-Episodic Drinking (HED) and is conceptualised as a single individual consuming six or more standard drinks (i.e.. at least six servings of alcohol) on one occasion and is highly prevalent among adolescents and young people (Morojele & Ramsoomar, 2016; Vellios & van Walbeek; 2018). According to a study by Morojele and Ramsoomar (2016), all alcohol consumption by young people is characterized by HED, which is reiterated by the South African Community Epidemiological Network on Drug Use (SACENDU) who report 41.5% of males and 17.1% of females in this population group report engaging in HED regularly (2021); which accounted for almost all of the non-abstaining drinking population in that demographic. As a result, the youth of South Africa is significantly associated with Foetal Alcohol Spectrum Disorder (FASD), risky sexual behaviour, underage drinking, drinking, and driving, and other alcohol-related violence (Ramlagan et al., 2021; Pengpid et al., 2021; Peltzer & Phaswana-Mafuya, 2018). Other health risks that AUD is directly associated with are increased mortality, morbidity, and disability due to its association with the presence of chronic-non communicable disease, poor response and adherence to medical treatment, HIV and Tuberculosis incidence, major depressive disorder and neurodegenerative disorders (Ewing et al., 2014). Alcohol consumption accounts for 27.83% of all measured inequality in health and 3.63% of the inequality in self-reported health (Lund et al., 2012).

## **Risk Factors and Vulnerable/Marginalized Groups**

Marginalized, or vulnerable groups, are universally accepted as high-risk communities for a particular social, economic, or health-related incident (Vogel et al., 2021) and universally agreed upon groups are the elderly, children, the mentally disabled, the physically disabled, at-risk youth, persons exposed to traumatic events, ethnic, gender, and religious minorities, displaced persons, and returning refugees. The Department of Health (2023) classifies vulnerable groups through a myriad of social, geographic, demographic, and economic factors. These groups frequently experience psychological distress (Pillay et al., 2019) or engage in risky behaviours (Ahmed & Jewkes, 2019) due to chronic trauma (Plüddemann et al., 2023; Slone et al., 2000), poverty (Seedat et al., 2009; Mngoma et al., 2023), limited access to education (Mngoma & Ayonrinde, 2022), training, or employment (Mngoma et al., 2023), and challenges in accessing healthcare services (Maphumulo & Bhengu, 2019; Meyer et al., 2017).

In the youth of South Africa, the probability that one would engage in illicit drug use (Pengpid et al., 2021) is significantly associated with a history of feeling victimised (Morojele & Brook, 2006), the presence of AUD (or HHDA use), sedentary behaviour (Peltzer et al., 2019), psychological distress (Pillay et al., 2019), and risky sexual behaviours. The intersection between risky sexual behaviour and substance misuse is mediated by exposure to intimate partner violence (Peltzer et al., 2019), criminal violence (Wicomb et al., 2018), as well as HIV-incidence (Kuteesa et al., 2019). Alcohol-attributable mortality is significantly more embedded in socioeconomic variance than overall morbidity rates (Probst et al., 2014). This association could be explained through an array of mechanisms, where increased socioeconomic status decreases vulnerability through increasing an individual's capacity to cope, reduces their potential exposure to stressors, as well as increased accessibility and resources which can be used on mental health care services (Probst et al. 2020).

Compelling evidence indicates that complex trauma, psychological distress (Pillay et al., 2019), and engagement in substance use as a coping mechanism (Morojele & Ramsoomar, 2016; Morojele et al., 2021; Pillay et al., 2020) are more prevalent within South Africa's youth population when compared to other LMIC settings (Jack et al., 2014; Shield et al., 2013; Vos et al., 2019). Stressors such as high unemployment rates (Zungu et al., 2023), persistent inequality (Nduna et al., 2010), and the after-effects of apartheid through direct and indirect racialized trauma (Docrat et al., 2019); there has been a steep rise in prevalence of mental health issues

(Maphumulo & Bhengu, 2019). Depression (Nyundo et al., 2020), anxiety (Chisholm et al., 2016), and PTSD (Mthembu et al., 2021) are the most prevalent mental disorders diagnosed among this demographic, with exposure to violence, familial instability (Groenewald & Bhana, 2018; Muchiri & Dos Santos, 2018), and societal pressures (Sorsdahl et al., 2012) exacerbating these conditions. Additionally, the HIV/AIDS epidemic has further compounded the stressors of many youths and adolescents who are either directly impacted or orphaned (Jumbe et al., 2021). South Africa's high rates of violence, sexual assault, and substance abuse contribute to widespread mental illness and complex trauma, especially among the youth (Adejumo et al., 2015; Adebisi et al., 2019). Considering the heavy burden on Health Care of mental illnesses, its significant comorbidities with HIV/AIDS, Diabetes Mellitus, Hypertension, Coronavirus Disease 2019 (COVID-19), AUD and SUDs; psychological and psychiatric treatments are not financially feasible for the most vulnerable groups through government-health care service provision (Mutymbizi-Mafunda et al., 2023). In the following subsection(s) the biological, psychological, and social risk factors associated with mental health care and substance use concerns in the context of the youth of South Africa are discussed (Bashmi et al., 2023; Engel, 1978). Furthermore, aligned with the Social Determinants of Health framework (Marmot, 2005), factors including healthcare access and quality, education access and quality, social and community context, economic stability, and neighbourhood and built environment are considered in contextual relevance to the geodemographic factors discussed. Lastly, as proposed by Blaikie and colleagues (1994), the concept of vulnerability in persons or communities is considered in four domains: lack of access, lack of resources, exposure to hazards, and the reduced capacity to cope and recover.

Inclusive education implementation in most of South Africa has severe challenges including poor support and education available to educators and parents, and skills in which to allow for effective implementation, poor funding or lack of knowledge of ways in which to get grants, bursaries, or alternate sources of funding (Peacock & Barker, 2014). Furthermore, considering the advocacy for accelerated implementation of inclusive education at all levels by the National Youth Policy, public misconceptions, social stigma, and the multiple domains that disability is perceived on must be explored in its contextual complexity (Peacock & Barker, 2014).

### ***Biological Risk Factors:***

**Genetics.** Vink (2016) postulates that there is a genetic link (Wing et al., 2012) between the neuro-mechanisms underlying addiction and neuro-mechanisms present in those with chronic environmental stressors. While the detrimental impact of substance abuse can impact any individual, some individuals have a particular neurocircuitry that increases their likelihood of developing a dual diagnosis of a mental illness (Debenham et al., 2021). While males are significantly more prevalent drinkers and females are more prevalent abstainers, drinking behaviour and chances were equal to develop binge drinking or AUD across drinking populations of both genders (Ramsoomar & Morojele, 2012). Likewise, the vast majority of illicit substance users are males (Mafa et al., 2019; Pengpid et al., 2021). There is variation between the neuro-vulnerabilities to experience psychological distress between the genders owing to the disproportionate disparity between them (Viertiö et al., 2021).

**Maturation.** Although more than 75% of people with mental illnesses experience the onset of distress before the age of 20 (Kessler et al., 2005; Solmi et al., 2022), only 5.8% of outpatients and 6.8% of inpatients that are treated for mental health problems in South Africa are below the age of 20 years (Docrat et al., 2019; WHO, 2018). Alcohol use reduces the capacity for self-control and inhibition (Spear, 2016; 2018), leading to more impulsive and risky behaviours in young people (Carney et al., 2019; WHO, 2018; Pengpid et al., 2021; Khuzwayo et al., 2020). In addition, most people tend to only develop full inhibitory executive functioning by 25 years old (Innocenti, 2022). Although all people, regardless of age, are impacted by the disinhibitory effects of alcohol consumption; the functioning of a fully developed pre-frontal cortex, corpus callosum, and limbic system interconnectivity moderates the disinhibitory impact of alcohol on behaviour in older adults (Jadhav & Boutrel, 2019a; Debenham et al., 2021). When people under 25 years old consume alcohol (Jadhav & Boutrel., 2019a; 2019b; 2019c) and other drugs (Pando-Naude et al, 2021), due to their reduced connectivity between their prefrontal cortex and the rest of their limbic system, the disinhibitory effects of alcohol and illicit drugs are amplified (Jadhav & Boutrel, 2019a; Debenham et al., 2021). This is likely why the youth tend to engage in high-risk behaviours more than older adults (WHO, 2022; Morojele et al., 2021) and struggle with executive control (Spear, 2016; 2018; Lees et al., 2020) as many areas of their brain are still developing (Morin et al., 2019). This impulsivity leads to unhealthy consumption in young people (Lees et al., 2020), drugs, it can be inferred that these substances influence

multiple neurocognitive mechanisms to amplify the disinhibitory effects of alcohol and subsequently reinforce the neural pathways responsible for impulsive behaviour. Furthermore, additive disinhibitory effects of polysubstance use during the neurodevelopmental stage of young people result in aggressive, impulsive, and antisocial behaviour that persists throughout life (Lees et al., 2020). The structural and functional changes are seen as both causes and effects of substance use as well as causes and effects of mental illness in people who are diagnosed with both SUD and other mental illnesses.

Alcohol and illicit substance use compromise neurodevelopmental processes (Johnson et al., 2009). Illicit Drug use has been associated with reduced empathy and antisocial behaviour in school-going South African adolescents (Morojele et al., 2002). Carbia and colleagues (2018) report that early exposure to alcohol in adolescents is associated with a poorer ability to be empathic while intoxicated. As a result, when youths in South Africa consume alcohol, they are susceptible to being both perpetrators and victims of substance-related violence and accidents, often resulting in permanent disability or homicide (Pengpid et al., 2021; Probst et al., 2018; Ramlagan et al., 2021; Rehm & Probst, 2018; WHO, 2018).

Youths who indulge in illegal drug use are likely to develop permanent structural neurological changes when compared to young people who do not consume substances (Lees, 2020; Pando-Naude et al., 2021). These changes result in neurological impairments even after the substance use has ceased (Fischer et al., 2020; Squeglia, 2020). These neurological morphic disturbances (Pando-Naude et al, 2021) and impaired neurodevelopmental processes (Koob & Volkow, 2006) result in permanent behavioural, emotional, and cognitive deficits (Hamidullah et al., 2020; WHO, 2022). Methamphetamine use, which is highly prevalent in South Africa, is significantly linked to poorer health, cognitive functioning, and abnormal neural development when individuals are exposed to it in adolescence (Guerin et al., 2023a). More than a third of the youth use cannabis recreationally and more than 10% use 'tic'(methamphetamine) or nyaope (SACENDU, 2021). Cannabis or methamphetamine use before 25 years old is associated with depression, anxiety, psychosis, neurological impairment, cognitive impairment and learning difficulties later in life (Fischer et al., 2020). Furthermore, the earlier use of psychostimulants and cannabis is associated with an earlier onset of schizophrenia and a worsened prognosis (Hunt et al., 2018). Substance use before 25 years old increases one's lifetime probability of developing mental health difficulties including substance-use disorders (SUD), mood disorders and

psychosis (Allen et al., 2022). Considering that the average age that adolescent males in South Africa report to have their first alcoholic beverage is 8 years old, while the average age of debut for females is 10 years old (Mafa et al., 2019); the youth is particularly influenced by the mal-effects of substance use. The United Nations Office on Drugs and Crime (UNODC) urges individuals to be aware that impairments in executive functioning are exacerbated, and the maldevelopment could remain permanent (Broadwater et al., 2014) when young people are intoxicated by alcohol and other drug (AOD) use (2022). This is particularly concerning as young people, due to under-developed neuroanatomy, display behavioural inhibition (Arian et al., 2013;), emotional reactivity (Lees et al., 2020), and compromised executive control (Hamidullah et al., 2021).

**Dual diagnoses.** SUD sufferers often have comorbid health complications and a "dual" psychiatric diagnosis (Kessler, 2004; Szerman et al., 2013; SAMHSA, 2020). It is estimated that up to 80% of individuals with SUD in the country have a comorbid psychiatric condition (South African Medical Research Council, 2022).

Mental health difficulties can either precede or be caused by illicit substance use. The "self-medication hypothesis" and the "neurobiological self-regulation hypothesis" are accepted as the explanation for the process of untreated mental health difficulties preceding drug use (Khantzian, 1985; UNODC, 2022). When drug use is longer-term, mental health distress is often related to the neurological, physiological, homeostatic, social, psychological, and behavioural changes that happen over time (Bruwer et al., 2013; 2014). Long-term use is associated with dependence, polydrug use, a dual psychiatric diagnosis, and permanent mental health distress associated with neurological and cognitive deterioration (Arian et al., 2013; Lees et al., 2020). According to the UNODC, as outlined by the 11th revision of the International Classification of Diseases (ICD-11), both "drug-use disorders" and "drug-dependence disorders" should be differentiated from "the harmful pattern of drug use" associated with drug abuse (UN, 2022; WHO, 2022). While illicit drug abuse, drug-use disorders, and drug-dependence disorders are all significantly damaging to millions of lives, each brings with it different risk factors, population vulnerabilities, and prognoses (UN, 2022). When psychopathology is only experienced after substance misuse, distress is usually understood as neurochemical symptoms of substance "withdrawal" and "intoxication".

UNODC reports that illicit substance use is significantly associated with mood disorders (major depressive disorder and bipolar disorder), anxiety disorders (generalized anxiety disorder and panic disorder), symptoms of psychosis, posttraumatic stress disorder, borderline personality disorder, antisocial personality disorder, alcohol and other substance use, eating disorders, mild to borderline intellectual disability, and attention-deficit hyperactivity disorder (NIDA, 2020; UNODC, 2022). Epidemiological research suggests that lifetime prevalence rates for illicit drug use disorders as a dual diagnosis of post-traumatic stress disorder (PTSD) is twice as high for females (Kessler et al., 2009) and between 26 and 52% for all people diagnosed with SUD (UNODC, 2022). PTSD is significantly associated with more severe SUD and particularly with cocaine use disorder, cannabis use disorder (Ramlagan et al., 2021), opiate use disorder, and intravenous consumption of drugs respectively (Barret, 2020; UNODC, 2022). Fischer (2020) reports that PTSD and AUD in the youth of South Africa are highly comorbid. This is reiterated by longitudinal studies that tracked chronic and acute experiences of abuse and found that chronic exposure to traumatic experiences is significantly associated with AUD (Wyatt et al., 2017). While exposure to trauma neurologically predisposes many individuals to develop AUD, the neurological mechanisms that embed addictive behaviour in young people are largely perpetuated by the further use and abuse of alcohol and other substances (Koob & Volkow, 2009; Hamidullah et al., 2020). Similar effects of alcohol are noted with cannabis and the young brain (Fischer et al., 2020). AUD is comorbid with PTSD and panic disorder in young males (Barret et al., 2020) and a combination of all three among prisoners in particular has been observed to be associated with violence (Barrett et al., 2020) as well as young females in the Western Cape (Carney, 2017b).

A considerably large number of people with SUD will report a history of a complex pattern of polysubstance use (PSU), defined as using multiple substances within a specified period during their lives (Conway et al., 2013; Crummy et al., 2020). Between 18 to 73% of borderline personality disorder and antisocial personality disorder cases have dual diagnoses related to illicit substance use, particularly cannabis (UNODC, 2022). More than a third of illicit-drug use disorders have a dual diagnosis of eating disorders, the majority of which is Bulimia Nervosa (Kanbur & Harrison, 2016). It is further estimated that in excess of 20% of diagnosed eating disorder cases worldwide have a current dual diagnosis of cannabis use disorder and in excess of 25% of eating disorder diagnosed cases have a comorbid cocaine use disorder

(UNODC, 2022). Adults with attention-deficit/hyperactivity disorder (ADHD) are almost three times more likely to have used cannabis in childhood (Lees et al., 2020) and twice as likely to have a comorbid cocaine use disorder (UNODC, 2022). Furthermore, in the United States of America, people with ADHD are eight times more likely to struggle with illicit substance dependence and three times more likely to have an illicit drug use disorder when compared to the general population (Kessler et al., 2006). In the undiagnosed population, more than half of daily cannabis users, half of illicit stimulant users, and one-fifth of daily cocaine users screen positively for ADHD (UNODC, 2022). Psychotic symptoms are experienced by more than half of people who use illicit drugs (UNODC, 2022). It is difficult to ascertain whether many of these mental illnesses contributed to, or were a result of, illicit substance use (UNODC, 2022; Morojele et al., 2021).

*There is often a cyclical relationship between many factors described above as consequences of substance use and substance use itself, as they can be antecedents of substance use, consequences, and in some cases both. (Morojele et al., 2021, p. 1529)*

The relationship between PSU and mental health is complex and interdependent (Morojele et al., 2021). On the one hand, PSU can exacerbate pre-existing mental health conditions or induce new psychiatric symptoms. On the other hand, mental health disorders can increase the vulnerability to PSU as individuals may use multiple substances to self-medicate or cope with their distress (Szerman et al., 2013; UNODC, 2022). Young people often engage in PSU as a means of enhancing or mitigating the effects of one substance with another (Crummy et al., 2020). This pattern of use can lead to a vicious cycle of dependence, tolerance, withdrawal, and relapse, which further deteriorates their mental health and quality of life (Arian et al., 2013; Lees et al., 2020). PSU is particularly prevalent among the youth and has been associated with a higher risk of overdose, acute and chronic health problems (Matzopoulos, 2022), mental illness, as well as a wide array of legal and social problems (Mohale & Mokoena, 2019). PSU also complicates the clinical management of SUD, as it requires a more holistic and integrated approach to address the multiple substances and the interrelated health and social issues (Conway et al., 2013; Crummy et al., 2020). Overall population demographics, as a result, can be reductive when trying to find causal links from dynamic risk factors (which act as both causes and predictors) to substance use. These factors of age, gender, race, socioeconomic background,

geolocation, and participation in risky behaviour are interdependent, and dynamic and should be assessed as such. Each risk factor should not be looked at in isolation.

Female youths in the Western Cape are particularly at risk for alcohol and other substance use disorders (Dada et al., 2021) as more than 25% of females in this age group are expected to engage in polysubstance use. Coloured females are particularly at risk for methamphetamine use while heroin risk was associated with white female youths (Dada et al., 2018). Blows and Isaacs (2022) indicate that AUD, illicit substance use, and psychological distress are associated and interdependent in Western Cape students. High-risk populations include premature Western Cape female school-leavers, individuals who were exposed to drug use at home, and trauma survivors (Carney et al., 2019). Key factors that have been identified that perpetuate Western Cape peri urban districts to engage in SUD and AUD include psychological distress, gender issues, status and inequality, feelings of powerless towards the government, a source of recreation, consequences for poor actions, and community-related factors (Puljevic & Learmonth, 2014). Risky sexual behaviour, poverty, and early sexual trauma share common covariance in rural KwaZulu-Natal (Karim et al., 2016)

### ***Psychosocial risk factors***

The impact of current healthcare inadequacies (Sorsdahl et al., 2024), social inequality (Mukong et al., 2017), the racial classification system and oppressive policies of the past (Bell et al., 2022; Kotze & Boschhoff, 2017; Khalfani & Zuberi, 2001), among other factors, have cast a long shadow of vulnerability (Blaikie et al., 1994) on many pockets of youths in South Africa as they have reduced capacity to cope and increased exposure to hazards and threats. The youths serviced by the public sector in South Africa lack the resources to access quality healthcare services and education (Docrat et al., 2019). The pattern of substance use varies by social context in South Africa (Blows & Isaacs, 2022; Dada et al., 2018; Morojele et al., 2021; Peltzer et al., 2018).

The historical context of South Africa is the relatively recent economic and socially oppressive policies implemented that enforced the mass-residential displacement into “informal urban townships.” Non-white South Africans were forcibly removed from their places of residence and largely segregated in underdeveloped “slums” with little healthcare, education, or correctional service provision afforded to them. The Group Areas Act, a key policy of the Apartheid regime, mandated racial segregation in residential areas (Khalfani et al., 2008),

concentrating criminal activity and socioeconomic disadvantages in specific neighbourhoods, predominantly affecting non-white communities (Jewkes et al., 2010). The segregation between the race groups has left long-lasting psychological impacts on the youth in these vulnerable communities, with certain groups facing greater psychological distress due to the concentration of criminal activity and social marginalization (Jackson et al., 2010). Non-white South Africans experience higher levels of psychological distress (Harimann et al., 2021) compared to the white population, a disparity attributed to the oppressive regime's unfair economic and social disadvantages (Kagee & Price, 1995; Jackson et al., 2010). This is partly due to the continued effects of Apartheid's policies, which created deep inequalities that persist today (Leibbrandt et al., 2012). Jewkes et al. (2010) highlight that rural youth, particularly in African race groups, experience higher rates of interpersonal violence, emotional neglect, and poverty. In communities influenced by the Group Areas Act, youth, particularly in rural or "urban township" geolocations, have easy access to alcohol and illicit drugs (Khuzwayo et al., 2020).

**Exposure to hazards and threats.** Childhood sexual trauma has been associated with adolescent psychopathology (Bruijnen et al., 2019). Female in-patients with psychotic symptoms who are under 25 years old in South Africa are significantly more likely to report exposure to childhood sexual abuse, engage in physically violent behaviour, and have a history of illicit substance abuse (Wicomb et al., 2021). Risky sexual behaviour, poverty, and early sexual trauma share common covariance in rural KwaZulu-Natal (Karim et al., 2016)

Substance use often occurs in contextually specific social situations, and is usually prevalent in subpopulations separated by several factors such as adversity in childhood, and age (Bruwer et al., 2014; The Society for Adolescent Health and Medicine, 2017), such as low SES (Mngoma & Ayonrinde, 2023); exposure to orphanhood (Chen, 2021), criminality and homelessness (Khuzwayo et al, 2020), or gang culture. Youths in these communities are disproportionately more likely to develop depression or alcohol use disorder in their lifetimes (Probst et al., 2017). This likelihood is significantly more pronounced in the Western Cape (Francis et al., 2019), particularly with illicit substance users (Bonner et al., 2021; Carney et al., 2019).

The Youth Risk Behaviour Survey (Kann, 2018) reports that substance use and mental illness often are associated with either being a perpetrator of, a victim of, or experiencing violent trauma (Cooper et al., 2015). In impoverished communities, factors such as poverty,

unemployment, and lack of opportunities contribute to feelings of frustration and marginalization among young men, often leading to violent behaviour towards women and peers. Experiences of violence are shaped by intersecting factors including age, gender, socio-economic status, and geographical location (Cooper et al., 2015). In addition, 8.5% of the burden of disability is attributable to interpersonal violence alone, accounting for almost 2 million disability-adjusted life years (Prinsloo et al., 2022). Males are significantly more at risk for experiencing interpersonal violence-related trauma (Prinsloo et al., 2022) and may resort to substance use as a coping mechanism due to the scarcity of mental health care services and prevailing social norms that discourage vulnerability (Petersen & Lund, 2011; Saban et al., 2014; Taukoor et al., 2017). Being in urban geolocation is significantly associated with more patients receiving treatment in hospitals for both psychological distress and substance misuse (Peltzer et al., 2012). Alcohol and drug use is a major predictor of re-admission to in-patient facilities as well as a significant hindrance towards effective treatment adherence in and out of mental health care facilities (Hornsby et al., 2021). Other systemic factors which contribute to the high-risk alcohol consumption among youths in South Africa are the ease of the availability and affordability of alcohol, the social and cultural norms that encourage drinking, and the lack of effective regulation and enforcement of alcohol policies (Morojele et al., 2021).

The youth are exposed to disproportionate levels of interpersonal violence, and chronic stressors related to poverty and inequality, and as they are searching for their identity, often engage in risky behaviours that have long-term effects on their health and well-being (Cooper et al., 2015). Factors include the exponential added costs due to treatment non-adherence and relapse admissions in in-patient facilities (Mkhize, 2021), the impact of alcohol marketing and alcohol-related media exposure (Anderson et al., 2009a). Young adolescent females who experience intimate partner violence and have geo-socio-demographic vulnerabilities are significantly more at risk of developing a substance use disorder or common mental health disorder (Mthembu et al., 2021). Social factors such as race, gender, income, geolocation, and education level significantly predict whether or not someone in South Africa is able to access pharmacotherapy for mental illness and whether or not treatment would be effective. A major factor, alcohol use, compromises accessibility and adherence to appropriate therapies and treatment (Morley et al., 2017). Poor mental health among young people is associated with various challenges including lower educational achievement, substance abuse, violence, and

reproductive health concerns. Factors such as poverty, violence exposure, substance abuse, and HIV exacerbate mental health vulnerabilities among youth (Lund et al., 2012). Research highlights the significant impact of environmental stressors, parental influences, and personal attributes on substance abuse among youth, emphasizing the importance of understanding emotional well-being. Alcohol misuse can be influenced by, and lead to, poorer mental health (Allen et al., 2022; Bonner et al., 2021), and increased suicidality (Clüver, 2015; Nyundo et al., 2020). Several risk factors contribute to HHDA use among young people in South Africa, such as the availability and affordability of alcohol, the social and cultural norms that encourage drinking, the lack of effective regulation and enforcement of alcohol policies, and the exposure to multiple stressors and adversities, such as poverty, unemployment, crime, violence, abuse and trauma (Adebiyi et al., 2019; Chatmon, 2020; Mthembu et al., 2021; Wyatt et al., 2017).

The frequent dual diagnosis of HIV/AIDS and AUD is embedded in geolocal and other socioeconomic predictors (Probst et al., 2018). The systemic drivers of illicit drug use among young people in South Africa are similar to those of alcohol use, such as the easy access and low cost of drugs, the peer pressure and social acceptance of drug use, the lack of awareness and education on the harms of drugs, the insufficient prevention and treatment services, and the exposure to multiple risk factors and challenges, such as family dysfunction, school dropout, unemployment, violence, abuse and trauma (Chisholm et al., 2016; Clement et al., 2015; Sorsdahl et al., 2012; Khuzwayo, 2020; National Department of Health, 2012; Pillay, 2019). 'Tic' misuse is associated with legal issues, participation in interpersonal violence, participation in antisocial behaviour, perceptual disturbances, diminished inhibition of behaviour, and global negative health outcomes in young people (Guerin et al., 2023). Nyaope use is prevalent in around 10% of South Africans, and is associated with violent gang-related crime, financial crime, unemployment, a burden on the healthcare system, poor adherence to tuberculosis medication, high risk of overdose, neurological seizures, amnesia, and HIV incidence (Guerin et al., 2023; Ngcobo & Steyn, 2019). In this population, Peltzer and colleagues found associations between sedentary behaviour (2019) as well as being a victim of perpetual intimate partner violence with AUD (2017). Several factors contribute to the high-risk alcohol consumption among young people in South Africa (Peltzer & Phaswana-Mafuya, 2018; Pengpid et al., 2021), such as exposure to multiple stressors and adversities, such as poverty, unemployment, crime, violence, abuse and trauma (Clüver, 2015; Saban et al., 2021; Ramlagan et al., 2021). Davis and

colleagues (2017) concluded that young females (Amanuel et al., 2017), particularly pregnant youth and young mothers in township geolocations were significantly at risk for experiencing depression, interpersonal violence, and AUD. Lastly, AUD is associated with race (Mngoma & Ayonrinde, 2023), Gender (Probst et al., 2015), being HIV positive (Probst et al., 2016; Ncitakalo et al., 2023), level of education, number of parents living at home, poverty, exposure to alcohol and other drug use at home, and exposure to traumatic experiences.

Female youths in the Western Cape are particularly at risk for alcohol and other substance use disorders (Dada et al., 2021) as more than 25% of females in this age group are expected to engage in polysubstance use. Coloured females are particularly at risk for methamphetamine use while heroin risk was associated with white female youths (Dada et al., 2018). Blows and Isaacs (2022) indicate that AUD, illicit substance use, and psychological distress are associated and interdependent in Western Cape students. Looking at this in isolation is not helpful. High-risk populations include premature Western Cape female school-leavers, individuals who were exposed to drug use at home, and trauma survivors (Carney et al., 2019).

Key factors that have been identified that perpetuate Western Cape peri urban districts to engage in SUD and AUD include psychological distress, gender issues, status and inequality, feelings of powerless towards the government, a source of recreation, consequences for poor actions, and community-related factors (Puljevic & Learmonth, 2014).

Less than 3% of schools in both rural (Mpumalanga) and urban (Gauteng) communities are located more than a five-minute walk from an alcohol retailer, with many of these retailers using marketing strategies that promote binge drinking to impressionable youth (Letsela, 2019; Morojele et al., 2019; 2021). Exposure to alcohol-related marketing significantly increased the chances of a high-school learner in South Africa to engage in Harmful, Hazardous, or Dependant Alcohol consumption (Morojele et al., 2018). This is particularly concerning for young women, who are at risk of transactional sex, unprotected sex, and becoming victims of violence at these local alcohol retailers (Letsela et al., 2019). Young women in South Africa are the most at-risk demographic for HIV incidence, intimate partner violence, and trauma (Guerin et al., 2023; Ngcobo, 2019). Plüddemann and colleagues (2014) report that of the learners (n=20 855) sampled across over 227 schools across the nation; 15% of learners in grades 8, 9, and 10 were at “high risk” for developing mental health problems. These findings were associated with differences in gender as females were found to be twice as likely as males in this age category

(Plüddemann et al., 2014); 18.5% of female learners, and 10.1% of male learners, were in the category of “high-risk.” High-school students in the Western Cape who use methamphetamine (Plüddemann et al., 2008) are associated with an increased risk of experiencing mental illnesses, having a poor attendance record at school, partaking in risky sexual behaviour (Plüddemann et al., 2008) or partaking in aggressive behaviour (Plüddemann et al., 2012). This group is particularly vulnerable to having an early debut of substance use behaviours (Morojele et al., 2013). Carney and team (2017b) found that in particular groups of trauma survivors in the Western Cape, that behaviour was significantly mediated by drug use and risky drinking behaviour. Common risk factors for individuals to participate in drug use include experiencing childhood adversity, a recent traumatic incident, untreated mental illness, antisocial behaviour, economic deprivation, social exclusion, academic failure, and interpersonal conflict (UNODC, 2020). An overwhelming majority of secondary school learners in South Africa have used illegal drugs or alcohol before (Bonner et al., 2021). It has been reported that up to 80% of secondary school learners in South Africa have used cannabis before and that more than 50% report having used alcohol before (Morojele & Ramsoomar, 2016). Peacock and Barker (2014) report that disabled youths in South Africa have a much lower school attendance, retention to secondary school, and completion when compared to learners without disabilities.

**Reduced Capacity to Cope.** A systematic review published by Ahmed and Jewkes (2018) indicates that substance use behaviours in South African youth pose a critical healthcare crisis. The pattern of substance use varies by social context in South Africa (Blows & Isaacs, 2022; Dada et al., 2018; Morojele et al., 2021; Peltzer et al., 2018).

South African tertiary students have been identified as a high-risk population for developing alcohol use disorder (Young & de Klerk, 2008). However, those who have not completed grade 12 are at higher risk according to Desai and colleagues (2019). Being enrolled in an academic institute in South Africa is considered a risk factor for engaging in drinking behaviour associated with a positive screening for AUD (Crummy et al., 2020). Furthermore, considering that more than a quarter of students in South Africa report feelings of food insecurity or vulnerability (Munro et al., 2013), students in South Africa are unlikely to be able to afford private mental health care and turn to substance use as a means to self-medicate (Khantzian, 1985) and social isolation (Hawke et al., 2021) as a dissociative coping mechanism (Hoffman,

2022). Inclusive education implementation in most of South Africa has severe challenges including poor support and education available to educators and parents, lack of knowledge and skills in which to allow for effective implementation, poor funding or lack of knowledge of ways in which to get grants, bursaries, or alternate sources of funding (Peacock & Barker, 2014). Furthermore, considering the advocacy for accelerated implementation of inclusive education at all levels by the National Youth Policy, public misconceptions, social stigma, and the multiple domains that disability is perceived on must be explored in its contextual complexity (Peacock & Barker, 2014).

There are an estimated 73 million youths unemployed worldwide (United Nations Department of Economic and Social Affairs, 2016), 4.6 million of which live in South Africa (StatsSA, 2023), this age demographic is systematically marginalized from access to economic tools and therefore lacks the financial resources that older generations had. Almost 60% of young adults (18-25 years old) are unemployed in South Africa (Mngoma et al., 2021) and more than 34.3% in this demographic are NEET (not employed and neither in education nor training). A significant proportion of the youth are refugees and migrants who find asylum in South Africa (IOL, 2023). These persons find it particularly difficult to find service provision. Variation in household social demographics still linked to inequality (Posel et al., 2020), being young (Morojele & Ramsoomar, 2016), participating in risky sexual behaviours (Francis et al., 2019; Carney et al., 2019) and engaging in illicit drug use (Pengpid et al., 2021).

South Africa is the most unequal country in terms of occupational income (The World Bank, 2023; Hendricks et al., 2023) and is only equipped to serve a small segment of the population. As we close our third decade in post-Apartheid South Africa more than 70% of our wealth is held by the wealthiest 10% of our population while only 6% is held by the bottom 60% of our population (The World Bank, 2023; Hendricks et al., 2023). Income inequality is slightly better distributed, with the top 10 per cent of earners earning 58% of the national annual income and the lower three quartiles earning less than a fifth of the nation's annual income (Leibbrandt et al., 2012). Individuals with lower socioeconomic status (SES) are disproportionately associated with amplified alcohol-attributable health harm, even when the amount and frequency of alcohol consumed are controlled for (Probst et al., 2020). Lower income, having health comorbidities, and living in urban residences, were associated risk factors for a higher cost of mental health care services (Mutymbizi-Mafunda et al., 2023). Despite the prevalence of health

conditions in the wealthier of South Africa being higher, the overall health outcomes for those who live in poverty are significantly worse (Schneider et al., 2009). Although our private mental health care adequately meets the needs of between 12% (Petersen & Lund, 2014) and 16% of the wealthier South Africans the majority of the nation does not have accessible and quality mental health care service provision (Lund et al., 2014). For example, women who have PTSD and are of lower socioeconomic status (SES) are less likely to utilize healthcare services (Guerin et al., 2023b).

### **The Treatment Gap**

Estimates suggest up to 75% of individuals across the nation with common mental health conditions (depression-related disorders, post-traumatic stress disorder, and anxiety disorders) go untreated (Craig et al., 2022; Sorsdahl et al., 2023). This figure refers to the treatment gap, a ratio between the number of those who can obtain adequate treatment strategies and the overall number of people suffering from a particular illness (Kohn et al., 2004). The treatment gap widens to 92% for those with severe mental health conditions (Docrat et al., 2019). This treatment gap is exponentially amplified for paediatric and adolescent mental health care (Sorsdahl et al., 2023). Servicing the 27-41% of the children and adolescents in South Africa who would need psychiatric treatment (StatsSA, 2023) are only thirty registered child and adolescent specialist psychiatrists. The majority solely service the private sector and only seven centres over three provinces (Gauteng, KwaZulu-Natal, and the Western Cape) provide public sector psychiatric services for persons under the age of 18 (Mokitimi et al., 2019). An illustration of the stark inequality of centralized service provision is that although 80% of South Africa is serviced by the public sector (Statistics South Africa, 2022), only 20% of the psychiatrists employed in the country are employed in the public sector (Janse van Rensburg et al., 2021). Furthermore, the shortage of mental health nurses in South Africa has been established as a public health crisis (de Kock & Pillay, 2016). The majority of government-allocated funds are inefficiently utilized (Sorsdahl et al., 2023). More than 60% of the government's expenditure on mental health care services is funnelled to tertiary psychiatric hospitals, where the majority of the funds are used on the repeated re-admission of and re-location of, state in-patients allocated towards the readmission of illuminating the inequalities in service provision (Docrat et al., 2019). Health outcomes are greatly affected by factors of income, education, geolocation, and race group and are also associated with reproductive health factors. Furthermore, poverty is a daily

experience for many people in South Africa and the challenges that face health care provision are embedded in inequality of resources and lack of access for large segments of the nation (Mayosi & Benatar, 2014). Social grants have reduced absolute poverty, however, 46% of the population lives on under 2 USD a day, which is considered the threshold to quantify poverty (Mayosi & Benatar, 2014; Statistics South Africa, 2014). Furthermore, more than 5% of South Africa's annual gross domestic product and 17 times its government expenditure on mental health is lost each year due to absenteeism and occupational dysfunction caused by mental illness (UNODC, 2020). South Africa, which spends US\$615 million annually (Docrat et al., 2019) has increased our spending on mental health care provision by ten-fold in the last decade (Lund et al., 2013; Sorsdahl et al., 2023). Indirect costs were the highest in persons diagnosed with AUD, and significantly larger than direct costs in all groups besides those who were diagnosed with depression, which the majority of costs fell within the private sector (Mutymbizi-Mafunda et al., 2023).

Despite elaborate plans and attention given to alcohol-related burden on health care in South Africa - the WHO Global Strategy, WHO Regional Strategy (for Africa) to Reduce the Harmful Use of Alcohol, and the WHO Global Action Plan for the Prevention and Control of Non-Communicable Diseases - little has been done to curb the effect of alcohol-related harms (Ferreira-Borges et al. 2017). This is indicative of global healthcare aligning its processes with its sustainable development goals (UNSDGs) and positive change in the recovery-based model of knowledge production and policymaking which considers the behavioural, social, and psychological elements of prognosis (UN, 2022). While evidence-based, ethical, and cost-effective ways of treating substance use, most nations lack the facilities, resources, and MHC workers to execute these treatments (UN, 2022; UNODC & WHO, 2020).

*...for people with drug use disorders and other coexisting health conditions, access [to mental health care] is challenging... due to the added complexity in diagnosis and treatment pose challenges for healthcare practitioners. Improving treatment systems to enable better management of comorbid conditions among people with drug use disorders will undoubtedly bring benefits not only to the affected individuals but also to their communities and the whole society. (UNODC, 2022, p. 7)*

Perhaps providing centralized biomedical treatments to the vast amounts of people around the world in need of mental health treatment is impractical and requires more resources

than most governments around the world are willing to provide (Cosgrove & Shaughnessy, 2020).

### **Moving Forward**

The delivery of care for mental health, neurological, and substance use disorders in Sub-Saharan Africa is in a state of permanent constraint due to the insufficient funding, personnel, training, and equipment which impedes the ability of policymakers and healthcare providers to deliver the level of service they strive for (Institute of Medicine, 2010). Consequently, the region's mental healthcare system operates in a crisis management mode, requiring constant assessment, rationing, and triage of resource allocation decisions (Prince et al., 2007). Mayosi and Benatar (2014) indicate that health care initiatives should realign its focus towards the broader social and economic factors that undermine service delivery.

South Africa has yet to find a viable solution to reducing substance-related harms and mental health (Cosgrove & Shaughnessy, 2020), partly due to the lack of access to mental health services, resources in public-sector mental health departments, stigmatization of mental health care, and the lack of mental health care workers to provide services to those in need (Maphumulo & Bhengu, 2019; Probst et al., 2016;). A better understanding of the relationship between mental health distress, substance misuse, and other biological, social, and psychological determinants is necessary (UNSDG, 2019). The World Mental Health Report (WHO, 2022) suggests that mental healthcare should adopt a decentralized approach by promoting community-based services over centralized psychiatric hospitals. This approach is more effective, especially in under-resourced and rural areas where access to mental health services is limited. The provision of mental health services in community settings like primary healthcare facilities, schools, and community centres would facilitate early identification and intervention. This model also addresses socio-economic disparities and stigma surrounding mental illness, making mental healthcare more accessible and reducing the burden on centralized systems.

To decentralize healthcare, we must identify and empower marginalized groups, particularly in cases where resources are scarce. Identifying marginalized communities is vital for mobilizing resources, knowledge production, and action. Understanding the complex relationship between substance use and mental illness is crucial to determine the type of substance use that is occurring and the type of governmental intervention that would be

beneficial. Developing district-level mental health care service provision is essential (Petersen et al., 2016).

Myers and colleagues (2019) evaluated the feasibility of implementing mental health care services in primary care facilities of LMIC and concluded that it can only happen if all available resources are localized and collaboration between private funders, community leaders, and governments is essential. This was reiterated by Jackson et al., 2012 indicate that interventions that involved multiple domains (i.e. The individual-peer, the family, the church, the school, policy, and the broader community). This was reiterated by Cassidy and colleagues (2015) who evaluated the current model of social intervention in Cape Town and identified collaboration and implementing agency as key indicators of an intervention's success. A brief pilot intervention aimed at vulnerable groups of young females in Cape Town who used substances, had left school, and engaged in risky sexual behaviour. These interventions included risk reduction and psychoeducational intervention. Promising signs were noted, albeit it was a small sample that was investigated (Carney et al., 2017).

Regarding the UNSDGs, Collin and Casswel (2018) report that alcohol use is the principal obstacle in attaining the goals set out by the UN. Considering the heavy burden on Health Care of mental illnesses, its significant comorbidities with HIV/AIDS, Diabetes Mellitus, Hypertension, Coronavirus Disease 2019 (COVID-19), AUD and SUDs; psychological and psychiatric treatments are not financially feasible for the most vulnerable groups through government-health care service provision (Mutyambizi-Mafunda et al., 2023).

South African interventions have largely been nonspecific in their approaches, with the exception of certain vulnerable populations which include HIV-infected people, school-goers, community leaders, general practitioners, and females seeking community-based assistance in the peri urban Western Cape (Mupara et al., 2022). The identification of key segments of the population is key in mobilising the appropriate resources and provisions, often not mental health care workers or politicians.

*...funding should be given to research that develops and assesses interventions that can be delivered by people who are not mental health professionals, and that assesses how health systems can scale up such interventions across all routine-care settings (Chisholm et al., 2007, p. 1241)*

## CHAPTER 4: METHODOLOGY

The following chapter can be separated into two parts; the description of the steps followed by the HSRC's research team led by Prof. Leickness Simbayi and colleagues (2019) and the steps followed by myself the author of this thesis. This section will start out by describing the sampling approach, survey design, and the data collection procedure. These subsections describe methodological processes that were carried out in SABSSM-V by the HSRC's research team (Simbayi et al., 2019) The subsequent subsections; Data Management, Measures, Sample Description, Data Analysis, Ethical Considerations, and Methodological Rigour; describe actions and considerations carried out by the author of this paper, Rikshay Ganasen.

The dataset that was analysed was sourced from the Human Science Research Centre (HSRC) library and was collected as part of The Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey (SABSSM-V) in 2017 (Simbayi et al., 2019). This dataset was the sole source of data analysed in this research. Researchers can request the data and supplementary documentation from the Human Sciences Research Council's library at <http://dx.doi.org/doi:10.14749/1585345902>.

### **Data Collection (Simbayi et al., 2019)**

To facilitate communication, an assistant accompanied the interviewer, collecting background information and supporting the administration procedure. Throughout the survey, informed consent, and assent, were given paramount importance. All consenting members of the households constituted the ultimate sampling unit. Informed consent was obtained from each household member and return visit dates were scheduled for absent members. To ensure comprehensive participation, up to three visits were made to some households. Emphasis was placed on individual participation, and surveys were completed anonymously (see Appendix C for informed consent form). questionnaires were aimed at gathering detailed sociodemographic information, sexual history, and HIV-related risk behaviours. The field workers were responsible for administering these questionnaires and electronically capturing the responses using CSPro software on Mercer electronic tablets, enabling access to the questionnaire and adherence to the structured interview schedule., thereby ensuring the accuracy and reliability of the collected data.

Each interviewer clarified the survey's aims, explained the consent process, and initiated engagement with the "head of the household."

### **Sampling Approach (Simbayi et al., 2019)**

This cross-sectional, population-based, household survey, was conducted utilizing a detailed multi-stage stratified cluster random sampling method (Simbayi et al., 2019), informed by scaffolding of resources and design frames from prior works. The national population sampling frame provided by Statistics South Africa (2015), which consisted of 84 907 small area layers (SALs) a subset of 1 000 SALs was strategically chosen, included individuals from all ages in the sample (n= 39 210). The selection of these SALs was systematically stratified by geolocality type (informal rural, formal rural, and urban), age, gender, and province (Simbayi et al., 2019). Race group stratification occurred only within urban SALs. This stratification was vital to capture the heterogeneity of the South African population and to ensure that diverse communities were adequately represented in the study (Simbayi et al., 2019). A total of 11 776 visiting points were validated for the survey, leading to a household response rate of 82.2%, while the response rate was 87.9% for schools and 93.1% for learners. Following the identification of visiting points through SALs, demographic and geographic stratification, and aerial photographs, the HSRC research team contacted each visiting point to schedule a convenient time for survey administration (Simbayi et al., 2019). This response rate is indicative of the broad participation and acceptance of the survey across the varied South African demographic (Simbayi et al., 2019). Efforts to prevent a poor response rate were made such as scheduling re-visits at convenient times, maintaining privacy, liaising with gatekeepers of the community to communicate the value of the survey and, employing well-trained interviewers to provide "detailed explanations to potential respondents of the value of their participation" (Simbayi et al., 2019, p. 40). To focus on household-based statistics, individuals residing in homeless shelters, hostels, care facilities, and hospitals were excluded from the sample.

### **Survey Design (Simbayi et al., 2019)**

In excess of one thousand variables were collected for each participant through various survey forms, including household and individual questionnaires. The latter comprised three modules designed for different age groups: children eleven years or younger, children between

12 and 14, and those 15 years and older. This study specifically assesses data from the questionnaire for individuals aged 15 and older (see Appendix B).

### **Data Management**

Access to this dataset was granted by the HSRC on July 18, 2022 (see Appendix D). The dataset, retrieved through the HSRC's online library portal, was downloaded in .xml format and subsequently imported into Statistical Product and Service Solutions (SPSS) software version 27.0 developed by International Business Machines Corporation (IBM). IBM SPSS was the primary tool employed for data management and analysis. This dataset has been used purely for academic reasons and strict protocols for data confidentiality and security, in line with HSRC guidelines, have been followed. The dataset was initially assessed for consistency and completeness. The HSRC categorised participants' ages using the variable `agecat_13` in the dataset, utilising it as the selection criterion to exclude cases involving individuals below 15 years old or above 24 years old. The dataset was then reduced to  $n=12\ 058$  to include only those aged between 15 and 24 years old. To ensure that the survey findings were representative of the South African population at large, the collected data was benchmarked against the 2017 mid-year population estimates (StatsSA, 2017), stratified by locality type (informal rural, formal rural, and urban), age, race, gender, and province, as outlined by Simbayi et al. (2019). This allowed for inferences to be made that are nationally representative and accurate. Descriptive statistics, including means, medians, standard deviations, and frequencies, were calculated to gain an initial understanding of the data distribution and participant demographics. This initial exploration provided valuable insights into the central tendencies, variability, and prevalence of key characteristics within the sample.

To simplify the analytical process, composite variables were established. These included (i) risky drinking (Harmful, Hazardous, or Dependent Alcohol Use), (ii) recent illicit substance use, and (iii) the presence of psychological distress (K10). These composite variables were each used as a dependent variable once and an independent variable twice. These were the only criterion measures used in the analysis covered by this thesis. Creating these composite variables involved utilising the compute variable function on SPSS and employing the syntax feature. Each variable was coded appropriately, ensuring that the scales and categories used were aligned with the measurement tools. Categorical predictors were transformed into dummy variables to

facilitate their inclusion in the various linear models. These included the categories (which served as predictors) for recent illicit substance use (yes or no), the presence of psychological distress (yes or no), gender (male or female), race groups (African, Coloured, Indian, or White), province of residence (one of the nine provinces), risky drinking (yes, no) and geolocation (Urban, Rural, or Farm) respectively. Highest level of education, Gross monthly Income, and age were included in the models as covariates.

## **Data Analysis**

### ***Contingent Variables***

**Psychological Distress.** Psychological distress, in this study, was measured using the Kessler-10 Assessment (K-10), a 10-item screening tool endorsed by the WHO (Kessler, 2003). K10 is a widely used tool to assess the frequency and severity of symptoms like anxiety and depression in South African youth (Andersen et al., 2011; Hoffman et al., 2022). The scale is simple and brief, making it practical for large-scale screenings in diverse settings, from educational institutions to community health centres (Andersen et al., 2011; Stolk et al., 2014). Psychological Distress (K-10 scale) is a contingent variable which is the sum of items q14\_1, q14\_2, q14\_3, q14\_4, q14\_5, q14\_6, q14\_7, q14\_8, q14\_9 and q14\_10 respectively (see Appendix H). The K-10 scale is a ten-item assessment battery measured on a scale ranging from 10 to 50. Scores below 16 indicate no mental distress (scored as 2); between 16 and 24 indicate the possibility of a mild mental disorder (Scored as 1); between 25 and 30 indicate the possibility of a moderate mental disorder and above 30 (scored as 1) is indicative of an individual with a severe mental disorder or psychological distress. The global psychological distress experienced in the past 30 days was assessed using the 10-item Kessler Psychological Distress Scale (K-10) (Kessler et al., 2005; Stolk et al., 2014). A sample of one of the items ‘In the past 30 days, how often did you feel so restless that you could not sit still?’ The response options ranged from 1 = ‘none of the time’ to 5 = ‘all of the time’. The total scores were obtained by summing up the responses, with higher scores indicating higher psychological distress. A cut-off point of 16 or more was used to identify depression and anxiety disorders, based on a previous validation study of the K-10 in the general population in South Africa (Peltzer & Phaswana-Mafuya, 2018). The Cronbach Standardized Alpha (internal consistency) for Psychological Distress K-10 Scale showed expected significant construct validity in the youth of South Africa’s population (.89)

indicative of a high inter-item reliability. Psychological distress serves as the criterion in research question 3 and research question 4. It is also used as a predictor measure in research questions 1 and 2.

**Risky Alcohol Use.** Hazardous, Harmful, or Dependent Alcohol (HHDA) use, or risky drinking, is the categorisation as informed by the Alcohol Use Disorders Identification Test (AUDIT) psychometric scale. A score of 8 or higher indicates the presence of, or a high risk for developing, AUD (American Psychology Association, 2013). Additionally, scores of 13 or higher for females and 15 or higher for males indicate Alcohol Dependence Disorder (Reinert & Allen, 2007; Saunders et al., 1993). AUDIT is adapted and standardized for all salient groups in South Africa (Young & Mayson, 2010).

AUDIT is designed to identify individuals with risky and harmful patterns of alcohol consumption (Saunders et al., 1993). It consists of 10 questions covering aspects like the frequency and quantity of drinking, dependence symptoms, and alcohol-related problems. Each question is scored from 0 to 4, with a maximum score of 40. As done in previous studies (Peltzer et al., 2011; Peltzer & Pengpid., 2018; Peltzer & Phaswana-Mafuya, 2018; Pengpid et al., 2021) and informed by an evidence base (Liskola et al., 2018; Babor et al., 2001) in the development of AUDIT; individuals aged 20-years-old and older at time of testing would be treated as adults for this measure while those aged 15-19 years-old will be assessed as adolescents. Adults with AUDIT scores lower than 8 (low risk drinking) were coded as 0, those with harmful and hazardous drinking (scores between 8 and 16) were coded as 1, and those with dependent alcohol use behaviour (over 16) were coded as 2. Adolescents with AUDIT scores (Liskola et al., 2018) lower than 5 (low- or no-risk drinking) were coded as 0, those with harmful and hazardous drinking (scores between 5 and 13) were coded as 1, and those with dependent alcohol use behaviour (over 13) was coded as 2. The Cronbach Standardized Alpha (internal consistency) for the AUDIT scale showed expected significant construct validity in the youth of South Africa's population (.83). This variable is the criterion variable in research question 1 and is a predictor variable in the remainder of the research questions.

**Recent Use of Illicit Substances.** The recent use of illicit substances is understood as the self-report measure of whether an individual has engaged in illegal substance use in the last 30 days. A binary composite variable used as a predictor variable in research questions 1, 3, and

4. It is also the criterion in research question 2. If any of the items q12\_1a, q12\_1b, q12\_1c, q12\_1d, q12\_1e, q12\_1f, q12\_1g, q12\_1h, or q12\_1i were recorded as greater than 1 was indicative of use of a specific illicit substance in the last 30 days. These nine items from Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) measure an individual's frequency of use of nine different illicit substances in the past three months. These substances included cannabis, cocaine, amphetamine-type stimulants, inhalants, as well as the illegal misuse of prescribed sedatives and opioids (Simbayi et al., 2019). The SABSSM-V questionnaire included an item enquiring about whoonga/nyaope use which was also regarded as illicit substance use. The Cronbach Standardized Alpha (internal consistency) for the ASSIST scale showed expected significant construct validity in the youth of South Africa's population (.91).

### ***Predictors and Covariates***

Relevant predictor variables were identified based on the study objectives, including demographic data, geographic factors, social factors, economic factors, substance use behaviours, and psychological distress indicators. In addition to the three contingent measures mentioned above, eight other items from the questionnaire were used as predictor variables. The nominal measures used as independent categorical variables analysis included (i) geolocation of residence, (ii) gender, (iii) province of residence (vi) race group respectively. Ordinal independent measures (v) highest education achieved, (vii) age and the scaled measure of (viii) gross monthly income were used as covariates in analysis. Kindly make reference to Appendix H. This study used highest level of education and gross monthly income as covariates to address potential confounding. It's important to note that nearly half the participants were under 20, potentially affecting the accuracy of these measures since many might still be in school. However, these variables were included only to account for their influence, not as the sole determinants of the outcome.

**Gender.** A dichotomous variable (item *sex\_q*) which is the reported sex of the participant.

**Province.** Province of residence is operationalised by participants' report to item province. This nominal variable ranges from 1 to 9.

**Race group.** A categorical variable (item *race*) ranging between 1 and 4 (representing African, Coloured, Indian, and White respectively).

**Type of geographical, location of residence (Geotype).** This nominal variable ranges from 1 to 3 which represents “urban”, “rural informal” and “rural formal.”

**Age.** A scale variable (item *age\_q*) which is the age of the participant ranging between 15 years old and 24 years old.

**Highest Level of Education Achieved (HLEA).** This variable is derived from item q1\_15c which is operationalised by participants' response to “What is the highest educational level that you obtained?” This ordinal variable ranges from 0 to 15.

**Gross Monthly Income (GMI).** A measure of participant’s response to item q1\_10 and is a scaled variable.

In summary, the composite variables used for analyses are (i) risky alcohol use, (ii) recent use of illicit substances, and (iii) the presence of psychological distress. The categorical variables used for analysis included (iv) geolocation of residence, (v) gender, (vi) highest education achieved, (vii) province of residence, and (viii) race group respectively. Continuous variables used were (ix) age and (x) gross monthly income.

#### ***Data Analysis Process:***

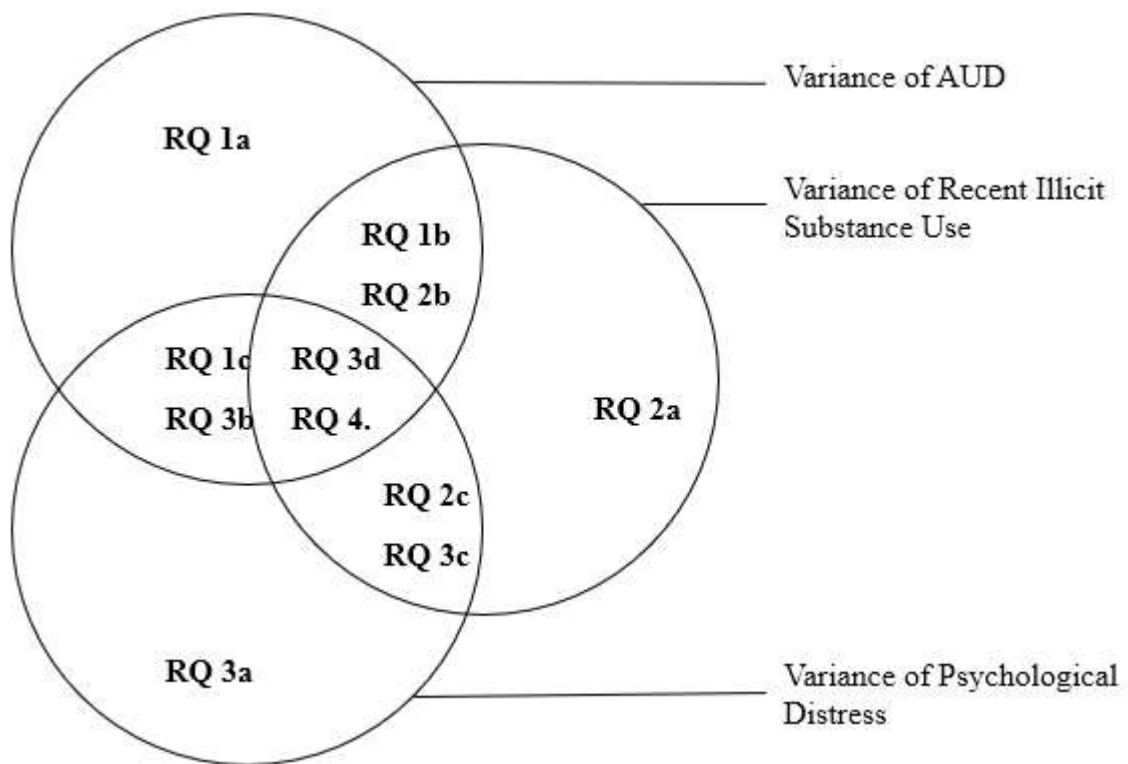
A series of nine independent quantitative models (Models A- I) were used to answer the above seven questions. The results from the regression models were interpreted, focusing on the strength and direction of relationships between predictors and outcome variables. Each of the inferences made from the models were generated at 95% probability significance. Missing values were excluded from analysis. For each of the linear regression models (Model A, Model B, Model C, Model D, Model E, Model F, Model G, and Model H), beta ( $\beta$ ) coefficients, and partial  $R^2$  values indicated effect size of variance association with the outcome variable(s). Tests for heteroskedasticity, with adjustments made for binary transformation. Post hoc analyses, using simple effects tests and pairwise comparisons with Bonferroni correction, were performed to explore significant interactions. As opposed to significance which is measured with alpha which assesses a quantitative model for a type I error; the power of a model refers to the probability of avoiding a type II error. This means that the probability that each measure, using the equation ( $\text{Power}_{\text{Predictor}} = 1 - \text{Beta}_{\text{Predictor}}$ ), will find a difference that exists in the given population can be inferred.

A main-effects only multivariate linear regression model (Model A) was initially utilized for exploratory analysis, assessing Risky Alcohol Use, the Recent Use of Illicit Substances, and the presence of Psychological Distress. This assessed predictors exposure to interpersonal violence, HIV status, Gender, Race group, Geolocation type, Province of Residence, Age, Education and Income.

Model B, a Univariate Full Factorial linear regression model with the scaled scores of the AUDIT being the criterion. The predictors that were included in the model were Gender, Race group, Geolocation type, Province of Residence, HIV status, Age, Education, and Income. This model was utilized to answer research question 1a.

**Figure 23**

*Research Questions: Venn Diagram of Proportion of Variance vs Predictor*



Research question 1b and 1c was tackled with Model C. Model C is a reverse entry full-factorial model which prioritised the entry of interaction effects. The model’s criterion was a binary screening of whether an individual screened positively for AUD while the predictors for

this model were Gender, Race group, Geolocation type, HIV status, Province of Residence, Age, Education, Income, Recent illicit substance use, and Psychological Distress.

Model D, a Univariate Full Factorial linear regression model with the binary response on whether they have engaged in any illicit drug use in the past 30 days as the sole criterion. The predictors that were included in the model were Gender, Race group, Geolocation type, Province of Residence, Age, Education, HIV-status, and Income. This model was utilized to answer research question 2a.

Research question 2b and 2c was tackled with Model E, a reverse entry full-factorial model which prioritised the entry of interaction effects. The model's criterion was a binary screening of whether an individual engaged in illicit drug use in the last 30 days while the predictors for this model were Gender, Race group, Geolocation type, Province of Residence, Age, Education, Income, a positive screening for AUD, HIV-status and Psychological Distress.

Model F, a Univariate Full Factorial linear regression model with the scaled scores of psychological distresses (K10) being the criterion. The predictors that were included in the model were Gender, Race group, HIV status, Geolocation type, Province of Residence, Age, Education, and Income. This model was utilized to answer research question 3a.

Research question 3b and 3c was answered with Model G. Model G is a reverse entry full-factorial model which prioritised the entry of interaction effects and its sole criterion was a binary screening of whether an individual had clinically significant symptoms of psychological distress. The predictors for this model were Gender, Race group, Geolocation type, Province of Residence, Age, Education, HIV status, Income, Recent illicit substance use, and a positive screening for AUD. A full-factorial multivariate model which assessed the intersection of AUD, recent illicit substance use, and psychological distress (Model H) as three independent criteria answered research question 3.4. This model's predictors were HIV status, Gender, Race group, Geolocation type, Province of Residence, Age, Education and Income.

The omnibus test (Model I) assessed to the inter-dependant relationship between risky drinking behaviour, recent illicit drug use, and the presence of psychological distress. Model I allowed for inferences to be made for research question 4. by investigating the significance of the inter-relationship between the predictors (Risky Alcohol Use and Recent Illicit Substance Use), as well the influence of each as a main effect, on the criterion of Psychological Distress (K10). Model I was adjusted to account for the variance of Race, Gender, Province, Geolocation, HIV

Status, Education, Age, Gross Monthly Income, and all possible interaction effects and see the net strength of the association of Risky Alcohol Use (Scale), Recent use of Illicit Substances, and the interaction between Risky Alcohol Use and Recent use of Illicit Substances on the magnitude and frequency of Psychological Distress (scale). Analysis of co linearity, normality, homoscedasticity, and heterogeneity of variance were executed to ensure validity is preserved.

### Characteristics of the Sample Studied

This study utilized a reduced sample (n=12 058) as the original sample (n 39 210) included cases from all ages. When the inclusion criteria were applied, the sample that was used for this study was reduced to 12 058. The only inclusion criteria that were applied was the condition that all individuals had to be between the ages of 15 and 24 years old at the time of interviewing. Although analysis is based on a sample of 12,058 cases, it was adjusted to accurately represent the South African youth population (N= 9,625,567). A detailed breakdown of this sample is presented in Table 1 and Table 2.

The age distribution within the adjusted sample revealed that a majority of 52.29% are young adults aged between 20 and 24 years, while the remaining portion comprises teenagers aged 15 to 19 years. This demographic distribution suggests the presence of over 4.5 million teenagers in South Africa.

**Table 1** *Sample Characteristics*

	Range	Median	Mode	Mean	SEM	Std.Dev	Skew (SE)	SErr	Kurtosis	SErr
Age (Years)	9.00	20.00	20.00	19.57	<.001	2.887	-.056(<.01)	<.001	-1.20	.002
Income (ZAR)	.9e7	.9e3	380.0 0	3.8e10	.3e2	5.7e5	17.1(<.01)	.002	291.10	.003
HIV Status	1.00	2.00	2.00	1.92	<.001	.274	-3.059(<.01)	.001	7.40	.002
Education Level (NQF)	15.00	12.00	12.00	10.89	.001	2.140	-1.501(<.01)	.001	3.30	.002
Illicit Drug Use	1.00	1.00	1.00	1.11	<.001	.318	2.423(<.01)	.001	3.90	.002
Psychological Distress	1.00	1.00	1.00	1.29	<.001	.453	.935(<.01)	.001	-1.10	.002
Risky Drinking	1.00	1.00	1.00	1.25	<.001	.434	1.140(<.01)	.001	-.70	.003
IP Violence	1.00	1.00	1.00	1.18	<.001	.387	1.634(<.01)	.002	.70	.004

*Note. Spread of Numerical Categorical Measures in Relation to the Sample*

This table above provides a comprehensive overview of the range, median, mode, mean, and other statistical measures across various parameters including age, income, HIV status, levels of education, illicit drug use, psychological distress, risky drinking, and intimate partner

violence. This table illustrates the numerical spread of these categorical measures within the sample, providing a clear picture of the prevailing trends among South African youth.

The final sample size used for this paper was 12 058, with 50.2% females and 49.8% males. The mean age was 19.57 years ( $SD = 2.9$ ). The age distribution within the adjusted sample revealed that a majority of 52.29% are young adults aged between 20 and 24 years, while the remaining portion comprises teenagers aged 15 to 19 years. This demographic distribution suggests the presence of over 4.5 million teenagers in South Africa.

The racial dispersion of participants is as follows, African (84%), followed by Coloured (8.8%), White (5.9%), and Indian (1.4%). Most participants lived in the urban geotype (64.2%), and the informal rural geotype (31.6%). Only 4.2% of participants live in rural formal (or farm) geotype. The participants were distributed across nine provinces, with the largest proportion from Gauteng (22.9%), followed by KwaZulu-Natal (21.1%), Western Cape (10.9%), Eastern Cape (10.7%), Limpopo (10.7%), Mpumalanga (9.2%), North-West (7.1%), Free State (4.8%), and Northern Cape (2.3%). The mean education level was 11.2 years ( $SD = 5.8$ ), and the modal and median education levels achieved are both 12 indicating that the average participant has completed secondary school. The mean income was R 3425 per month ( $SD = R 4 678$ ). The analysis is based on a sample ( $n=12,058$ ) that was weighted with the variable *ibreal12* (informed by StatsSA [2017] included in data documentation provided by the Human Science Research Council) to accurately represent the South African youth population ( $N= 9 625 567$ ).

Table 2 the percentage and adjusted number (in thousands) of youth across different provinces and geolocations, including urban, informal, and farm areas. This table highlights the geographical spread and diversity of the sample, offering insights into the regional variations within the youth population. It can be seen that 44.4% of the weighted sample are either from Gauteng or KwaZulu-Natal, which is reflective of the higher populations in these provinces. This does not compromise the generalizability of this research as large sample size upholds the claims to validity and the weighting procedure ensures that the demographics are reflective of the proportional differences in the population. Likewise, almost two thirds of the youths in South Africa are residing in urban settlements.

**Table 2** *Sample Characteristics: Geolocation and Province of residence*

Province of Residence	Adj. N (in thousands)	Percentage of Young South Africans
Gauteng	2 204	22.9%
KwaZulu-Natal	2 069	21.5%
Western Cape	1 049	10.9%
Limpopo	1 030	10.7%
Eastern Cape	1 030	10.7%
Mpumalanga	886	9.2%
Coloured	846	8.8%
North-West	683	7.1%
Free State	462	4.8%
Northern Cape	221	2.3%
<b>Geolocation</b>		
Urban	6 177	64.2%
Informal	3 040	31.6%
Farm	407	4.2%

*Note. Spread of Categorical Measures in Relation to the Sample, N= Adjusted Sample size when weighted to represent South Africa's population.*

**Table 3**

*Prevalence across Racial and Gendered demographics in Adjusted Sample*

	Population of YPSA		Risky Alcohol Users		Illicit Substance Use		Psychological Distress	
	%	Adj. N <sup>1</sup>	%	Adj. N	%	Adj. N	%	Adj. N
Youth <sup>2</sup>		9 625 <sup>3</sup>	25.2	2 425	11.4	1 100	28.8	2 772
<b>Race</b>								
<i>African</i>	84	8 083	7.4	595	10.4	844	29.8	2 409
<i>Coloured</i>	8.8	845	11.3	95	17.3	146	21.31	180
<i>White</i>	5.9	564	7.5	42	16	90	26.59	149
<i>Indian</i>	1.4	132	5.1	6	15.9	21	26.86	35
<b>Gender</b>								
<i>Male</i>	50	4 812	37.1	1 786	17.2	828	24.8	1 191
<i>Female</i>	50	4 812	4.1	197	5.7	272	32.9	1 583

Table 3 delves into the specific prevalence rates of risky drinking, illicit substance use, and psychological distress among South African youth. It provides a detailed breakdown by

<sup>1</sup> Adjusted to Nationally Representative Census Data, in thousands.

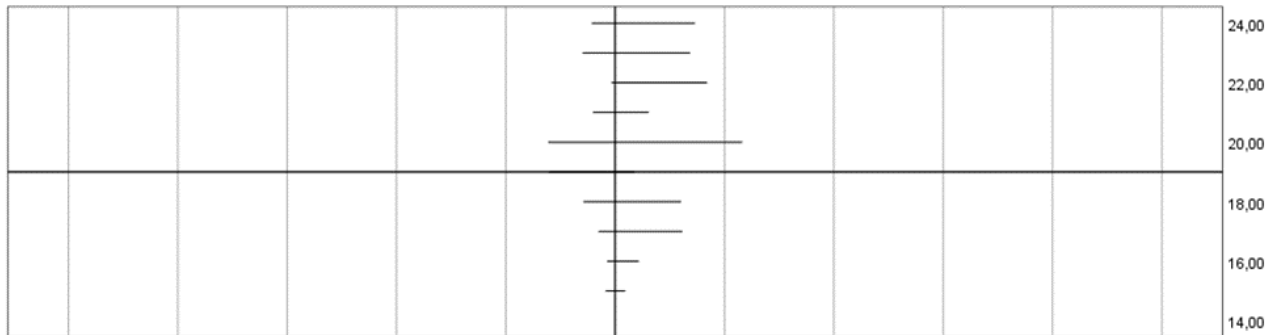
<sup>2</sup> Young people in South Africa, aged 15-24 years old.

<sup>3</sup> Unadjusted Sample (n=12 058)

population, race, and gender, with corresponding percentages and adjusted numbers (in thousands). This table is critical in understanding the extent of these issues among different

**Figure 4:**

*Age and Gender Distribution of illicit drug users with Psychological Distress*



demographic groups, shedding light on the varying impacts across racial and gender lines.

The majority of youths who engage in illicit substance use and risky drinking behaviour are males over 20 years of age, as depicted in Figure 5. As this is a weighted sample, this is reflective of the demographics in South Africa. It can also be noted that the non-risky drinking and non-substance using youths are spread out between and across gender and age (Figure 6). AUD intersection with psychological distress is gendered, but less so than poly substance.

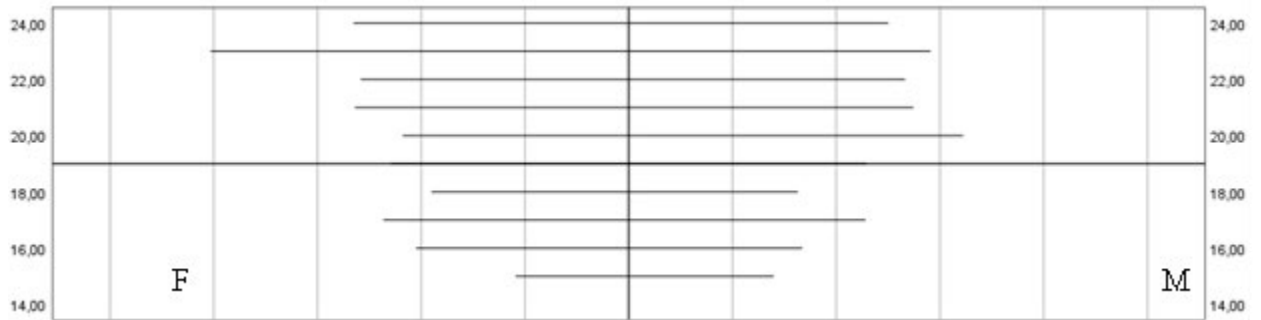
**Figure 6**

*Age and Gender Distribution of polysubstance users with Psychological Distress*



**Figure 5:**

*Age and Gender Distribution of non-AUD and non-illicit drug users with Psychological Distress*



abuse's intersection with psychological distress. This can be illustrated in Figure 7 below. Lastly, we see that illicit drug use and psychological distress together is biased towards males (Figure 4).

**Figure 7:**

*Age and Gender Distribution of AUD with Psychological Distress*



## **Methodological rigour**

Methodological rigour in quantitative research refers to the "soundness or precision of a study in terms of planning, data collection, analysis, and reporting" (Marquart, 2017, p. 1). Heale and Twycross report that rigour further refers to the efforts put in place by the relevant research team to upkeep or enhance the overall quality of the study. This is assessed in quantitative studies through assessments of validity and reliability (2015).

To maintain the content validity of measuring all young people in South Africa, a representative sample was drawn, and this was further weighted to census data. As the data collected originated from population-based surveys, the weighting allows for generalizability. And for the sample to represent the population as a whole. The population estimates of July 2017 provided by Statistics South Africa (Stats SA) were congruent with the data collected. This suggests that the surveying and sampling process maintained the criterion validity. Several measures also showed convergent validity with other estimates and surveys measuring HIV prevalence rates, Illicit drug use prevalence rates, and HHDA use prevalence rates. The demographic constructs (with contextual exceptions) of race, gender, age, and HIV status matched the estimates provided by StatsSA with more than 95% equal variability (Simbayi et al., 2019; StatsSA, 2017). This suggests that the representativeness of the sample was preserved, and the inferences made from this dataset can be generalizable to the whole South African population. Equivalence of items is observed, as many items are reworded and repeated to allow for checks of homogeneity and internal consistency to be executed. This further indicated the stability of the instrument in measuring consistent results. This assists policymakers in health care to predict the actual burden to mental health in the absence of accurate prevalence rates of mental illness.

As this is a quantitative study it is based on positivistic principles of falsifiability and a unidirectional approach where the research process is predetermined. During analysis, validity was maintained by appropriately weighing the variables. The linear models included tests for heteroskedasticity, with adjustments made for binary transformation. Post hoc analyses, using simple effects tests and pairwise comparisons with Bonferroni correction, were performed to explore significant interactions. Lastly, the quality of the research design and data analytic processes was executed meticulously, with independent checks, to uphold rigour.

Overall, this study attempts to encapsulate the nuanced, contextually complex, and interdependent nature of mental health distress, risky drinking behaviour, and illicit substance use. Although many variables from multiple domains were included in the models, this study still claims to have face validity as these assessment tools used were valid and designed by multiple experts in the field(s). This study upheld reliability by utilizing universal scales of measurement (such as the ASSIST, K10 and AUDIT scales). The K-10, ASSIST, and AUDIT questionnaires are designed to screen for mental illness and the vast majority of mental illness in the youth of South Africa is currently undiagnosed. The Cronbach Standardized Alpha (internal consistency) for Psychological Distress K-10 Scale (.89), the ASSIST scale (.91) and AUDIT (.83). Furthermore, this upholds criterion validity as these instruments are empirically based, standardized, and adapted to the South African population.

### **Ethical Considerations**

In terms of the National Health Act (Act No. 61 of 2003), all health research proposals and protocols require approval by an accredited health research ethics committee before the research may commence. The principle of best interest or well-being, The principle of respect for persons: The principle of justice. The National Health Act (Act No. 61 of 2003) further suggests that academic research must further adopt methods where informed consent is central practice. It is further stated that this is foundational to the constitution of the land, HPCSA principles of ethical conduct, APA standards, as well as a variety of common laws (APA, 2013; HPCSA, 2016). According to the Children Act (2003), as well as HPCSA guidelines, and APA principles, concepts around verbal and non-verbal consent, how to inform the illiterate, or hard of understanding about informed consent, and the need for accent on the top of parental consent.

For scholarly works to be considered viable to be used for academic reasons, or the advancement of society's "body of knowledge", it is the obligation of the researcher to present findings in a manner that meets a particular standard of academic integrity and trustworthiness, "as this is the desired and ideal purpose of research" (Ederio et al., 2023, p. 2711). These standards which are discussed by Nikko Ederio and colleagues' (2023) publication *Ethical Research Practices in Educational Institutions* published in the International Journal of Current Science Research and Review (IJCSRR), reported the importance of regulatory ethical boards and research ethics committees alike in that they actively maintain (i) standards of scientific

integrity, (ii) social dignity, and the (iii) collaboration between knowledge production institutes and society (Ederio et al., 2023)

Under the governance of the Republic of South Africa (2004, 2005, 2013), these standards are outlined and research practice is regulated by the Health Professions Act whose authority over health research is embedded in the national constitution (Act No. 108 of 1996) as well as many other common laws such as the Health Professions Act, 1974 (Act No. 56 of 1974), National Health Act (Act No. 61 of 2003), and the Children's Act (Act No. 38 of 2005). Explicit guidelines can be found in the General Ethical Guidelines for Health Researchers (HPCSA, 2016) which describe to (1) protect the rights of research participants, (2) enhance research validity, and (3) maintain academic integrity. Furthermore, the general principles that embed these standards are the principle of best interest or well-being, The principle of respect for persons, And the principle of justice. These were the ethical and legal considerations taken throughout the process of this research. The following considerations were made during the process of this research.

Aligned with the National Health Act (No. 61 of 2003) this study embarked upon seeking socially valuable answers that investigated the health needs of vulnerable groups. Furthermore, this research design included most people living in South Africa and made all attempts not to discriminate against already discriminatory social structures that have plagued the nation for centuries. As outlined by the HPCSA, nationwide, multi-centre and multi-national studies, must ensure equal standards of care are applied across countries to all research participants are included and accounted for proportionately. This was accentuated in all parts of the research, from the conceptualization of the problem to Simbayi and teams' data collections, the weighting of the sample to the StatsSA census data and then the conceptualization, opalization, and execution of the data analysis and design of the research. The syntactic and semantic expression in this thesis avoids biased or stereotyped language and careful consideration was made given the volatility of the topic of study.

Furthermore, this act (National Health Act of 2003) outlines the requirement for ethical approval. This survey protocol was approved by the Human Sciences Research Council (HSRC) Research Ethics Committee (REC: 4/18/11/15), and both the Division of Global HIV and TB (DGHT) and the Centre for Global Health (CHG) of the Centres for Disease Control and Prevention (CDC). Permission to access data and use it for academic purposes was granted by

the HSRC in July 2022 (see Appendix D). On 14 July 2023 the Humanities and Social Sciences Research Ethics Committee (HSSREC), registered with the South African National Health Research Ethics Council (REC-040414-040), issued a full approval (see Appendix A) for this thesis (HSSREC/00005357/2023).

The HPCSA and the South African National Health Research Ethics Council, have embodied ethical standards and concepts that align with publications that inform the American Psychological Association and their practices as well as more general social science research principles (Emanuel et al., 2004; Resnik, 2020). This research adhered to the seven principles of ethical research in social and biomedical research throughout all its stages. These principles are applied in developing countries to evaluate ethical issues and design research that aligns with pro-social goals. These principles are social value, scientific validity, fair subject selection, favourable risk-benefit ratio, independent review, informed consent, and respect for the enrolled subject (Emanuel et al., 2004). In addition, this paper adhered to the “urgent request” by the Office of the High Commissioner for Human Rights (OHCHR; 2017) to re-align research, knowledge production and mental health care treatment to be more community-based, recovery-oriented and adhere to the movement towards the biopsychosocial framing of mental illness and acknowledging the limitations of the biomedical framing of mental illness.

## CHAPTER 5: RESULTS

### Part A: The geodemographic determinants of a positive screening for Alcohol Use Disorder (AUD) in the youth of South Africa

#### *Research Question 1a: What are the geodemographic risk-factors associated with AUD in the youth of South Africa?*

Model 2 (Appendix E) is a univariate full-factorial model where AUD is the sole criterion and Age, Education, Income, Gender, Race, Geolocation, and Province are predictors. In Model 2 ( $F(66) = 2471.605$ ,  $R^2 = 0.347$ ,  $p < 0.001$ ), reports that White females, white individuals who live in urban geolocations, Indian females, Coloured individuals in urban environments and Coloured females, particularly in KwaZulu Natal are less likely to have protective factors when it comes to risky drinking engagement or risk of AUD.

Males in Urban Gauteng are significantly at risk of engaging in risky drinking ( $\beta = 1.507$ ,  $\sigma_M = 0.245$ ,  $t(66) = 6.138$ ,  $R^2 = 0$ ,  $p < 0.001$ ) while urban females in Free State ( $\beta = -8.93$ ,  $\sigma_M = 0.183$ ,  $t(66) = -48.785$ ,  $R^2 = 0.008$ ,  $p < 0.001$ ), Eastern Cape ( $\beta = -8.16$ ,  $\sigma_M = 0.378$ ,  $t(66) = -21.572$ ,  $R^2 = 0.002$ ,  $p < 0.001$ ), and the Western Cape ( $\beta = 14.837$ ,  $\sigma_M = 0.439$ ,  $t(66) = 33.776$ ,  $R^2 = 0.004$ ,  $p < 0.001$ ) are also disproportionately at risk of developing an alcohol use disorder. In the Eastern Cape, males in formal rural residences are significantly more likely to engage in risky alcohol use ( $\beta = -3.728$ ,  $\sigma_M = 0.398$ ,  $t(66) = -9.371$ ,  $R^2 = 0$ ,  $p < 0.001$ ). Province, Geolocation, Gender ( $F(5, 66) = 529.747$ ,  $R^2 = 0.009$ ,  $p < 0.001$ ), and Race ( $F(4, 66) = 836.872$ ,  $R^2 = 0.011$ ,  $p < 0.001$ ) three-way interactions on the criterion risky drinking behaviour yielded significant parameters (see Appendix E).

Coloured individuals are more likely to engage in risky drinking particularly males in Northern Cape ( $\beta = 5.598$ ,  $\sigma_M = 0.307$ ,  $t(66) = 18.244$ ,  $R^2 = 0.001$ ,  $p < 0.001$ ), females in North-West ( $\beta = 1.725$ ,  $\sigma_M = 0.186$ ,  $t(66) = 9.27$ ,  $R^2 = 0$ ,  $p < 0.001$ ) which is more accentuated in the rural areas ( $\beta = -4.166$ ,  $\sigma_M = 0.353$ ,  $t(66) = -11.801$ ,  $R^2 = 0$ ,  $p < 0.001$ ). Rural living was the biggest predictor of coloured youths engaging in risky drinking behaviour ( $\beta = -12.979$ ,  $\sigma_M = 0.288$ ,  $t(66) = -45.032$ ,  $R^2 = 0.007$ ,  $p < 0.001$ ). Females coloured youths are less likely than males to engage in risky drinking ( $\beta = -9.08$ ,  $\sigma_M = 0.151$ ,  $t(66) = -59.943$ ,  $R^2 = 0.012$ ,  $p < 0.001$ ). Coloured individuals in Limpopo are also at risk ( $\beta = -8.526$ ,  $\sigma_M = 0.39$ ,  $t(66) = -21.844$ ,  $R^2 =$

0.002,  $p < 0.001$ ). Female coloured youths in KwaZulu Natal are significantly associated with risky drinking behaviour ( $\beta = -2.802$ ,  $\sigma M = 0.394$ ,  $t(66) = -7.111$ ,  $R^2 = 0$ ,  $p < 0.001$ ).

Race alone accounted for 0.3% of the variance seen in risky drinking while interaction effects with Race add up to 7.2% of the total variance explained. This include interaction with Gender ( $F(3, 66) = 2686.149$ ,  $R^2 = 0.026$ ,  $p < 0.001$ ), Province ( $F(12, 66) = 699.084$ ,  $R^2 = 0.027$ ,  $p < 0.001$ ), geolocational type ( $F(2, 66) = 1055.84$ ,  $R^2 = 0.007$ ,  $p < 0.001$ ) and a three-way interaction between race, province and gender ( $F(5, 66) = 529.747$ ,  $R^2 = 0.009$ ,  $p < 0.001$ ) respectively.

The gendered nature of risky drinking is particularly salient in Indian youths with males significantly more likely to have a positive screening of AUD ( $\beta = -14.072$ ,  $\sigma M = 0.206$ ,  $t(66) = -68.248$ ,  $R^2 = 0.015$ ,  $p < 0.001$ ) as were white males compared with white females ( $\beta = -19.141$ ,  $\sigma M = 0.199$ ,  $t(66) = -96.186$ ,  $R^2 = 0.029$ ,  $p < 0.001$ ) Although African Males are seen as high risk when main effects are only considered, interaction effect analysis suggests that when the influence of income, education, geolocational type, gender, and province of residence are controlled for, they are less likely than Indian, White, and Coloured groups to engage in risky alcohol use suggesting the social and economic influence on these behaviours and enduring impact on the downtrodden race groups of the past.

***Research Question 1b: What are the geodemographic risk factors of AUD in the youth of South Africa mediated by the recent use of illicit substances?***

Model 3 (Appendix E) is a univariate full-factorial model where AUD is the sole criterion and Age, Education, Income, Gender, Race, Geolocation, province, psychological distress, and the recent use of illicit substances are predictors.

Recent use of drugs is significantly associated with risky alcohol consumption (directly associated with frequency, prevalence, and quantity of alcohol consumed) in several subpopulations within South Africa. The stronger associations with these interactions occurred most frequently and strongly in urban parts of South Africa and were spread across race groups and gender depending on geolocation and province of residence. African Males who have recently engaged in illicit substance use and live in urban areas were shown to be high-risk

groups in the Western Cape ( $\beta = 2.400$ ,  $\sigma M = 0.080$ ,  $t = 300.000$ ,  $p < .001$ ,  $R^2 = 0.576$ ) and Mpumalanga ( $\beta = 2.080$ ,  $\sigma M = 0.104$ ,  $t = 200.000$ ,  $p < .001$ ,  $R^2 = 0.433$ ) respectively.

Coloured Females who live in the urban Western Cape show a strong interaction between risky drinking and illicit drug use ( $\beta = 0.750$ ,  $\sigma M = 0.040$ ,  $t = 81.967$ ,  $p < .001$ ,  $R^2 = 0.042$ ). The fifth and sixth most at-risk demographics who use illicit drugs are White Females in Urban Gauteng ( $\beta = 1.320$ ,  $\sigma M = 0.066$ ,  $t = 120.000$ ,  $p < .001$ ,  $R^2 = 0.174$ ) and Indian Females in Urban KwaZulu-Natal ( $\beta = 1.100$ ,  $\sigma M = 0.055$ ,  $t = 100.000$ ,  $p < .001$ ,  $R^2 = 0.121$ ) respectively.

In the rural parts of Eastern Cape, young Coloured Males ( $\beta = 2.530$ ,  $\sigma M = 0.135$ ,  $t = 187.407$ ,  $p < .001$ ,  $R^2 = 0.276$ ) and young African Females ( $\beta = 0.500$ ,  $\sigma M = 0.070$ ,  $t = 71.429$ ,  $p < .001$ ,  $R^2 = 0.089$ ) are both significantly associated with risky drinking behaviours if they also have recently used illicit drugs. The following detailed findings identify which subpopulations of South African youth are particularly susceptible to this mediating mechanism of drug use leading to risky drinking and vice versa.

Race group identity alone explains slightly less than 12% of the overall variance seen in drinking behaviour disparities in young South Africans with either psychological distress or the recent use of illicit substances ( $F [82.35]$ ;  $\alpha < .001$ ;  $R^2 [0.3754]$ ). Gender independently explains less than 1% of the variance in risk drinking prevalence ( $F [0.025]$ ;  $\alpha [0.024]$ ;  $R^2 [<0.001]$ ) but is a significant predictor that mediates the psychological distress. Gross monthly income and highest level of education achieved each exhibits a profound influence, with a regression coefficient indicating a substantial decrease in the likelihood of risky drinking behaviours as income increases ( $\beta = -1.41$ ;  $SEM = .04$ ;  $p < .001$ ;  $R^2 = .243$ ; 95% CI [.224; .264]).

***Research Question 1c: What are the geodemographic risk factors of AUD in the youth of South Africa mediated by the presence of Psychological Distress?***

African males in urban Western Cape ( $\beta = 1.406$ ,  $\sigma M = 0.003$ ,  $t = 420.44$ ,  $p < .001$ ,  $R^2 = 0.605$ ), KwaZulu Natal urban areas ( $\beta = 1.22$ ,  $\sigma M = 0.002$ ,  $t = 488.261$ ,  $p < .001$ ,  $R^2 = 0.674$ ), and Eastern Cape ( $\beta = 0.847$ ,  $\sigma M = 0.003$ ,  $t = 254.801$ ,  $p < .001$ ,  $R^2 = 0.3601$ ) are significantly at-risk populations to screen positively for AUD while concurrently experiencing psychological distress. White males in the Western Cape show a similar relationship ( $\beta = 1.311$ ,  $\sigma M = 0.003$ ,  $t = 416.905$ ,  $p < .001$ ,  $R^2 = 0.601$ ).

Indian females in Urban KwaZulu Natal are the highest risk population to consume alcohol when psychologically distressed ( $\beta = 1.44$ ,  $\sigma M = 0.012$ ,  $t = 118.881$ ,  $p < .001$ ,  $R^2 = 0.109$ ). Similarly, Coloured females in Urban Western Cape, and White females in Urban Gauteng are significantly associated with this interaction ( $\beta = 1.2959$ ,  $\sigma M = 0.004$ ,  $t = 300.021$ ,  $p < .001$ ,  $R^2 = 0.438$ ).

In summary, Males in Gauteng are significantly at risk for AUD compared to females in Gauteng and male in other provinces. Female urban resident in the Eastern Cape, Free State, and Western Cape are also at increased risk. Coloured males in the Northern Cape, coloured females in North-West (particularly in rural areas), Indian males, and White males are more likely to have AUD than the rest of the nation. Urban females in the Eastern Cape, Free State, and Western Cape are also at increased risk. Urban areas, especially in Gauteng, is a high-risk zone for AUD. AUD is further inversely associated with income and education level.

Substance use strongly increases AUD risk, especially for Indian females in urban KwaZulu-Natal, Coloured females in urban Western Cape, White females in urban Gauteng, African females in rural Eastern Cape, African males in urban Western Cape, African males in Mpumalanga, and coloured males in Eastern Cape. Psychological distress significantly increases AUD risk, especially for White males in the Western Cape, Indian females in urban KwaZulu-Natal, Coloured females in urban Western Cape, White females in urban Gauteng, and African males in urban Western Cape, KwaZulu-Natal, and Eastern Cape respectively.

## **Part B: The geodemographic determinants for the self-reported use of Illicit Substances in the last 30 days in the youth of South Africa**

### ***Research Question 2a: What are the geodemographic risk-factors associated with the recent engagement with illicit substances in the South African youth?***

Model 4 (see Appendix F) is a univariate full-factorial model where recent substance use is the sole criterion and Age, Education, Income, Gender, Race, Geolocation, and Province are predictors. This model ( $F(100) = 2762.236$ ,  $R^2 = 0.239$ ,  $p < 0.001$ ) inferred that female youths of the coloured race group are significantly influenced by factors of geolocation and province. This is iterated by the significant four-way interaction between this group and the geolocation of residence urban Western Cape ( $\beta = 0.458$ ,  $\sigma M = 0.033$ ,  $t(100) = 14.007$ ,  $R^2 < 0.001$ ,  $p < 0.001$ )

which are associated with a high risk for using illicit substances. Four-way interactions between Province of residence, Geolocational type, Race, and Gender interactions significantly explains around 0.01% of the variance seen across the youth with regard to recent illicit substance use ( $F(1, 100) = 196.189, R^2 < 0.001, p < 0.001$ ). Accounting for the single significant parameter which suggests that coloured males in rural Western Cape are significantly more likely to engage in Illicit Substance Use when compared to the urban population of coloured males in the Western Cape. Furthermore, these factors together when accounted for all interaction effects and main effects, accounts for 23.9% of the variance seen in illicit drug use in young South Africa ( $F(100) = 2762.236, R^2 = 0.239, p < 0.001$ ).

Coloured female youths residing in the urban geolocations of the Western Cape were significantly associated with recent illicit substance use ( $\beta = 0.458, \sigma M = 0.033, t(100) = 14.007, R^2 = 0, p < 0.001$ ). This was the only four-way interaction effect between gender, race, province, and geotype, however, this pattern of interaction significant accounted for a significant proportion of variance in recent illicit substance use country-wide ( $F(1, 100) = 196.189, R^2 = 0, p < 0.001$ ). The Western Cape was a significant predictor of illicit substance use in white males, African males, and coloured males. The interaction between males and Western Cape accounted for 1% of the total variance seen country-wide ( $\beta = 0.266, \sigma M = 0.011, t(100) = 23.535, R^2 = 0.001, p < 0.001$ ).

The Western Cape was further a significant predictor of illicit substance use in white individuals in urban geotype locations ( $\beta = 0.666, \sigma M = 0.036, t(100) = 18.645, R^2 = 0, p < 0.001$ ), African males ( $\beta = -0.162, \sigma M = 0.021, t(100) = -7.539, R^2 = 0, p < 0.001$ ), Coloured males, and White females, and with females in urban geolocations irrespective of race ( $\beta = -0.162, \sigma M = 0.021, t(100) = -7.539, R^2 = 0, p < 0.001$ ). White males in KwaZulu-Natal are most at risk in the province, followed by Coloured males, and Indian males ( $\beta = 0.288, \sigma M = 0.022, t(100) = 12.87, R^2 = 0, p < 0.001$ ) respectively. White males are a high-risk population with regard to recent illicit substance use being significantly associated with the behaviour in Gauteng ( $\beta = 0.236, \sigma M = 0.021, t(100) = 11.275, R^2 = 0, p < 0.001$ ), Northern Cape, Western Cape, Eastern Cape, Free State and KwaZulu-Natal respectively. Similarly, Coloured males in Northern Cape ( $\beta = 0.765, \sigma M = 0.015, t(100) = 52.536, R^2 = 0.003, p < 0.001$ ), Eastern Cape ( $\beta = 1.454, \sigma M = 0.035, t(100) = 41.207, R^2 = 0.002, p < 0.001$ ), Free State ( $\beta = 0.849, \sigma M = 0.027, t(100) = 31.03,$

$R^2 = 0.001$ ,  $p < 0.001$ ), Western Cape ( $\beta = 0.891$ ,  $\sigma M = 0.033$ ,  $t(100) = 26.693$ ,  $R^2 = 0.001$ ,  $p < 0.001$ ), and KwaZulu Natal are at risk ( $\beta = 0.111$ ,  $\sigma M = 0.019$ ,  $t(100) = 5.869$ ,  $R^2 = 0$ ,  $p < 0.001$ ).

The three-way interaction with Province, Race, and Gender accounted for 1.3% of the variance seen the south African youth's illicit substance use behaviour ( $F(13, 100) = 878.598$ ,  $R^2 = 0.013$ ,  $p < 0.001$ ). The interaction between gender, race and geolocational type ( $F(2, 100) = 47.897$ ,  $R^2 = 0$ ,  $p < 0.001$ ) accounted for a significant proportion, albeit, less than the Province, Race, and Gender interaction indicating that there is a stark difference in behaviours between provinces, irrespective of urbanicity or rurality of the individual's residence. Males in urban Free State ( $\beta = 0.606$ ,  $\sigma M = 0.089$ ,  $t(100) = 6.775$ ,  $R^2 = 0$ ,  $p < 0.001$ ) and Urban Northern Cape ( $\beta = 0.591$ ,  $\sigma M = 0.017$ ,  $t(100) = 35.255$ ,  $R^2 = 0.001$ ,  $p < 0.001$ ) are significantly more at risk than males in rural residences in these provinces.

***Research Question 2b: What is the geodemographic risk-factors associated with the recent engagement with illicit substances for the South African youth with a positive screening for Alcohol Use Disorder?***

Youth who engage in Illicit Substance Use and positive for AUD	$R^2$	$\beta$	Sig
African Females in Urban Eastern Cape	29%	1.66	<.001
Coloured Females in Urban Gauteng	24%	1.55	<.001
African females in Urban Mpumalanga	55%	1.25	<.001
African females in Urban Gauteng	81%	0.94	<.001
Coloured Females in Urban Eastern Cape	30%	0.88	<.001

*Notes. Between Subjects effects interactions, Risky Drinking as a mediator for Illicit Substance Use*

The analysis of model 5 (see Appendix F) revealed significant interactions between risky drinking and various demographic variables, which are indicative of the likelihood of engaging in recent illicit drug use among South African youth. This multivariate linear regression model suggests that urban-residing African females who engage in risky drinking are more likely to engage in illicit substance use in the Eastern Cape ( $\beta = 1.66$ ,  $p < .001$ ,  $R^2 = .29$ ), Mpumalanga ( $\beta = 1.25$ ,  $p < .001$ ,  $R^2 = .55$ ), and Gauteng ( $\beta = .94$ ,  $p < .001$ ,  $R^2 = .81$ ) are high-risk populations to engage in risky alcohol use and illicit drug use. Further, Coloured females in Urban residences of Eastern Cape ( $\beta = .88$ ,  $p < .001$ ,  $R^2 = .3$ ) and Gauteng ( $\beta = 1.55$ ,  $p < .001$ ,  $R^2 = .24$ ) are associated with engagement in illicit substance use when they have a positive AUD screening.

***Research Question 2c: What are the geodemographic risk-factors associated with the recent engagement with illicit substances for the South African youth mediated by the presence of psychological distress?***

The most significant interactions with illicit drug use and psychological distress were localized in North-West, Gauteng, and KwaZulu-Natal (in both informal rural and urban areas). African males in both urban ( $\beta=2.32, p <.001, R^2=.56$ ) and rural North-West ( $\beta=1.17, p <.001, R^2=.37$ ) as well as females in urban North-West ( $\beta=2.27, p <.001, R^2=.57$ ) are likely to use illicit drugs when distressed. Likewise, in Urban KwaZulu-Natal, African females ( $\beta=1.12, p <.001, R^2=.43$ ), Indian males ( $\beta=2.06, p <.001, R^2=.46$ ), and White males ( $\beta=2.32, p <.001, R^2=.75$ ) are significantly more likely to engage in drug use concurrently with psychological distress when compared to the average South African youth. Informal settings mediate the positive association between psychological distress and drug use. African Females in informal KwaZulu-Natal ( $\beta=1.55, p <.001, R^2=.39$ ) and informal Gauteng ( $\beta=1.26, p <.001, R^2=.44$ ) are high-risk demographics for this interaction. Furthermore, African males in informal Gauteng ( $\beta=2.05, p <.001, R^2=.58$ ) and Mpumalanga ( $\beta=1.6, p <.001, R^2=.44$ ) are significantly associated with this interaction effect.

Gender is associated with an overall the interaction effects of gender and race with risky drinking further highlighted significant predictors of recent illicit drug use. A significant amount of shared variance between gender and risky drinking on recent illicit drug use ( $R^2 = .382, p <.001$ ) was observed. Likewise, the interaction between race and risky drinking also emerged as a significant predictor of recent illicit drug use ( $R^2 = .437, p <.001$ ). Provincial differences significantly impacted the relationship between risky drinking and recent illicit drug use ( $R^2 = .512, p <.001$ ). Socioeconomic status, particularly income, was significantly associated with substance use patterns. Those reporting an income of R3 000 were most frequently associated with a 29.4% variance in recent illicit drug use and 8.9% greater odds compared to other income brackets. An income of R1 000 was strongly correlated with recent illicit drug use, explaining 20.9% of the variance and associated with more than a 50% increased likelihood of using illicit drugs. Notably, all individuals reporting drug use in the last 30 days also reported an income above R0, highlighting the potential link between economic factors and substance use behaviours. A positive relationship with illicit drug use, indicating an increased likelihood with to engage as a person matures ( $\beta = 0.06, p <.001$ ). As expected, education achievement is

inversely associated with illicit drug use ( $\beta = -0.02, p < .001$ ). Violent Trauma: A strong association, indicating that those exposed to violent trauma are significantly more likely to use illicit drugs ( $\beta = 0.65, p < .001$ ).

In summary, Coloured females in urban Western Cape, White males across multiple provinces (Western Cape, KwaZulu-Natal, Gauteng, Northern Cape), Coloured males in various provinces (Northern Cape, Eastern Cape, Free State, Western Cape, KwaZulu-Natal) show elevated risk of illicit substance use. In the Western Cape, KwaZulu-Natal, and Gauteng illicit substance use is significantly more prevalent compared to other provinces.

Informal living situations seem to play a role in the relationship between psychological distress and higher substance use. Higher income levels, older age, and lower education levels were associated with increased likelihood of illicit substance use. Urban locations in the Free State and Northern Cape show higher risk for males compared to their rural counterparts. Urban African females in Eastern Cape, Mpumalanga, and Gauteng, and urban Coloured females in Eastern Cape and Gauteng are at a high risk for using illicit substances if they also engage in risky alcohol use. African males and females in both urban and rural North-West are significantly more likely to engage in illicit substance use when they experience psychological distress. Likewise Urban African females, Indian males, and White males in KwaZulu-Natal are more likely to use illicit drugs with psychological distress. Lastly, African males and females in informal settlements in Gauteng and KwaZulu-Natal also fall within this intersection.

### **Part C: The geodemographic determinants of a positive screening for psychological distress in the youth of South Africa**

Geodemographic Predictors for the model were Race, Gender, Province, Geolocation type, Education, HIV Status, and Income. Behavioural predictors could have either been the recent engagement in illicit substance use or the engagement in risky drinking behaviour while Psychological Distress refers to the self-reported measure of clinically significant mental distress that would likely meet the criteria for a common mental illness.

***Research Question 3a: What are the geodemographic risk-factors associated with the experience of psychological distress?***

Model 6 (Appendix G) is a univariate full-factorial model where psychological distress is the sole criterion and Age, Education, Income, Gender, Race, Geolocation, and Province are predictors. When Psychological Distress was assessed independently from risky alcohol use and recent illicit substance use ( $F(100) = 1453.445$ ,  $R^2 = 0.142$ ,  $p < 0.001$ ) all possible three-way, and two-way interaction effects were found to be significant predictors of psychological distress. All main-effects were significant besides HIV-status which was not associated with psychological distress when all other factors were considered. This model accounted for 14.2% of the variance seen in psychological distress.

**Three-way interaction Effects.** Race, Gender and Geolocational Type interactions ( $F(2, 100) = 25.283$ ,  $p < 0.001$ ) accounted for less than 0.01% of the total variance seen in psychological distress. Significant parameters were coloured males in urban settings ( $\beta = 1.992$ ,  $\sigma_M = 0.534$ ,  $t(64) = 3.728$ ,  $R^2 = 0$ ,  $p < 0.001$ ) were significantly more likely to experience psychological distress than African males in urban areas. However, when compared to White males ( $\beta = -6.87$ ,  $\sigma_M = 1.188$ ,  $t(64) = -5.783$ ,  $R^2 = 0$ ,  $p < 0.001$ ), African males in urban settings are significantly more likely to experience psychological distress.

The interaction effect between province of residence, race and respectively gender ( $F(13, 100) = 373.847$ ,  $R^2 = 0.006$ ,  $p < 0.001$ ) indicate that White males and Coloured males are significantly associated with psychological distress in the Western Cape and the Northern Cape respectively. African females in the Eastern Cape ( $\beta = 6.127$ ,  $\sigma_M = 0.455$ ,  $t(64) = 13.462$ ,  $R^2 = 0$ ,  $p < 0.001$ ), and Gauteng ( $\beta = 3.722$ ,  $\sigma_M = 0.39$ ,  $t(64) = 9.55$ ,  $R^2 = 0$ ,  $p < 0.001$ ) and Coloured Females in the Eastern Cape are further associated with psychological distress ( $\beta = -7.09$ ,  $\sigma_M = 0.649$ ,  $t(64) = -10.918$ ,  $R^2 = 0$ ,  $p < 0.001$ ). Coloured Males ( $\beta = 8.717$ ,  $\sigma_M = 0.51$ ,  $t(64) = 17.102$ ,  $R^2 = 0$ ,  $p < 0.001$ ) and African Males in the Free state are further associated with psychological distress ( $\beta = -2.596$ ,  $\sigma_M = 0.491$ ,  $t(64) = -5.29$ ,  $R^2 = 0$ ,  $p < 0.001$ ). In KwaZulu-Natal, Psychological distress is associated with females more than males of White ( $\beta = -6.965$ ,  $\sigma_M = 0.417$ ,  $t(64) = -16.707$ ,  $R^2 = 0$ ,  $p < 0.001$ ), Coloured ( $\beta = -1.412$ ,  $\sigma_M = 0.351$ ,  $t(64) = -4.018$ ,  $R^2 = 0$ ,  $p < 0.001$ ), and the Indian race groups ( $\beta = -3.31$ ,  $\sigma_M = 0.259$ ,  $t(64) = -12.796$ ,  $R^2 = 0$ ,  $p < 0.001$ ).

Province, Geolocation and Race ( $F(4, 100) = 26.922$ ,  $R^2 = 0$ ,  $p < 0.001$ ) and Province, Geolocation, and Gender ( $F(13, 100) = 1548.872$ ,  $R^2 = 0.022$ ,  $p < 0.001$ ) yielded significant

parameters. Urbanicity was associated with lower psychological distress when compared to informal rural residences.

**Two-Way Interactions.** The interaction effect between gender and race group yielded significant effects for psychological distress ( $F(3, 100) = 35.43, R^2 = 0, p < 0.001$ ), as did race group and geolocation ( $F(2, 100) = 44.573, R^2 = 0, p < 0.001$ ), and gender and geolocation ( $F(2, 100) = 8.071, R^2 = 0, p < 0.001$ ). Likewise, province yielded significant interaction effects with geolocation ( $F(15, 100) = 0.02, p < 0.001$ ), gender ( $F(8, 100) = 1027.559, R^2 = 0.009, p < 0.001$ ), and race group ( $F(18, 100) = 479.277, R^2 = 0.01, p < 0.001$ ). African race group, when compared with the White race group, was significantly more associated with Psychological Distress in Western Cape, Eastern Cape, Northern Cape, Free State, and Gauteng. Likewise, The Coloured race group is more at risk than the African race group in Western Cape, Eastern Cape, Northern Cape, North-West, and Gauteng. Indians in the Eastern Cape, KwaZulu-Natal, and Gauteng are significantly at risk. Informal Gauteng and Urban Gauteng was the least associated with distress. Informal rural Free state, urban free state, Informal rural Kwazulu-Natal, and Rural KwaZulu Natal was significantly associated with lower levels of distress. Farm (or formal rural) settlements are less likely to experience psychological distress in Western Cape, Northern Cape, Eastern Cape, and North-West.

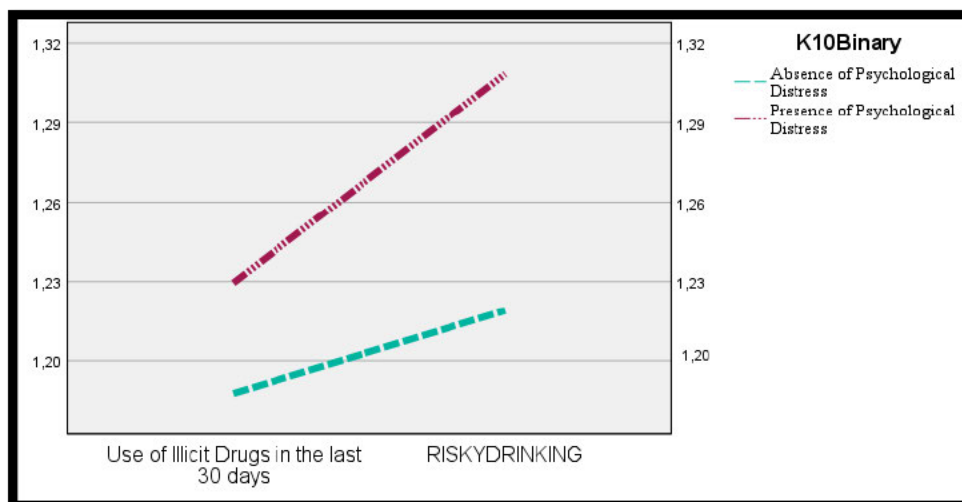
**Main effects.** Coloureds and Indian race groups were significantly less at risk than individuals in the African race group. Furthermore, when all interactions were considered, males were 91% more likely to experience psychological distress compared to females in this age group. Overall, being in informal settlements was associated with lower levels of psychological distress while age, income, and education were all negatively associated with distress. Those in Eastern Cape ( $F(8, 100) = 230.367, R^2 = 0.002, p < 0.001$ ), Northern Cape, North-West, and the Western Cape are far less likely to experience distress *than those* in Gauteng, Free State, KwaZulu-Natal, and Mpumalanga. Geolocation ( $F(2, 100) = 195.208, R^2 = 0, p < 0.001$ ), Gender ( $F(1, 100) = 14.796, R^2 = 0, p < 0.001$ ), Race group ( $F(3, 100) = 567.133, R^2 = 0.002, p < 0.001$ ), education level ( $F(1, 100) = 4361.561, R^2 = 0.005, p < 0.001$ ), age ( $F(1, 100) = 333.137, R^2 = 0, p < 0.001$ ), and income ( $F(1, 100) = 395.847, R^2 = 0, p < 0.001$ ) were significant predictors.

**Research Question 3b: What are the geodemographic risk factors of symptoms of psychological distress mediated by a positive screening for Alcohol Use disorder?**

In urban Western Cape, females ( $\beta = .263$ ) and males ( $\beta = .784$ ) of African ethnicity are significantly associated with risky drinking and psychological distress. This association with the interaction effect is further seen in Coloured females in urban Western Cape ( $\beta = .848$ ), Coloured males in urban Gauteng ( $\beta = 1.006$ ), and Indian females in urban KwaZulu-Natal ( $\beta = .465$ ). A consistent increase in psychological distress with age is noted ( $\beta = .054$  per year,  $p < .001$ ). An association between higher education levels and an increase in distress was seen ( $\beta = .004$ ,  $p < .001$ ). Among younger females (15-24 years), particularly those with lower educational attainment and residing in rural areas, risky drinking was a substantial predictor of psychological distress. This demographic is particularly vulnerable due to limited resources and heightened societal pressures. In contrast, for males, the distress associated with risky drinking was more closely tied to economic factors such as financial stress and unemployment. This finding indicates that the social and economic context in which males consume alcohol significantly impacts their mental health. Looking at the gender and age-distribution disparities between populations of youth in South Africa who engage in illicit drug use, those who are at risk for AUD, and those who are at risk for AUD and engage in illicit substance use – we can infer that substance use behaviours influence the presence of psychological distress in different groups of youths in South Africa based on their age, gender, and substance use behaviours respectively.

**Figure 3**

*Relationship between substance use and Psychological Distress*



***Research Question 3c: What are the geodemographic risk factors of psychological distress symptoms mediated by the recent use of illicit substances?***

In urban Gauteng, the African and Coloured race groups are at significant risk of experiencing illicit drug use with psychological distress. Coloured females ( $\beta = 1.208$ ), African males ( $\beta = 1.203$ ), and Coloured males ( $\beta = 2.22$ ) are of particular concern in the Gauteng metropolitan. African males in informal Gauteng ( $\beta = .82$ ) and females in informal North-West ( $\beta = 1.4$ ) are of high-risk for this interaction.

Although substance use was a critical factor, demographic and social elements explained a portion of the variance in psychological distress. Education and Age accounted for a 4% variance in psychological distress, indicating that factors beyond substance use are also influential. The relationship between risky alcohol use and psychological distress was notably more pronounced in females, especially among African females in urban areas of the Eastern Cape and Coloured females in urban Gauteng. The data indicated that these subgroups experienced significantly higher levels of distress related to alcohol consumption. This pattern suggests that risky drinking behaviours among females, often compounded by societal stigma and dual burdens of personal and household responsibilities, lead to heightened psychological distress.

In summary, males of the African race group are the most at risk homogenised group of the South African youth to experience psychological distress, while Coloured males and Indian males were the least at-risk group. Females throughout South Africa were more likely to experience psychological distress in urban residences. Both males and females were more at risk in Urban centres of Gauteng and Eastern Cape respectively while individuals in informal rural settlements tend to have less psychological distress. Higher income and lower education levels are associated with psychological distress while maturation is negatively associated with psychological distress.

Females are more likely to screen positively for AUD when experiencing psychological distress and, as are males but to a lesser extent. Younger females who are less educated in rural areas are particularly vulnerable. For males, economic pressures seem to drive the association between risky drinking behaviour and psychological distress. Lastly the co-occurrence of illicit

substance use, and psychological distress is highest in urban Gauteng, particularly among African and Coloured individuals.

***Research Question 3d: What are the geodemographic risk-factors associated with the engagement with a positive screening for alcohol use disorder, the recent use of illicit substances, and the experience of symptoms of psychological distress respectively?***

Psychological Distress, when the variance associated with Risky Drinking and Recent Illicit Drug Use is accounted for, is associated with 53 of the possible 64 predictors of the multivariate full factorial model. Risky Drinking is associated with 61 of the 64 and Illicit Drug Use all 64 (Model 8 in Appendix G). The 64 predictors is derived from the 18 independent variable levels and their interactions, of these, 15 were found to have significant associations with Risky Alcohol Use, Psychological Distress, and Illicit Substance Use. It is important to note that this is a semi-partial association that exists in the shared variance between the three criterion variables Risky Alcohol Use, Psychological Distress, and Recent Illicit Substance Use in this model.

The interaction between geolocation, gender, and province of residence was a salient predictor of Psychological Distress ( $F(3, 64)=33600.644, p<0.001$ ), Risky Alcohol Use ( $F(3, 64)= 1213.025, R^2= 0.012, p < 0.001$ ), and the Recent Use of illicit Substances respectively ( $F(3, 64)= 1003.753, R^2= 0.01, p < 0.001$ ). This interaction effect accounts for 1.2% of the variance in risky alcohol use and of psychological distress experienced by the South African youth while it explains 1% of the variance seen in illicit substance use. Males in urban Gauteng are also more likely to experience psychological distress ( $\beta=6.603, p<0.001$ ) as well as more likely to engage in risky drinking behaviour ( $\beta= 1.887, \sigma_M = 0.246, t(64) =7.669, R^2= 0, p < 0.001$ ). However, males in urban Gauteng who experience psychological distress are negatively associated with illicit substance use ( $\beta= -0.421, \sigma_M = 0.02, t(64) =-20.971, R^2= 0.001, p < 0.001$ ).

Female youths residing in urban Eastern Cape are particularly more likely to experience psychological distress ( $\beta=-9.163, p<0.001$ ) while they are also more likely to engage in illicit substance use ( $\beta= -0.187, \sigma_M = 0.013, t(64)=-14.489, R^2= 0.001, p < 0.001$ ) and engage in risky drinking ( $\beta= -3.553, \sigma_M = 0.158, t(64)=-22.5, R^2= 0.002, p < 0.001$ ). Females in Urban North-West are associated with risky drinking behaviour ( $\beta= -10.439, \sigma_M = 0.187, t(64) =-55.698,$

$R^2 = 0.01, p < 0.001$ ) as well as recent illicit substance use ( $\beta = -0.187, \sigma_M = 0.013, t(64) = -14.489, R^2 = 0.001, p < 0.001$ ).

The predictor operationalized by the interaction between Race and Geographic factors (Geolocation and Province of residence was not a significant independent predictor, however, the parameter assessing Urban residents in Western Cape of the Coloured race group suggested that they are particularly at risk of developing Psychological Distress ( $R^2 = 0.002, \beta = 16.578, p < 0.001$ ).

The interaction between Race, Gender, and Province of residence ( $p < 0.0001$ ) accounted 0.5% of the overall variance seen in psychological distress in South African youths ( $F(4,64) = 10508.063$ ) as well as the variance of risky drinking behaviour and illicit substance use respectively.

White males in the Western Cape ( $\beta = 7.073, p < 0.0001$ ) as well as in the Northern Cape ( $\beta = 15.098, p < 0.001$ ) are associated with higher levels of psychological distress. White males in Western Cape, and the Northern Cape ( $\beta = -0.242, \sigma_M = 0.031, t(64) = -7.758, R^2 = 0, p < 0.001$ ) are further associated with lower levels of illicit substance use. Likewise, White males in Western Cape ( $\beta = 11.74, \sigma_M = 0.267, t(64) = 44.013, R^2 = 0.006, p < 0.001$ ), and the Northern Cape are further associated with higher levels of risky drinking. Likewise, Coloured Males in North-West ( $\beta = 10.644, p < 0.001$ ), Northern Cape ( $\beta = 3.778, p < 0.001$ ), and urban Western Cape ( $\beta = 16.578, p < 0.001$ ) are more at risk of experiencing symptoms of psychological distress. Coloured Males in North-West and KwaZulu Natal are positively associated with illicit substance use while negatively associated with risky drinking ( $\beta = 16.52, \sigma_M = 0.486, t(64) = 34.006, R^2 = 0.004, p < 0.001; \beta = -3.58, \sigma_M = 0.395, t(64) = -9.061, R^2 = 0, p < 0.001$ ). Coloured males in Northern Cape are associated with risky drinking ( $\beta = 8.24, \sigma_M = 0.383, t(64) = 21.527, R^2 = 0.002, p < 0.001$ ) while lower levels of illicit substance use ( $\beta = -0.242, \sigma_M = 0.031, t(64) = -7.758, R^2 = 0, p < 0.001$ ).

The interaction between Geolocational type and Province of Residence ( $R^2 = 0.019, F(11, 64) = 542.43, p < 0.001$ ) yielded significant association with Psychological Distress, Recent Illicit Substance Use, and AUD. Urban residents of Western Cape, rural farm dwellers of Free State ( $R^2 < 0.001, \beta = 0.626, p < 0.05$ ), KwaZulu-Natal ( $R^2 = 0.001, \beta = -21.948, p < 0.001$ ), Western Cape ( $R^2 = 0.002, \beta = -12.789, p < 0.001$ ), Northern Cape ( $R^2 = 0.002, \beta = -4.101, p < 0.001$ ), and

North-West ( $R^2 < 0.001$ ,  $\beta = 0.626$ ,  $p < 0.001$ ) were significantly associated with psychological distress.

Living in informal settlements is a protective factor with regard to psychological distress for YPSA in Eastern Cape ( $R^2 < 0.001$ ,  $\beta = -2.754$ ,  $p < 0.001$ ), North-West ( $R^2 < 0.001$ ,  $\beta = -1.439$ ,  $p < 0.001$ ), and Mpumalanga ( $R^2 = 0.002$ ,  $\beta = -5.462$ ,  $p < 0.001$ ). Urban residents in Eastern Cape are most likely to experience psychological distress. Race and Geolocation type yielded significant ( $p < 0.001$ ) associations with the criterion ( $F(2, 64) = 96.915$ ) accounting for 0.1% of the variance seen in the criterion's expression in the population. White individuals in urban areas ( $R^2 = 0.002$ ,  $\beta = 12.079$ ,  $p < 0.001$ ) were significantly associated with symptoms of psychological distress. This was contrasted with Coloured males in urban residences who were less likely to experience distress in urban settings ( $R^2 = 0.001$ ,  $\beta = -4.924$ ,  $p < 0.001$ )

Gender and Province of residence significantly accounted for 0.2% of the criterion's variance ( $F(8, 64) = 554.347$ ,  $p < 0.001$ ). Males in Limpopo and Free State ( $R^2 < 0.001$ ,  $\beta = 1.927$ ,  $p < 0.001$ ) were significantly more at risk than males in North-West ( $R^2 = 0.015$ ,  $\beta = -13.137$ ,  $p < 0.001$ ), Gauteng ( $R^2 = 0.006$ ,  $\beta = -12.406$ ,  $p < 0.001$ ), Mpumalanga ( $R^2 = 0.009$ ,  $\beta = -8.151$ ,  $p < 0.001$ ), Northern Cape ( $R^2 = 0.002$ ,  $\beta = -4.077$ ,  $p < 0.001$ ), Western Cape ( $R^2 = 0.001$ ,  $\beta = -4.315$ ,  $p < 0.001$ ), and the Eastern Cape ( $R^2 = 0.001$ ,  $\beta = -6.093$ ,  $p < 0.001$ ).

Race and Province of residence yielded significant ( $p < 0.001$ ) associations with the criterion ( $F(12, 64) = 177.892$ ). When compared with YPSA of the African race group, Indians in KwaZulu-Natal are significantly associated with higher scores of psychological distresses ( $R^2 < 0.001$ ,  $\beta = 6.175$ ,  $p < 0.001$ ). Coloureds in Western Cape ( $R^2 = 0.002$ ,  $\beta = -16.362$ ,  $p < 0.001$ ), Northern Cape ( $R^2 < 0.001$ ,  $\beta = -3.513$ ,  $p < 0.001$ ), Eastern Cape ( $R^2 < 0.001$ ,  $\beta = -2.56$ ,  $p < 0.001$ ), and North-West ( $R^2 = 0.001$ ,  $\beta = -4.628$ ,  $p < 0.001$ ) are significantly less likely to experience distress, while Coloured YPSA in Gauteng and KwaZulu-Natal respectively ( $R^2 < 0.001$ ,  $\beta = 1.168$ ,  $p < 0.004$ ) are the most at risk. In the Western Cape ( $R^2 = 0.002$ ,  $\beta = -8.566$ ) and Northern Cape ( $R^2 = 0.001$ ,  $\beta = -11.474$ ), African YPSA are significantly ( $p < 0.001$ ) more likely to experience Psychological Distress. The corollary of which is that White YPSA are more likely to experience psychological distress in Eastern Cape ( $R^2 = 0.001$ ,  $\beta = 1.812$ ,  $p < 0.001$ ).

Gender and Geolocation type yielded significant ( $p < 0.001$ ) associations with the criterion. Females in urban areas ( $R^2 < 0.001$ ,  $\beta = 2.259$ ) were significantly associated with symptoms of psychological distress.

The interaction between Race and Gender ( $R^2 < 0.007$ ,  $F(3, 64) = 146.694$ ;  $p < 0.001$ ) yielded significant association with Psychological Distress (Model 3). African males are more likely to experience psychological distress than males who are White ( $\beta = -10.813$ ,  $\sigma_M = 0.247$ ,  $t(64) = -43.72$ ,  $R^2 = 0.006$ ,  $p < 0.001$ ), Coloured ( $\beta = -4.032$ ,  $\sigma_M = 0.186$ ,  $t(64) = -21.657$ ,  $R^2 = 0.002$ ,  $p < 0.001$ ), or Indian ( $\beta = -2.529$ ,  $\sigma_M = 0.389$ ,  $t(64) = -6.495$ ,  $R^2 = 0$ ,  $p < 0.001$ ).

Once all interactions were considered, geolocational type alone accounted for less than 0.01% of the variance seen in experiencing psychological distress in the population ( $F(2, 64) = 19.665$ ,  $p < 0.001$ ). Province of Residence accounted for 2.1% of the variance seen in criterion ( $F(8, 64) = 820.805$ ,  $p < 0.001$ ), while Gender differences alone accounted for 0.3% of the variance ( $F(1, 64) = 828.413$ ,  $p < 0.0001$ ), suggesting that males are significantly more at risk ( $\beta = 6.343$ ,  $\sigma_M = 0.368$ ,  $t(64) = 17.244$ ,  $R^2 = 0.001$ ,  $p < 0.001$ ).

Main effect of Race alone ( $F(3, 64) = 409.024$ ,  $p < 0.001$ ) accounted for 0.04% of the variance seen in psychological distress in young people when all other predictors are considered. Further, Coloured youths are the most likely at risk of experiencing distress ( $\beta = 6.11$ ,  $\sigma_M = 0.375$ ,  $t(64) = 16.308$ ,  $R^2 < 0.001$ ,  $p < 0.001$ ) followed by African youths. Indian ( $\beta = -2.529$ ,  $\sigma_M = 0.389$ ,  $t(64) = -6.495$ ,  $R^2 < 0.001$ ,  $p < 0.001$ ) and White ( $\beta = -2.28$ ,  $\sigma_M = 0.598$ ,  $t(64) = -3.813$ ,  $R^2 < 0.001$ ;  $p < 0.001$ ) youths are significantly less likely to experience psychological distress when compared to African youths. Being HIV positive ( $\beta = 0.279$ ,  $p < 0.001$ ) was found to be significantly associated with psychological distress ( $R^2 < 0.001$ ,  $F(1, 64) = 34.181$ ,  $p < 0.001$ ). Gross Monthly Income in thousands of Rands (ZAR) was positively associated with psychological distress ( $\beta = 0.0287$ ,  $p < 0.001$ ) accounted 2% of the variance seen in psychological distress ( $F(1, 64) = 6363.797$ ). Conversely, Highest Level of Education accounted for 6% ( $F(1, 64) = 19385.012$ ,  $p < 0.001$ ) each significantly influence the variance of psychological distress in young South Africans ( $\beta = -0.463$ ).

In summary, geodemographic factors such as living in urban areas, particularly in Gauteng and the Eastern Cape, is associated with the intersection of substance use and psychological distress. African males face the highest risk of this interaction while Coloured males in certain provinces show varying associations with substance use and psychological distress. Females in urban areas are more likely to experience psychological distress and engage in substance use. Urban Gauteng males are more prone to psychological distress and risky drinking but less likely to use illicit substances. Female youths in urban Eastern Cape show

increased vulnerability to all three problems. Youth residing in informal settlements in certain provinces seem to have lower psychological distress risk, however being HIV-positive status increases the risk of psychological distress. Higher income is associated with greater psychological distress while higher levels of education are associated with lower psychological distress. White males in Western Cape and Northern Cape show higher psychological distress, but those in the Western Cape also exhibit higher risky drinking and lower illicit substance use.

**Part D: The relationship between AUD, illicit drug use, and psychological distress**

***Research Question 4: What are the relationship between recent illicit substance use, risky drinking, and psychological distress in the South African youth?***

The ANOVA model was conducted to assess the significance of risky alcohol use and recent illicit substance use in predicting the presence of psychological distress in young South Africans. The overall model fit was assessed using the adjusted R-square, which was found to be .09. This indicates that the model explained approximately 9% of the variance in psychological distress observed in the youth’s dataset.

While the proportion of explained variance is relatively modest, it is important to note that psychological distress is a multifaceted construct influenced by various factors beyond the scope of this study. The error term in the analysis had a mean square of .474, reflecting the variability in psychological distress that was not accounted for by the predictors included in the model. Analysis of co linearity, normality, homoscedasticity, and heterogeneity of variance were executed to ensure validity is preserved. This model will assess whether high-risk alcohol (HHDA) use, recent illicit substance use or an interaction between the two is best associated with mental health distress. In this model, a univariate general linear model (or two-way ANOVA model) was generated at 95% statistical significance.

**Table 3 ANOVA**

Source of Variation	SS	df	MS	F	p
HHDA Use	6052.266	1	6052.266	12758.047	< .001
Recent Illicit Substance Use	228.649	1	228.649	481.988	< .001
Interaction (HHDA * Drug Use)	639.274	1	639.274	1347.575	< .001
Error	0.474				
Total	6720.663	4			

*Note.* ANOVA assessing interaction between risky drinking and illicit substance use on the presence of psychological distress in youth. Criterion: Psychological Distress (N= 9 092 523).

Both HHDA use (MS= 6052.266,  $F(1,4) = 12758.047$ ,  $p < .001$ ) and recent illicit substance use (MS = 228.649,  $F(1,4) = 481.988$ ,  $p < .001$ ) are significant predictors of psychological distress. Furthermore, a strong and significant interaction effect between recent drug use and harmful, hazardous, or dependent alcohol consumption is reported (MS = 639.274,  $F(1,4) = 1347.575$ ,  $p < .001$ ). This strong and significant interaction suggests that the impact on psychological distress is not merely additive but involves a complex interplay between recent drug use and harmful alcohol consumption. Considering the influence of all the significant interaction-effects above, it can be inferred that youth who engage in illicit drug use, risky drinking, and are older are significantly more likely to experience psychological distress, even when all other significant interactions discussed in this paper have been considered. This suggests that, on average, young South Africans 'experience of psychological distress is significantly mediated by recent illicit drug use, risky alcohol use, and their age.

## CHAPTER 6: DISCUSSION

More than 91% of the global population who are under 25 years old living in LMIC account for half of all people in LMIC worldwide (Probst et al., 2020). Although the burden is not unique to South Africa (Erskine et al., 2015), the youth in South Africa and other LMICs are the greatest risk (Karim, 2016). Substance use in young people in South Africa also suffering from psychiatric conditions significantly hinders their accessibility to effective and quality mental health care treatment for inpatient and outpatient care (Pelzer et al., 2012). Cooper and colleagues (2015) reflect on the opportunity that South Africa (and other LMICs) have in that the "youth bulge" in their population(s) potential to provide a demographic dividend - future economic growth due to a large working-age population.

The global mental health endemic has rallied the attention and efforts of influential organizations like the WHO and the United Nations (UN) resulting in the emergence of an array of initiatives and policy instruments issued in the past decade (Carlsen & Bruggemann, 2022). The WHO's Comprehensive Mental Health Action Plan 2013–2030 and Special Initiative for Mental Health highlight the need for inclusive, accessible, and culturally sensitive mental health services, underlining the importance of integrating mental health care into a range of societal sectors (World Health Organization, 2022). This framework explicitly advocates for a decentralized approach to health-care, investment into prevention, moderating social stressors, and both challenging and empowering local communities, health-care workers, politicians, and knowledge-producers (particularly so in lower-to-middle income countries) to address mental health issues through using an approach that goes beyond traditional, Western-centric, and discriminatory bio-medical model of mental health care (Cosgrove & Shaughnessy, 2020). Examining the social, economic, and geodemographic factors are crucial in understanding the disparities in health, especially among young people in South Africa, where poverty, unemployment, and violence are prevalent and exacerbate the risks of substance abuse (Plüddemann et al., 2016).

Our research unravels the interconnectedness between risky alcohol consumption and illicit drug use, underscoring a pattern where engagement in one often leads to the other. Both

behaviours significantly predict psychological distress, shedding light on their critical mental health implications (World Health Organization, 2017).

African males face the highest overall risk of experiencing psychological distress, while Coloured and Indian individuals have lower relative risk. Females in urban areas are more likely to experience distress. Urban environments in Gauteng and the Eastern Cape, are associated with higher distress in both genders. Location interacts significantly with gender and race. Informal settlements sometimes show lower psychological distress risk. For Alcohol Use Disorder (AUD), Gender and Race influence vulnerability. Males, especially those in urban Gauteng, are at higher risk for AUD while females in urban areas of the Eastern Cape, Free State, and Western Cape also show increased vulnerability. Coloured males in the Northern Cape and females in the North-West (particularly rural areas) are at a higher risk while Indian and White males are more likely to experience AUD when compared to females of the same race groups. Urban settings, particularly in Gauteng, are associated with higher AUD risk. However, rural living can also increase risk for AUD in Coloured individuals.

Coloured females in urban Western Cape face particularly high risk for illicit substance use. White males across multiple provinces (Western Cape, KwaZulu-Natal, Gauteng, Northern Cape) and Coloured males in various provinces (Northern Cape, Eastern Cape, Free State, Western Cape, KwaZulu-Natal) also show increased risk to engage in illicit substance use when compared to the rest of the nation. Substance use strongly exacerbates AUD risk, especially for African males in urban Western Cape and Mpumalanga, Coloured females in urban Western Cape, White females in urban Gauteng, Indian females in urban KwaZulu-Natal, and Coloured males and African females in the rural Eastern Cape who use illicit substances. Likewise,

The role of social determinants, as outlined by Marmot (2005), is evident in the heightened vulnerability of certain demographic groups to psychological distress and substance use. The South African youth face systemic challenges magnified by historical oppression, with the remnants of apartheid still influencing socio-economic disparities. Vulnerability stems from the interaction between the stressors individuals face and their coping capacities (Blaikie et al., 1994; Burton et al., 2018). Systemic disadvantages, such as limited social and economic resources, healthcare access, and education, worsen this vulnerability (Vogel et al., 2021). Addressing these underlying issues, such as resource scarcity and limited access to education and

employment, is key to reducing vulnerability, even if the root causes of social stressors are structural and deeply entrenched.

Addressing the challenges associated with mental illness and substance use in an attempt to improve the health outcomes of the population, particularly the youth, requires a multi-faceted approach that attends to the treatment gap, considers the impact of mental illness and substance use on health outcomes, and is able to dismantle the complex socioeconomic landscape and historical structures that perpetuate poor service delivery in the country. A potential solution is to increase access to mental healthcare services, particularly in marginalized communities, through the expansion of primary healthcare services and community-based interventions. Another potential approach is to address the stigma associated with mental illness and substance use by promoting awareness and education. Education level affects awareness, access to information, and future prospects, thereby impacting health behaviours and mental well-being (Cutler & Lleras-Muney, 2010). This is particularly salient in South Africa and reflected upon in the results (Groenewald & Bhana, 2018; Mngoma et al., 2021). Higher income is associated with a slightly increased AUD risk, while higher education levels are associated with decreased risk of AUD. Similar trend is seen for illicit substance use and psychological distress. It can be inferred that psychoeducation and policy are vital factors of intervention and is expected to have a similar positive effect as with foetal alcohol syndrome (Adebisi et al., 2023; de Jong et al., 2021). The availability of substances, neighbourhood safety, and exposure to violence significantly impact the mental health and behaviours of young people (Lerner & Steinberg, 2009). Older youths had a slightly higher recent substance use risk while younger individuals were more at risk for psychological distress.

In the South African youth, a complex dynamic between illicit substance use, risky alcohol consumption, and psychological distress has been observed. Notably, African Males and Coloured Females in urban areas display a strong correlation between psychological distress and risky drinking, a pattern also evident among Indian Females in urban KwaZulu-Natal and African Females in informal and rural settings. The link between psychological distress and substance use is complex. African males and females in both urban and rural North-West, urban African females, Indian males, and White males in KwaZulu-Natal, and African individuals in informal settlements in Gauteng and KwaZulu-Natal are high-risk groups. The availability of substances, neighbourhood safety, and exposure to violence significantly impact the mental

health and behaviours of young people (Lerner & Steinberg, 2009) which is reflected in the results. Economic hardships and limited access to resources can lead to increased stress levels and contribute to substance abuse as a coping mechanism (Volkow et al., 2016), which is why we see psychological distress and substance use issues existing in particular pockets of individuals.

Urban settings, particularly in KwaZulu Natal for Indian Females and in the Eastern Cape for African Females, show that urbanization intensifies the stressors leading to risky behaviours. Economic pressures and social contexts, especially for African Males in urban Gauteng and Coloured Males in the same locale, underscore the relationship between substance use and psychological distress. In urban areas, specific demographic groups, particularly African and Coloured females, exhibit higher rates of risky drinking and illicit drug use compared to rural areas. This discrepancy highlights the significant role of environmental factors and the urban-rural divide in shaping these behaviours. Muchiri and Dos Santos (2018) found that young, coloured individuals are significantly more likely to have more risk factors when drugs and alcohol are used by them and significantly more likely to have protective factors when not. This was reiterated as Coloured individuals did not show significant association with psychological distress when substance use was controlled for. Urban African females in Eastern Cape, Mpumalanga, and Gauteng, and urban Coloured females in Eastern Cape and Gauteng are at extremely high risk for using illicit substances if they engage in risky drinking. African and White Males in the Western Cape, and Coloured Females in the same region, are more likely to engage in risky drinking when experiencing psychological distress. White Females in Gauteng are also significantly affected, with a considerable portion of their drinking behaviours mediated by psychological distress.

Gender plays a crucial role in substance use and mental distress throughout Africa (Mafa et al., 2019) with males and females demonstrating different patterns of risk behaviours and psychological distress. Specific vulnerabilities were re-confirmed such as young females in rural Gauteng (Desai et al. 2019), KwaZulu-Natal (Khuzwayo, 2020; Zuma et al., 2020), and urban Western Cape (Plüddemann et al., 2016). Males in urban areas are often more prone to substance use-related distress, whereas urban females exhibit a strong correlation between risky drinking and psychological distress. Psychological distress significantly elevates AUD risk, especially for African males in urban areas of the Western Cape, KwaZulu-Natal, and Eastern Cape, White

males in the Western Cape, Indian females in urban KwaZulu-Natal, Coloured females in urban Western Cape, and White females in urban Gauteng. A strong link exists between risky drinking and psychological distress, especially for females and those with less education in rural areas. For males, economic pressures seem to drive the association. Co-occurrence of illicit substance use, and psychological distress is highest in urban Gauteng, particularly among African and Coloured individuals. Income levels and education consistently influences the likelihood of engaging in risky behaviours or experiencing psychological distress. Lower income and education levels often correlates with higher rates of these behaviours and distress, underscoring the need for comprehensive interventions that address these socioeconomic disparities.

In the case of South African youth, poverty (Lund et al., 2012), unemployment (Mngoma et al., 2021), and exposure to violence (Wechsberg et al., 2010) are significant issues that perpetuate the cycle of trauma, distress, and risky behaviours such as substance use. The availability of substances, neighbourhood safety, and exposure to violence can all influence the mental health and behaviours of young people. Economic hardships and limited access to resources can also increase stress levels, making substance abuse a coping mechanism. The broader environmental and social context, including exposure to violence (Prinsloo et al., 2022) and differences in urban versus rural living conditions, plays a significant role in shaping substance use behaviours and experiences. This was reiterated by our findings which suggest that urban geolocations in Gauteng, Eastern Cape, KwaZulu-Natal, North-West, and Western Cape predispose vulnerable populations to the interaction between substance use and psychological distress. This suggests that Psychological Distress acts as both a precursor and a result of risky substance use in young people. This understanding, coupled with the understanding that most of South African youth are not able to mental health care services is indicative of maladaptive coping mechanisms in these areas (Mngoma & Ayonrinde, 2022).

Limited access to mental health care facilities for most young people in South Africa is a significant concern, necessitating alternative and innovative solutions to address the mental health and substance use crisis (Seedat et al., 2009). Particular attention is needed for specific subpopulations, especially those from African, Coloured, and rural communities, due to their heightened vulnerability arising from systemic barriers and discrimination. The sustainable development goals (UNSDG, 2019; UN, 2016) emphasizes the importance of addressing stigma and discrimination associated with mental illness, promoting mental health in various settings,

and ensuring access to care. Centralized services have proven to continue to favour the economically and socially privileged while those with inadequate resources are left on the fringes of society, despite in the presence of efforts to redress inequality by the government (United Nations, 2021; Robertson, 2021).

South Africa remains the most unequal country in the world according to the Gini index, and this exacerbates the daily challenges that young people face, such as poor access to healthcare services, poor education, poverty, rife substance abuse, and interpersonal violence. Certain subpopulations, especially those from African, Coloured, and rural communities, are particularly vulnerable due to systemic barriers. These groups often confront discrimination and inadequate service access, intensifying their psychological distress and propensity for risky behaviours. Educational attainment significantly influences substance use and psychological distress. Higher education levels may increase distress due to academic and career-related pressures, while lower education levels might contribute to a lack of awareness and insufficient coping strategies for substance use. Lower income brackets correlate strongly with a higher prevalence of risky drinking and drug use, particularly in underprivileged or rural areas. Economic challenges often parallel limited access to education and healthcare, exacerbating mental health issues and substance abuse. Thus, addressing economic disparities is integral to mitigating substance use and psychological distress.

The WHO's Special Initiative for Mental Health (2019–2023) aims to ensure access to quality and affordable care for mental health conditions in 12 priority countries, including South Africa. It highlights the need for evidence-based strategies that encompass prevention, treatment, and recovery within a human rights framework. Overall, addressing the challenges associated with mental illness and substance use in South Africa requires a collaborative effort involving healthcare providers, policymakers, researchers, and the community at large. Central to the social determinants of health (Marmot, 2005), the circumstances in which an individual is born into, develops in, is educated in, works and ages in informs their daily living conditions that impact outcomes. Secondly, the structural drivers that perpetuate the inequitable distribution of key resources (such as power and money) influence health outcomes and should be tackled in combination with other social factors. The structural and systemic factors that perpetuate poor conditions of employment, education, and daily living (such as poor urban planning, and economic inequality) should be tackled.

According to the WHO (2017) and South Africa's Department of Health (2015), it is essential to consider how one's environment, economic status, and educational opportunities shape health behaviours and outcomes. These factors are crucial in understanding the health disparities, especially among young people in South Africa, where poverty, unemployment, and violence are prevalent and worsen the risks of substance abuse (Plüddemann et al., 2016). Interventions must be culturally sensitive, gender-responsive, and tailored to address the specific socioeconomic realities of each subgroup. Additionally, there is a need for further research to understand the geodemographic determinants of mental illness and substance use in South Africa, as well as the effectiveness of various interventions and solutions. This research can inform future researchers on the direction and potential vulnerable population demographics in which to engage with.

For improvement in health care to take place in South Africa, provisions to socioeconomic mechanisms that exist outside of health care need to be assessed and mitigated (Cooper et al., 2015). In addition, considering the relatively young median age of South Africa's population and the significant proportion of young people; mental health care services must be more youth centric. The person-environment mechanism of neurodevelopment means that adverse psychosocial stressors, including but not limited to exposure to traumatic violence, structural social oppression, and risky substance use (The Society for Adolescent Health and Medicine, 2017) primarily lead to the maldevelopment of neurological systems (Squeglia et al., 2017; Lees et al., 2019). Moreover, education level can affect awareness, access to information, and prospects, which in turn can impact health behaviours and mental well-being.

## CHAPTER 7: CONCLUSION

The relationship between mental health issues and substance abuse in South African youth is marked by a cyclical nature, where each can exacerbate the other (Volkow et al., 2016). The brain development in youth, particularly the preservation of neuroplasticity until late adulthood, is crucial. This development phase makes them more susceptible to the impacts of trauma and substance use, which can hinder critical processes like impulse control and affective regulation (Arian et al., 2013). Poverty, unemployment, and exposure to violence are key determinants that exacerbate psychological distress and substance use in youth (Plüddemann et al., 2016). Furthermore, the stressors in urban settings, especially in regions like KwaZulu Natal and the Eastern Cape, intensify risky behaviours among youth (Lerner & Steinberg, 2009). The level of education influences awareness and coping mechanisms related to substance use and mental well-being (Cutler & Lleras-Muney, 2010).

Different racial and gender groups, such as African and White males in the Western Cape and Coloured females in the same region, show distinct patterns of risky drinking associated with psychological distress (Plüddemann et al., 2016). *WHO's Mental Health Action Plan* emphasizes reducing stigma and promoting mental health in various settings, with a focus on inclusive and evidence-based policies. *WHO* and the *National Department of Health* advocates for an ecological biopsychosocial model, integrating various health determinants such as socioeconomic conditions, environment, and education (World Health Organization, 2017; South Africa's Department of Health, 2015).

According to Kotze and Boshoff (2017), the end of Apartheid in 1994 did not translate into an end to the pre-democracy status quo nor the allocation of key resources in the nation. The majority of South Africa's population has become accustomed to a storm that keeps the most downtrodden trapped in economic oppression, leading to a lack of accessible healthcare, equitable access to education and jobs, and governmental foresight to act against environmental, traumatic, and social stressors that engulf the nation's youth. This has resulted in a serious decline in the quality of life for many South Africans, with the health system being under immense pressure due to the economic situation in the country (The World Bank, 2021; Hendricks et al., 2023). The UN's paradigm shift towards a recovery/community-based mental health care should seek out means to treat and prevent mental illness in a way that actively

avoids discrimination, non-consensual practices, and the maintenance of the unequal status quo. Investment in preventative measures for children, adolescents, and the youth of South Africa could potentially deter the eventual financial burden of adult disability, morbidity, or mortality on the economic and healthcare system respectively. This could be achieved by increasing the legal minimum age for activities such as using alcohol, operating a motor vehicle, purchasing nicotine products, participating in risky financial decisions, and entering high-risk zones such as taverns, nightclubs, and brothels. Alcohol advertising should not be allowed given the detrimental impact on social, economic, and healthcare services (Parry et al., 2013).

### **Limitations**

This study measured the main constructs: Mental Health Distress of the youth, Recent Illicit Drug Use, and HHDA use. These constructs have been repeatedly proven to be reliable and valid in multiple contexts (Babor et al., 2001; Humeniuk et al., 2011; Kessler et al., 2005; Stein et al., 2008); however, the data collection instrument measured heterogeneous constructs which could compromise validity. To combat this, the interviewers were accompanied by another person who could hopefully better communicate with the participants clearly explain the items and record their responses. Although other assessment tools for psychological distress and alcohol use disorders do exist and are used in South Africa, the majority of the research that has been conducted has utilized the K-10 and AUDIT respectively (Harriman et al., 2022; Pengpid et al., 2019; Ramlagan et al., 2019; 2024). As the data collection was framed as an HIV/AIDS-related survey, it is possible that reports on illicit substances, alcohol use, and mental illnesses could have been under-accentuated by the interviewer, rushed through carelessly, or even misreported by participants due to assuming potential persecution or consequences for reporting mental illness or substance use. However, these instruments were administered by interviewers and not mental health care workers as they were standardized. This could compromise the validity of the results of those questionnaires as semantic and syntactic misunderstandings and false responses could have been elicited if the instruments were maladministered.

This study further claims to assess the impact of polysubstance use on mental health distress. Mental Health Distress is a subjective and self-reported variable derived from the K10 questionnaire. Given the stigma towards mental health in South African society, it can be assumed that information on mental illness, sexual behaviour, criminality, and substance use would be expected to be under-reported, especially since interviewers were not trained mental

health care workers (Sorsdahl et al., 2012; Stolk et al., 2014). Furthermore, given the political history and poor health care accessibility, the mistrust of authority, illicit substances are illegal, and this would deter individuals from reporting that they use these substances, particularly since the visiting points were often the residential homes where people may have kept their illegal drugs. To combat this, illicit drug use was simplified into a binary variable assuming that assessing a scaled variable of an ASSIST score would compromise content and criterion validity, respectively. Lastly, in this study we used highest level of education and gross monthly income as covariates to address potential confounding factors in research questions 1, 2, and 3. It's important to note that nearly half the participants were under 20, potentially affecting the accuracy of these measures since many might still be in school. However, these variables were included only to account for their influence, not as the sole determinants of the outcome.

## **Recommendations**

For future researchers, ideas that should be investigated include preventative measures (Matzopoulos, 2022) such as increasing legal age limits for alcohol use and driving and investing in educational programs can mitigate the risks associated with substance use (WHO, 2017). Furthermore, the need for innovative, community-based mental health solutions that are accessible and non-discriminatory is imperative (South Africa's Department of Health, 2015). It is incumbent upon policymakers and governing bodies to uphold the ethical responsibility of safeguarding the welfare of the youth by fostering environmental conditions conducive to optimal neurodevelopment. By doing so, the potential for disabilities, premature deaths, and widespread illness related to the overlooked developmental needs of youth can be reduced.

Addressing South Africa's large Gini coefficient (The World Bank, 2023; Hendricks et al., 2023), indicative of the vast inequality in income distribution, requires structural changes. South Africa's significant income disparity necessitates systemic changes to address the root causes of psychological distress and substance use. The limitations of centralized mental health services highlight the necessity for a decentralized approach. Integrating mental health care into primary healthcare, schools, and community centres can offer more accessible and stigma-free services. In the context of South Africa, decentralization of mental health services is particularly important given the country's history of apartheid and colonialism, which have perpetuated systemic racism and socioeconomic disparities. These disparities have contributed to high rates

of psychological distress and substance use among youth in marginalized communities. Given that many South African youths may never utilize traditional mental health services, it's imperative that the Department of Health innovates to pre-empt the impact of substance use on development. Focused prevention, through educational and awareness programs, can mitigate these effects, fostering healthier outcomes in line with global health goals (WHO, 2020). Policies and programs must be inclusive, incorporating inputs from those with lived experiences of mental illness (United Nations, 2019). Interventions should be customized to address the unique needs of different subpopulations, considering their environmental, socio-economic, and educational backgrounds (Hendricks et al., 2023). Considering the neurodevelopmental sensitivity of youth, preventative strategies should focus on reducing exposure to risk factors like substance abuse and trauma (Health Professionals Council South Africa, 2016). Additionally, confronting the historical effects of apartheid and colonialism is crucial in dismantling systemic racism and socio-economic disparities. Many are unable to access vital healthcare services and necessities. To improve the situation, there must be a concerted effort to address the various social, economic, and environmental stressors that impact the vulnerable population, especially the youth.

The government and other stakeholders should work together to develop policies that address the root causes of economic oppression and inequality and provide resources to help the most vulnerable members of society. Strategic measures that should be considered by the governance of South Africa include moderately increasing taxation on alcoholic beverages, banning alcohol advertising, reducing alcohol availability by regulating sales times and availability to minors, implementing evidence-based countermeasures, integrating alcohol education to NCD, HIV, and TB education approaches, prevent international organizations from dictating sales quotas and advertising policy, and lastly, to increase research funding in this area (Ferreira-Borges et al. 2017). Burger and Mufuze (2023) advocate for incorporating sports and exercise into a comprehensive treatment plan for addressing mental health challenges in younger individuals while Carney and colleagues (2019) show that integrating interventions at schools can be useful. Lastly, according to Mertens et al. (2009), hazardous substance use significantly increases the risk of various medical conditions. They highlight that treating the underlying substance use disorder is essential for the optimal management of these conditions.

Unfortunately, access to such treatment is limited, making brief (and sometimes reduced quality) interventions a valuable alternative in most situations.

Modern neuroscience has developed far faster than the politics, education, and economic systems of the world and continues to ignore these discoveries in favour of more primitive models which maintain the status quo (UN, 2017). Through considering, and not discriminating against, the youth have been treated as fully formed adults for decades as policymakers around the world had formed laws on a legal minimum age of alcohol consumption, sexual consent, tobacco use, age of consent to sexual acts, minimum age of employment and, of particular concern in South Africa, the legal minimum age to operate a vehicle (Matzopoulos, 2022; WHO, 2018). Economic change and policy change for alcohol use issues (Barron et al., 2022) in attempts to reduce injury-related mortalities and suicide (Manthey et al., 2020) are vital if the burden of disease is to improve. The incomplete neural development in people under 25, particularly in areas responsible for cognitive (Jadhav & Boutrel, 2019b) and emotional regulation, underpins the propensity of the youth to engage in high-risk behaviours (Debenham et al., 2021; Jadhav & Boutrel, 2019c; Lees et al., 2020; Morin et al., 2019) suggests that policy disallowing the operation of heavy motor vehicles until later in adulthood, increasing and improving provision of mental health care services to developing individuals, and increasing the minimum legal age to consume alcohol are some outcomes that could arise when policy accounts for the still maturing brain of the youth. The prolonged neuroplastic nature of the brain into late adulthood is highlighted, especially regarding young people's vulnerability to trauma and substance use, and their ongoing neurodevelopmental processes until around 25 years of age (Innocenti, 2022).

The United Nations, WHO, and the American Psychological Association emphasize the need for global attention to the neurostructural vulnerabilities of youth, particularly in the context of trauma and substance use, which can impede proper neurodevelopment. To fulfil their ethical obligation, policymakers and government officials must prioritize the creation of nurturing environments that promote healthy neurodevelopment, thus reducing developmental and mental health issues among the youth. This proactive approach, highlighted in the comprehensive analysis by Docrat et al. (2019), is essential to mitigate the risk of disabilities and the associated high rates of morbidity and mortality. The current expenditure pattern, heavily skewed towards

inpatient and psychiatric hospital care, often leaves insufficient funds for community-based interventions and public health initiatives (Docrat et al., 2019).

In South Africa it is important to have interventions that respect cultural, gender, and socioeconomic differences are critical for effective mental health care. Further, strategies should align with the UN Sustainable Development Goals, focusing on health equity, quality education, and reduced inequalities. In conclusion, successfully mitigating the risks associated with substance use and psychological distress in South African youth requires a coordinated effort across various sectors. This includes aligning with global health objectives, understanding local contexts, and implementing targeted interventions. Acknowledging the disproportionate allocation of mental health care funding towards hospitalization and recurrent inpatient care (Docrat et al., 2019), which depletes resources that could benefit the wider population, there's a clear need for a more decentralized approach to mental health services (Schneider et al., 2016; van Zyl et al., 2022). This strategy would focus on supporting vulnerable groups within their own communities, aiming to intervene early in the progression of mental illness and to implement preventative initiatives. Given the reality that the majority of young individuals with mental health issues may never seek treatment from mental health facilities, the South African Department of Health is challenged to devise alternative and forward-thinking strategies to address the crisis of substance use and mental health. Since substance use significantly impedes developmental progress, and young people are particularly susceptible to its detrimental impacts, there is an urgent need to amplify awareness and champion preventive efforts. These should be designed to mitigate the adverse effects of substance use on the mental health and holistic well-being of the youth.

## REFERENCE LIST

- Adebiyi, B. O., Mukumbang, F. C., & Beytell, A. M. (2019). To what extent is foetal alcohol spectrum disorder considered in policy-related documents in South Africa? A document review. *Health Research Policy and Systems, 17*(1). <https://doi.org/10.1186/s12961-019-0447-9>
- Adejumo, O. A., Malee, K. M., Ryscavage, P., Hunter, S. J., & Taiwo, B. O. (2015). Contemporary issues on the epidemiology and antiretroviral adherence of HIV-infected adolescents in sub-Saharan Africa: A narrative review. *Journal of the International AIDS Society, 18*(1), 20049.
- Adler, R. H. (2009). Engel's biopsychosocial model is still relevant today. *Journal of Psychosomatic Research, 67*(6), 607–611. <https://doi.org/10.1016/J.JPSYCHORES.2009.08.008>
- Ahmed, S., & Jewkes, R. (2018). Substance use among South African youth: A systematic review. *South African Journal of Child Health, 12*(4), 179-188.
- Ali, R., Awwad, E., Babor, T. F., Bradley, F., Butau, T., Farrell, M., Formigoni, M. L. O. S., Isralowitz, R., de Lacerda, R. B., Marsden, J., McRee, B., Monteiro, M., Pal, H., Rubio-Stipec, M., & Vendetti, J. (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Development, reliability, and feasibility. *Addiction, 97*(9), 1183–1194. <https://doi.org/10.1046/J.1360-0443.2002.00185.X>
- Allen, J., Balfour, R., Bell, R., & Marmot, M. (2022). Social determinants of mental health. *International Review of Psychiatry, 14*(1), 57–73. <https://doi.org/10.1080/09540260220132668>
- Amanuel H, Morojele N, London L. The health and social impacts of easy access to alcohol and exposure to alcohol advertisements among women of childbearing age in urban and rural South Africa. *J Stud Alcohol Drugs. 2017;79*(2):302-8.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- American Psychiatric Association. (2018). *APA Dictionary of Psychology*. <https://dictionary.apa.org/psychological-distress>
- Andersen LS, Grimsrud A, Myer L, Williams DR, Stein DJ, Seedat S. (2011). The psychometric properties of the K10 and K6 scales in screening for mood and anxiety disorders in the South African Stress and Health study. *Int J Methods Psychiatr Res, 20*(4), 215–223. <https://doi.org/10.1002/mpr.351>

- Anderson P, De Bruijn A, Angus K, Gordon R, Hastings G. (2009). Impact of alcohol advertising and media exposure on adolescent alcohol use: A systematic review of longitudinal studies. *Alcohol*, 44(3), 229–43.
- Arfer, K. B., Tomlinson, M., Mayekiso, A., Bantjes, J., van Heerden, A., & Rotheram-Borus, M. J. (2018). Criterion validity of self-reports of alcohol, cannabis, and methamphetamine use among young men in Cape Town, South Africa. *International journal of mental health and addiction*, 16(1), 45-52.
- Arian, N., Pincus, H. A., & Kessler, R. C. (2013). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiology and Psychiatric Sciences*, 18(1), 23–33. <https://doi.org/10.1017/S1121189X00001421>
- Arian, N., Pincus, H. A., & Kessler, R. C. (2021). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. In D. J. Stein & I. P. Grant (Eds.), *Global mental health and neuroethics* (pp. 11–25). Academic Press
- Atwoli, L., Platt, J., Basu, A., Williams, D. R., Stein, D. J., & Kessler, R. C. (2015). Associations between lifetime potentially traumatic events and chronic physical conditions in the South African Stress and Health Survey: A cross-sectional study. *BMC Psychiatry*, 15(1), 113–123. <https://doi.org/10.1186/s12888-015-0497-8>
- Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. (2001). AUDIT: The Alcohol Use Disorders Identification Test. Guidelines for use in primary care. Geneva, Switzerland: World Health Organization.
- Bahji, A., Stephenson, C., Tyo, R., Hawken, E.R., & Seitz D.P. (2019). Prevalence of cannabis withdrawal symptoms among people with regular or dependent use of cannabinoids: A systematic review and meta-analysis. *JAMA Network Open*, 2(4), e192591–e192591. <https://doi.org/10.1001/jamanetworkopen.2019.2591>
- Barrett, A. J., Taylor, S. L., Kopak, A. M., & Hoffmann, N. G. (2020). PTSD, panic disorder and alcohol use disorder as a triple threat for violence among male jail detainees. *Journal of criminal psychology*, 11(1), 21-29.
- Bashmi, L., Cohn, A., Chan, S. T., Tobia, G., Gohar, Y., Herrera, N., Wen, R. Y., Ishak, W. W., & Debonis, K. (2023). The Biopsychosocial Model of Evaluation and Treatment in Psychiatry. *Atlas of Psychiatry*, 57–89. [https://doi.org/10.1007/978-3-031-15401-0\\_3/COVER](https://doi.org/10.1007/978-3-031-15401-0_3/COVER)

- Bell, G. J., Ncayiyana, J., Sholomon, A., Goel, V., Zuma, K., & Emch, M. (2022). Race, place, and HIV: The legacies of apartheid and racist policy in South Africa. *Social Science & Medicine*, 296, 114755.
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.
- Blows, S., & Isaacs, S. (2022). Prevalence and factors associated with substance use among university students in South Africa: implications for prevention. *BMC Psychology*, 10(1), 1–12. <https://doi.org/10.1186/S40359-022-00987-2/TABLES/12>
- Bonner, C. P., Carney, T., Browne, F. A., Ndirangu, J. W., Howard, B. N., & Wechsberg, W. M. (2021). Substance use and depressive and anxiety symptoms among out-of-school adolescent girls and young women in Cape Town, South Africa. *South African Medical Journal*, 111(1), 40-45.
- Breuer, E., de Silva, M. J., Shidaye, R., Petersen, I., Nakku, J., Jordans, M. J. D., Fekadu, A., & Lund, C. (2016). Planning and evaluating mental health services in low- and middle-income countries using theory of change. *British Journal of Psychiatry*, 208(s56), s55–s62. <https://doi.org/10.1192/BJP.BP.114.153841>
- Broadwater MA, Liu W, Crews FT, Spear LP. (2014). Persistent loss of hippocampal neurogenesis and increased cell death following adolescent, but not adult, chronic ethanol exposure. *Dev Neurosci*, 36, 297–305. [PubMed: 24993092]
- Bruijnen, C., Dijkstra, B., Doreleijers, T., Vermeiren, R., & van de Ven, P. (2019). The impact of childhood trauma on psychopathology and somatic complaints in justice-involved adolescents. *Child Abuse & Neglect*, 88, 189-199. <https://doi.org/10.1016/j.chiabu.2018.11.012>
- Bruwer B., Govender R., Bishop M., Williams D.R., Stein D.J., & Seedat S. (2013). Association between childhood adversities and long-term suicidality among South Africans from the results of the South African Stress and Health study: A cross-sectional study. *BMC Psychiatry*, 13(1), 209–219. <https://doi.org/10.1186/1471-244X-13-209>
- Bruwer, J., Stein, D. J., & Lochner, C. (2014). The impact of cannabis use on memory-related cognitive processes in patients with obsessive-compulsive disorder. *Journal of Psychiatric Research*, 55, 141-146. <https://doi.org/10.1016/j.jpsychires.2014.04.014>

- Burger, J. W., & Mafuze, B. (2023). Getting psyched up: Developing the field of Sport and Exercise Psychiatry in South Africa. *South African Journal of Sports Medicine*, 35(1), v35i1a16352. <https://doi.org/10.17159/2078-516X/2023/v35i1a16352>
- Burns, J. K. (2010). Mental health services funding and development in KwaZulu-Natal: A tale of inequity and neglect. *South African Medical Journal*, 100(10), 662–666. <https://doi.org/10.7196/SAMJ.4100>
- Burns, J. K. (2011). The mental health gap in South Africa: A human rights issue. *The Equal Rights Review*, 6(99), 99-113.
- Burns, J. K. (2015). Poverty, inequality, and a political economy of mental health. *Epidemiology and Psychiatric Sciences*, 24(2), 107-113. <https://doi.org/10.1017/S2045796015000086>
- Burns, J. K. (2015). Poverty, inequality, and a political economy of mental health. *Epidemiology and Psychiatric Sciences*, 24(2), 107-113. <https://doi.org/10.1017/S2045796015000086>
- Burton, C., Rufat, S., & Tate, E. (2018). Social Vulnerability. In *Vulnerability and resilience to natural hazards* (pp. 53-81). Cambridge University Press.
- Carbia, C., López-Caneda, E., Corral, M., & Cadaveira, F. (2018). Neurophysiological correlates of the effects of alcohol binge drinking on empathy for pain: An event-related potential study. *Alcoholism: Clinical and Experimental Research*, 42(9), 1731-1742. <https://doi.org/10.1111/acer.13829>
- Carlsen, L., & Bruggemann, R. (2022). The 17 United Nations' sustainable development goals: A status by 2020. *International Journal of Sustainable Development & World Ecology*, 29(3), 219-229.
- Carney T, Browne FA, Myers B, Kline TL, Howard B, Wechsberg WM. (2019). Adolescent female school dropouts who use drugs and engage in risky sex: Effects of a brief pilot intervention in Cape Town, South Africa. *AIDS Care*, 31(1), 77–84.
- Carney, T., Myers, B., Kline, T. L., Johnson, K., & Wechsberg, W. M. (2017). Aggressive behaviour among drug-using women from Cape Town, South Africa: Ethnicity, heavy alcohol use, methamphetamine and intimate partner violence. *BMC Women's Health*, 17(1). <https://doi.org/10.1186/s12905-017-0447-2>
- Carney, T., Myers, B., Kline, T.-L., Johnson, K., Brower, K., & Rohde, G. (2019). The relationship between substance use and exit security on psychiatric wards in South Africa: A case-control

study. *International Journal of Mental Health Systems*, 13(1), Article 13(1).

<https://doi.org/10.1186/s13033-019-0265-0>

- Cassidy T, Ntshingwa M, Galuszka J & Matzopoulos R (2015) Evaluation of a Cape Town safety intervention as a model for good practice: A partnership between researchers, community and implementing agency. *Stability: International Journal of Security & Development*, 4(1): 1-12
- Chatmon, S.T. (2020). The impact of substance use on mental health outcomes among adolescents in South Africa [Doctoral dissertation]. University of Cape Town.
- Chen, H. E. (2021). Smoking sugars in Wentworth, South Africa: drugs, masculinity, and ‘coloured’ identity. *African Identities*. <https://doi.org/10.1080/14725843.2021.1929061>
- Chisholm, D., Docrat, S., Abdulmalik, J., Alem, A., Gureje, O., Gurung, D., Hanlon, C., Jordans, M. J. D., Kangere, S., Kigozi, F., Mugisha, J., Muke, S., Olayiwola, S., Shidhaye, R., Thornicroft, G., & Lund, C. (2019). Mental health financing challenges, opportunities and strategies in low- and middle-income countries: findings from the Emerald project. *BJPsych Open*, 5(5). <https://doi.org/10.1192/BJO.2019.24>
- Chisholm, D., Flisher, A., Lund, C., Patel, V., Saxena, S., Thornicroft, G., & Tomlinson, M. (2007). Scale up services for mental disorders: a call for action. *Lancet*, 370(9594), 1241–1252. [https://doi.org/10.1016/S0140-6736\(07\)61242-2](https://doi.org/10.1016/S0140-6736(07)61242-2)
- Chisholm, D., Sweeny, K., Sheehan, P., Rasmussen, B., Smit, F., Cuijpers, P., & Saxena, S. (2016). Scaling-up treatment of depression and anxiety: A global return on investment analysis. *The Lancet Psychiatry*, 3(5), 415-424. [https://doi.org/10.1016/S2215-0366\(16\)30024-4](https://doi.org/10.1016/S2215-0366(16)30024-4)
- Chisholm, D., Sweeny, K., Sheehan, P., Rasmussen, B., Smit, F., Cuijpers, P., & Saxena, S. (2016). Scaling-up treatment of depression and anxiety: A global return on investment analysis. *The Lancet Psychiatry*, 3(5), 415-424. [https://doi.org/10.1016/S2215-0366\(16\)30024-4](https://doi.org/10.1016/S2215-0366(16)30024-4)
- Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J.S.L., & Thornicroft, G. (2015). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological Medicine*, 45(1), 11-27. <https://doi.org/10.1017/S0033291714000129>
- Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J.S.L., & Thornicroft, G. (2015). What is the impact of mental health-

- related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological Medicine*, 45(1), 11-27. <https://doi.org/10.1017/S0033291714000129>
- Cluver, L. (2015). Parenting for lifelong health: From South Africa to other low- and middle-income countries. *Current Opinion in Psychology*, 4, 131-136. <https://doi.org/10.1016/j.copsyc.2014.12.002>
- Commission on Social Determinants of Health, & World Health Organization. (2008). *Closing the gap in a generation: health equity through action on the social determinants of health: Commission on Social Determinants of Health final report*. World Health Organization.
- Conway, K. P., Vullo, G. C., Kennedy, A. P., Finger, M. S., Agrawal, A., Bjork, J. M., & Bierut, L. J. (2013). Personality-targeted interventions delay uptake of drinking and decrease risk of alcohol-related problems when delivered by teachers. *Journal of the American Academy of Child & Adolescent Psychiatry*, 52(9), 963-972.e8. <https://doi.org/10.1016/j.jaac.2013.06.007>
- Cooper, D., De Lannoy, A., & Rule, C. (2015). Youth health and well-being: Why it matters. *South African child gauge*, 60.
- Cosgrove, L., & Shaughnessy, A. F. (2020). Mental health as a basic human right and the interference of commercialized science. *Health and Human Rights*, 22(1), 61.
- Cosgrove, V., & Shaughnessy, R. (2020). The economic burden of bipolar disorder: A systematic review of the literature. *PharmacoEconomics - Open*, 4(1), 13-29. <https://doi.org/10.1007/s41669-019-00166-x>
- Craig, A., Rochat, T., Naicker, S. N., Mapanga, W., Mtintsilana, A., Dlamini, S. N., Ware, L. J., du Toit, J., Draper, C. E., Richter, L., & Norris, S. A. (2022). The prevalence of probable depression and probable anxiety, and associations with adverse childhood experiences and socio-demographics: A national survey in South Africa. *Frontiers in Public Health*, 10, 986531. <https://doi.org/10.3389/FPUBH.2022.986531/BIBTEX>
- Cratsley, K., & Mackey, T. K. (2018). Health policy brief: Global mental health and the United Nations' sustainable development goals. *Families, Systems and Health*, 36(2), 225–229. <https://doi.org/10.1037/FSH0000329>
- Crummy, E.A. (2020). The effects of alcohol use on academic performance among college students. *Journal of Alcohol and Drug Education*, 64(2), 36-52.
- Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviours by education. *Journal of Health Economics*, 29(1), 1-28.

- Dada, S. (2018). Monitoring alcohol and drug abuse trends in South Africa (July 1996–December 2017) [Research report]. South African Medical Research Council.
- Dada, S. (2021). Monitoring alcohol and drug abuse trends in South Africa (July 1996–December 2020) [Research report]. South African Medical Research Council.
- Dada, S., Burnhams, N., Parry, C., Bhana, A., & Timol, F. (2018). Alcohol and drug abuse trends in South Africa. *Journal of Substance Use*, 23(1), 63-69.
- Davis, E. C., Rotheram-Borus, M. J., Weichle, T. W., Rezai, R., & Tomlinson, M. (2017). Patterns of Alcohol Abuse, Depression, and Intimate Partner Violence Among Township Mothers in South Africa Over 5 Years. *AIDS and behavior*, 21(Suppl 2), 174–182.  
<https://doi.org/10.1007/s10461-017-1927-y>
- de Jong, M., George, A., & Jacobs, T. (2021). A scoping review of the determinants of foetal alcohol spectrum disorder in South Africa: An intersectional perspective. *Health Policy and Planning*, 36(9), 1459–1469. <https://doi.org/10.1093/HEAPOL/CZAB101>
- de Kock, J. H., & Pillay, B. J. (2016). Mental health nurses in South Africa’s public rural primary care settings: A human resource crisis. *Rural and Remote Health*, 16(3).  
<https://doi.org/10.22605/rrh3865>
- Debenham, J. (2021). The role of social support in substance use treatment outcomes among people who inject drugs in Cape Town [Doctoral dissertation]. University of Cape Town.
- Debenham, J., Birrell, L., Champion, K., Lees, B., Yücel, M., & Newton, N. (2021). Neuropsychological and neurophysiological predictors and consequences of cannabis and illicit substance use during neurodevelopment: A systematic review of longitudinal studies. *The Lancet Child & Adolescent Health*, 5(8), 589-604.
- Degenhardt, L., Peacock, A., Colledge, S., Leung, J., Grebely, J., Vickerman, P., ... & Larney, S. (2017). Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review. *The Lancet Global Health*, 5(12), e1192-e1207.
- Department of Health & Department of Basic Education (2012) Integrated School Health Policy. Pretoria: DoH & DBE.
- Department of Health (1997) National health policy guidelines for improved mental health in South Africa.

- Department of Health. (2023). Mental health policy and strategic plan. Government of South Africa. <https://doi.org/10.1093/eurpub/ckac029>.
- Department of Health. 2003. National Health Act No 61 of 2003. Cape Town: Government Printers.
- Department of Health. 2003. *National Health Act No 61 of 2003*. Cape Town: Government Printers.
- Department of Health. National adolescent and youth friendly health services strategy. Pretoria: NDoH; 2012. URL: <http://www.ppdafrica.org/docs/southafricaadolescent.pdf>
- Desai, R., Mercken, L., Ruiter, R., Schepers, J., & Reddy, P. (2019). Reasons for Leaving School and Alcohol Use Among Out of School Youth in Sout
- Docrat, S., Besada, D., Cleary, S., Daviaud, E., & Lund, C. (2019). Mental health system costs, resources, and constraints in South Africa: A national survey. *Health policy and planning*, 34(9), 706-719.
- Doran, C. M., & Kinchin, I. (2017). A review of the economic impact of mental illness. *Australian Health Review*, 43(1), 43-48.
- Ederio, N. T., P. Inocian, E., I. Calaca, N., & M. Espiritu, J. G. (2023). Ethical Research Practices in Educational Institutions: A Literature Review. *International Journal of Current Science Research and Review*, 06(05). <https://doi.org/10.47191/IJCSRR/V6-I5-02>
- Emanuel, E. J., Wendler, D., Killen, J., & Grady, C. (2004). What makes clinical research in developing countries ethical? The benchmarks of ethical research. *Journal of infectious diseases*, 189(5), 930-937.
- Engel, G. L. (1981). The clinical application of the biopsychosocial model. In *The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine* (Vol. 6, No. 2, pp. 101-124). Oxford University Press.
- Erksine, H., Moffitt, T., Copeland, W., Costello, E., Ferrari, A., Patton, G., Degenhardt, L., Vos, T., Whiteford H., & Scott J. (2015). A heavy burden on young minds: the global burden of mental and substance use disorders in children and youth. *Psychological Medicine*, 45(7), 1551–1563. <https://doi.org/10.1017/S0033291714002888>
- Ewing SW, Sakhardande A, Blakemore S-J. (2014). The effect of alcohol consumption on the adolescent brain: A systematic review of MRI and fMRI studies of alcohol-using youth. *NeuroImage: Clinical*, 5, 420–37. [PubMed: 26958467]

- Ferreira-Borges, C., Parry, C. D., & Babor, T. F. (2017). Harmful use of alcohol: a shadow over sub-Saharan Africa in need of workable solutions. *International journal of environmental research and public health*, *14*(4), 346.
- Ferreira-Borges, C., Parry, C. D., & Babor, T. F. (2017). Harmful Use of Alcohol: A Shadow over Sub-Saharan Africa in Need of Workable Solutions. *International journal of environmental research and public health*, *14*(4), 346. <https://doi.org/10.3390/ijerph14040346>
- Fischer, A. S., Tapert, S. F., Louie, D. L., Schatzberg, A. F., & Singh, M. K. (2020). Cannabis and the Developing Adolescent Brain. In *Current Treatment Options in Psychiatry* (Vol. 7, Issue 2, pp. 144–161). Springer. <https://doi.org/10.1007/s40501-020-00202-2>
- Fischer, F. (2020). Alcohol use disorder comorbidity in posttraumatic stress disorder: A population-based analysis. *European Journal of Psychotraumatology*, *11*(1), Article 1700618. <https://doi.org/10.1080/20008198.2020.1700618>
- Flisher, A. J., Dawes, A., Kafaar, Z., Lund, C., Sorsdahl, K., Myers, B., ... & Seedat, S. (2012). Child and adolescent mental health in South Africa. *Journal of Child & Adolescent Mental Health*, *24*(2), 149-161.
- Francis, J. M., Myers, B., Nkosi, S., Williams, P. P., Carney, T., Lombard, C., Nel, E., & Morojele, N. (2019). The prevalence of religiosity and association between religiosity and alcohol use, other drug use, and risky sexual behaviours among grade 8-10 learners in Western Cape, South Africa. *PLoS ONE*, *14*(2).
- Francis, J. M., Myers, B., Nkosi, S., Williams, P. P., Carney, T., Lombard, C., Nel, E., & Morojele, N. (2019). The prevalence of religiosity and association between religiosity and alcohol use, other drug use, and risky sexual behaviours among grade 8-10 learners in Western Cape, South Africa. *PLoS ONE*, *14*(2). <https://doi.org/10.1371/JOURNAL.PONE.0211322>
- Goodwin, J., & Zaman, U. (2023). Mental health stigma and UN Sustainable Development Goals. *Frontiers in psychiatry*, *14*, 1190406.
- Groenewald, C., & Bhana, A. (2018). Substance abuse and the family: An examination of the South African policy context. *Drugs: Education, Prevention and Policy*, *25*(2), 148–155. <https://doi.org/10.1080/09687637.2016.1236072>
- Guerin N.A., Shih R.A., Levitt J.T., Blonigen D.M., Zickgraf H.F., Timko C., & Simpson T.L. (2023). Posttraumatic stress disorder symptom severity and socioeconomic factors associated

- with Veterans Health Administration use among women veterans. *Women's Health Issues*, 33(1), 12–19.
- Haas, A. D., Ruffieux, Y., van den Heuvel, L. L., Lund, C., Boulle, A., Euvrard, J., Orrell, C., Prozesky, H. W., Tiffin, N., Lovero, K. L., Tlali, M., Davies, M. A., & Wainberg, M. L. (2020). Excess mortality associated with mental illness in people living with HIV in Cape Town, South Africa: a cohort study using linked electronic health records. *The Lancet Global Health*, 8(10), e1326–e1334. [https://doi.org/10.1016/S2214-109X\(20\)30279-5](https://doi.org/10.1016/S2214-109X(20)30279-5)
- Hahn, E.A. (2018). Genetic correlations between pain phenotypes and depression and neuroticism. *European Journal of Human Genetics*, 26(4), 581-592. <https://doi.org/10.1038/s41431-017-0082-z>
- Hamidullah, M.F. (2021). The relationship between substance use disorders and mental health disorders among adolescents in Pakistan [Doctoral dissertation]. University of Cape Town.
- Harriman, N. W., Williams, D. R., Morgan, J. W., Sewpaul, R., Manyapelo, T., Sifunda, S., ... & Reddy, S. P. (2021). Racial disparities in psychological distress in post-apartheid South Africa: Results from the SANHANES-1 survey. *Social Psychiatry and Psychiatric Epidemiology*.
- Hawke, L. D., Szatmari, P., Cleverley, K., Courtney, D., Cheung, A., Voineskos, A. N., & Henderson, J. (2021). Youth in a pandemic: A longitudinal examination of youth mental health and substance use concerns during COVID-19. *BMJ Open*, 11(10). <https://doi.org/10.1136/bmjopen-2021-049209>
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, 18(3), 66-67.
- Health Professions Council of South Africa. (2016). General Ethical Guidelines For Health Researchers Booklet 13. *Guidelines For Good Practice In The Health Care Professions*. Pretoria <http://www.hpcsa.co.za>
- Hendricks, L.K. (2023). The impact of trauma exposure on substance use outcomes among adolescents in South Africa [Doctoral dissertation]. University of Cape Town.
- Hermens DF, Lagopoulos J, Tobias-Webb J, De Regt T, Dore G, Juckes L, et al. (2013). Pathways to alcohol-induced brain impairment in young people: A review. *Cortex*, 49(1), 3–17. [PubMed: 22789780]

- Hoffman, J. (2022). The impact of COVID-19 on substance use disorders in South Africa. *Journal of Substance Abuse Treatment*, 132, 108476. <https://doi.org/10.1016/j.jsat.2021.108476>
- Hoffman, J., Cossie, Q., Ametaj, A. A., Kim, H. H., James, R., Stroud, R. E., Stevenson, A., Zingela, Z., Stein, D. J., & Gelaye, B. (2022). Construct validity and factor structure of the Kessler-10 in South Africa. *BMC Psychology*, 10(1), 1–11.
- Hogarth, L., Hardy, L., Mathew, A. R., & Hitsman, B. (2018). Negative mood-induced alcohol-seeking is greater in young adults who report depression symptoms, drinking to cope, and subjective reactivity. *Experimental and Clinical Psychopharmacology*, 26(2), 138.
- Hoosen, P., Adams, S., Tiliouine, H., & Savahl, S. (2022). Youth and Adolescents' Perceptions of Violence in Post-Apartheid South Africa: A Systematic Review of the Literature. *Child indicators research*, 15(3), 885-911.
- Hornsby, N., Harker Burnhams, N., Erasmus, J., Lucas, W., & Dada, S. (2021). Monitoring alcohol, tobacco and other drug abuse treatment admissions in South Africa and outpatient wellbeing NACOSA, *The Foundation for Professional Development and Tintswalo*.
- Human Rights Watch. (2023). Global report on mental health rights. Human Rights Watch.
- Human Sciences Research Council. South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey (SABSSM) 2017: Combined - All provinces. [Data set]. SABSSM 2017 Combined. Version 1.0. Pretoria South Africa: Human Sciences Research Council [producer] 2017, Human Sciences Research Council [distributor] 2020. <http://dx.doi.org/doi:10.14749/1585345902>
- Humeniuk, R., Ali, R., Babor, T., Farrell, M., Formigoni, M., Jittiwutikarn, J., ... & Simon, S. (2010). A randomized controlled trial of a brief intervention for illicit drugs linked to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in clients recruited from primary health-care settings in four countries. *Addiction*, 105(5), 919-928.
- Humeniuk, R., Ali, R., Babor, T., Farrell, M., Formigoni, M., Jittiwutikarn, J., ... & Simon, S. (2010). A randomized controlled trial of a brief intervention for illicit drugs linked to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in clients recruited from primary health-care settings in four countries. *Addiction*, 105(5), 919-928.
- Innocenti, G. M. (2022). Defining neuroplasticity. *Handbook of Clinical Neurology*, 184, 3-18.
- Institute for Health Metrics and Evaluation (IHME). (2023). *GBD Compare*. University of Washington. <https://vizhub.healthdata.org/gbd-compare/>

- Institute of Health Metrics and Evaluation, University of Washington. 2010. GBD profile: South Africa. Available from <http://www.healthmetricsandevaluation.org/sites/default/files/country-profiles/GBD%20Country%20Report%20-%20South%20Africa.pdf>
- Institute of Medicine (US) Forum on Neuroscience and Nervous System Disorders; Uganda National Academy of Sciences Forum on Health and Nutrition. Mental, Neurological, and Substance Use Disorders in Sub-Saharan Africa: Reducing the Treatment Gap, Improving Quality of Care: Workshop Summary. Washington (DC): National Academies Press (US); 2010. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK53436/> doi: 10.17226/12828
- IOL. (2023). *Youth and Migration*. Available online: <https://www.ilo.org/global/topics/labour-migration/policy-areas/youth-and-migration/lang--en/index.htm>
- Jack, H. E., Anvari, M. S., Abidogun, T. M., Ochieng, Y. A., Ciya, N., Ndamase, S., Rose, A. L., Kleinman, M. B., Myers, B., & Magidson, J. F. (2023). Applying a mutual capacity building model to inform peer provider programs in South Africa and the United States: A combined qualitative analysis. *International Journal of Drug Policy*, 120. <https://doi.org/10.1016/j.drugpo.2023.104144>
- Jack, H., Wagner G., R. G., Petersen, I., Thom, R., Newton R., C. R., Stein, A., Kahn, K., Tollman, S., & Hofman, K. J. (2014). Closing the mental health treatment gap in South Africa: A review of costs and cost-effectiveness. *Global Health Action*, 7(SUPP.1). <https://doi.org/10.3402/GHA.V7.23431>
- Jackson, C., Geddes, R., Haw, S., & Frank, J. (2012). Interventions to prevent substance use and risky sexual behaviour in young people: a systematic review. *Addiction*, 107(4), 733–747. <https://doi.org/10.1111/j.1360-0443.2011.03751.x>
- Jackson, P. B., Williams, D. R., Stein, D. J., Herman, A., Williams, S. L., & Redmond, D. L. (2010). Race and psychological distress: The South African stress and health study. *Journal of health and social behaviour*, 51(4), 458-477
- Jadhav, K. S., & Boutrel, B. (2019a). Prefrontal cortex development and emergence of self-regulatory competence: The two cardinal features of adolescence disrupted in context of alcohol abuse. *European Journal of Neuroscience*, 50(3), 2274-2281.

- Jadhav, S., & Boutrel, B. (2019b). Adolescent binge drinking disrupts the maturation of the prefrontal cortex myelin and cognitive functions: Potential role of IL-6. *Neuropharmacology*, *144*, 274-285. <https://doi.org/10.1016/j.neuropharm.2018.10.028>
- Jadhav, S., & Boutrel, B. (2019c). Stress and addiction: contribution of the corticotropin releasing factor (CRF) system in neuroplasticity. *Frontiers in Molecular Neuroscience*, *12*(219), 1-15.
- Jansen, S., White, R., Hogwood, J., Jansen, A., Gishoma, D., Mukamana, D., & Richters, A. (2015). The “treatment gap” in global mental health reconsidered: sociotherapy for collective trauma in Rwanda. *European Journal of Psychotraumatology*, *6*(1). <https://doi.org/10.3402/ejpt.v6.2870>
- Jewkes, R. K., Dunkle, K., Nduna, M., & Shai, N. (2010). Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. *The Lancet*, *376*(9734), 41-48.
- Johnson, S. B., Blum, R. W., & Giedd, J. N. (2009). Adolescent maturity and the brain: The promise and pitfalls of neuroscience research in adolescent health policy. *Journal of adolescent health*, *45*(3), 216-221.
- Jörns-Presentati, A., Napp, A. K., Dessauvagie, A. S., Stein, D. J., Jonker, D., Breet, E., ... & Groen, G. (2021). The prevalence of mental health problems in sub-Saharan adolescents: A systematic review. *Plos one*, *16*(5), e0251689.
- Jumbe S.L.A.M., Nyirenda M.J., Kauye F.A.M.K & Chirwa E.D (2021). Prevalence and correlates of depression among adolescents living with HIV in Malawi [Research article]. *BMC Psychiatry*, *21*(1), 1–11.
- Kagee, A., & Price, J. L. (1995). Apartheid in South Africa: Toward a model of psychological intervention. *Journal of Black Studies*, *25*(6), 737-748.
- Kanbur R., & Harrison A. (2016). Globalization and inequality: Introduction to special issue of world development on globalization and inequality [version 1; peer review: awaiting peer review]. *World Development*, *90*(C). <https://doi.org/10.1016/j.worlddev.2016.08.011>
- Kann, L. (2018). Youth risk behavior surveillance—United States, 2017. *MMWR. Surveillance Summaries*, *67*.
- Karim, Q. A. (2016). Mental health of and substance use by adolescents. *SAMJ South African Medical Journal*, *106*(6), 547-548

- Karoly, L. A. (2012). Toward standardization of benefit-cost analysis of early childhood interventions. *Journal of Benefit-Cost Analysis*, 3(1), 1-45.
- Kessler R.C. (2004). The epidemiology of dual diagnosis [version 1; peer review: awaiting peer review]. *Biological Psychiatry*, 56(10). <https://doi.org/10.1016/j.biopsych.2004.06.034>
- Kessler, R. C., Adler, L., Berkley, R., Biederman, J., Conners, C. K., Demler, O., Faraone, S. V., Greenhill, L. L., Howes, M. J., Secnik, K., Spencer, T., Ustun, T. B., Walters, E. E., & Zaslavsky, A. M. (2006). The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. *American Journal of Psychiatry*, 163(4), 716–723. <https://doi.org/10.1176/ajp.2006.163.4.716>
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Üstün, T. B., & Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia e Psichiatria Sociale*, 18(1), 23. <https://doi.org/10.1017/S1121189X00001421>
- Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., Howes, M. J., Normand, S. L. T., Manderscheid, R. W., Walters, E. E., & Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, 60(2), 184–189. <https://doi.org/10.1001/ARCHPSYC.60.2.184>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, 62(6), 593–602. <https://doi.org/10.1001/ARCHPSYC.62.6.593>
- Khalfani, A. K., & Zuberi, T. (2001). Racial classification and the modern census in South Africa, 1911–1996. *Race and society*, 4(2), 161-176.
- Khalfani, A. K., Zuberi, T., Bah, S., & Lehohla, P. J. (2008). Race and population statistics in south africa. *White logic, white methods: Racism and methodology*, 63-90.
- Khantzian E.J. (1985). The self-medication hypothesis of addictive disorders: focus on heroin and cocaine dependence [version 1; peer review: awaiting peer review]. *American Journal of Psychiatry*, 142(11). <https://doi.org/10.1176/ajp.142.11>
- Khuzwayo N. (2020). The experiences of pregnant adolescents regarding the use of health care services in uMgungundlovu District Municipality (Doctoral dissertation).

- Khuzwayo, N., Taylor, M., & Connolly, C. (2020). Changing youth behaviour in South Africa. *Health SA Gesondheid*, 25. <https://doi.org/10.4102/hsag.v25i0.1031>
- Kleintjes S, Lund C, Flisher A and the Mental Health and Poverty Project (2010). A situational analysis of child and adolescent mental health services in Ghana, Uganda, South Africa and Zambia. *African Journal of Psychiatry*, 13(2), 132-139
- Kleintjes, S., & Schneider, M. (2023). History and politics of mental health policy and care in South Africa. *SSM-Mental Health*, 3, 100206.
- Kleintjes, S., Lund, C., & Swartz, L. (2013). Barriers to the participation of people with psychosocial disability in mental health policy development in South Africa: A qualitative study of perspectives of policy makers, professionals, religious leaders and academics. *BMC International Health and Human Rights*, 13(1). <https://doi.org/10.1186/1472-698X-13-17>
- Kohn, R., Saxena, S., Levav, I., & Saraceno, B. (2004). The treatment gap in mental health care. *Bulletin of the World Health Organization*, 82(11), 858-866.
- Koob, G. F. & Volkow, N. D. Neurocircuitry of addiction. *Neuropsychopharmacology* 35, 217–238 (2009)
- Koob, G. F., & Volkow, N. D. (2006). Neurobiology of addiction: a neurocircuitry analysis. *The Lancet Psychiatry*, 3(8), 760-773. [https://doi.org/10.1016/S2215-0366\(16\)00104-8](https://doi.org/10.1016/S2215-0366(16)00104-8)
- Kotzé, H. J., & Boshoff, S. W. (2017). Political leadership and the management of economic stagnation in South Africa. *Journal of Public Administration*, 52(2), 264-276.
- Kuteesa, M. O., Weiss, H. A., Cook, S., Seeley, J., Ssentongo, J. N., Kizindo, R., Ngonzi, P., Sewankambo, M., & Webb, E. L. (2020). Epidemiology of Alcohol Misuse and Illicit Drug Use Among Young People Aged 15–24 Years in Fishing Communities in Uganda. *International Journal of Environmental Research and Public Health*, 17(7). <https://doi.org/10.3390/IJERPH17072401>
- Lees, B., Garcia-Carmona, M., Lacasa-Ruiz, P., & de la Torre-Luque, A. (2019). The effects of a mindfulness-based intervention on emotional regulation and affect in university students: A randomized controlled trial. *Mindfulness*, 10(11), 2325-2337. <https://doi.org/10.1007/s12671-019-01181-4>
- Lees, B., Meredith, L. R., Kirkland, A. E., Bryant, B. E., & Squeglia, L. M. (2020). Effect of alcohol use on the adolescent brain and behaviour. In *Pharmacology Biochemistry and Behaviour* (Vol. 192). Elsevier Inc. <https://doi.org/10.1016/j.pbb.2020.172906>

- Leibbrandt, M., Finn, A., & Woolard, I. (2012). Describing and decomposing post-apartheid income inequality in South Africa. *Dev South Afr*, 29(1), 19–34.  
<https://doi.org/10.1080/0376835x.2012.645639>
- Lerner, R. M., & Steinberg, L. (2009). *Handbook of Adolescent Psychology*. Wiley.
- Letsela T.N. (2019). The impact of antiretroviral therapy on the quality of life of HIV-positive adolescents at Dr George Mukhari Academic Hospital (Doctoral dissertation).
- Letsela, L., Weiner, R., Gafos, M., & Fritz, K. (2019). Alcohol Availability, Marketing, and Sexual Health Risk Amongst Urban and Rural Youth in South Africa. *AIDS and Behaviour*, 23(1), 175–189. <https://doi.org/10.1007/s10461-018-2250-y>
- Liskola, J., Haravuori, H., Lindberg, N., Niemelä, S., Karlsson, L., Kiviruusu, O., & Marttunen, M. (2018). AUDIT and AUDIT-C as screening instruments for alcohol problem use in adolescents. *Drug and alcohol dependence*, 188, 266-273.
- Lund C, de Silva M, Plageron S, Cooper S, Chisholm D, Das J, Knapp M & Patel V (2012) Poverty and Mental disorders: Breaking the Cycle in Low-income and Middle-income Countries. Prime Policy Brief 1. Cape Town: Programme for Improving Mental Health Care, UCT
- Lund C, Stansfeld S & de Silva M (2013) Social determinants of mental health. In: Patel V, Minas H, Cohen A & Prince M (eds) (2013) Global Mental Health: Principles and Practice. Oxford: Oxford University Press.
- Lund, C., Breen, A., Flisher, A. J., Kakuma, R., Corrigall, J., Joska, J. A., Swartz, L., & Patel, V. (2010). Poverty and common mental disorders in low and middle income countries: A systematic review. *Soc Sci Med*, 71(3), 517–528.  
<https://doi.org/10.1016/j.socscimed.2010.04.027>
- Lund, C., de Silva, M., Plageron, S., Cooper, S., Chisholm, D., Das, J., Knapp, M., & Patel, V. (2011). Poverty and mental disorders: Breaking the cycle in low-income and middle-income countries. *The Lancet*, 378(9801), 1502–1514. [https://doi.org/10.1016/S0140-6736\(11\)60754-X](https://doi.org/10.1016/S0140-6736(11)60754-X)
- Lund, C., Kleintjes, S., Cooper, S., Petersen, I., Bhana, A., & Flisher, A. J. (2011). Challenges facing South Africa’s mental health care system: Stakeholders’ perceptions of causes and potential solutions. *International Journal of Culture and Mental Health*, 4(1), 23–38.  
<https://doi.org/10.1080/17542863.2010.503039>

- Lund, C., Kleintjes, S., Kakuma, R., & Flisher, A. J. (2010). Public sector mental health systems in South Africa: Inter-provincial comparisons and policy implications. *Social Psychiatry and Psychiatric Epidemiology*, 45(3), 393–404. <https://doi.org/10.1007/S00127-009-0078-5>
- Lund, C., Petersen, I., Kleintjes, S., & Bhana, A. (2012). Mental health services in South Africa: Taking stock. In *African Journal of Psychiatry (South Africa)* (Vol. 15, Issue 6, pp. 402–405). <https://doi.org/10.4314/ajpsy.v15i6.48>
- Mafa, P., Makhubele, J. C., Ananias, J. A., Chilwalo, B. N., Matlakala, F. K., Rapholo, S. F., Svinurai, A., Hasheela, M. W., Hamuse Tiberia, N. I., & Freeman, R. J. (2019). Alcohol Consumption Patterns: A Gender Comparative Study Among High School Youth in South Africa. *Global Journal of Health Science*, 11(2), 92. <https://doi.org/10.5539/gjhs.v11n2p92>
- Mahajan M (2019). The IHME in the shifting landscape of Global Health metrics. *Glob Policy*;10:110–20. <https://doi.org/10.1111/1758-5899.12605>.
- Mahgoub, Y., & Khalfani, F. (2012). Sustainability of gated communities in developing countries. *Developing Country Studies*, 2(6), 53-63.
- Manthey, J., Probst, C., Rylett, M., & Rehm, J., (2020). 'National alcohol policies and suicide mortality in OECD countries over the period 1990 to 2016', *Drug And Alcohol Review*.
- Maphumulo, W. T., & Bhengu, B. R. (2019). Challenges of quality improvement in the healthcare of South Africa post-apartheid: A critical review. *Curationis*, 42(1), 1-9.
- Marais DL, Petersen I. (2015). Health system governance to support integrated mental health care in South Africa: challenges and opportunities. *Int J Ment Health Syst*, 9(1), 14.
- Marmot, M. (2005). Social determinants of health inequalities. *The lancet*, 365(9464), 1099-1104.
- Marquart, F. (2017). Methodological Rigor in Quantitative Research. In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *The International Encyclopedia of Communication Research Methods* (pp. 1–9). Hoboken, NJ, USA: John Wiley & Sons, Inc. <https://doi.org/10.1002/9781118901731.iecrm0221>
- Mathers C. D. (2020). Global health risks: Mortality and burden of disease attributable to selected major risks. *Archives of Public Health*, 78(77), 1-11.
- Matzopoulos R.G. (2022). Alcohol policy and injury in South Africa: a review of evidence and policy implications. *South African Medical Journal*, 112(1), 18–22.
- Matzopoulos, R., Cois, A., Probst, C., Parry, C. D. H., Vellios, N., Sorsdahl, K., Joubert, J. D., Pillay-van Wyk, V., Bradshaw, D., & Pacella, R. (2022). Estimating the changing burden of

- disease attributable to alcohol use in South Africa for 2000, 2006 and 2012. *South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde*, 112(8b), 662–675.  
<https://doi.org/10.7196/SAMJ.2022.V112I8B.16487>
- Mayosi, B. M., & Benatar, S. R. (2014). Health and health care in South Africa—20 years after Mandela. *New England Journal of Medicine*, 371(14), 1344-1353.
- McDowell, I. (2023). Understanding Health Determinants: Explanatory Theories for Social Epidemiology. *Understanding Health Determinants: Explanatory Theories for Social Epidemiology*, 1–526. <https://doi.org/10.1007/978-3-031-28986-6>
- Mertens, J. R., Flisher, A. J., Ward, C. L., Bresick, G. F., Sterling, S. A., & Weisner, C. M. (2009). Medical Conditions of Hazardous Drinkers and Drug Users in Primary Care Clinics in Cape Town, South Africa. *J Drug Issues*, 39(4).
- Meyer, J. C., Schellack, N., Stokes, J., Lancaster, R., Zeeman, H., Defty, D., ... & Steel, G. (2017). Ongoing initiatives to improve the quality and efficiency of medicine use within the public healthcare system in South Africa; a preliminary study. *Frontiers in pharmacology*, 8, 751.
- Mgoqi-Mbalo, N., Zhang, M., & Ntuli, S. (2017). Risk factors for PTSD and depression in female survivors of rape. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(3), 301–308. <https://doi.org/10.1037/TRA0000228>
- Milanovic, B. (2016). *Global Inequality*. <https://doi.org/10.4159/9780674969797>
- Mirowsky, J., & Ross, C. E. (2002). Measurement for a human science. *Journal of health and social behavior*, 152-170. <https://doi.org/10.1192/BJP.BP.114.153726>:
- Mkhize, H. (1994). Violent oppression: Implications for mental health priorities in South Africa. *Medicine and Law*, 13(1–2).
- Mngoma, N. F., & Ayonrinde, O. A. (2023). Mental distress and substance use among rural Black South African youth who are not in employment, education or training (NEET). *International Journal of Social Psychiatry*, 69(3), 532-542.
- Mngoma, N. F., Ayonrinde, O. A., Fergus, S., Jeeves, A. H., & Jolly, R. J. (2021). Distress, desperation and despair: anxiety, depression and suicidality among rural South African youth. *International review of psychiatry*, 33(1-2), 64-74.
- Mohale, D., & Mokwena, K. E. (2020). Substance use amongst high school learners in the south of johannesburg: Is this the new norm? *South African Family Practice*, 62(1), 1–6.  
<https://doi.org/10.4102/SAFP.V62I1.5122>

- Mokitimi, S., Jonas, K., Schneider, M., & De Vries, P. J. (2019). Child and adolescent mental health services in South Africa—Senior stakeholder perceptions of strengths, weaknesses, opportunities, and threats in the Western Cape Province. *Frontiers in Psychiatry, 10*, 464772.
- Morar, T., Breedt, J. E., Mdaka, N., Maaroganye, K., & Robertson, L. (2024). Is mental health in South Africa moving forward? *BJPsych International, 21*(1), 1–3.  
<https://doi.org/10.1192/bji.2023.32>
- Morin, J. F. G., Afzali, M. H., Bourque, J., Stewart, S. H., Séguin, J. R., O’Leary-Barrett, M., & Conrod, P. J. (2019). A population-based analysis of the relationship between substance use and adolescent cognitive development. *American Journal of Psychiatry, 176*(2), 98-106.
- Morley, K., Logge, W., Pearson, S., Baillie, A., & Haber, P. (2017). Socioeconomic and geographic disparities in access to pharmacotherapy for alcohol dependence. *J Subst Abuse Treat, 74*, 23–25.
- Morojele N, Lombard C, Burnhams NH, Williams PP, Nel E, Parry C. (2018). Alcohol marketing and adolescent alcohol consumption: Results from the International Alcohol Control study (South Africa). *S Afr Med J, 108*(9), 782–8.
- Morojele N.K. (2016). Alcohol use trends in South Africa. *Journal of Psychology in Africa, 26*(4), 277–281.
- Morojele NK, Ramsoomar L, Dumbili EW, Kapiga S. (2021). Adolescent Health Series – Alcohol, tobacco, and other drug use among adolescents in sub-Saharan Africa: A narrative review. *Trop Med Int Health, 26*, 1528–1538. <https://doi.org/10.1111/tmi.13687>
- Morojele, N. K., & Ramsoomar, L. (2016). Addressing adolescent alcohol use in South Africa. *South African Medical Journal, 106*(6), 551–553.  
<https://doi.org/10.7196/SAMJ.2016.V106I6.10944>
- Morojele, N., Nkosi, S., Kekwaletswe, C., Saban, A., & Parry, C. (2021). Alcohol use and sexual risk behaviour among adolescents in South Africa: A systematic review. *African Journal of AIDS Research, 20*(1), 1-13.
- Morojele, N.K., Nkosi, S., Kekwaletswe, C.T., Shuper, P.A., Manda, S.O., Myers, B., & Parry, C.D.H. (2016). Utility of Brief Versions of the Alcohol Use Disorders Identification Test (AUDIT) to Identify Excessive Drinking Among Patients in HIV Care in South Africa. *J. Stud. Alcohol Drugs, 78*, 88–96.

- Mthembu, J. C., Mabaso, M. L. H., Khan, G., & Simbayi, L. C. (2017). Prevalence of psychological distress and its association with socio-demographic and HIV-risk factors in South Africa: Findings of the 2012 HIV prevalence, incidence and behaviour survey. <https://doi.org/10.1016/j.ssmph.2017.07.009>
- Mthembu, J., Mabaso, M., Reis, S., Zuma, K., & Zungu, N. (2021). Prevalence and factors associated with intimate partner violence among the adolescent girls and young women in South Africa: findings the 2017 population based cross-sectional survey. *BMC Public Health*, 21(1). <https://doi.org/10.1186/s12889-021-11183-z>
- Muchiri, B. W., & dos Santos, M. M. L. (2018). Family management risk and protective factors for adolescent substance use in South Africa. *Substance Abuse: Treatment, Prevention, and Policy*, 13(1). <https://doi.org/10.1186/S13011-018-0163-4>
- Mukong, A. K., van Walbeek, C., & Ross, H. (2017). Lifestyle and income-related inequality in health in South Africa. *Int J Equity Health*, 16(1), 103. <https://doi.org/10.1186/s12939-017-0598-7>
- Munro, N., Quayle, M., Simpson, H., Barnsley, S., & Quayle, M. (2013). Hunger for knowledge: Food insecurity among students at the University of KwaZulu-Natal. *Perspectives in Education*, 2013(4), 31. <http://www.perspectives-in-education.com>
- Mupara, L. M., Tapera, R., Selemogwe-Matsetse, M., Kehumile, J. T., Gaogane, L., Tsholofelo, E., & Murambiwa, P. (2022). Alcohol and substance use prevention in Africa: systematic scoping review. *Journal of Substance Use*, 27(4), 335–351. <https://doi.org/10.1080/14659891.2021.1941356>
- Mutyambizi-Mafunda, V., Myers, B., Sorsdahl, K., Chanakira, E., Lund, C., & Cleary, S. (2023). Economic evaluation of psychological treatments for common mental disorders in low-and middle-income countries: a systematic review. *Health Policy and Planning*, 38(2), 239-260.
- Mutyambizi-Mafunda, V., Myers, B., Sorsdahl, K., Obse, A., Lund, C., & Cleary, S. (2023). The economic burden of chronic diseases with co-occurring depression and alcohol use disorder for people in the Western Cape, South Africa. *SSM-Mental Health*, 4, 100268.
- Myers, B., Breuer, E., Lund, C., Petersen Williams, P., van der Westhuizen, C., Brooke-Sumner, C., Naledi, T., Stein, D. J., & Sorsdahl, K. (2019). Assessing capability for implementing mental health counselling within primary care facilities in a middle-income country: A feasibility

study. *Journal of Psychiatric and Mental Health Nursing*, 26(5–6), 163–174.

<https://doi.org/10.1111/JPM.12519>

National Department of Health (South Africa). (2012). National mental health policy framework and strategic plan 2013–2020. *Government of South Africa*.

National Department of Health. (2023). Healthcare worker training manual on substance abuse. *Government of South Africa*.

National Department of Health. National adolescent and youth friendly health services strategy. Pretoria: NDoH; 2012. URL: <http://www.ppdafrica.org/docs/southafricaadolescent.pdf>

National Institute on Drug Abuse (NIDA). (2020). *Drugs of abuse: Alcohol*.

Ncetakalo, N., Mabaso, M., Joska, J., & Simbayi, L. (2021). Factors associated with external HIV-related stigma and psychological distress among people living with HIV in South Africa. *SSM-Population Health*, 14, 100809.

Ncetakalo, N., Sigwadhi, L. N., Mabaso, M., Joska, J., & Simbayi, L. (2023). Exploring HIV status as a mediator in the relationship of psychological distress with socio-demographic and health related factors in South Africa: findings from the 2012 nationally representative population-based household survey. *AIDS Research and Therapy*, 20(1). <https://doi.org/10.1186/s12981-022-00498-5>

Nduna, M., & Jewkes, R. (2012). Disempowerment and Psychological Distress in the Lives of Young People in Eastern Cape, South Africa. *Journal of Child and Family Studies*, 21(6), 1018–1027. <https://doi.org/10.1007/s10826-011-9564-y>

Ngcobo ZS. (2019). The relationship between alcohol consumption patterns and sexual risk behaviour among students at a South African university. *African Journal Of Primary Health Care & Family Medicine*.

Ngcobo, S. B., & Steyn, J. (2019). *An Exploration of the Association between the Whoonga/Nyaope Drug and Criminality through the Eyes of Convicted Drug Offenders in Three Metropolitan Cities of the Republic of South Africa*.

Nyundo A, Manu A, Regan M, Ismail A, Chukwu A, Dessie Y, et al. (2020). Factors associated with depressive symptoms and suicidal ideation and behaviours amongst sub-Saharan African adolescents aged 10–19 years: Cross-sectional study. *Trop Med Int Health*, 25(1), 54–69.

OHCHR. (2016). Living free and equal: What states are doing to tackle violence and discrimination against lesbian, gay, bisexual, transgender and intersex people. New York: United Nations.

- OHCHR. (2017). The right to mental health. New York: *United Nations*.  
<https://www.ohchr.org/en/special-procedures/sr-health/right-mental-health>
- OHCHR. (2022). Born free and equal: Sexual orientation, gender identity, and sex characteristics in international human rights law (2nd ed.). New York: *United Nations*.
- Olawole-Isaac, A., Ogundipe, O., Amoo, E. O., & Adelaye, D. O. (2018). Substance use among adolescents in sub-Saharan Africa: a systematic review and meta-analysis. *South African Journal of Child Health*, 12(2b), 79.
- Pando-Naude, V., Toxto, S., Fernandez-Lozano, S., Parsons, C. E., Alcauter, S., & Garza-Villarreal, E. A. (2021). Gray and white matter morphology in substance use disorders: A neuroimaging systematic review and meta-analysis. *Translational Psychiatry*, 11(1), 1-18.
- Parry C, Burnhams NH, & London L. (2012) A total ban on alcohol advertising: Presenting the public health case. *S Afr Med J*. 102(7):602-4
- Patel V, Flisher AJ, Hetrick S & McGorry P (2007) Mental health of young people: A global public-health challenge. *The Lancet*, 369(9569): 1302-1313
- Paus T. (2008). Mapping brain maturation and cognitive development during adolescence. *Trends in Cognitive Sciences*, 9(2), 60–68.
- Paus T., Keshavan M., Giedd J.N. (2008). Why do many psychiatric disorders emerge during adolescence? *Nature Reviews Neuroscience*, 9(12), 947–957.
- Peacock D & Barker G (2014) Working with men and boys to prevent gender based violence. Principles, lessons learned and ways forward. *Men and Masculinities*, 17(5): 578-599.
- Peltzer, K., & Phaswana-Mafuya, N. (2018). Drug use among youth and adults in a population-based survey in South Africa. *South African journal of psychiatry*, 24(1), 1-6.
- Peltzer, K., Phaswana-Mafuya, N., & Pengpid, S. (2017). Victimization and perpetration of intimate partner violence among female and male youth and adults in South Africa.
- Peltzer, K., Phaswana-Mafuya, N., & Pengpid, S. (2019). Correlates of sedentary behaviour among adolescents and adults with hazardous, harmful or dependent drinking in South Africa. *South African Journal of Psychiatry*, 25(0), 6.  
<https://doi.org/10.4102/SAJPSYCHIATRY.V25I0.1217>
- Pengpid, S., Peltzer, K., & Ramlagan, S. (2021). Prevalence and correlates of hazardous, harmful or dependent alcohol use and drug use amongs persons 15 years and older in South Africa:

- Results of a national survey in 2017. *African Journal of Primary Health Care and Family Medicine*, 13(1). <https://doi.org/10.4102/PHCFM.V13I1.2847>
- Petersen, I., & Lund, C. (2011). Mental health service delivery in South Africa from 2000 to 2010: One step forward, one step back. *South African Medical Journal*, 101(10), 751-757.
- Petersen, I., Bhana, A., Lund, C., & Herrman, H. (2014). Primary prevention of mental disorders. *Early intervention in psychiatry: EI of nearly everything for better mental health*, 117-133.
- Petersen, I., Fairall, L., Bhana, A., Kathree, T., Selohilwe, O., Brooke-Sumner, C., Faris, G., Breuer, E., Sibanyoni, N., Lund, C., & Patel, V. (2016). Integrating mental health into chronic care in South Africa: The development of a district mental healthcare plan. *British Journal of Psychiatry*, 208(s56), s29–s39.
- Pillay AL. (2019). Alcohol consumption patterns among university students in South Africa. *Journal Of Psychology In Africa*, 29(4):377-381.
- Pillay, U., Tomita, A., & Mak, A. (2019). Psychological distress and substance abuse in South Africa. *South African Medical Journal*, 109(3), 175-179.
- Plüddemann A, Morojele N, Myers B, Townsend L, Lombard CJ, Williams PP & Nel E (2014) The prevalence of risk for mental health problems among highschool students in the Western Cape Province, South Africa. *South African Journal of Psychology*, 44(1): 30-35
- Plüddemann, A., Flisher, A. J., McKetin, R., Parry, C., & Lombard, C. (2016). Methamphetamine use, aggressive behaviour and other mental health issues among high-school students in Cape Town, South Africa. *Journal of Child & Adolescent Mental Health*, 28(2), 83-91.
- Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M. R., & Rahman, A. (2007). No health without mental health. *Lancet*, 370(9590), 859–877. [https://doi.org/10.1016/S0140-6736\(07\)61238-0](https://doi.org/10.1016/S0140-6736(07)61238-0)
- Prinsloo, M., Machisa, M., Kassanje, R., Ward, C. L., Neethling, I., Artz, L., Jewkes, R., Abrahams, N., Pillay van-Wyk, V., Matzopoulos, R., Bradshaw, D., & Pacella, R. (2022). Estimating the changing burden of disease attributable to interpersonal violence in South Africa for 2000, 2006, and 2012. *South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde*, 112(8), 693–704. <https://doi.org/10.7196/SAMJ.2022.v112i8b.16512>
- Probst C. & Rehm J. (2016). Alcohol use disorder: definition, epidemiology, etiology, consequences, diagnosis, treatment, monitoring, and control. *International Encyclopedia of Public Health* (Second Edition), pp.188–197.

- Probst C. & Rehm J. (2018). Socioeconomic differences in alcohol-attributable mortality compared with all-cause mortality: a systematic review and meta-analysis. *International Journal for Equity in Health*, Article ID a0164.
- Probst, C., Kilian, C., Sanchez, S., Lange, S., & Rehm, J. (2020). The role of alcohol use and drinking patterns in socioeconomic inequalities in mortality: a systematic review. *The Lancet Public Health*, 5(6), e324–e332. [https://doi.org/10.1016/S2468-2667\(20\)30052-9](https://doi.org/10.1016/S2468-2667(20)30052-9)
- Probst, C., Manthey, J., Martens, M. S., & Rehm, J. (2017). Alcohol use disorder severity and reported reasons not to seek treatment: a cross-sectional study in European primary care practices. *Substance Abuse Treatment, Prevention, And Policy*, 12, 32.
- Probst, C., Parry, C. D., & Rehm, J. (2018). HIV/AIDS mortality attributable to alcohol use in South Africa: a comparative risk assessment by socioeconomic status. *BMJ open*, 8(2), e017955.
- Probst, C., Roerecke, M., Behrendt, S., & Rehm, J. (2014). Socioeconomic differences in alcohol-attributable mortality compared with all-cause mortality: a systematic review and meta-analysis. *Int J Epidemiol*, 43, 1314–1327.
- Probst, C., Shuper, P. A., & Rehm, J. (2016). Coverage of alcohol consumption by national surveys in South Africa. *Addiction*, 112(4), 705–710. <https://doi.org/10.1111/add.13692>
- Probst, C., Simbayi, L. C., Parry, C. D. H., Shuper, P. A., & Rehm, J. (2017). Alcohol use, socioeconomic status and risk of HIV infections. *AIDS Behav*, 21(7), 1926–1937. <https://doi.org/10.1007/s10461-017-1758-x>
- Rajkumar, R. P. (2022). The Correlates of Government Expenditure on Mental Health Services: An Analysis of Data From 78 Countries and Regions. *Cureus*, 14(8). <https://doi.org/10.7759/CUREUS.28284>
- Ramlagan, S., & Peltzer, K. (2021). Awareness, knowledge, attitudes, beliefs, practices, and barriers related to HIV/AIDS among secondary school learners in KwaZulu-Natal, South Africa. *SAARC Journal of Tuberculosis, Lung Diseases & HIV/AIDS*, IV(2), pp.23–35.
- Ramlagan, S., Peltzer, K., & Pengpid, S. (2021). Prevalence and correlates of non-daily and daily cannabis use among persons 15 years and older in South Africa: results of a national survey in 2017. *Substance Abuse Treatment, Prevention, and Policy*, 16, 1-10.
- Ramlagan, S., Sewpaul, R., Shean, Y., Schmidt, T., North, A., & Reddy, S. P. (2024). Psychological distress among South African healthcare workers during the COVID-19 pandemic. *Curationis*, 47(1), 2477.

- Ramsoomar, L., & Morojele, N. K. (2012). Trends in alcohol prevalence, age of initiation and association with alcohol-related harm among South African youth: Implications for policy. *South African Medical Journal*, *102*(7), 609–612. <https://doi.org/10.7196/SAMJ.5766>
- Rehm, J., & Probst, C. (2018). Alcohol use disorder definition based on DSM-5 criteria performs as well as DSM-IV or ICD-10 but with greater flexibility. *Evidence-Based Mental Health*.
- Rehm, J., & Probst, C. (2018). Decreases of life expectancy despite decreases in non-communicable disease mortality: The role of substance use and socioeconomic status. *European Addiction Research*, *24*(2), 53–59. <https://doi.org/10.1159/000488328>
- Rehm, J., & Shield, K. D. (2019). Global Burden of Disease and the Impact of Mental and Addictive Disorders. *Current Psychiatry Reports 2019 21:2*, *21*(2), 1–7. <https://doi.org/10.1007/S11920-019-0997-0>
- Rehm, J., Anderson, P., Fischer, B., Gual, A., & Room, R. (2016). Policy implications of marked reversals of population life expectancy caused by substance use. *BMC Medicine*, *14*(1). <https://doi.org/10.1186/S12916-016-0590-X>
- Rehm, J., Gmel Sr, G. E., Gmel, G., Hasan, O. S., Imtiaz, S., Popova, S., ... & Shuper, P. A. (2017). The relationship between different dimensions of alcohol use and the burden of disease—an update. *Addiction*, *112*(6), 968-1001.
- Reinert, D. F., & Allen, J. P. (2007). The alcohol use disorders identification test: an update of research findings. *Alcohol Clin Exp Res*, *31*(2), 185–199. <https://doi.org/10.1111/j.1530-0277.2006.00295.x>
- Resnik, D. B. (2020). What is ethics in research & why is it important? *National Institute of Environmental Health Sciences*.
- Saban, A., Flisher, A. J., Grimsrud, A., Morojele, N., London, L., Williams, D. R., & Stein, D. J. (2014). The association between substance use and common mental disorders in young adults: results from the South African Stress and Health (SASH) Survey. *The Pan African Medical Journal*, *17*(Suppl 1).
- Saban, A., Kowalski-Dobson, T., Pelletier, J., & Smith, C. (2014). Alcohol use among college students: An international perspective. *Current Opinion in Psychiatry*, *27*(4), 213-221. <https://doi.org/10.1097/YCO.0000000000000063>

- SAMRC (South African Medical Research Council). (2022). The impact of COVID-19 on substance use disorders in South Africa [Report]. <http://www.mrc.ac.za/sites/default/files/files/2022-01-15/COVID19SUD.pdf>
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88(6), 791-804.
- Saxena, S., Thornicroft, G., Knapp, M., & Whiteford, H. (2007). Resources for mental health: scarcity, inequity, and inefficiency. *Lancet*, 370(9590), 878–889.  
[https://doi.org/10.1016/S0140-6736\(07\)61239-2](https://doi.org/10.1016/S0140-6736(07)61239-2)
- Schneider, M., Baron, E., Breuer, E., Docrat, S., Honikman, S., Onah, M., ... & Tomlinson, M. (2016). Integrating mental health into South Africa's health system: Current status and way forward. *South African Health Review*, 2016(1), 153-163.
- Schneider, M., Norman, R., Parry, C., Bradshaw, D., & Plüddemann, A. (2007). Estimating the burden of disease attributable to alcohol use in South Africa in 2000. *South African Medical Journal*, 97(8), 664–672.
- Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol*, 63(SUPPL. 14), 54–70. <https://doi.org/10.15288/JSAS.2002.S14.54>
- Seedat, S., Scott, K. M., Angermeyer, M. C., Berglund, P., Bromet, E. J., Brugha, T. S., Demyttenaere K., de Girolamo G., Haro J.M., Jin R., Karam E.G., Kovess-Masfety V., Levinson D., Medina Mora M.E., Ono Y., Ormel J., Pennell B.E., Posada-Villa J.A., Sampson N.A., ... Kessler R.C. (2009). Cross-national associations between gender and mental disorders in the World Health Organization World Mental Health Surveys. *Archives of General Psychiatry*, 66(7), 785–795.
- Seedat, S., Williams, D. R., Herman, A. A., Moomal, H., Williams, S. L., Jackson, P. B., Myes, L., & Stein, D. J. (2009). Mental health service use among South Africans for mood, anxiety and substance use disorders. *South African Medical Journal. Suid-Afrikaanse Tydskrif Vir Geneeskunde*, 99(5 Pt 2), 346–352.
- Shield, K. D., & Rehm, J. (2019). Substance use and the objectives of current global health frameworks: measurement matters. *Addiction*, 114(5), 771–773.  
<https://doi.org/10.1111/ADD.14485>

- Shortell S.M.; Sehgal N.J.; Bibi S.; Ramsay P.P.; Neuhauser L.; Colla C.H.; Lewis V.A.; Fisher E.S. (2022). An early assessment of accountable care organizations' efforts to engage patients and their families. *Medical Care Research and Review*, 79(1), 14–33.
- Simbayi, L. C., Zuma, K., Zungu, N., Moyo, S., Marinda, E., Jooste, S., ... & SABSSM V Study Group Contributors. (2019). The HIV Epidemic in South Africa: Key Findings from 2017 National Population-Based Survey. *International Journal of Environmental Research and Public Health*, 19(13), 8125.
- Solmi F., Melamed D., Lewis G. (2022). The association between loneliness and depressive symptoms among adults: A systematic review and meta-analysis. *Social Psychiatry and Psychiatric Epidemiology*, 57(1), 13–25.
- Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., il Shin, J., Kirkbride, J. B., Jones, P., Kim, J. H., Kim, J. Y., Carvalho, A. F., Seeman, M. v., Correll, C. U., & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide: large-scale meta-analysis of 192 epidemiological studies. In *Molecular Psychiatry* (Vol. 27, Issue 1, pp. 281–295). Springer Nature. <https://doi.org/10.1038/s41380-021-01161-7>
- Sorsdahl, K., Petersen, I., Myers, B., Zingela, Z., Lund, C., & van der Westhuizen, C. (2023). A reflection of the current status of the mental healthcare system in South Africa. *SSM-Mental Health*, 4, 100247.
- Sorsdahl, K., Stein, D. J., & Myers, B. (2012). Negative attributions towards people with substance use disorders in South Africa: Variation across substances and by gender. *BMC Psychiatry*, 12(1), 1-8.
- South African College of Applied Psychology (SACAP). (2018). SACAP's code of professional conduct. Pretoria: SACAP.
- South African Community Epidemiology Network on Drug Use. (2021). Monitoring alcohol and drug abuse trends in South Africa (July 1996–December 2020) (Phase 46). South African Medical Research Council.
- South African Depression and Anxiety Group. (2019). Substance abuse and mental health disorders: The dual diagnosis challenge [Fact sheet]. [http://www.sadag.org/images/brochures/substance\\_abuse\\_and\\_mental\\_health\\_disorders.pdf](http://www.sadag.org/images/brochures/substance_abuse_and_mental_health_disorders.pdf)

- South African Medical Research Council. (2017). Alcohol use and burden for 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016 [Report]. <http://www.mrc.ac.za/sites/default/files/files/2018-09-21/AlcoholGBD.pdf>
- South African Medical Research Council. (2019). South Africa demographic and health survey 2016 [Report]. <http://www.mrc.ac.za/sites/default/files/files/2019-07-30/SADHS2016.pdf>
- Spear, L.P. (2016). Effects of adolescent alcohol consumption on the brain and behaviour. *Nature Reviews Neuroscience*, 17(4), 197–211.
- Spear, L.P. (2018). Adolescent neurodevelopment. *Journal of Adolescent Health*, 62(4), 371–377.
- Squegla, L. M. (2020). Alcohol and the developing adolescent brain. In *World Psychiatry* (Vol. 19, Issue 3, pp. 393–394). Blackwell Publishing Ltd. <https://doi.org/10.1002/wps.20786>
- Squegla, L.M., Ball, T.M., Jacobus, J., Brumback, T.Y., McKenna, B.S., Nguyen-Louie, T.T. (2017). Neural predictors of initiating alcohol use during adolescence. *American Journal of Psychiatry*, 174(2), 172–185.
- Statistics South Africa. (2014). Poverty trends in South Africa: An examination of absolute poverty between 2006 and 2011.
- Statistics South Africa. (2017). Mid-year population estimates. Pretoria: Stats SA.
- Statistics South Africa. (2023). General household survey (GHS) series volume IX: Education In-depth analysis of the general household survey data 2002–2017. Statistics South Africa.
- StatsSA. (2018). *Demographic Profile of Adolescents*. [www.statssa.gov.za](http://www.statssa.gov.za)
- Stein, D. J., Seedat, S., Herman, A., Moomal, H., Heeringa, S. G., Kessler, R. C., & Williams, D. R. (2008). Lifetime prevalence of psychiatric disorders in South Africa. *British Journal of Psychiatry*, 192(2), 112–117. <https://doi.org/10.1192/bjp.bp.106.029280>
- Stolk, Y., Kaplan, I., & Szwarc, J. (2014). Clinical use of the Kessler psychological distress scales with culturally diverse groups. *International Journal of Methods in Psychiatric Research*, 23(2), 161-183.
- Substance Abuse and Mental Health Services Administration. (2020). Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health (HHS Publication No. PEP20-07-01-001). U.S. Department of Health and Human Services.
- Szerman, N., Martinez-Raga, J., Peris, L., Roncero, C., Basurte, I., Vega, P., ... & Casas, M. (2013). Rethinking dual disorders/pathology. *Addictive Disorders & Their Treatment*, 12(1), 1-10.

- Taukoor, B., Paruk, S., Karim, E., & Burns, J. K. (2017). Substance use in adolescents with mental illness in Durban, South Africa. *Journal of Child & Adolescent Mental Health*, 29(1), 51-61.
- The Society for Adolescent Health and Medicine. (2017). Abstinence-only-until-marriage policies and programs: An updated position paper of the Society for Adolescent Health and Medicine. *Journal of Adolescent Health*, 61(3), 400-403.
- The World Bank. (2023). World development report 2023: Gender equality and development. The World Bank.
- Tindimwebwa, L., Ajayi, A. I., & Adeniyi, O. V. (2021). Prevalence and demographic correlates of substance use among adults with mental illness in eastern cape, south africa: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105428>
- UNAIDS. (2021). Young people and HIV. <https://www.unaids.org/en/keywords/young-people>
- UNICEF. (2021). United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). *Monit Situation Children Women*, 386, 2276-2286.
- UNICEF. (2021). United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). *Monit Situation Children Women*, 386, 2276-2286.
- UNICEF.(2021). Children orphaned by AIDS: front-line responses from Eastern and Southern Africa.London: *Earthscan Publications Ltd.*.
- United Nations Department of Economic and Social Affairs. (2016). *YOUTH AND MIGRATION: Youth Issue Briefs*. Available online: <https://www.un.org/esa/socdev/documents/youth/factsheets/youth-migration.pdf>
- United Nations General Assembly (1995). *World programme of action for youth to the year 2000 and Beyond*. A/50/81.
- United Nations High Commissioner for Human Rights General Assembly Official Records Sixty-third Session Supplement No. 36. (n.d.).
- United Nations Inter-agency Group for Child Mortality Estimation. (2021). *Levels & trends in child mortality : report 2021*. United Nations.
- United Nations Office on Drugs and Crime. (2022). World drug report 2022. United Nations.
- United Nations. (2016). Transforming our world: the 2030 agenda for sustainable development. New York: *United Nations*.

- United Nations. (2019). World population prospects. New York: United Nations Department of Economic and Social Affairs Population Division.
- United Nations. (2022). The sustainable development goals report. New York: United Nations Department of Economic and Social Affairs Population Division.
- United Nations.(2019). World population prospects.New York: United Nations Department of Economic and Social Affairs Population Division.
- United Nations.(2022). The sustainable development goals report.New York: United Nations Department of Economic and Social Affairs Population Division.
- UNODC (2020). World drug report 2020: executive summary conclusions and policy implications [Report]. United Nations Office on Drugs and Crime.
- UNODC World Drug Report. (2021) World drug report. Vienna: United Nations Office on Drugs and Crime.
- UNSDG. (2019) Sustainable development goals knowledge platform.New York : United Nations
- Van Boekel LC, Brouwers EPM, Van Weeghel J, Garretsen HFL. (2013). Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. *Drug Alcohol Depend*, 131(1–3), 23–35. [Internet]. [cited 24 March 2016]. URL: <http://dx.doi.org/10.1016/j.drugalcdep.2013.02.018>
- van Heerden, M. S., Grimsrud, A. T., Seedat, S., Myer, L., Williams, D. R., & Stein, D. J. (2009). Patterns of substance use in South Africa: Results from the South African Stress and Health study. *SAMJ*, 99(5), 358–366.
- van Zyl, M., Fee, C., Burton, J., & Leon, E. (2022). Bridging the Global Mental Health Gap. *Suicide Risk Assessment and Prevention*, 1019–1035. [https://doi.org/10.1007/978-3-030-42003-1\\_63](https://doi.org/10.1007/978-3-030-42003-1_63)
- Vellios N.G. & van Walbeek C.P. (2018). Self-reported alcohol use and binge drinking in South Africa: Evidence from the National Income Dynamics Study 1998–2015. *South African Medical Journal*, Article ID a0164.
- Viertiö, S., Kiviruusu, O., Piirtola, M., Kaprio, J., Korhonen, T., Marttunen, M., & Suvisaari, J. (2021). Factors contributing to psychological distress in the working population, with a special reference to gender difference. *BMC Public Health*, 21(1), 1–17. <https://doi.org/10.1186/S12889-021-10560-Y/PEER-REVIEW>

- Vink, J. M. Genetics of addiction: future focus on gene × environment interaction? *J. Stud. Alcohol Drugs* <https://doi.org/10.1037/a0017376> (2016).
- Vogel, C., Maree, G., Köhler, T., Stanwix, B., Bhorat, H., Sodi, T., Ubomba-Jaswa, E., Drimie, S., Mbhenyane, X., Symington, E., Adebayo, P. & Ndinda, C. (2021). Impact on vulnerable groups. South Africa Covid-19 Country Report [Interim draft]. DPME (Department of Planning, Monitoring and Evaluation), GTAC (Government Technical Advisory Centre) & NRF (National Research Foundation), Pretoria: May.
- Volkow, N. D., Koob, G. F., & McLellan, A. T. (2016). Neurobiological advances from the brain disease model of addiction. *New England Journal of Medicine*, 374(4), 363-371.
- Vos, T., Lim, S. S., Abbafati, C., & al., et. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*, 396, 1204–1222.
- Wechsberg, W. M., Jones, H. E., Zule, W. A., Myers, B. J., Browne, F. A., Kaufman, M. R., ... & Parry, C. D. (2010). Methamphetamine (“tik”) use and its association with condom use among out-of-school females in Cape Town, South Africa. *The American Journal of Drug and Alcohol Abuse*, 36(4), 208-213.
- Wechsberg, W. M., Parry, C. D., & Jewkes, R. K. (2010). Drugs, sex, gender-based violence, and the intersection of the HIV/AIDS epidemic with vulnerable women in South Africa. *RTI Press Policy Brief [Internet]*.
- Wicomb, R., Jacobs, L., Ebrahim, N., Rensburg, M., & Macharia, M. (2018). Illicit drug use and violence in acute psychosis among acute adult admissions at a South African psychiatric hospital. *African Health Sciences*, 18(1), 132–136. <https://doi.org/10.4314/ahs.v18i1.17>
- Wing, V. C., Wass, C. E., Soh, D. W. & George, T. P. A review of neurobiological vulnerability factors and treatment implications for comorbid tobacco dependence in schizophrenia. *Ann. N. Y. Acad. Sci.* 1248, 89–106 (2012).
- World Health Organisation. (2020). Substance abuse. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/substance-abuse>
- World Health Organisation. Adolescent and young adult health. *WHO*. 2022; Fact sheet Available: <https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions> . Accessed 2022 Nov 3.

- World Health Organization (2023, October). World Mental Health Day Commemoration: Mental is a universal human right, "Our Minds, Our Rights". *World Health Organization South Africa*. <https://www.afro.who.int/countries/south-africa/news/world-mental-health-day-commemoration-mental-universal-human-right-our-minds-our-rights>
- World Health Organization. (2007) Technical Consultation on the Public Health Problems Caused by Harmful Use of Alcohol in the African Region. World Health Organization, Regional Office for Africa; Brazzaville, Congo [Google Scholar]
- World Health Organization. (2009). Global health risks: Mortality and burden of disease attributable to selected major risks. <http://apps.who.int/adolescent/second-decade/section2/page4/adolescence-neurodevelopmental-changes.html>
- World Health Organization. (2012). Making health services adolescent friendly: Developing national quality standards for adolescent friendly health services. [invalid URL removed]
- World Health Organization. (2014). Adolescence: Neurodevelopmental changes. <http://apps.who.int/adolescent/second-decade/section2/page4/adolescence-neurodevelopmental-changes.html>
- World Health Organization. (2018). *Global status report on alcohol and health*. World Health Organization, Geneva, Switzerland.
- World Health Organization. (2019). *Global status report on alcohol and health 2018*. World Health Organization.
- World Health Organization. (2019). Universal Health Coverage. [https://www.who.int/health\\_financing/universal\\_coverage\\_definition/en/](https://www.who.int/health_financing/universal_coverage_definition/en/)
- World Health Organization. (2020). World Mental Health Day: an opportunity to kick-start a massive scale-up in investment in mental health. In *World Health Organisation*.
- World Health Organization. (2021). *Global status report on alcohol and health*. World Health Organization.
- World Health Organization. (2022). ICD-11: International classification of diseases (11th revision).
- World Health Organization. (n.d.). *The Global Action Plan for Healthy Lives and Well-being for All, SDG 3*. Retrieved May 7, 2023, from <https://www.who.int/initiatives/mental-health-action-plan-2013-2030>

- World Health Organization. WHO Mortality Database.  
[http://www.who.int/healthinfo/mortality\\_data/en/](http://www.who.int/healthinfo/mortality_data/en/)
- World Health Organization., & Institute for Health Metrics and Evaluation (2018). Memorandum of Understanding between the World Health Organisation and the Institute for Health Metrics and Evaluation. [http:// www.healthdata.org/sites/default/files/files/WHO-IHME%20MoU\\_052218.pdf](http://www.healthdata.org/sites/default/files/files/WHO-IHME%20MoU_052218.pdf). Accessed 28 Feb 2022.
- WHO. (2023, November). *WHO issues new and updated recommendations on treatment of mental, neurological and substance use conditions*. <https://www.who.int/news/item/20-11-2023-who-issues-new-and-updated-recommendations-on-treatment-of-mental--neurological-and-substance-use-conditions>
- World Population Review. (2021). South Africa population 2021.  
<https://worldpopulationreview.com/countries/south-africa-population>
- Wyatt, G. E., Davhana-Maselesele, M., Zhang, M., Wong, L. H., Nicholson, F., Sarkissian, A. der, Makhado, L., & Myers, H. F. (2017). A longitudinal study of the aftermath of rape among rural South African women. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(3), 309–316. <https://doi.org/10.1037/TRA0000246>
- Wyatt, G. E., Thames, A., Simbayi, L., Stein, D. J., Burns, J., & Maselesele, M. (2017). Trauma and mental health in South Africa: Overview. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(3), 249. <https://doi.org/10.1037/TRA0000144>
- Young, C., & de Klerk, V. (2008). Patterns of alcohol use on a South African university campus: the findings of two annual drinking surveys. *Afr J Drug Alcohol Stud.*, 7(2).  
<https://doi.org/10.4314/ajdas.v7i2.46367>
- Young, C., & Mayson, T. (2010). The Alcohol Use Disorders Identification Scale (AUDIT) normative scores for a multiracial sample of Rhodes University residence students. *J Child Adolesc Ment Health*, 22(1), 15–23. <https://doi.org/10.2989/17280583.2010.493659>
- Yu, S. (2018). Uncovering the hidden impacts of inequality on mental health: a global study. *Translational psychiatry*, 8(1), 98.
- Zuma, K., Simbayi, L., Zungu, N., Moyo, S., Marinda, E., Jooste, S., ... & Shahmanesh, M. (2020). Young people’s experiences of sexual and reproductive health interventions in rural KwaZulu-Natal, South Africa. *International Journal of Adolescence and Youth*, 25(1), 1058-1075.

Zungu, N., Mabaso, M., Ramlagan, S., Simbayi, L., Moyo, S., Shisana, O., Murangandi, P., Igumbor, E., Sigida, S., Jooste, S., Marinda, E., Ayalew, K., & Zuma, K. (2022). Is There Risk Compensation among HIV Infected Youth and Adults 15 Years and Older on Antiretroviral Treatment in South Africa? Findings from the 2017 National HIV Prevalence, Incidence, Behaviour and Communication Survey. *International Journal of Environmental Research and Public Health*, 19(10). <https://doi.org/10.3390/ijerph19106156>

## APPENDIX A



14 July 2023

Rikshay Ganasen (214507708)  
School Of Applied Human Sc  
Pietermaritzburg Campus

Dear R Ganasen,

**Protocol reference number:** HSSREC/00005357/2023

**Project title:** The effect of high-risk alcohol consumption and recent illicit substance use on the psychological distress experienced by young South Africans

**Degree:** Masters

### Approval Notification – Expedited Application

This letter serves to notify you that your application received on 15 March 2023 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

**Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.**

This approval is valid until 14 July 2024.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,

Professor Dipane Hlalele (Chair)

/dd

### Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: [hssrec@ukzn.ac.za](mailto:hssrec@ukzn.ac.za) Website: <http://research.ukzn.ac.za/Research-Ethics>

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

**APPENDIX B**

**Questionnaire for persons aged 15 years and older**

**Questionnaire number**

Barcode
---------

**THE FIFTH SOUTH AFRICAN NATIONAL HIV, BEHAVIOUR,  
AND  
HEALTH SURVEY, 2017**

<b>A</b>	<b>GEOGRAPHIC AND INTERVIEW PARTICULARS</b>							
Province								
Small area layer								
Visiting point number (from the map)								
Person number of respondent								

<b>B</b>	<b>INTERVIEW DETAILS</b>							
	Year		Month		Day		Time code	
First visit	1							
Second visit	1							
Third visit	1							
								Final response code
<b>Time code</b>				<b>Response code</b>				
1 = Morning till 12:00				1 = Interview completed and sample taken				
2 = 12:01-16:00				2 = Interview completed but sample not taken				
3 = 16:01-18:00				3 = Appointment made for interview and/or sample				
4 = 18:01-20:00				4 = Selected respondent not at home				
5 = 20:01 and later				5 = Refusal by head of household				
				6 = Refusal by respondent				
				7 = Other				

<b>INTERVIEW STARTING TIME:</b>				
---------------------------------	--	--	--	--

<b>INTERVIEWER: NAME AND EMPLOYEE NUMBER</b> .....			
---	--	--	--

C	REFUSAL PARTICULARS (IF APPLICABLE)
At what point did the respondent refuse? SPECIFY .....	

- 1 = At the gate or door
- 2 = After explanation of the survey and the process
- 3 = After the first respondent has been identified (before interview)
- 4 = During the individual interview
- 5 = After the individual interview when requested to do the test 6 = Other

Do you wish to tell me why you don't want to take part? You are not forced to tell me. SPECIFY .....	
---	--

Upfront refusals

- 01 = Too busy to grant interview
- 02 = Not available now
- 03 = Too late in the evening
- 04 = Not willing to participate in any survey/interview
- 05 = Objected to the topic of the survey (HIV/AIDS)
- 06 = Objected to being interviewed by the specific interviewer
- 07 = Afraid
- 08 = Fear a breach of confidentiality
- 09 = Government is not doing enough for him/her
- 10 = Discovered it was for the HSRC
- 11 = Violence and gangsterism in area
- 12 = Enumerated in the recent population census
- 13 = Other

Refusals during individual interview

- 20 = Objected to providing any/some information on the topic
- 21 = Objected to providing personal/confidential information
- 22 = Unable to provide requested information
- 23 = Refused to continue because he/she got irritated/bored
- 24 = Refused to continue because he/she got angry

- 25 = Refused to continue because he/she lost interest or got tired
- 26 = Refused to continue because he/she was in a hurry
- 27 = Other

Refusal to provide a blood sample

- 40 = Apprehensive of blood sample being taken
- 41 = Against religious beliefs to provide a blood sample
- 42 = Did not want to know HIV status
- 43 = Fear a breach of confidentiality
- 44 = Did not trust the interviewers
- 45 = Recently had an HIV test
- 46 = Other

<b>GENERAL INSTRUCTION</b>	<b>CIRCLE THE CODE NEXT TO THE APPROPRIATE ANSWER. IF INDICATED READ THE ANSWER OPTIONS.</b>
----------------------------	--

<b>SECTION 1</b>	<b>RESPONDENT'S BIOGRAPHICAL DATA</b>
------------------	---------------------------------------

<b>1.1</b>	<b>How old were you on your last birthday? (<i>Age of the respondent</i>)</b>		
<b>1.1.1</b>	<b>What is your date of birth?</b>		
	Year	Month	Day

<b>INSTRUCTION</b>	<b>DO NOT ASK; RECORD</b>	Male	Female
<b>1.2</b>	<b>SEX</b>		
	<b>Sex of the respondent</b>	1	2

<b>INSTRUCTION</b>	<b>READ EACH OPTION</b>
--------------------	-------------------------

<b>INSTRUCTION</b>	<b>How would you describe yourself in terms of gender?</b>	Male	Female	Transgender	Intersex
<b>1.3</b>		1	2	3	4

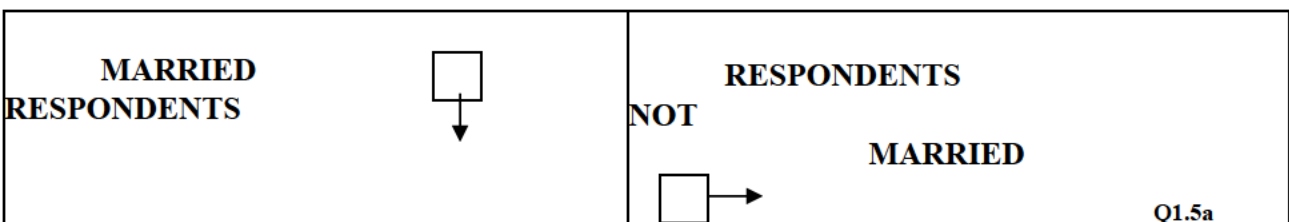
**INSTRUCTION***I am now going to ask you about your marital status*

<b>1.4a</b>	<b>What is your current marital status? (Marital status referring to legal, traditional or common-law)</b>	
	Married	1
	Never married <i>GO TO 1.4c</i>	2
	Divorced / separated	3
	Widower / Widow	4

<b>1.4b</b>	<b>How old were you when you were married for the first time?</b>		
-------------	---	--	--

**INSTRUCTION****READ EACH OPTION**

<b>1.4c</b>	<b>What is your current living arrangement?</b>	
	Living with husband/wife	1
	Living on own or other arrangement but not living with husband / wife	2
	Living together with boyfriend/girlfriend/civil union (same sex) partner /other partner	3
	Single/divorced/widowed – in a steady relationship but not living together	4
	Single; not in a steady relationship	5



<b>1.4d</b>	<b>Are you in a polygamous union?</b> (the practice or custom of having more than one wife or husband at the same time)	Yes	No
		1	2
			<i>GO TO 1.5a</i>

<b>1.4e</b>	<b>Altogether, how many wives do you have / or how many wives does your husband have?</b>		
-------------	---	--	--

<b>INSTRUCTION</b>	<b>ORPHANHOOD STATUS</b> The following section deals with whether your biological mother and/or father have passed away	
<b>RESPONDENTS 15 TO 19 YEARS OF AGE</b>	<input type="checkbox"/> ↓	<b>RESPONDENTS 1.7 20 YEARS AND OLDER</b>

<b>1.5a</b>	<b>Is your biological mother alive?</b>	Yes	No	Don't know
		1	2	3
			<b>GO TO 1.5c</b>	<b>GO TO 1.6a</b>

<b>1.5b</b>	<b>Does your biological mother live in this household?</b>	Yes	No
		1	2
		<b>GO TO 1.6a</b>	<b>GO TO 1.6a</b>

<b>1.5c</b>	<b>How old were you when she passed away? (Age in years)</b>			Don't know
-------------	--	--	--	---------------

<b>1.6a</b>	<b>Is your biological father alive?</b>	Yes	No	Don't know
		1	2	3
			<b>GO TO 1.6c</b>	<b>GO TO 1.7</b>

<b>1.6b</b>	<b>Does your biological father live in this household?</b>	Yes	No
		1	2
		<b>GO TO 1.7</b>	<b>GO TO 1.7</b>

<b>1.6c</b>	<b>How old were you when he passed away? (Age in years)</b>			Don't know
-------------	---	--	--	---------------

<b>INSTRUCTION</b>	<i>I am now going to ask about your employment situation</i>
--------------------	--

<b>1.7</b>	<b>How would you describe your present employment situation?</b>	
	Unemployed	1
	Sick/disabled and unable to work	2
	Student/pupil/learner	3
	Employed/Self employed	4
	Other	5

<b>1.8</b>	<b>Did you receive an income from any source in the last month?</b>	Yes	No
		1	2
		<b>GO TO 1.11</b>	

<b>1.9</b>	<b>What was your <u>main</u> source of income in the last month?</b>	
	Salary/earnings	1
	Contributions by family members or relatives	2
	Government pensions/grants (e.g., old age pension, child support grant, disability grant)	3
	Grants/donations by private welfare organizations	4
	Other sources (Specify?.....)	5

<b>1.10</b>	<b>What is your gross monthly income?</b>						
	<b>R</b>						

<b>1.11</b>	<b>Do you have a disability?</b>	Yes	No	Don't know
		1	2	3
		<b>GO TO 1.14</b>		<b>GO TO 1.14</b>

<b>1.12</b>	<b>How long have you had the disability?</b>	Years	
<b>FILL IN '00'IF LESS THAN ONE YEAR</b>			

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>1.13</b>	<b>What is the disability?</b>	
<b>a</b>	Physical (spinal injury, loss of a limb, etc.)	1

<b>b</b>	Sight	2
<b>c</b>	Partial hearing	3
<b>d</b>	Communication/speech	4
<b>e</b>	Mental or psychiatric illness	5

<b>INSTRUCTION</b>	<b>SCHOOL ATTENDANCE</b>
--------------------	--------------------------

<b>1.14</b>	<b>Have you ever attended school?</b>	Yes	No
		1	2
		<b>TO GO</b> <b>2.1</b>	

<b>1.15a</b>	<b>Are you currently attending school/post-school?</b>	Yes	No
		1	2
		<b>TO GO</b> <b>1.15c</b>	

<b>1.15b</b>	<b>What grade are you attending this year?</b>	
	Grade 3/Standard 1/Abet 1	3
	Grade 4/Standard 2/Abet 2	4
	Grade 5/Standard 3/Abet 2	5
	Grade 6/Standard 4/Abet 3	6
	Grade 7/Standard 5/Abet 3	7
	Grade 8/Standard 6/Abet 3	8
	Grade 9/Standard 7/Abet 3	9
	Grade 10/Standard 8/Ntc 1	10
	Grade 11/Standard 9/Ntc 2	11
	Grade 12/Standard 10/Ntc 3	12
	Diploma/undergraduate degree/other post school	13
	Further degree	14
		<b>TO AGE FILTER</b> <b>GO</b>

<b>1.15c</b>	<b>What is the highest educational level that you obtained?</b>	
	Pre-school/ Gr R	0
	Grade 1/Sub a/Class 1	1
	Grade 2/Sub b/Class 2	2
	Grade 3/Standard 1/Abet 1	3

Grade 4 /Standard 2/Abet 2	4
Grade 5 /Standard 3/Abet 2	5
Grade 6 /Standard 4/Abet 3	6
Grade 7/Standard 5/Abet 3	7
Grade 8 /Standard 6/Abet 3	8
Grade 9 /Standard 7/Abet 3	9
Grade 10/Standard 8/Ntc 1	10
Grade 11/Standard 9/Ntc 2	11
Grade 12/Standard 10/Ntc 3	12
Further studies incomplete	13
Diploma/undergraduate degree/other post school completed	14
Further degree completed	15
Don't know	98

<p><b>RESPONDENTS 15- 18 YEARS</b></p> <p style="text-align: center;"><input type="checkbox"/> ↓</p> <p>1.16 If not attending school - go to</p> <p>1.17 If attending school – go to</p>	<p><b>RESPONDENTS 19 YEARS AND OLDER</b></p> <p style="text-align: center;"><input type="checkbox"/> →</p> <p style="text-align: right;">2 SECTION</p>
--	--

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>1.16</b>	<b>Why are you not attending school?</b>	
a	My family does not have enough money	1
b	I don't like school	2
c	I have to look after my younger brothers/sisters	3
d	I have to look after a sick family member	4
e	I failed	5
f	I was expelled	6
g	I became pregnant (if female)	7
h	Completed grade 12	8
I	School is far from where I live	8
J	Other	10
		<b>GO TO SECTION 2</b>

**INSTRUCTION****READ EACH STATEMENT**

1.17	At your school, how often do	Always	Often	Some times	Never	Don't know
	a	Educators attend classes?	1	2	3	4
b	Educators and other staff watch children at break time?	1	2	3	4	5
c	Educators and other staff watch children coming to school?	1	2	3	4	5
d	Educators and other staff watch children leaving school?	1	2	3	4	5
e	Educators and other staff monitor the toilets?	1	2	3	4	5
f	Educators and other staff make sure no unauthorized person can enter the school?	1	2	3	4	5
g	Boys sexually harass girls by touching, threatening or making rude remarks to them?	1	2	3	4	5
h	Girls sexually harass boys by touching, threatening or making rude remarks to them?	1	2	3	4	5

i	Male educators propose relationships with girl pupils?	1	2	3	4	5
j	Female educators propose relationships with boy pupils?	1	2	3	4	5
k	Teachers propose relationships with pupils of the same sex?	1	2	3	4	5
l	Teachers hit children?	1	2	3	4	5

<b>1.18</b>	<b>In the last month, have you missed school on the days that you were supposed to be at school?</b>	Yes	No
		1	2
			<b>GO</b> <b>TO</b> <b>SECTION 2</b>

<b>1.19</b>	In the last month, how many days have you missed school?		
-------------	--	--	--

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>1.20</b>	<b>Why have you missed school?</b>	
a	I have been sick	1
b	I don't feel safe going to school	2
c	I don't feel safe at school	3
d	I don't like school	4
e	I have to look after my younger brothers/sisters	5
f	I have to look after a sick family member	6
g	I don't have enough money to go to school everyday	7
h	Exams were done	8
i	Got a temporary job	9
j	Other	10

<b>SECTION 2</b>	<b>KNOWLEDGE AND PERCEPTIONS OF HIV/AIDS</b>
------------------	--

<b>INSTRUCTION</b>	<i>I am now going to ask you question about your knowledge and perceptions of HIV/AIDS</i>
--------------------	--

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>	
<b>2.1</b>	<b>Reword as: Can you tell me all the ways you know how to prevent HIV infection?</b>	
<b>a</b>	It can't be prevented	1
<b>b</b>	Using condoms	2
<b>c</b>	Sticking to one sex partner	3
<b>d</b>	Being faithful to one sex partner who is also faithful to you	4
<b>e</b>	Reducing number of sex partners	5
<b>f</b>	Abstaining from sex	6
<b>g</b>	Avoiding contact with blood	7
<b>h</b>	Using drugs to prevent HIV transmission from mother to child	8
<b>i</b>	Medical male circumcision (as an HIV prevention method)	9
<b>j</b>	Microbicides (gel/ring inserted into the vagina to prevent HIV infection)	10
<b>k</b>	PrEP (taking ARVs to prevent HIV infection)	11
<b>l</b>	Other	12
<b>m</b>	I don't know	13

<b>INSTRUCTION</b>	<i>I am now going to ask you a number of additional questions about knowledge and perceptions of HIV and AIDS</i>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
<b>2.2</b>				
<b>a</b>	Can AIDS be cured?	1	2	3
<b>b</b>	Can a person reduce the risk of HIV by having fewer sexual partners?	1	2	3
<b>c</b>	Can a healthy-looking person have HIV?	1	2	3
<b>d</b>	Can HIV be transmitted from a mother to her unborn baby?	1	2	3
<b>e</b>	Can the risk of HIV transmission be reduced by having sex with only one	1	2	3

f	uninfected partner who has no other partners?			
	Can a person get HIV by sharing food with someone who is infected?	1	2	3
	Can a person reduce the risk of getting HIV by using a condom every time he/she has sex?	1	2	3
	Can medical male circumcision reduce the risk of HIV infection in males?	1	2	3
i	Can the risk of HIV transmission through sex be reduced by a HIV-positive partner consistently taking drugs that treat HIV?	1	2	3

2.3.1	Can a woman infected with HIV have an HIVnegative baby?	Yes	No	Don't know
		1	2	3
<i>Go to 2.4.1</i>				

INSTRUCTION		DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE	
2.3.2	Can you tell me all the ways to prevent an HIV-positive pregnant woman from passing on HIV to her baby?		
a	There is no way to prevent transmission		1
b	Drugs, medicine, pills, or ARV's		2
c	Traditional medicine		3
d	Homeopathic treatment		4
e	Immune boosters		5
f	Giving breast milk only, no formula		6
g	Giving formula instead of breast milk		7
h	Caesarean section		8
i	Other		9
j	Don't Know		10

2.4.1	Is there a treatment for HIV infection and AIDS?	Yes	No	Don't know
-------	--	-----	----	------------

	<b>NOTE: READ OUT DEFINITION</b> [Treatment being something to keep people healthy for a long time & not a cure for the disease]	1	2	3
		<i>Go to 2.5</i>		

INSTRUCTION	DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE	
<b>2.4.2</b>	<b>What is that treatment?</b>	
a	Antiretroviral drugs/treatment (ARVs/ART)	1
b	Other drugs, medicine, pills	2
c	Traditional medicine	3
d	Homeopathic treatment	4
e	Immune boosters	5
f	Prayers	6
g	Other (specify)	7
h	Don't Know	8

2.4.3	How long do people have to stay on that treatment for HIV/AIDS?	
	For the rest of their lives	1
	As long as they want	2
	Until they feel better	3
	Until they are cured	4
	Don't know	5
	Other (specify)	6

INSTRUCTION 2.5	<i>Now I want to ask you some questions relating to people living with HIV/AIDS</i>	Yes	No	Don't know
a	If you knew that a shopkeeper or food seller had HIV, would you buy food from them?	1	2	3
b	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?	1	2	3
c	Would you be willing to care for a family member with AIDS?	1	2	3
INSTRUCTION		Yes	No	

<b>2.5</b>		<i>Now I want to ask you some questions relating to people living with HIV/AIDS</i>			<b>Don't know</b>
<b>d</b>	If a teacher has HIV but is not sick, should he or she be allowed to continue teaching?	1	2	3	
<b>e</b>	Is it a waste of money to train or give a promotion to someone with HIV/AIDS?	1	2	3	
<b>f</b>	Would you want to keep the HIV-positive status of a family member a secret?	1	2	3	
<b>h</b>	Are you comfortable talking to at least one member of your family about HIV/AIDS?	1	2	3	
<b>i</b>	A person would be foolish to marry a person who is living with HIV/AIDS	1	2	3	
<b>j</b>	If a pupil has HIV but not sick, should he or she be allowed to continue to go to school?	1	2	3	
<b>k</b>	Do you think children living with HIV should be able to attend school with children who are HIV negative?	1	2	3	

<b>INSTRUCTION</b>	<b>READ EACH STATEMENT</b>
--------------------	----------------------------

<b>2.6</b>	<b>Do you agree or disagree with the following statements:</b>	<b>Agree</b>	<b>Disagree</b>	<b>Don't know</b>
<b>a</b>	Parents are talking to their children about sex and HIV prevention	1	2	3
<b>b</b>	Parents are encouraging their children to use condoms	1	2	3
<b>c</b>	It is okay for young women to have children before they are married	1	2	3
<b>d</b>	It is okay for young men to have children before they are married	1	2	3

<b>e</b>	Young women can have older male sexual partners for money, other necessities, or luxuries	1	2	3
<b>f</b>	Young men can have older female sexual partners for money, other necessities, or luxuries	1	2	3
<b>g</b>	Women can have two or more sexual partners at the same time	1	2	3
<b>h</b>	Men can have two or more sexual partners at the same time	1	2	3

<b>INSTRUCTION</b>	<i>Now I'm going to ask some questions regarding your general perceptions related to HIV/AIDS policies</i>
--------------------	--

<b>2.7</b>	<i>Please tell me whether you agree or disagree with the following statements</i>	<b>Agree</b>	<b>Disagree</b>	<b>Don't know</b>
<b>a</b>	Political leaders are committed to controlling HIV/AIDS in South Africa	1	2	3
<b>b</b>	Political leaders publicly recognise the importance of HIV/AIDS	1	2	3
<b>c</b>	The government allocates sufficient funds to control the spread of HIV infections	1	2	3
<b>d</b>	There are enough community-based organizations helping with HIV/AIDS in your community	1	2	3
<b>2.7</b>	<i>Please tell me whether you agree or disagree with the following statements</i>	<b>Agree</b>	<b>Disagree</b>	<b>Don't know</b>
<b>e</b>	The government supports people and families living with HIV/AIDS	1	2	3
<b>f</b>	The government supports children affected by HIV/AIDS	1	2	3

**SECTION 3****KNOWLEDGE, ATTITUDES, AND PERCEPTIONS OF TUBERCULOSIS (TB)****INSTRUCTION**

*I am now going to ask you about tuberculosis (TB). Please remember that there are no correct or wrong answers*

<b>3.1</b>	<b>Do you agree or disagree with the following statements</b>	<b>Agree</b>	<b>Disagree</b>	<b>Don't Know</b>
<b>a</b>	Anybody can get TB	1	2	3
<b>b</b>	People living with HIV are more likely to get TB	1	2	3
<b>c</b>	People that are HIV negative can get TB	1	2	3

<b>3.2</b>	<b>Do you agree or disagree with the following statements</b>	<b>Agree</b>	<b>Disagree</b>	<b>Don't Know</b>
<b>a</b>	A person can prevent getting TB by avoiding shaking hands	1	2	3
<b>b</b>	A person can prevent spreading TB by covering the mouth when coughing or sneezing	1	2	3
<b>c</b>	A person can prevent getting TB by opening windows at home and in public areas	1	2	3
<b>d</b>	A person can prevent getting TB by limiting close contact with people who have TB that is not treated	1	2	3
<b>e</b>	A person can prevent getting TB by completing religious or traditional practices	1	2	3
<b>f</b>	A person living with HIV can prevent TB by using specific medication to prevent TB, that is given by health professionals	1	2	3

<b>3.3</b>	<i>Now I want to ask you some questions relating to how TB can be cured</i>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
<b>a</b>	Can TB be cured by herbal remedies?	1	2	3
<b>b</b>	Can someone with TB be cured by home rest without any medicine?	1	2	3
<b>c</b>	Can TB be cured by traditional or religious practices?	1	2	3
<b>d</b>	Can TB be cured by specific drugs given by a health professional that are taken for the entire recommended duration	1	2	3
<b>e</b>	Can TB be cured in people with HIV?	1	2	3

<b>3.4</b>	<b>Are people with TB always also HIV positive?</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		1	2	3

**INSTRUCTION**      **READ EACH STATEMENT AND CHECK ONE ANSWER**

<b>3.5</b>	<b>In your community, how is a person who has TB usually regarded/treated? I am going to read all options and you can tell me which one best describes your community</b>	
	Most people reject him or her	1
	Most people are friendly but they generally try to avoid him or her	2
	The community mostly supports him or her	3
	Do not know any person who has TB	4
	Do not know how community treat a person who has TB	5
	Other	6

<b>3.6</b>	<b>Have you ever been told by a doctor or other health professional that you had TB?</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		1	2	3
		<i>GO TO 3.8</i>		

<b>INSTRUCTION</b>		<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>	
<b>3.7</b>	<b>What would be your reaction if you found out that you have TB?</b>		
<b>a</b>	Fear		1
<b>b</b>	Surprise		2
<b>c</b>	Shame/ embarrassment		3
<b>d</b>	Sadness/hopelessness		4
<b>e</b>	Other		5

<b>INSTRUCTION</b>	<b>ONCE YOU HAVE ASKED QUESTION 3.7 SKIP TO 3.12</b>
--------------------	--

<b>3.8</b>	What month and year did a doctor or other health professional last tell you that you have (had) TB?  IF "DON'T KNOW" MONTH, THEN RECORD '88' IF "DON'T KNOW" YEAR, THEN RECORD '8888'	<b>MONTH</b>				
		<b>YEAR</b>				

<b>3.9</b>	Were you also tested for HIV at the TB clinic?	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		1	2	3

<b>3.10</b>	Did you complete your TB treatment, i.e., were you informed by a nurse or doctor that you no longer needed to take treatment for TB?	<b>Yes</b>	<b>No</b>	<b>Still on treatment</b>
		1	2	3

<b>3.11</b>	<b>When you fell sick with TB, were you:</b>	<b>Yes</b>	<b>No</b>
	<b>a</b> Teased, insulted or sworn at?	1	2
	<b>b</b> Gossiped about?	1	2
	<b>c</b> Did you feel unclean or dirty because of your TB?	1	2
<b>d</b> Did you tell anyone outside your household about your TB diagnosis?	1	2	

<b>3.12</b>	<b>Would you like to have more information about TB?</b>	Yes	No
		1	2


<b>SECTION 4</b>	<b>MEDIA, COMMUNICATION AND NORMS</b>
------------------	---------------------------------------

<b>INSTRUCTION</b>	<i>I am now going to ask you a number of questions about different sources of information and what you think of them</i>
--------------------	--

<b>INSTRUCTION</b>	<b>READ EACH STATEMENT</b>
--------------------	----------------------------

<b>4.1</b>	<b>How often do you do the following in a week?</b>	<b>Never</b>	<b>Once a week</b>	<b>2-6 days a week</b>	<b>Every day of the week</b>
<b>a</b>	Listen to the radio	1	2	3	4
<b>b</b>	Watch television	1	2	3	4
<b>c</b>	Read a print magazine	1	2	3	4
<b>d</b>	Read a print newspaper	1	2	3	4
<b>e</b>	Use the internet to go onto news sites	1	2	3	4
<b>f</b>	Use cell phone or the internet to go onto Facebook	1	2	3	4
<b>g</b>	Use cell phone or the internet to go onto Twitter	1	2	3	4
<b>h</b>	Use the cell phone for WhatsApp	1	2	3	4
<b>i</b>	Use cell phone or the internet to go Instagram	1	2	3	4
<b>j</b>	Use a cellphone to send sms	1	2	3	4
<b>k</b>	Read leaflets or booklets	1	2	3	4
<b>l</b>	Download Apps	1	2	3	4

## Brothers for Life Exposure

<b>4.2</b>	<b>In the past 12 months have you seen this logo? [Show BROTHERS FOR LIFE logo- Picture 4.2]</b>	Yes	No
		1	2
		<b>GO TO Q4.4</b>	

<b>4.3</b>	<b>What does this logo stand for (represent)?</b>	
	Brothers for Life	1
	Other: (specify)	2
	Don't know	3

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.4</b>	<b>Can you tell me all the places where you have heard about or seen BROTHERS FOR LIFE?</b>	
<b>a</b>	Never heard of it -	1
<b>b</b>	Television	2
<b>c</b>	Radio	3
<b>d</b>	Facebook	4
<b>e</b>	Twitter	5
<b>f</b>	Posters/billboards	6
<b>g</b>	Pamphlets/booklets	7
<b>h</b>	Community event	8
<b>i</b>	Friend or relative	9
<b>j</b>	From an HIV & AIDS organisation	10
<b>k</b>	Clinic or hospital	11
<b>l</b>	Daily Sun newspaper	12
<b>m</b>	Don't remember	13
<b>n</b>	Other (specify)	14

<b>4.5</b>	Yes
------------	-----

<b>In the last 12 months have you seen this advert on television before?</b>	1
<b>SHOW SCREEN GRAB OF ZING ADVERT [Picture 4.5]</b>	



*TO Q*

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS</b>
--------------------	--------------------------------

<b>4.6</b>	<b>In this advert, what is meant by “get the upgrade that counts”?</b>
Circumcise	1
Condomise	2
Circumcise and condomise	3
Don’t know	4
Other: specify	5


<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.7</b>	<b>What is the message(s) of this advert?</b>	
a	Women should talk to men about medical male circumcision.	1
b	Women should talk to other women about encouraging their partners to get circumcised.	2
c	Women should support their men when they get circumcised	3
d	Men should get circumcised	4
e	Circumcision means getting better sex	5
f	Men who are circumcised should still use condoms	6
g	Healthy relationship.	7
h	People who are circumcised should wait for six weeks before having sex	8
i	Don’t know	9
j	Other: specify	10

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.8</b>	<b>Why do the women in the advert want their men to get circumcised?</b>	
<b>a</b>	To reduce the risk of HIV	1
<b>b</b>	To reduce the risk of cervical cancer	2
<b>c</b>	To improve their sex life	3
<b>d</b>	Circumcision is more hygienic	4
<b>e</b>	Other: specify	5

### ZAZI Exposure

<b>4.9</b>	<b>In the past 12 months have you seen this logo?</b>  <i>[Show pic of ZAZI logo- Picture 4.9]</i>	Yes	No
		1	2
			<b>GO TO Q4.12</b>

<b>4.10</b>	<b>What does this logo stand for (represent)?</b>	
	ZAZI	1
	Other: (specify)	2
	Don't know	3

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.11</b>	<b>Can you tell me all the places where you have heard about or seen Zazi?</b>	
<b>a</b>	Never heard of it	1
<b>b</b>	Television	2
<b>c</b>	Radio	3
<b>d</b>	Facebook	4
<b>e</b>	Twitter	5
<b>f</b>	Posters/billboards	6
<b>g</b>	Pamphlets/booklets	7
<b>h</b>	Community event	8
<b>i</b>	Friend or relative	9
<b>j</b>	From an HIV & AIDS organisation	10
<b>k</b>	Clinic or hospital	11
<b>l</b>	Daily Sun newspaper	12

<b>m</b>	Don't remember	13
<b>n</b>	Other: (specify)	14

<b>4.12</b>	<b>In the past 12 months have you seen this on television?</b>	Yes	
	<b>[show picture of Zonke walking with girls following her]</b>	1	

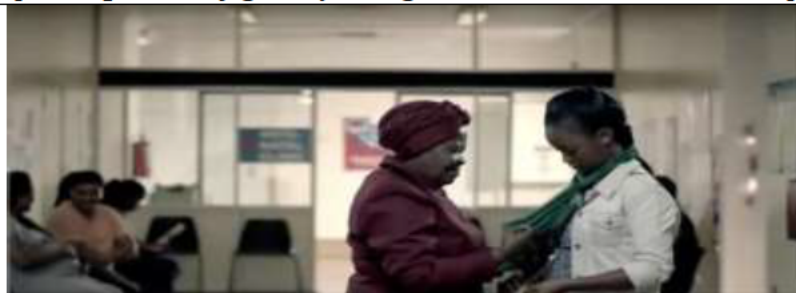


TO Q

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>4.13</b>	<b>What do you think was the message(s) of the television spot?</b>	
<b>a</b>	When you are a (young) woman you must know yourself and stand up for yourself	1
<b>b</b>	Sugar daddies/older men can give young girls HIV and young women must stay away from them	2
<b>c</b>	Young women must use contraceptives and condoms to protect themselves from pregnancy and HIV	3
<b>d</b>	Young women must say no to peer pressure and do the right things for themselves	4
<b>e</b>	Education comes before friends	5
<b>f</b>	Young women must leave men who are abusive to them	6
<b>g</b>	Other (specify)	7

<b>4.14</b>	<b>In the past 12 months have you seen this on television?</b>	Yes	
	<b>[Show picture of granny and girl at the clinic- Picture 4.14]</b>	1	



TO Q

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.15</b>	<b>In this advert, what is going on with the girl at the clinic?</b>	
<b>a</b>	Girl is at the clinic to seek contraception and condoms	1
<b>b</b>	Clinic Sister is showing girl contraceptive methods and condoms	2
<b>c</b>	Clinic Sister is giving girl contraceptive pills and condoms	3
<b>d</b>	Granny sees girl at the clinic with contraceptives and condoms	4
<b>e</b>	Granny affirms girl by tying green scarf around her neck	5
<b>f</b>	Girl shows that she cares about her own future	6
<b>g</b>	Refused/Do not know	7

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.16</b>	<b>What is the message(s) of this advert?</b>	
<b>a</b>	Girls should get contraceptives if they are sexually active	1
<b>b</b>	Grandmothers/mothers should support their grandchildren to get contraceptives	2
<b>c</b>	Young women have the right to get contraceptives from the clinic	3
<b>d</b>	Young women should use both contraceptives and condoms to prevent pregnancy, STIs, and HIV	4
<b>e</b>	Other (specify)	5

<b>4.17</b>	<b>With whom did you discuss the ZAZI television adverts?</b>	
<b>a</b>	No one <b>SKIP to q4.19</b>	1
<b>b</b>	Friend	2
<b>c</b>	My sexual partner	3
<b>d</b>	A sister	4
<b>e</b>	A daughter or granddaughter	5
<b>f</b>	Other family members	6
<b>g</b>	Other (specify)	7

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.18</b>	<b>What did you talk to them about?</b>	
<b>a</b>	The importance of loving oneself and being strong	1
<b>b</b>	Using contraception and condoms to prevent pregnancy and HIV	2
<b>c</b>	Staying away from older men	3
<b>d</b>	Being focused on one's dreams and ignoring peers	4

e	Staying away from or leaving abusive men	5
f	Other (specify)	6

4.19	Can you complete the following slogan? “ZAZI, know your....” [Correct answer: strength]	Able to complete	Unable to complete
		1	2

4.20	Can you complete the following slogan? “My responsibility, my choice, Our.....” [Correct answer: future]	Able to complete	Unable to complete
		1	2

**Siyayinqoba Beat it!**

4.21	In the past 12 months have you heard of “Siyayinqoba Beat it!”?	Yes	No
		1	2
			<b>GO TO Q4.25</b>

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

4.22	Can you tell me all the places where you have heard about or seen “Siyayinqoba Beat It!”?	
a	Don’t remember	1
b	Television	2
c	Radio	3
d	Branded taxis	4
e	Newspapers	5
f	At a community event / door to door campaign	6
g	At a training	7
a	From a clinic or hospital	8
b	Branded Condoms	9
c	Information pamphlets	10
d	Web or mobile media	11


e	Other (specify)	12
---	-----------------	----


4.23	In the past 12 months have you watched any episodes of <i>Siyayinqoba Beat It!</i> on television?	Yes	No
		1	2
		<i>GO TO 4.24</i>	

4.23b	How many episodes have you watched in the past 12 months?		
-------	---	--	--


4.24	In the past 12 months have you listened to any <i>Siyayinqoba Beat It!</i> live call-in shows on radio?	Yes	No
		1	2
		<i>GO TO 4.25</i>	


4.24b	How many shows have you listened to in the past 12 months?		
-------	--	--	--

4.25	In the past 12 months have you seen this logo?  <i>[Show picture 4.25: Siyayinqoba Beat It! logo –]</i>	Yes	No
		1	2
			

4.26	In the past 12 months, have you seen this in a newspaper?  <i>[Show picture 4.26: Siyayinqoba Beat It! newspaper banner ]</i>	Yes	No
		1	2
			


4.27		Yes	No
------	--	-----	----

	<p><b>In the past 12 months, have you seen these condom holders?</b></p> <p><i>[Show picture 4.27: Siyayinqoba Beat It! Branded Condom</i></p> 	1	2

4.28	<p><b>In the past 12 months, have you seen this?</b></p> <p><i>[Show picture 4.28: Siyayinqoba Beat It! Information pamphlets]</i></p> 	Yes	No
		1	2

4.29	<p><b>Can you complete the following slogan?</b>  <b>“Protect yourself....”</b>  <b>[Correct answer: Protect yourself. Protect others]</b></p>	<b>Able to complete</b>	<b>Unable to complete</b>
		1	2

**Inside Story**

4.30	<p><b>In the past 12 months, have you seen this?</b></p>  <p><i>[Show pic card for Inside Story]</i></p>	Yes	No
		1	2

4.31	<p><b>Have you watched the movie Inside Story?</b></p>	Yes	No	No
		1	2	3
<b>Go to 4.35</b>				

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.32</b>	<b>Where did you watch it?</b>	
a	Television	1
b	At a cinema/film theatre	2
c	At a <i>World AIDS Day</i> event	3
d	At a clinic/health centre	4
e	At an event in my community	5
f	At school/university/college	6
g	At work	7
h	I have the DVD/I have borrowed the DVD	8
i	Don't remember	9
j	Other (specify)	10

**INSTRUCTION**

**DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>4.34</b>	<b>From what happens in the story, what do you think was the message(s) of the film?</b>	
a	Having many sexual partners increases one's risk of getting HIV	1
b	It is important to get tested for HIV when you meet a new sexual partner	2
c	It is important to know your HIV status	3
d	Use condoms every time you have sex	4
e	You can be HIV positive and still be successful/happy	5
f	Knowledge is power	6
g	Other (specify)	7


**Soul City**

<b>4.35</b>	<b>Have you ever watched Soul City TV?</b>	Yes	No
		1	2
			<b>GO</b>
			<b>TO</b>
			<b>4.40</b>

<b>4.36</b>	<b>Have you ever talked to your sexual partner about what you saw on Soul City TV?</b>	Yes	No	No sexual partner
		1	2	3

4.37	Have you ever talked to your peers or friends about what you saw on Soul City TV?	Yes	No
		1	2

4.38	Have you ever talked to your children about what you saw on Soul City TV?	Yes	No	No children
		1	2	3

4.39	<p>In the past 12 months, have you watched Soul City Television</p> <p><i>[Show picture 4.39: Soul City Television]</i></p> 	Yes	No
		1	2
			<i>GO TO 4.40</i>

4.39b	How many episodes have you watched?	1 to 4	5 to 9	10 or more
		1	2	3

4.40	<p>Have you ever watched Rise TV Talk Show?</p> <p><i>Show picture 4.40: Rise TV Talk Show</i></p> 	Yes
		1

*TO*

4.40b	How many episodes have you watched?	1 to 4	5 to 9	10 or more
		1	2	3

4.41	Have you ever talked to your sexual partner about what you saw on Rise TV Talk Show?	Yes	No	No sexual partner

		1	2	3
--	--	---	---	---

4.42	Have you ever talked to your peers or friends about what you saw on Rise TV Talk Show?	Yes	No
		1	2

4.43	Are you a member of a Rise Club?	Yes	No
		1	2
		<i>TO</i>	<i>GO</i>
		4.45	

4.44	Have you ever been a member of a Rise club	Yes	No
		1	2

4.45	Have you participated or followed any of the following: Rise, SoulCity, or SoulCityItsReal on Facebook?	Yes	No
		1	2

4.46	Have you participated or followed any of the following: Rise, SoulCity, or SoulCityItsReal on twitter?	Yes	No
		1	2

4.47	Have you participated or followed SoulCity or SoulCityItsReal on MXIT?	Yes	No
		1	2

4.48	Have you ever listened to Soul City or Soul City radio talk shows?	Yes	No
		1	2

4.49	In the past 12 months, have you seen this logo?	Yes	No
		1	2
[Show pic Rise logo]			

<b>INSTRUCTION</b>	<b>READ OUT EACH OPTION, SHOW CARDS</b>
--------------------	---

4.50	Have you read any of the following Soul City booklets in the past 12 months?	Yes	No
		a	Phuza Wize

<b>b</b>	Dual Protection	1	2
<b>c</b>	Soul Sex	1	2
<b>d</b>	HIV-free babies	1	2
<b>e</b>	Alcohol and you	1	2
<b>f</b>	Parenting and alcohol	1	2
<b>g</b>	Circumcision for Life	1	2
<b>h</b>	Rise Magazine any edition	1	2
<b>i</b>	HeartBeat	1	2
<b>j</b>	Onelove	1	2
<b>k</b>	Positive Living any edition	1	2

<b>4.51</b>	<b>Have you ever belonged to a Soul Buddyz Club?</b>	Yes	No
		1	2
			<b>GO TO Q4.53</b>

<b>4.52</b>	<b>How long were you a member of the Soul Buddyz Club?</b>	1	2	3
		yr	yr	yr
		1	2	3

<b>4.53</b>	<b>Have you participated in a Soul City community dialogue about HIV or other health issues?</b>	Yes	No
		1	2

<b>4.54</b>	<b>Have you ever heard of the Thuthuzela Care Centres (TCCs)?</b>	Yes	No
		1	2

<b>4.55</b>	<b>Have you participated in any community dialogue about violence against women?</b>	Yes	No
		1	2

<b>4.56</b>	<b>Have you participated in any community dialogue about positive living?</b>	Yes	No
		1	2

<b>4.57</b>	<b>In the past 12 months, which of these apply to you?</b>	<b>Yes</b>	<b>No</b>
<b>a</b>	Attended a training workshop on HIV/AIDS	1	2
<b>b</b>	Attended a community meeting about HIV/AIDS	1	2
<b>c</b>	Attended play or dialogue or educational event on HIV/AIDS	1	2
<b>d</b>	Attended a clinic discussion on HIV	1	2
<b>e</b>	Know someone who is on ART	1	2

<b>f</b>	Been told by someone you know that they are HIV positive	1	2
<b>g</b>	Helped care for a child whose parents have died of AIDS	1	2

**loveLife**

<b>4.58</b>	<b>Have you heard about loveLife?</b>	<b>Yes</b>	<b>No</b>
		1	2
			<b>GO TO Q4.60</b>

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.59</b>	<b>Where did you hear about loveLife?</b>	
<b>a</b>	Radio	1
<b>b</b>	TV	2
<b>c</b>	loveLife groundBREAKERS/mpintshis	3
<b>d</b>	School	4
<b>e</b>	Adolescent and Youth Friendly Clinic	5
<b>f</b>	UNCUT	6
<b>g</b>	Y-Centre Academy	7
<b>h</b>	loveLife Call Centre	8
<b>i</b>	ilovelife mobisite	9
<b>k</b>	Social media	10
<b>i</b>	Sport and recreation events	11
<b>j</b>	Other (Specify)	12

<b>4.60</b>	<b>In the past 12 months, have you seen this logo?</b>	<b>Yes</b>	<b>No</b>
		1	2
 <i>(Show loveLife logo)</i>			

<b>4.61</b>	<b>Have you read any editions of UNCUT in the last 12 months?</b>	<b>Yes</b>	<b>No</b>
		1	2

**GO TO  
Q4.63**

**INSTRUCTION**

**DO NOT READ OUT OPTIONS, MULTIPLE  
RESPONSES POSSIBLE**

<b>4.62</b>	<b>What do you like about UNCUT?</b>		
	<i>[INSTRUCTION TO INTERVIEWER: More than one response possible] Probe: What else?</i>		
	a	Nothing	1
	b	To get information about sex	2
	c	To get information about relationships	3
	d	To get information about HIV	4
	e	To get information on teenage pregnancy	5
	f	News about fashion	6
	g	Stories about sport	7
	h	Stories about popular youth culture	8
	i	Hearing other young people's voices	9
	j	The pictures	10
	k	The book, CD, and DVD reviews	11
	l	The puzzles and games	12
	m	The pull-out poster	13
	n	To access opportunities such as competitions and learnerships	14
o	Other (please specify)	15	

<b>4.63</b>	<b>Have you listened to a loveLife talk show on the radio in the last 12 months?</b>	Yes	No
		1	2
			<b>GO TO Q4.66</b>

**INSTRUCTION**

**DO NOT READ OUT OPTIONS, MULTIPLE  
RESPONSES POSSIBLE**

<b>4.64</b>	<b>On which radio stations have you listened to loveLife radio talk shows?</b>		
	<i>INTERVIEWER: More than one response possible] Probe: What else?</i>		
	a	Ikwewezi FM	1
	b	Lesedi FM	2
c	Ligwalagwala FM	3	

d	Motsweding FM	4
e	Munghana Lonene FM	5
f	Phalaphala FM	6
g	Thobela FM	7
h	Ukhozi FM	8
i	Umhlobo Wenene	9
j	Tru FM	10
k	Other (please specify)	11

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>4.65</b>	<b>What do you like about loveLife Radio Content?</b> [Probe: What else?]	
a	Nothing	1
b	To get information about sex	2
c	To get information about relationships	3
d	To get information about HIV	4
e	To get information on teenage pregnancy	5
f	To get information on Youth Unemployment	6
g	Stories about sport	7
h	Stories about popular youth culture	8
i	Hearing other young people's voices	9
j	To get information about medical topics (MMC, etc.)	10
k	The Foxy Chix	11
l	Other (Specify)	12

<b>4.66</b>	<b>In the last year, have you heard about the loveLife groundBREAKER or Mpintshi programmes?</b>	Yes	No
		1	2
		<i>GO TO Q 4.68</i>	

<b>4.67</b>	<b>Have you interacted with a groundBREAKER or Mpintshi in any loveLife Programmes in the last year?</b>	Yes	No
		1	2

<b>4.68</b>	<b>Have you participated in a loveLife programme in the past 12 months?</b>	Yes	No
		1	2

*GO*  
*TO*  
*Q*  
*4.70*

**INSTRUCTION** DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE

4.69		Which loveLife programmes have you participated in, in the past 12 months	
a	Don't know		1
b	love4Life		2
c	Living my Life		3
d	Community Dialogues		4
e	loveLife Youth Festivals		5
f	love4life challenge		6
g	loveLife Debates		7
h	iloveLife		8
i	Cyber Ys		9
j	loveLife Games		10
k	Sports events		11
l	Recreational sporting leagues (basketball, soccer, indigenous, netball etc)		12
m	Gender Based Violence Programme		13
n	Site Events		14
o	Other (specify)		15

4.70	Have you ever called the loveLife Call Centre's Youth line?	Yes	No
		1	2

4.71	Have you ever called the loveLife Call Centre's Parent line?	Yes	No
		1	2

4.72	Have you ever sent a Plz Call Me to loveLife?	Yes	No
		1	2

**INSTRUCTION** IF answered NO to question 4.70 or 4.71 or 4.72 SKIP TO 4.74

<b>4.73</b>	<b>IF answered YES to question 4.70 or 4.71 or 4.72: How did you feel about your conversation with the loveLife Call Centre?</b>	
	I got the help I needed	1
	I did not get the help I needed	2
	I am not sure	3

<b>4.74</b>	<b>Have you ever used any other communication channels to contact loveLifes Call Centre, e.g., Mxit, Mizz B, live Webchats etc.</b>	Yes	No
		1	2

<b>4.75</b>	<b>Have you heard of loveLife’s Mizz B?</b>	Yes	No
		1	2

<b>4.76</b>	<b>Are you following loveLife on social media?</b>	Yes	No
		1	2
			<i>GO</i>
			<i>TO</i>
			<i>Q</i>
			<i>4.78</i>

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>4.77</b>	<b>Which platform do you check for updates?</b>	
<b>a</b>	Facebook	1
<b>b</b>	Twitter	2
<b>c</b>	YouTube	3
<b>d</b>	Mxit	4
<b>e</b>	Instagram	5

<b>4.78</b>	<b>Have you heard of loveLife’s mobile website iloveLife.mobi?</b>	Yes	No
		1	2
			<i>GO</i>
			<i>TO</i>
			<i>Q</i>
			<i>5.1</i>

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

4.79 From which channels did you hear of iloveLife.mobi?	
Radio	1
groundBREAKERS/ Mpintshi	2
Social Media (Facebook, Twitter, etc.)	3
Via a friend	4
Other (Specify)	5

4.80 What is your favourite part of iloveLife.mobi?	
Completing your profile	1
The quizzes	2
Earning points for attending loveLife events	3
Entering competitions	4
Share to Facebook and Twitter	5
Other (Specify)	6

<b>SECTION 5</b>	<b>SEXUAL HISTORY</b>
------------------	-----------------------

<b>INSTRUCTION</b>	<i>I now have to ask you sensitive questions on sex and other sex-related matters. Please remember that your name will not be recorded anywhere in this questionnaire and the information you give will be kept confidential.</i>
--------------------	---

<b>5.1</b>	<b>Have you ever had sexual intercourse?</b> [That is when the penis is in the vagina or anus]	Yes	No	No response
		1	2	3
		<i>Go to 5.3</i>		<i>Go to 8.1</i>

INSTRUCTION		AGE AND SEX FILTER	
<b>YOUTH 15 TO 24 YEARS WHO NEVER HAD SEX</b>	<input type="checkbox"/> ↓	<b>MEN AND WOMEN 25 YEARS AND OLDER WHO NEVER HAD SEX</b>	<input type="checkbox"/> →

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>5.2</b>	<b>Could you please tell me why you have not had sex yet?</b>		
<b>a</b>	Not ready		1
<b>b</b>	I am too young		2
<b>c</b>	Not interested		3
<b>d</b>	Avoiding pregnancy		4
<b>e</b>	Avoiding STDs, including HIV		5
<b>f</b>	Religious grounds		6
<b>g</b>	Cultural grounds		7
<b>h</b>	Don't have a partner		8
<b>i</b>	No response		9
<b>j</b>	Other (Specify)		10
			<b>Go to 8.1</b>

<b>5.3</b>	<b>How old were you when you had sex for the first time?</b> _____ yrs old			Cannot remember the age
				1

<b>5.4</b>	<b>How many people have you had sexual intercourse with in your lifetime?</b>		
<b>5.5</b>	<b>Did you use a condom the first time you had sex?</b>	Yes	No
		1	2
			Cannot remember 3

<b>SECTION 6</b>	<b>PARTNER(S) AND PARTNER CHARACTERISTICS</b>
------------------	---

<b>INSTRUCTION</b>	<i>I am now going to ask you questions on partner(s) and partner characteristics.</i>
--------------------	---

<b>6.1</b>	<b>Have you had sex during the past 12 months?</b>	Yes	No	No response
		1	2	3
			<b>Go to 8.1</b>	<b>Go to 8.1</b>

<b>6.2</b>	<b>Overall, how many sexual partners did you have during the past 12 months?</b>	<b>0</b>	<b>1</b>
<b>INSTRUCTION</b>	<b>IF '00', CLARIFY THE ANSWER IN Q6.1</b>		

<b>6.3</b>	<b>How many male sexual partners did you have during the past 12 months?</b>		
------------	--	--	--

<b>6.4</b>	<b>How many female sexual partners did you have during the past 12 months?</b>		
------------	--	--	--

Sum answers to 6.3 and 6.4 and enter

<b>TOTAL</b>			
<b>INSTRUCT</b>			
<b>6</b>	<b>Just to make sure that I have this right: you have had in TOTAL _____ sexual partners during the past 12 months. Is that correct?</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	<b>2</b>		
		<b>Probe and correct</b>	

<b>INSTRUCTION</b>	<i>Now I would like to talk with you about your sexual activity in general</i>
--------------------	--

<b>6.5a</b>	<b>Have you ever <u>received</u> money, gifts, or favours in exchange for sex?</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		<b>1</b>	<b>2</b>	<b>3</b>
		<b>GO TO 6.5d</b>		

<b>6.5b</b>	<b>In the last 12 months, have you <u>received</u> money, gifts, or favours in exchange for sex?</b>	<b>Yes</b>	<b>No</b>
		<b>1</b>	<b>2</b>
		<b>GO TO 6.5d</b>	

<b>6.5c</b>	<b>The last time you <u>received</u> money, gifts, or favours in exchange for sex, was a condom used?</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		<b>1</b>	<b>2</b>	<b>3</b>

<b>6.5d</b>	<b>Have you ever <u>given</u> money, gifts, or favours in exchange for sex?</b>	<b>Yes</b>	<b>No</b>	<b>Refused</b>
		<b>1</b>	<b>2</b>	<b>3</b>

			<b>GO TO NEXT FILTER</b>	
--	--	--	--------------------------	--

<b>6.5e</b>	<b>In the last 12-months, have you <u>given</u> money, gifts, or favours in exchange for sex?</b>	<b>Yes</b>	<b>No</b>	<b>Refused</b>
		1	2	3

<b>GO TO NEXT FILTER</b>	
--------------------------	--

<b>6.5f</b>	<b>The last time you <u>gave</u> money, gifts, or favours in exchange for sex, was a condom used?</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
		1	2	3

<b>6.5g</b>	<b>Have any of these sexual partner(s) had other sexual partners in the past 12 months?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

<b>INSTRUCTION</b>	<b>SEXUAL PARTNERS FILTER</b>
<p>More than one sexual partner <input type="checkbox"/> ↓</p>	<p>One sexual partner <input type="checkbox"/> → <b>GO TO NEXT FILTER</b></p>

<b>6.6</b>	<b>Did any of these relationships mentioned above overlap with each other?</b>	<b>Yes</b>	<b>No</b>	<b>No response</b>
		1	2	3

<b>6.7</b>	<b>Do you have two or more sexual partners at the moment?</b>	<b>Yes</b>	<b>No</b>	<b>No response</b>
		1	2	3

<b>6.8a</b>	<b>Overall, how many different sexual partners did you have during the past 3 months?</b>		
-------------	---	--	--

<b>6.8b</b>	<b>Have you used a condom with any of your partners in the last 3 months?</b>	<b>Yes</b>	<b>No</b>
		1	2
		<b>GO TO NEXT FILTER</b>	

<b>6.8c</b>	<b>In the last 3 months when you had sexual intercourse, did the condom ever break/leak/slip off during sex or while pulling out?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

**INSTRUCTION** *Now I would like to ask you some questions about sexual Health*

**INSTRUCTION** *The next section deals with infections related to the urinary tracts*

<b>FEMALES</b>	<input type="checkbox"/>	<b>MALES</b>	<input type="checkbox"/>	<b>Q6.8f</b>
----------------	--------------------------	--------------	--------------------------	--------------

*(Note: An arrow points from the MALES checkbox to Q6.8f, and a downward arrow points from the FEMALES checkbox.)*

<b>6.8d</b>	<b>During the last 12 months have you had an abnormal discharge from your vagina? This may include an unusual smell, colour, or texture.</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

<b>6.8e</b>	<b>During the last 12 months, have you had an ulcer or sore on or near your vagina?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

**INSTRUCTION** **IF EITHER q6.8d OR q6.8e = YES, THEN GO TO Q6.8h. ELSE GO TO Q6.9**

<b>6.8f</b>	<b>During the last 12 months, have you had an abnormal discharge from your penis?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

<b>6.8g</b>	<b>During the last 12 months, have you had an ulcer or sore on or near your penis?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

<b>6.8h</b>	<b>During the last 12 months have you experienced pain when passing urine?</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>
		1	2	3

**INSTRUCTION** **IF EITHER 6.8f OR 6.8g OR 6.8h '1'YES, GO TO Q6.8i. OTHERWISE GOT TO Q6.9**

<b>6.8i</b>	<b>Did you visit a health facility or see a healthcare provider because of these problems?</b>	Yes	No
		1	2
			<b>GO TO 6.9</b>

<b>6.8j</b>	<b>Did you get treatment for these problems from the healthcare provider?</b>	Yes	No
		1	2

<b>INSTRUCTION</b>	<b>CHECK 6.2 (NUMBER OF PARTNERS LAST 12-MONTHS):</b>
	<b>IF LESS THAN 3:</b> <i>INTERVIEWER SAY: Now I would like to ask you some questions about the ___partners you have had sexual intercourse with in the last 12 months.</i>
	<b>IF 3 OR GREATER:</b> <i>INTERVIEWER SAY: Now I would like to ask you some questions about the LAST 3 partners you have had sex with in the past 12 months.</i>
	<b>INTERVIEWER SAY TO ALL:</b> <i>Let me assure you again that your answers are completely confidential and will not be told to anyone. If we should come to any question that you don't want to answer, just let me know and we will go to the next question.</i>

<b>INSTRUCTION</b>	<b>IN THE NEXT SECTION, ONLY RECORD UP TO A MAXIMUM OF THREE PERSONS WITH WHOM THE RESPONDENT HAD A SEXUAL RELATIONSHIP WITHIN THE PAST 12 MONTHS</b>
	<i>If applicable, this will include their spouse/regular partner and any other persons</i>

	<i>Most recent person with whom you had sex</i>	<i>Second most recent person with whom you had sex</i>	<i>T person w</i>
--	---	--	-------------------

6.9a	<b>What is your relationship?</b>	Husband / Wife.....1 Live-in partner ..... 2 Girlfriend / Boyfriend not living with you..... 3 Casual partner .....4 Someone whom you paid for sex .....5 Other .....6	Husband / Wife.....1 Live-in partner ..... 2 Girlfriend / Boyfriend not living with you..... 3 Casual partner .....4 Someone whom you paid for sex .....5 Other .....6	H L G not living Casual pa Someone pa O
6.9b	<b>Is your partner a male or a female?</b>	Male.....1 Female.....2	Male.....1 Female.....2	M Female...
6.9c	<b>What is the highest level of school this partner has completed?</b>	Primary level.....1 Secondary level....2 Grade 12/ Standard 10/Ntc 3.....3 Further studies incomplete.....4 Diploma/other post school completed.....5 Further degree completed.....6 Don't know.....98 No schooling.....99	Primary level.....1 Secondary level....2 Grade 12/ Standard 10/Ntc 3.....3 Further studies incomplete.....4 Diploma/other post school completed.....5 Further degree completed.....6 Don't know.....98 No schooling.....99	Pr Secondar Standard 10 Further st in Diploma/ co Further d co Don't kno schooling
6.10a	<b>What is the employment status of your partner?</b>	Employed.....1 Unemployed.....2 Student.....3 Don't know.....98	Employed.....1 Unemployed.....2 Student.....3 Don't know.....98	E U S D
6.10b	<b>Where does your partner reside?</b>	In same area.....1 In another area.....2 In same household....3	In same area.....1 In another area.....2 In same household....3	In In In same h
	<b>Household number of partner, if applicable</b>	_____	_____	_____

	<i>Most recent person with whom you had sex</i>	<i>Second most recent person with whom you had sex</i>	<i>Third most recent person with whom you had sex</i>
--	---	--	---

6.10c	<p>What is the approximate age of your partner?</p>	<p>_____</p> <p>GO TO 6.11 IF 3 year age gap</p> <p>Don't know.....88</p> <p>TO 6.13</p>	<p>_____</p> <p>GO TO 6.11 IF 3 year age gap</p> <p>TO 6.13</p> <p>Don't know.....88</p>	<p>GO TO 6.11 IF 3</p> <p>Don't know.....88</p>
6.11	<p>What is the MOST important reason for having a sexual partner <u>younger</u> than yourself?</p>	<p>Younger partner is less likely to be infected with STI/HIV.....1</p> <p>Younger partner will give a sexual boost ....2 It is sexually more exciting than having an older or same-age partner.....3</p> <p>Fear of getting old; younger partner rejuvenates.....4</p> <p>A younger partner will cure me of HIV/AIDS..5</p> <p>It is easier to seduce a younger person.....6</p> <p>Age is not important...7</p> <p>Other.....8</p>	<p>Younger partner is less likely to be infected with STI/HIV.....1</p> <p>Younger partner will give a sexual boost....2 It is sexually more exciting than having an older or same-age partner.....3</p> <p>Fear of getting old; younger partner rejuvenates .....4</p> <p>A younger partner will cure me of HIV/AIDS..5</p> <p>It is easier to seduce a younger person.....6</p> <p>Age is not important...7</p> <p>Other.....8</p>	<p>Younger partner is less likely to be infected with STI/HIV.....1</p> <p>Younger partner will give a sexual boost....2 It is sexually more exciting than having an older or same-age partner.....3</p> <p>Fear of getting old; younger partner rejuvenates .....4</p> <p>A younger partner will cure me of HIV/AIDS..5</p> <p>It is easier to seduce a younger person.....6</p> <p>Age is not important...7</p> <p>Other.....8</p>
6.12	<p>What is the MOST important reason for having a sexual partner <u>older</u> than yourself?</p>	<p>Feeling secure.....1</p> <p>He/she can give financial support .....2</p> <p>He/she does not cheat.....3</p> <p>He/she is experienced and satisfies my sexual needs.....4</p> <p>Age is not important...5</p> <p>Other.....6</p>	<p>Feeling secure.....1</p> <p>He/she can give financial support .....2</p> <p>He/she does not cheat.....3</p> <p>He/she is experienced and satisfies my sexual needs.....4</p> <p>Age is not important...5</p> <p>Other.....6</p>	<p>Feeling secure.....1</p> <p>He/she can give financial support .....2</p> <p>He/she does not cheat.....3</p> <p>He/she is experienced and satisfies my sexual needs.....4</p> <p>Age is not important...5</p> <p>Other.....6</p>

6.13	<b>How long ago did you first have sex with your partner?</b>	A year ago.....1	A year ago.....1	A ye
		Below a year.....2	Below a year.....2	Bel
6.14	<b>When last did you have sex with your partner?</b>	More than a year ago...3	More than a year ago...3	More
		Can't remember...99	Can't remember...99	Can
		Months ago [ ][ ]	Months ago [ ][ ]	Mon
		Days ago [ ][ ]	Days ago [ ][ ]	Day
		Can't remember...99	Can't remember...99	Can

		<i>Most recent person with whom you had sex</i>	<i>Second most recent person with whom you had sex</i>	<i>Third most recent person with whom you had sex</i>
6.15	<b>What type of sex do you have with your partner?</b>	Yes....No Vaginal.....1.....2 Anal.....1.....2 Oral sex.....1.....2	Yes....No Vaginal.....1.....2 Anal.....1.....2 Oral sex.....1.....2	Vaginal Anal... Oral sex
6.16	<b>Are you still sexually active with your partner?</b>	Yes.....1 No.....2	Yes.....1 No.....2	Yes..... No.....
6.17	<b>Do you expect to have sex with your partner again?</b>	Yes.....1 No.....2 Do not know.....3	Yes.....1 No.....2 Do not know.....3	Yes..... No..... Do not know...
6.18	<b>How many times during the last 30 days did you have penetrative sexual intercourse with your partner?</b>	_____	_____	_____

6.19	How often do you use a condom with your partner?	Every time.....1 Almost every time....2 Sometimes.....3  Never.....4 <b>GO T</b> ← →	Every time.....1 Almost every time....2 Sometimes.....3  Never.....4 <b>GO T</b> ← →	Every ti Almost Sometin  Never... <b>G</b>
6.20	Did you use a condom at last sex?	Yes.....1  No.....2 <b>GO T</b> ← →	Yes.....1  No.....2 <b>GO T</b> ← →	Yes.....  No.....
6.21	Was it a male or female condom?	Male.....1 Female.....2	Male.....1 Female.....2	Male... Female
6.22	Who suggested using a condom?	Yourself.....1 Your partner.....2 Mutual agreement...3	Yourself.....1 Your partner.....2 Mutual agreement...3	Yourse Your pa Mutual
		<i>Most recent person with whom you had sex</i>	<i>Second most recent person with whom you had sex</i>	<i>Third most recent person with whom you had sex</i>
6.23	If you used a condom, what were your reasons for doing so?	Concern about HIV infection.....1 People are urged to use condoms.....2 Want to prevent STI's .....3 Want to prevent pregnancy .....4 I or partner on ARV...5 Other .....6 <b>GO T</b> ← →	Concern about HIV infection.....1 People are urged to use condoms.....2 Want to prevent STI's .....3 Want to prevent pregnancy .....4 I or partner on ARV...5 Other .....6 <b>GO T</b> ← →	Concern infection..... are urged to use c Want to preven STI's ... Want pregnancy ... I or part Other ..

6.24	If you did not use a condom, what were your reasons for not doing so?	Did not have a condom.....1	Did not have a condom.....1	Did not have a condom.....1
		Partner objected.....2	Partner objected.....2	Partner objected.....2
6.25	The last time you had sex with your partner did you drink alcohol before sex?	Used other contraceptive..... 3 Don't like them.....4 Didn't think it was necessary.....5	Used other contraceptive..... 3 Don't like them.....4 Didn't think it was necessary.....5	Used other contraceptive..... 3 Don't like them.....4 Didn't think it was necessary.....5
		I am married.....6 I am faithful /trust them.7 I was drunk/high.....8 Other .....9	I am married.....6 I am faithful/trust them 7 I was drunk/high.....8 Other .....9	I am married.....6 I am faithful/trust them 7 I was drunk/high.....8 Other .....

6.26	Is it easy to get a condom if you need one? (Male and/female condoms)	Yes	No	No response
		1	2	3

INSTRUCTION		NON CONDOM USE FILTER (CHECK Q. 6.19)	
SEXUALLY ACTIVE RESPONDENT WHO EVER USED A CONDOM <i>GOTO 6.27</i>		SEXUALLY ACTIVE RESPONDENT WHO HAS NEVER USED A CONDOM BEFORE <i>GO TO SEX FILTER</i>	

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

6.27	Where do YOU normally obtain condoms? (Male and/female condoms)	
a	Government clinic or hospital	1
b	Private clinic or hospital	2
c	Pharmacy/chemist	3

<b>d</b>	Shop/supermarket/café	4
<b>e</b>	Garage/ station	5
<b>f</b>	Spaza shop	6
<b>g</b>	Shebeen/tavern/hotel	7
<b>h</b>	Workplace	
<b>i</b>	Other	8

<b>6.28</b>	<b>Did you or your partner pay for the last condom you used or did you get it for free? (Male and/female condoms)</b>		
	Paid for	Free	Not sure/don't know
	1	2	3

<b>7</b>	<b>SECTION</b>	<b>REPRODUCTION</b>
----------	----------------	---------------------

<b>INSTRUCTION</b>	<b>SEX FILTER</b>
<b>WOMEN 15 TO 54 YEAR OF AGE</b>  Check Q1.1 to confirm age of respondent	<b>ALL MEN AGED 15 YEARS AND OLDER AND WOMEN AGED 55 YEARS AND OLDER GOTO SECTION 8</b>

<b>INSTRUCTION</b>	<i>I have now going to ask you about your reproductive history</i>
--------------------	--

<b>7.1</b>	<b>Have you been pregnant in the last 24 months?</b>	Yes	No
		1	2

<b>7.2</b>	<b>Are you pregnant now?</b>	Yes	No	Unsure
		1	2	3
<b>GO TO 8.16</b>				

<b>7.3</b>	<b>Have you visited an antenatal clinic during this pregnancy?</b>	Yes	No
		1	2
<b>Go to 7.8</b>			

<b>7.4</b>	<b>At what stage of this pregnancy did you visit an antenatal service/clinic? (How many weeks)</b>		
------------	--	--	--

<b>7.5</b>	<b>During this current pregnancy, was an HIV test offered to you during any of your antenatal care clinic visits?</b>	Yes	No	Don't know
		1	2	3

<b>7.6</b>	<b>During this current pregnancy, have you been tested for HIV during any of your antenatal care clinic visits?</b>	Yes	No
		1	2
		<i>Go to 8.16</i>	

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>7.7</b>	<b>Can you tell me the main reason you have not tested for HIV during antenatal care with your current pregnancy?</b>	
<b>a</b>	I tested HIV positive previously and already knew my status	1
<b>b</b>	I did not want an HIV test done	2
<b>c</b>	HIV test kit was not available	3
<b>d</b>	HIV test was not offered to me	4
<b>e</b>	Don't need to test/low risk	5
<b>f</b>	Don't want to know my status	6
<b>g</b>	Afraid others will know about my test results	7
<b>h</b>	Test cost too much	8
<b>i</b>	Can't get treatment if have HIV/AIDS	9
<b>j</b>	Other	10
		<i>Go to 8.1</i>

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>7.8</b>	<b>Can you tell me the main reason you have not attended an antenatal care clinic during your current pregnancy?</b>	
<b>a</b>	The clinic is too far away	1
<b>b</b>	I can't take time off work/too busy	2
<b>c</b>	I can't afford to pay for the visit	3

d	I know all i need to give birth	4
e	I will ask friends/family who can tell me about giving birth	5
f	My culture/religion doesn't allow	6
g	I don't trust the clinic staff	7
h	I'm receiving care at home	8
i	I just found out I am pregnant	9
j	I do not want an HIV test done	10
k	Other	11

<b>INSTRUCTION</b> <i>The next section deals with circumcision</i>	
<b>MALES CONTINUE TO 8.1</b>	<b>FEMALES GO TO 8.16</b>

<b>8</b>	<b>SECTION</b> <b>MALE CIRCUMCISION</b>
----------	---

<b>INSTRUCTION</b>	<i>I am now going to ask you a few questions on male circumcision.</i>
--------------------	--

<b>8.1</b>	<b>Some men are circumcised. Have you been circumcised?</b>	Yes	No
		1	2
			<b>GO TO 8.12</b>

<b>INSTRUCTION</b>	<i>I am now going to ask you a sensitive question, please remember that your responses are confidential</i>
--------------------	---

<b>8.2</b>	<b>What type of circumcision did you have?</b>	
	Partial (where some of the foreskin still remains)	1
	Full/complete (foreskin is totally removed)	2
	Don't know	3

<b>8.3</b>	<b>How old were you when you were circumcised? (in years) If at birth - 00</b>			Don't know	99
------------	--	--	--	------------	----

<b>8.4</b>	<b>Did you receive any explanation or counselling</b>	Yes	No	Too young	Don't remember
------------	---	-----	----	-----------	----------------

<b>about the circumcision before it was done?</b>	1	2	3	4
<i>GO TO 8.6</i>				

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>8.5</b>	<b>What were you advised to do after the circumcision about having sex?</b>		
<b>a</b>	Nothing		1
<b>b</b>	Wait to have sex until the wound is completely healed		2
<b>c</b>	You still have to use a condom even after circumcision		3
<b>d</b>	Have one sex partner		4
<b>e</b>	Other		5

<b>8.6</b>	<b>Where were you circumcised?</b>		
	At home		1
	In hospital/clinic		2
	In the mountain/ in the bush/initiation school		3
	Circumcision camps		4
	Mobile clinic circumcision clinic		5
	Other		6
	Don't know		7

<b>8.7</b>	<b>What method was used for circumcision?</b>		
	Forceps guided method		1
	Other device.....		2
	Don't know		3

<b>8.8</b>	<b>Who performed the circumcision?</b>		
	Medical Doctor/nurse		1
	Spiritual or religious leader		2
	Traditional circumciser		3
	Other		4
	Don't know		5

<b>8.9</b>	<b>What was your <u>main</u> reason for being circumcised?</b>		
	Traditional practice such as initiation		1
	Religious reasons		2
	My parents decided for me		3
	Health reasons		4

Prevent HIV and other STIs	5
Other	6

<b>8.10</b>	<b>Did you experience complications following circumcision?</b>	Yes	No	Don't know
		1	2	3

<b>8.11</b>	<b>Would you recommend circumcision?</b>	Yes	No
		1	2
		<i>GO TO 8.16</i>	<i>GO TO 8.16</i>

<b>8.12</b>	<b>ASK MALES WHO ARE NOT CIRCUMCISED</b>	Yes	No
	<b>Would you consider being circumcised?</b>	1	2
		<i>GO TO 8.14</i>	

<b>8.13</b>	<b>Why would you not consider male circumcision?</b>		
	Personal reasons		1
	Religious reasons		2
	Health reasons		3
	Other		4
<b>INSTRUCTION</b>	<b>ONCE YOU HAVE ANSWERED Q8.13 GO TO 8.16</b>		

<b>INSTRUCTION</b>	<b>READ EACH OPTION</b>
--------------------	-------------------------

<b>8.14</b>	<b>Are you planning to be circumcised in the next 12 months?</b>		
	Definitely will		1
	Probably will		2
	Probably will not <b>SKIP TO Q8.16</b>		3
	Definitely will not <b>SKIP TO Q8.16</b>		4
	Unsure <b>SKIP TO Q8.16</b>		5

<b>INSTRUCTION</b>	<b>READ EACH OPTION</b>
--------------------	-------------------------

<b>8.15</b>	<b>Would this circumcision be</b>		
	Medical only-doctor or nurse		1
	Traditional only		2

Medical circumcision followed by a traditional initiation ceremony	3
--	---

<b>INSTRUCTION</b>	<b>ASK BOTH MALES AND FEMALE</b>
--------------------	----------------------------------

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
--------------------	---

<b>8.16</b>	<b>What do you think are the benefits that men get from being medically circumcised?</b>	
<b>a</b>	No benefits	1
<b>b</b>	Reduce the risk of getting HIV	2
<b>c</b>	Reduces the risk of getting STI's	3
<b>d</b>	Keeps men clean	4
<b>e</b>	Reduces female partner's chance of getting cervical cancer	5
<b>f</b>	Makes sex more pleasurable for him	6
<b>g</b>	Makes sex more pleasurable for her	7
<b>h</b>	Other	8
<b>i</b>	Don't know	9

<b>8.17</b>	<b>How long should a man wait to have sex after he is circumcised?</b>	
	0 weeks (they shouldn't wait);	1
	1 week	2
	2 weeks	3
	3 weeks	4
	4 weeks	5
	6 weeks	6
	Other (Specify)	7
	Don't know	8

<b>INSTRUCTION</b>	<b>ASK MALE AND FEMALE RESPONDENTS WHO HAVE A MALE SEXUAL PARTNER</b>
--------------------	---

<b>INSTRUCTION</b>	<i>I have now going to ask you about male circumcision</i>
--------------------	--

<b>8.18</b>	<b>Is your current or main sex partner circumcised?</b>	
	Yes <b>SKIP TO Q9.1</b>	1
	No	2
	Don't have a main sex partner	3
	Don't know	4

<b>8.19</b>	<b>Would you be supportive of your current, main, or future sex partner getting circumcised now or in the future?</b>	Yes	No	Don't know
		1	2	3

<b>SECTION 9</b>	<p align="center"><b>HIV COUNSELLING AND TESTING</b></p> <p align="center"><i>I am now going to ask you a few about H IV testing</i></p>
------------------	--

<b>9.1</b>	<b>Do you know of a place nearby where you can get an HIV test?</b>	Yes	No
		1	2

<b>9.2</b>	<b>Have you <u>ever</u> had an HIV test?</b>	Yes	No	No response
		1	2	3
		<b>GO TO 9.24</b>	<b>GO TO SECTION 10</b>	

<b>9.3</b>	<b>How long ago did you have your most recent HIV test?</b>	
	0 to 3 months	1
	4 to 6 months	2
	7 to 11 months	3
	Less than a year ago	4
	Between 1-2 years ago	5
	Between 2-3 years ago	6
	Three or more years ago	7

<b>INSTRUCTION</b>	<i>Please note that you should not tell me about the actual result. I am only interested whether you have been told/informed of the result of the test.</i>
--------------------	---

<b>9.4</b>	<b>Have you been told/informed of the result of your most recent test?</b>	Yes	No
		1	2

<b>9.5</b>	<b>Where did you get your most recent HIV test?</b>	
	Public hospital	1
	Private hospital	2

Public clinic or doctor	3
Private clinic or doctor	4
Mine hospital	5
Traditional healer	6
NGO	7
Pharmacy/chemist	8
HIV testing centre	9
Workplace	10
Health Jamboree event	11
Other	

<b>9.6</b>	<b>During your most recent HIV test, did you have counselling <u>before</u> the HIV test?</b>	Yes	No
		1	2

<b>9.7</b>	<b>During your most recent HIV test, did you have counselling <u>after</u> the HIV test?</b>	Yes	No
		1	2

<b>9.8</b>	<b>What was the <u>main</u> reason for going for your last HIV test?</b>	
	I wanted to know my HIV status	1
	My partner asked me to go for testing	2
	I wanted to start a new sexual relationship	3
	I wanted to get married	4
	I applied for an insurance policy	5
	I applied for a loan	6
	My employer requested it	7
	I was feeling sick	8
	I was instructed by a health worker (nurse/doctor)	9
	I was pregnant	10
	Workplace campaign	11
	Other	12

<b>9.9</b>	<b>You indicated that you were previously tested for HIV. Are you willing to tell me the last HIV test result you received?</b>	Yes	No	Never received result
		1	2	3
<b>GO TO 9.18</b>				

<b>9.10a</b>	<b>What was the result of that HIV test?</b>	Positive	Negative	Indeterminate
		1	2	3
<b>GO TO 9.18</b>				

<b>9.10b</b>	What was the month and year of your first HIV positive test?	<b>MONTH</b>				
		<b>YEAR</b>				
	IF "DON'T KNOW" MONTH, THEN RECORD '88'					
	IF "DON'T KNOW" YEAR, THEN RECORD '8888'					

<b>9.11a</b>	Are you currently taking ARVS, that is, antiretroviral medications?	Yes	No
		1	2
		<i>TO</i>	<i>GO</i> <i>9.18</i>

<b>9.11b</b>	Are you taking ART/ARVS, that is, antiretroviral medications, daily?	Yes	No
		1	2

<b>9.12</b>	How long have you been taking daily ART/ARVs?  RECORD THE ANSWER IN MONTHS IF LESS THAN ONE YEAR. RECORD '00' IF LESS THAN ONE MONTH.	<b>Number of years</b>		
		<b>Number of months</b>		

<b>9.13</b>	Have you ever missed ART/ARV treatment?	Yes	No
		1	2
		<i>TO</i>	<i>GO</i> <i>9.18</i>

		Yes	No
--	--	-----	----

<b>9.14</b>	<b>In the past 30 days, have you missed taking any of your ART/ARV pills?</b>	1	2
-------------	---	---	---

**INSTRUCTION DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE**

<b>9.15</b>	<b>Why did you miss your ART/ARV treatment?</b>	
a	Forgotten to take ARVs	1
b	I travelled away from my clinic and could not go to another one	2
c	Health reasons	3
d	I had no money to go to the clinic to pick up my treatment	4
e	Health facility had no stock	5
f	Transport problems	6
g	I decided to stop taking treatment because the treatment makes me sick	7
h	Other reasons: Specify	8

<b>9.16</b>	<b>How long were you not taking the treatment?</b>	<b>Days</b>		
		<b>Months</b>		

**INSTRUCTION ONCE YOU HAVE ANSWERED Q9.16 GO TO 9.18**

<b>9.17</b>	<b>Can you tell me the <u>main</u> reason why you are not taking ART/ARVs daily?</b>	
	Have trouble taking a tablet everyday/can't remember	1
	I don't think I need it; I don't feel sick	2
	I fear people will know that I have HIV if I take it	3
	Forgotten to take ARVs	4
	I travelled away from my clinic and could not go to another one	5
	Health reasons	6
	I had no money to go to the clinic to pick up my treatment	7
	Health facility had no stock	8
	Transport problems	9
	I decided to stop taking treatment because the treatment makes me sick	10
	ART makes me fat	11
	Other reasons: Specify	12

<b>INSTRUCTION SEXUAL ACTIVITY FILTER (CHECK Q6.1)</b>	
<b>HAD SEXUAL PARTNER(S) IN LAST</b>	<b>NO SEXUAL PARTNERS</b>

<b>12 MONTHS</b>	<b>IN LAST 12 MONTHS NEXT HIV FILTER (q9.24)</b>
------------------	--

<b>9.18</b>	<b>Now that we have discussed your HIV status, I want you to remember <u>main</u> sexual partner in the last 12 months that we had discussed earlier. Did you tell this person the results of your last HIV test?</b>	Yes	No	Don't know
		1	2	3

<b>9.19</b>	<b>Have you told <u>other</u> current sexual partners about this test result in the last 12 months?</b>	Yes	No	No partner
		1	2	3

<b>9.20</b>	<b>In the past six months, how many sex partners have you had whose HIV status you did not know at the time that you had sex?</b>		
-------------	---	--	--

<b>9.21</b>	<b>In the past six months, how many sex partners have you had who did not know your HIV status when you had sex with them?</b>		
-------------	--	--	--

<b>9.22</b>	<b>Have you ever taken an HIV test with any of your sex partners where you both received the test results together?</b>	Yes	No
		1	2
		<b>GO TO SECTION 10</b>	

<b>9.23</b>	<b>What was the main reason why haven't you tested for HIV as a couple?</b>		
	Never discussed it		1
	Discussed it, but decided not to do it		2
	My partner refused to allow me to go for a test		3
	I did not want to be tested although my partner wanted to do so		4
	My partner and I already know our status		5
	Don't know where to get couples testing		6
	Other (Specify)		7

<b>INSTRUCTION</b>	<b>HIV TESTING FILTER</b>
--------------------	---------------------------

<b>NEVER HAD AN HIV TEST carry on to 9.24</b>	<b>HAD AN HIV TEST GO TO SECTION 10</b>
---	---

<b>INSTRUCTION</b>	<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>	
<b>9.24</b>	<b>What were your reasons for not going for an HIV test?</b>	
<b>a</b>	Do not know where to get tested	1
<b>b</b>	Do not think that I have HIV	2
<b>c</b>	Not at risk for HIV	3
<b>d</b>	Trust partner	4
<b>e</b>	Afraid to find out that I might be HIV positive	5
<b>f</b>	Not ready to have an HIV test	6
<b>g</b>	Concerned about CONFIDENTIALITY	7
<b>h</b>	Concerned about STIGMA, DISCRIMINATION, or REJECTION	8
<b>i</b>	Concerned about LOSING MY JOB	9
<b>j</b>	Concerned about the STANDARD OF SERVICE	10
<b>k</b>	Haven't got around to do it	11
<b>l</b>	Other: specify	12

<b>INSTRUCTION</b>	<b>HIV POSITIVE</b>
<b>IF HIV STATUS UNKNOWN OR NEGATIVE</b>	<b>HIV POSITIVE GO TO SECTION 11</b>

<b>SECTION 10</b>	<b>HIV RISK PERCEPTION</b>
-------------------	----------------------------

<b>INSTRUCTION</b>	<i>I am now going to ask you some questions on how you perceive your risk to HIV infection</i>
--------------------	--

<b>INSTRUCTION</b>	<b>READ EACH STATEMENT</b>
--------------------	----------------------------

<b>10.1</b>	<b>On a scale of 1 to 4 (with 1 being low and 4 being high), how would you rat yourself in terms of risk of becoming infected with HIV?</b>	<b>e</b>
	You are definitely going to get infected with HIV	4
	You are probably going to get infected	3
	You probably won't get infected	2

You definitely will not get infected with HIV	1
Already HIV positive	<b>Go to 11.1</b> 9

<b>INSTRUCTION</b>		<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
<b>10.2</b>	<b>What are your reasons for believing so?</b>	
a	Never had sex before	1
b	Abstain from sex	2
c	Faithful to his/her partner	3
d	Trust his/her partner	4
e	Use condoms	5
f	Know his/her HIV status	6
g	Know the HIV status of his/her partner	7
h	Do not have sex with sex workers/prostitutes	8
i	Protected by ancestors	9
j	Protected by God	10
k	I am not at risk for HIV	11
l	Other	12

<b>INSTRUCTION</b>	<b>ONCE YOU HAVE ASKED QUESTION 10.2 SKIP TO Q10.4</b>
--------------------	--

<b>INSTRUCTION</b>		<b>DO NOT READ OUT OPTIONS, MULTIPLE RESPONSES POSSIBLE</b>
<b>10.3</b>	<b>What are your reasons for believing so? (Respondents who answered 3 or 4 in Q10.1)</b>	
a	Sexually active	1
b	Had many sexual partners	2
c	Don't use condoms	3
d	Don't always use condoms	4
e	Don't trust his/her partner	5
f	I am sick	6
g	My partner is sick	7
h	My partner died of AIDS	8
i	Had an accident/cuts	9
j	I am HIV positive	10
k	Other	11







<b>10.4</b>	<b>Scientists are now studying a medication where, if taken orally every day, can reduce a person's chances of getting HIV infection. If such a medication was available, would you want to take it?</b>	Yes	No	Don't know
		1	2	3

<b>10.5</b>	<b>An HIV self-test kit is a method where people can test for HIV in private or at home. If such a kit was available to you, would you be willing to use it to test yourself?</b>	Yes	No	Don't know
		1	2	3

<b>10.6</b>	<b>Have you heard about drug treatments that can help reduce the risk of HIV infection if a person has been raped?</b>	Yes	No
		1	2

<b>SECTION 11</b>	<b>ALCOHOL USE</b>
-------------------	--------------------

<b>INSTRUCTION</b>	<i>The next section contains questions on the use of alcohol</i>
	<b>USE THE EXAMPLE BELOW TO HELP YOU UNDERSTAND WHAT A STANDARD UNIT OR A STANDARD DRINK IS:</b>

 One standard drink: <i>A single tot of spirits</i> (e.g. 25ml at 43%)	 <i>A small glass of liqueur or aperitif</i> (e.g. 25ml at 30%)
 <i>1 can of ordinary beer</i> (e.g. 340ml at 5%)	 <i>Carton of 1 glass of wine</i>  <i>sorghum</i> (e.g. 120ml at 12%)
	 <i>ordinary commercial beer</i> (e.g. 500ml at 3%)

<b>11.1</b>	<b>Have you <u>ever</u> had a drink containing alcohol?</b>	Yes	No
		1	2
		<b>GO TO 12.1</b>	

<b>11.2</b>	<b>How often did you have a drink containing alcohol in the <u>past 12 months</u>?</b>				
	Not in the past 12 months	Once a month or less	2-4 times a month	2-3 times a week	4 or more times a week
	1	2	3	4	5
	<b>GO TO 11.5</b>				

<b>11.3</b>	<b>How many drinks containing alcohol do you have on a typical day when you are drinking?</b>				
	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
	1	2	3	4	5

<b>11.4</b>	<b>INSTRUCTION</b>	<b>READ EACH QUESTION</b>	<b>Never</b>	<b>Less than monthly</b>	<b>Monthly</b>	<b>Weekly</b>	<b>or da</b>
			<b>a</b>	How often do you have ( <i>for men</i> ) five or more and ( <i>for women</i> ) four or more drinks on one occasion?	1	2	3
<b>b</b>	How often during the past 12 months were you not able to stop drinking once you had started?	1	2	3	4		
<b>c</b>	How often during the past 12 months did you fail to do what was normally expected of you because of drinking?	1	2	3	4		
<b>d</b>	How often during the past 12 months did you need a first drink in the morning to get yourself going after a heavy drinking session?	1	2	3	4		

e	How often during the past 12 months did you feel guilt or remorse after drinking?	1	2	3	4
f	How often during the past 12 months were you unable to remember what happened the night before because of your drinking?	1	2	3	4

<b>11.5</b>	<b>Have you or someone else been injured as a result of your drinking?</b>		
	No	Yes, but not in the past 12 months	Yes, during the past 12 months
	1	2	3

<b>11.6</b>	<b>As a result of your drinking, have you and others been involved in violent actions and aggression?</b>		
	No	Yes, but not in the past 12 months	Yes, during the past 12 months
	1	2	3

<b>11.7</b>	<b>Has a concerned relative, friend, doctor, or other health worker ever suggested that you should cut down on your drinking?</b>		
	No	Yes, but not in the past 12 months	Yes, during the past 12 months
	1	2	3

<b>SECTION 12</b>	<b>USE OF OTHER SUBSTANCES</b>
-------------------	--------------------------------

<b>INSTRUCTION</b>	The next section deals with the use of drugs. I once again want to assure you that the information you give us is combined with all the respondents and we do not analyse the information of one person. I once again want to confirm my earlier guarantee of confidentiality. As interviewer, I also had to sign an undertaking never to speak to others about the interviews I conduct.
--------------------	---

<b>12.1</b>	<i>In the past three months, how often have you used</i>	Never	Once or twice	Monthly	Weekly	4 dai
-------------	--	-------	---------------	---------	--------	-------

	<i>any of the following substances?</i>					
a	Cannabis (dagga, marijuana, pot, grass, hash, etc.)	1	2	3	4	
b	Cocaine (coke, rocks, crack, etc.)	1	2	3	4	
c	Amphetamine-type stimulants (speed, ecstasy, tik, etc.)	1	2	3	4	
d	Inhalants (nitrates, glue, petrol, paint thinners, etc.)	1	2	3	4	
e	Sedatives or sleeping pills (Valium, Mandrax, Serepax, Rohypnol, etc.)	1	2	3	4	
f	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	1	2	3	4	
g	Opiates (heroin, morphine, methadone, codeine, etc.)	1	2	3	4	
h	Whoonga (mixture of heroin, dagga and ARVs), Nyaope	1	2	3	4	
i	Other	1	2	3	4	

<b>12.2</b>	<b>Besides drugs prescribed by a health professional, have you ever used a drug by injection?</b>		
	No, never	Yes, in the past 3 months	Yes, but not in the past 3 months
	1	2	3
	<b>GO TO 13.1</b>		

<b>12.3</b>	<b>Have you ever shared injection needles?</b>
-------------	--

No, never	Yes, in the past 3 months	Yes, but not in the past 3 months
1	2	3

<b>SECTION 13</b>	<b>HEALTH QUESTIONS</b>
-------------------	-------------------------

<b>INSTRUCTION</b>	<i>The next section deals with some questions pertaining to your own health as well as services you received in clinics/hospitals or elsewhere. Please remember that your name is not written anywhere and everything you tell me is confidential.</i>
--------------------	--

<b>13.1</b>	<b>In general, would you say that your health is excellent, good, fair, or poor?</b>
Excellent	1
Good	2
Fair	3
Poor	4

<b>13.2</b>	<b>When was the last time you went to see a health professional (doctor, nurse, traditional healer, etc.)?</b>
Within the past six months	1
More than six months but not more than a year ago	2
More than one year ago	3
Never	4

<b>13.3</b>	<b>Where do you usually obtain health care?</b>
Government hospital	1
Day hospital/clinic/community health centre	2
Mobile clinic	3
Family planning clinic	4
Private hospital/clinic	5
Pharmacy	6
Private doctor	7
Other private medical	8
Other	9

<b>13.4</b>	<b>In the past 12 months, have you been hospitalised for any illness?</b>	Yes	No
		1	2
		<i>TO</i>	<i>GO</i>
			<i>13.7</i>

<b>13.5</b>	<b>How many times have you been admitted to hospital during the past 12 months?</b>		
-------------	---	--	--

<b>13.6</b>	<b>What was the total time you spent in hospital during the past 12 months? (In days)</b>		
-------------	---	--	--

<b>INSTRUCTION</b>	<b>ONLY ASKED (ii) FOR EACH ILLNESS IF YES IN (i)</b>
--------------------	---

<b>13.7</b>	Do you currently have any of the following illnesses?	<b>i. Diagnosed with illness</b>			<b>ii. Are you currently taking medicines for this disease?</b>	
		<b>Yes</b>	<b>No</b>	<b>Refused</b>	<b>Yes</b>	<b>No</b>
<b>a</b>	Hypertension/high blood pressure	1	2	3	1	2
<b>b</b>	Diabetes	1	2	3	1	2
<b>c</b>	Tuberculosis (TB)	1	2	3	1	2
<b>d</b>	Cancer	1	2	3	1	2
<b>e</b>	HIV	1	2	3	1	2
<b>f</b>	Heart disease	1	2	3	1	2

<b>13.8</b>	<b>Are you covered by a Medical Aid or Medical Benefit Scheme?</b>	Yes	No
		1	2
		<b>GO TO 14.1</b>	

<b>13.9</b>	<b>Are your visits to clinic, hospital, or doctor paid for by medical aid?</b>	Yes	No
		1	2

<b>SECTION 14</b>	<b>MENTAL HEALTH</b>
-------------------	----------------------

<b>INSTRUCTION</b>	<i>The next set of questions concern how you have been feeling over the past 30 days</i>
--------------------	--

	<b>None of the time</b>	<b>A little of the time</b>	<b>Some of the time</b>	<b>Most of the time</b>	<b>All of the time</b>

		(rarely)				
<b>14.1</b>	<b>During the last 30 days, about how often did you feel tired out for no good reason?</b>	1	2	3	4	5
<b>14.2</b>	<b>During the last 30 days, about how often did you feel nervous?</b>	1	2	3	4	5
<b>14.3</b>	<b>About how often did you feel so nervous that nothing could calm you down?</b>	1	2	3	4	5
<b>14.4</b>	<b>About how often did you feel hopeless?</b>	1	2	3	4	5
<b>14.5</b>	<b>During the last 30 days, about how often did you feel restless or fidgety?</b>	1	2	3	4	5
<b>14.6</b>	<b>About how often did you feel so restless you could not sit still?</b>	1	2	3	4	5
<b>14.7</b>	<b>About how often did</b>	1	2	3	4	5

	you feel depressed?					
14.8	During the last 30 days, about how often did you feel that everything was an effort?	1	2	3	4	5
14.9	About how often did you feel so sad that nothing could cheer you up?	1	2	3	4	5
14.10	About how often did you feel worthless?	1	2	3	4	5

<b>SECTION 15</b>	<b>HOUSEHOLD RELATIONS</b>
-------------------	----------------------------

<b>INSTRUCTION</b>	<i>I am now going to ask you questions about relationships.</i>
--------------------	---

<b>15.0</b>	<i>Have you ever been in a relationship?</i>	Yes	No
		1	2
		<i>GO TO 16.1</i>	

<b>INSTRUCTION</b>	<b>ONLY ADMINISTERED TO ONE HOUSEHOLD MEMBER</b>
	<b><i>READ TO THE RESPONDENT</i></b>
	<i>I am now going to ask you questions about relationships. You may find some of these questions very personal.</i>

*Let me assure you that your answers are completely confidential and will not be told to anyone and no one else in your household will know that you were asked these questions.*

<b>15.1</b>	<b>Did your partner ever do any of the following things to you that could hurt you?</b>	<b>Yes</b>	<b>No</b>
<b>a</b>	Push you, shake you, or throw something at you?	1	2
<b>b</b>	Slap you?	1	2
<b>c</b>	Twist your arm or pull your hair?	1	2
<b>d</b>	Punch you with his fist or with something	1	2
<b>e</b>	Kick you, drag you, or beat you up?	1	2
<b>f</b>	Try to choke you or burn you on purpose?	1	2
<b>g</b>	Threaten or attack you with a knife, gun, or other weapon?	1	2
<b>h</b>	Physically force you to have sexual intercourse with him/her when you did not want to	1	2
<b>i</b>	Physically force you to perform any other sexual acts you did not want to	1	2
<b>j</b>	Force you with threats or in any other way	1	2
<b>k</b>	Perform sexual acts you did not want to?	1	2

<b>15.2</b>	<b>Did the following ever happen as a result of what your partner did to you?</b>	<b>Yes</b>	<b>No</b>
<b>a</b>	You had cuts, bruises, or aches?	1	2
<b>b</b>	You had eye injuries, sprains, dislocations, or burns?	1	2
<b>c</b>	You had deep wounds, broken bones, broken teeth?	1	2
<b>d</b>	Other serious injury?	1	2

<b>15.3</b>	<b>In the last 12 months, how often has your partner physically hurt you?</b>	
<b>a</b>	Often,	1
<b>b</b>	Only sometimes,	2
<b>c</b>	Not at all?	3

<b>15.4</b>	<b>Have you ever hit, slapped, kicked, or done anything else to physically hurt your partner?</b>	
<b>a</b>	Yes	1
<b>b</b>	No	2

<b>SECTION 16</b>	<b>MIGRATION</b>
-----------------------	------------------

**INSTRUCTION**      *In this last section I am going to ask you some questions about your geographic mobility and migration. As stated earlier all the information you give me is confidential*

<b>16.1</b>	<b>How many years have you been living continuously in (NAME OF CURRENT PLACE OF RESIDENCE)?</b> <b><u>Record in years</u></b>	<b>9</b>	<b>6</b>
	IF LESS THAN ONE YEAR, RECORD '00' IF 'ALWAYS LIVED' RECORD '95' IF 'VISITOR' RECORD '96'		

<b>16.2</b>	<b>In the past 12 months have you been away from your usual residence for more than one month?</b>	<b>Yes</b>	<b>No</b>
		1	2

<b>16.3</b>	<b>In the past week, how many nights have you stayed away from home?</b>							
	0	1	2	3	4	5	6	7

<b>16.4</b>	<b>What is your country of birth?</b>	
	South Africa <b>GO TO 16.7</b>	1
	Zimbabwe	2
	Lesotho	3
	Botswana	4
	Swaziland	5
	Mozambique	6
	Other Southern African country	7
	Central African country (e.g., Congo, Cameroon)	8
	West African country (e.g., Nigeria)	9\
	North African country (e.g. Morocco, Algeria)	10

South Asian country (India, Pakistan, Bangladesh)	11
East Asian country (China, Taiwan)	12
Country in the Americas (US, Canada, Argentina)	13
Country in Europe (UK, Netherlands, Portugal, Italy)	14
Other	15

<b>16.5</b>	<b>If not born in South Africa, how long have you been living in South Africa?</b> <b>NUMBER OF YEARS</b>		
-------------	--	--	--

<b>16.6a</b>	<b>What is your current nationality? By that I mean which country issued you passport or ID document.</b>	<b>r</b>
	South Africa	1
	South Africa and other	2
	Other	3
	If Other, write down the name of the country .....	

<b>16.6b</b>	<b>If not born in South Africa, what kind of international migrant do you consider yourself to be?</b>	
	Documented migrant	1
	Undocumented migrant	2
	Asylum seeker	2
	Refugee	4
	Other	5

<b>INSTRUCTION</b> <b>16.7</b>	<b>Which of the following describes your race?</b>				
	African	White	Coloured	Indian/Asian	Other
	1	2	3	4	5

**THANK YOU VERY MUCH FOR AGREEING TO PARTICIPATE AND ASSIST US IN THIS IMPORTANT RESEARCH PROJECT.**

<b>INTERVIEW ENDING TIME:</b>		
-------------------------------	--	--

--	--

<b>INSTRUCTION</b>	WHAT IS THE PERSON NUMBER OF THE PARTNER OF THIS PERSON? (Get the person number from the VP questionnaire)?		
<b>17.1</b>			

## APPENDIX C

### Adult consent form

# THE SOUTH AFRICAN NATIONAL HIV, BEHAVIOUR AND HEALTH SURVEY, 2016



### Information sheet and Consent form *Participants aged 18 years and older*

Dear Participant

Hello. My name is ..... I would like to inform you of a study named: *South African National HIV, Behaviour and Health survey*, which is being conducted by a group of research organisations led by the Human Sciences Research Council (HSRC). Following four previous surveys since 2002, we are contacting people from your community to answer some questions, which we hope will assist with developing effective strategies to improve the health of people living in South Africa.

For the purposes of this type of survey it is impossible to visit every household in South Africa. A total of 15 000 households have been selected in a number of different areas in the country.

Please understand that you are not being forced to take part in this study and the choice to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not take part in answering the questions, you will not be affected in any way. If you agree to participate, you may stop me and tell me that you don't want to go on with the interview at any time without any consequences to you or your or the household.

The information you provide will remain confidential and there will be no "come-backs" from the answers you give. Your name will not be written down or recorded in any way.

Although your head of household/parent has given us permission to collect information from all members of this household, we also need your own permission for you to take part in the study. Your interview by our fieldworker will take between 45 and 90 minutes to complete.

I will be asking you questions and I ask that you are as open as possible in answering the questions. Some questions may be of a personal and/or sensitive nature and you are free not to answer them if you do not wish to do so. We know that you cannot be absolutely certain about the answers to some of the questions. When it comes to answering questions there are no right and wrong answers.

If I ask you a question which makes you feel sad or upset, we can stop and talk about it. There are also people from ..... (*this will be adapted based on organizations operating in the area.*) who have said they are happy to talk with you about those things that upset you, if you need any assistance later.

1

After the interview I will be asked you to allow me to take a few drops of blood from a finger prick on a special filter paper. Collecting the samples will take about 10 minutes. You will experience some minor discomfort but the test can in no way endanger you. Only disposable sterile instruments are used that are clean and completely safe. The interviewers for the survey have been trained in the proper techniques to obtain a sample. The drops of blood will be dried on the filter paper which will be then be sent to a laboratory to test for HIV antibodies.

If you are interested in knowing your HIV status, you will be giving the opportunity to be tested using rapid HIV tests and you will receive pre-test and post-test counselling. If you test HIV positive, you will be referred to nearby public health clinics to make sure that the HIV test result you received is correct. If HIV test result is positive, health care workers will confirm whether you ought to be put on HIV medication or not.

I would also like to request your permission that the blood sample you provide can be used for the current and ongoing research.

### **Who to contact if you have been harmed or have any concerns**

This research has been approved by the HSRC Research Ethics Committee (REC). If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please call the HSRC's toll-free ethics hotline 0800 212 123 (when phoned from a landline from within South Africa) or contact the Human Sciences Research Council REC Administrator, on Tel 012 302 2012 or e-mail [research.ethics@hsrc.ac.za](mailto:research.ethics@hsrc.ac.za) .

If you have concerns or questions about the research you may call the project leaders Mr Sean Jooste at 021 466 7942, Ms Alicia at 021 466 7954 or Mr Shandir Ramlagan at 012 302 2635.

Your contribution and that of your household is highly valued.

Thank you for your time.

Yours sincerely

Prof Leickness Simbayi  
Overall Principal Investigator  
Cape Town  
Tel: (021) 466 7920  
Fax: (021) 466 7831

2

## **CONSENT**

I hereby agree to participate in the South African National HIV, Behaviour and Health survey. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.



Do you agree to complete a questionnaire? Yes No

No Do you agree to provide a dried blood specimen?   Yes

Do you agree to provide a dried blood specimen for    
research in future studies? Yes No ongoing

Do you want to know your HIV status? Yes  No

I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage.

.....  
**Signature of participant**

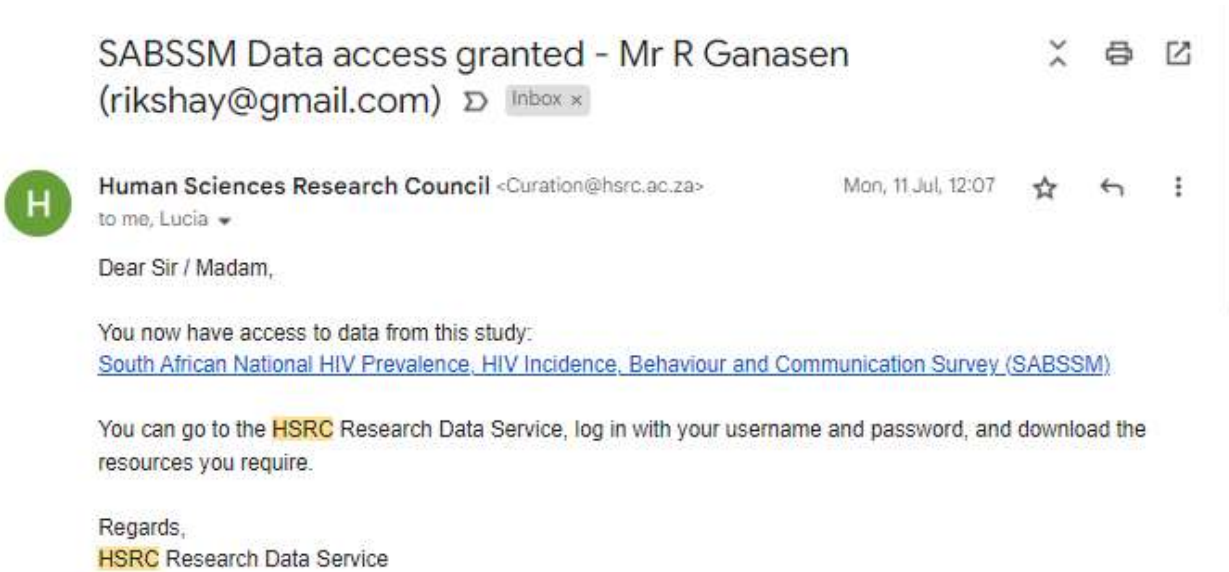
**Date:**.....





*The extra copy of the consent form is for you to keep.*







## APPENDIX D

**Figure 82:** Correspondence indicating Permission to Dataset



SABSSM Data access granted - Mr R Ganasen  
(rikshay@gmail.com)    

 **Human Sciences Research Council** <Curation@hsrc.ac.za> Mon, 11 Jul, 12:07   

to me, Lucia ▾

Dear Sir / Madam,

You now have access to data from this study:  
[South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey \(SABSSM\)](#)

You can go to the **HSRC** Research Data Service, log in with your username and password, and download the resources you require.

Regards,  
**HSRC** Research Data Service

## APPENDIX E

### Research Question: 1a

#### *Parameter Estimates*

#### Figure 9

#### *Parameter Estimates RQ1a*

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
					Lower Bound	Upper Bound		
Intercept	21,844	,356	61,305	<,001	21,146	22,543	,012	61,305
HLEA	-,499	,006	-88,415	<,001	-,510	-,488	,025	88,415
GM_INCOME	-1,787E-6	2,686E-6	-,665	,506	-7,051E-6	3,477E-6	,000	,665
AGE	,269	,005	50,465	<,001	,258	,279	,008	50,465
HIV_STATUS	4,460	,038	115,892	<,001	4,385	4,536	,042	115,892
[province=1]	-5,187	,411	-12,634	<,001	-5,991	-4,382	,001	12,634
[province=2]	-13,453	,386	-34,810	<,001	-14,211	-12,696	,004	34,810
[province=3]	-10,778	,320	-33,697	<,001	-11,405	-10,151	,004	33,697
[province=4]	-21,626	,380	-56,963	<,001	-22,370	-20,882	,010	56,963
[province=5]	-25,149	1,071	-23,480	<,001	-27,248	-23,050	,002	23,480
[province=6]	-17,788	,235	-75,771	<,001	-18,248	-17,328	,018	75,771
[province=7]	1,096	,179	6,114	<,001	,745	1,448	,000	6,114
[province=8]	-8,906	,210	-42,456	<,001	-9,317	-8,495	,006	42,456
[province=9]	0a	.	.	.	.	.	.	.
[geotype=1]	-7,231	,278	-26,018	<,001	-7,776	-6,687	,002	26,018
[geotype=2]	-12,455	,323	-38,563	<,001	-13,088	-11,822	,005	38,563
[geotype=3]	0a	.	.	.	.	.	.	.
[GENDER=1,00]	-2,642	,297	-8,904	<,001	-3,224	-2,060	,000	8,904

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[GENDER=2,00]	0a	.	.	.	.	.	.
[RACE=1,00]	13,408	,410	32,729	<,001	12,605 14,211	,003	32,729
[RACE=2,00]	16,018	,302	53,118	<,001	15,427 16,609	,009	53,118
[RACE=3,00]	6,621	,314	21,091	<,001	6,005 7,236	,001	21,091
[RACE=4,00]	0a	.	.	.	.	.	.
[province=1] * [geotype=1]	,344	,368	,933	,351	-,378 1,066	,000	,933
[province=1] * [geotype=3]	0a	.	.	.	.	.	.
[province=2] * [geotype=1]	9,108	,345	26,408	<,001	8,432 9,784	,002	26,408
[province=2] * [geotype=2]	11,435	,384	29,799	<,001	10,683 12,187	,003	29,799
[province=2] * [geotype=3]	0a	.	.	.	.	.	.
[province=3] * [geotype=1]	-,711	,144	-4,925	<,001	-,995 -,428	,000	4,925
[province=3] * [geotype=3]	0a	.	.	.	.	.	.
[province=4] * [geotype=1]	,835	,140	5,977	<,001	,561 1,108	,000	5,977
[province=4] * [geotype=2]	13,455	,201	67,096	<,001	13,062 13,848	,014	67,096
[province=4] * [geotype=3]	0a	.	.	.	.	.	.
[province=5] * [geotype=1]	16,009	1,055	15,180	<,001	13,942 18,076	,001	15,180
[province=5] * [geotype=3]	0a	.	.	.	.	.	.
[province=6] * [geotype=1]	12,266	,206	59,597	<,001	11,862 12,669	,011	59,597
[province=6] * [geotype=2]	15,287	,192	79,743	<,001	14,911 15,662	,020	79,743
[province=6] * [geotype=3]	0a	.	.	.	.	.	.
[province=7] * [geotype=1]	-7,974	,254	-31,416	<,001	-8,471 -7,476	,003	31,416
[province=7] * [geotype=2]	0a	.	.	.	.	.	.
[province=8] * [geotype=1]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=8] * [geotype=2]	9,302	,182	51,113	<,001	8,945 9,659	,008	51,113
[province=8] * [geotype=3]	0a	.	.	.	.	.	.
[province=9] * [geotype=2]	0a	.	.	.	.	.	.
[province=9] * [geotype=3]	0a	.	.	.	.	.	.
[province=1] * [GENDER=1,00]	-7,017	,486	-14,446	<,001	-7,969 -6,065	,001	14,446
[province=1] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=2] * [GENDER=1,00]	4,683	,398	11,770	<,001	3,903 5,463	,000	11,770
[province=2] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=3] * [GENDER=1,00]	1,552	,272	5,700	<,001	1,018 2,086	,000	5,700
[province=3] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=4] * [GENDER=1,00]	12,318	,338	36,426	<,001	11,655 12,981	,004	36,426
[province=4] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=5] * [GENDER=1,00]	11,921	,169	70,336	<,001	11,588 12,253	,016	70,336
[province=5] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=6] * [GENDER=1,00]	10,558	,154	68,456	<,001	10,256 10,860	,015	68,456
[province=6] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=7] * [GENDER=1,00]	2,716	,239	11,377	<,001	2,248 3,184	,000	11,377
[province=7] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=8] * [GENDER=1,00]	,182	,124	1,472	,141	-,060 ,425	,000	1,472
[province=8] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=9] * [GENDER=1,00]	0a	.	.	.	.	.	.
[province=9] * [GENDER=2,00]	0a	.	.	.	.	.	.
[province=1] * [RACE=1,00]	-3,829	,255	-15,002	<,001	-4,329 -3,329	,001	15,002

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=1] * [RACE=2,00]	-3,710	,096	-38,642	<,001	-3,898 -3,521	,005	38,642
[province=1] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] * [RACE=1,00]	19,640	,332	59,103	<,001	18,989 20,292	,011	59,103
[province=2] * [RACE=2,00]	-8,526	,390	-21,844	<,001	-9,291 -7,761	,002	21,844
[province=2] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] * [RACE=1,00]	5,699	,415	13,724	<,001	4,885 6,513	,001	13,724
[province=3] * [RACE=2,00]	,149	,256	,580	,562	-,353 ,650	,000	,580
[province=3] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] * [RACE=1,00]	16,852	,335	50,375	<,001	16,197 17,508	,008	50,375
[province=4] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] * [RACE=1,00]	5,997	,268	22,384	<,001	5,472 6,522	,002	22,384
[province=5] * [RACE=2,00]	,722	,326	2,216	,027	,083 1,360	,000	2,216
[province=5] * [RACE=3,00]	-5,085	,262	-19,395	<,001	-5,598 -4,571	,001	19,395
[province=5] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] * [RACE=2,00]	1,725	,186	9,270	<,001	1,360 2,089	,000	9,270
[province=6] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] * [RACE=1,00]	14,634	,319	45,936	<,001	14,010 15,259	,007	45,936
[province=7] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=7] * [RACE=3,00]	0a	.	.	.	.	.	.
[province=7] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=8] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] * [RACE=4,00]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
[geotype=1] * [GENDER=1,00]	6,100	,261	23,389	<,001	5,589	6,612	,002	23,389
[geotype=1] * [GENDER=2,00]	0a	.	.	.	.	.	.	.
[geotype=2] * [GENDER=1,00]	1,510	,283	5,343	<,001	,956	2,064	,000	5,343
[geotype=2] * [GENDER=2,00]	0a	.	.	.	.	.	.	.
[geotype=3] * [GENDER=1,00]	0a	.	.	.	.	.	.	.
[geotype=3] * [GENDER=2,00]	0a	.	.	.	.	.	.	.
[geotype=1] * [RACE=1,00]	-14,449	,329	-43,943	<,001	-15,094	-13,805	,006	43,943
[geotype=1] * [RACE=2,00]	-12,979	,288	-45,032	<,001	-13,544	-12,414	,007	45,032
[geotype=1] * [RACE=3,00]	0a	.	.	.	.	.	.	.
[geotype=1] * [RACE=4,00]	0a	.	.	.	.	.	.	.
[geotype=2] * [RACE=4,00]	0a	.	.	.	.	.	.	.
[geotype=3] * [RACE=1,00]	0a	.	.	.	.	.	.	.
[geotype=3] * [RACE=2,00]	0a	.	.	.	.	.	.	.
[geotype=3] * [RACE=4,00]	0a	.	.	.	.	.	.	.
[GENDER=1,00] * [RACE=1,00]	-19,141	,199	-96,186	<,001	-19,531	-18,751	,029	96,186
[GENDER=1,00] * [RACE=2,00]	-9,080	,151	-59,943	<,001	-9,377	-8,783	,012	59,943
[GENDER=1,00] * [RACE=3,00]	-14,072	,206	-68,248	<,001	-14,476	-13,667	,015	68,248
[GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.	.
[GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.	.
[GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.	.
[GENDER=2,00] * [RACE=3,00]	0a	.	.	.	.	.	.	.
[GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=1] [GENDER=1,00]	14,837	,439	33,776	<,001	13,976	15,698	,004	33,776

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
[province=1] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=3] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=1] [GENDER=1,00]	-8,160	,378	-21,572	<,001	-8,901	-7,418	,002	21,572
[province=2] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=2] [GENDER=1,00]	-3,728	,398	-9,371	<,001	-4,508	-2,948	,000	9,371
[province=2] [geotype=2] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=3] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=3] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=3] [geotype=3] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=4] [geotype=1] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=4] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=4] [geotype=2] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=4] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=5] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=6] [geotype=1] [GENDER=1,00]	-8,930	,183	-48,785	<,001	-9,289	-8,572	,008	48,785
[province=6] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=6] [geotype=2] [GENDER=1,00]	0a	.	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
[province=6] [geotype=2] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=6] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=1,00]	1,507	,245	6,138	<,001	1,026	1,988	,000	6,138
[province=7] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=7] [geotype=2] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=7] [geotype=2] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=1] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=1] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=2] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=2] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=9] [geotype=2] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=9] [geotype=2] [GENDER=2,00]	0a	.	.	.	.	.	.	.
[province=9] [geotype=3] [GENDER=1,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=1] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=3] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=3] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=1] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=2] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=2] [geotype=3] [RACE=2,00]	0a	.	.	.	.	.	.
[province=2] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [RACE=2,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=3] [RACE=2,00]	0a	.	.	.	.	.	.
[province=3] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.
[province=4] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [RACE=2,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [RACE=3,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] [geotype=3] [RACE=1,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [RACE=2,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [RACE=2,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [RACE=3,00]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
[province=7] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=7] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=1] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=1] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=8] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=9] [geotype=2] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=9] [geotype=3] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=1] [GENDER=1,00] [RACE=1,00]	10,767	,267	40,392	<,001	10,245	11,290	,005	40,392
[province=1] [GENDER=1,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=1] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=1] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=1] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=2] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=2] [GENDER=1,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=2] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=2] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=3] [GENDER=1,00] [RACE=1,00]	13,517	,430	31,451	<,001	12,674	14,359	,003	31,451
[province=3] [GENDER=1,00] [RACE=2,00]	5,598	,307	18,244	<,001	4,997	6,200	,001	18,244
[province=3] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=3] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=3] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared	Noncent. Parameter
[province=3] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=4] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=4] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=4] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=1,00] [RACE=2,00]	-2,802	,394	-7,111	<,001	-3,574	-2,030	,000	7,111
[province=5] [GENDER=1,00] [RACE=3,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=2,00] [RACE=3,00]	0a	.	.	.	.	.	.	.
[province=5] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=6] [GENDER=1,00] [RACE=2,00]	-4,166	,353	-11,801	<,001	-4,858	-3,475	,000	11,801
[province=6] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=6] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=6] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=1,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=1,00] [RACE=3,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.	.
[province=7] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=8] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.
[province=8] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=1,00] [RACE=2,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=1,00] [RACE=3,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=2,00] [RACE=1,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=2,00] [RACE=2,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=2,00] [RACE=3,00]	0a	.	.	.	.	.	.
[geotype=1] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=2] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=2] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=3] [GENDER=1,00] [RACE=1,00]	0a	.	.	.	.	.	.
[geotype=3] [GENDER=1,00] [RACE=2,00]	0a	.	.	.	.	.	.
[geotype=3] [GENDER=1,00] [RACE=4,00]	0a	.	.	.	.	.	.
[geotype=3] [GENDER=2,00] [RACE=4,00]	0a	.	.	.	.	.	.
[province=1] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=1] [geotype=1] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=1] [geotype=1] [GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=1] [geotype=1] [GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=1] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=1] [geotype=3] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=1] [geotype=3] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=1] [geotype=3] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=2] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=2] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=3] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=2] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=2] [geotype=3] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=3] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=3] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=3] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=3] [geotype=3] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=4] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=4] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] [geotype=1] [GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=4] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=4] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=1,00] * [RACE=3,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=2,00] * [RACE=3,00]	0a	.	.	.	.	.	.
[province=5] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=5] [geotype=3] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=6] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=2] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=6] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=1,00] * [RACE=1,00]	0a	.	.	.	.	.	.

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	Partial Eta Squared	Noncent. Parameter
[province=7] [geotype=1] [GENDER=1,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=1,00] * [RACE=3,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=2,00] * [RACE=2,00]	0a	.	.	.	.	.	.
[province=7] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=7] [geotype=2] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [geotype=1] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [geotype=1] [GENDER=2,00] * [RACE=1,00]	0a	.	.	.	.	.	.
[province=8] [geotype=1] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [geotype=2] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=8] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] [geotype=2] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] [geotype=2] [GENDER=2,00] * [RACE=4,00]	0a	.	.	.	.	.	.
[province=9] [geotype=3] [GENDER=1,00] * [RACE=4,00]	0a	.	.	.	.	.	.

Note. Dependent Variable: Risky Alcohol Use (Scale), a. This parameter is set to zero because it is redundant, b. Computed using alpha = .05

**Tests of Between-Subjects Effects:**  
**Figure 10**  
*Tests of Between Subjects Effects RQ1a*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Corrected Model	2863892,677a	66	43392,313	2471,605	<,001	,347	163125,911
Intercept	68792,962	1	68792,962	3918,413	<,001	,013	3918,413
EDUCATION	137241,120	1	137241,120	7817,186	<,001	,025	7817,186
INCOME	7,770	1	7,770	,443	,506	,000	,443
AGE	44711,183	1	44711,183	2546,727	<,001	,008	2546,727
HIV	235798,041	1	235798,041	13430,940	<,001	,042	13430,940
province	85756,615	8	10719,577	610,582	<,001	,016	4884,654
geotype	18680,729	2	9340,364	532,023	<,001	,003	1064,045
GENDER	5,505	1	5,505	,314	,576	,000	,314
RACE	13724,239	3	4574,746	260,575	<,001	,003	781,726
province geotype	239362,504	11	21760,228	1239,452	<,001	,043	13633,970
province GENDER	172471,456	8	21558,932	1227,986	<,001	,031	9823,889
province RACE	147280,121	12	12273,343	699,084	<,001	,027	8389,003
Geotype GENDER	13547,790	2	6773,895	385,838	<,001	,003	771,675
geotype RACE	37073,339	2	18536,670	1055,840	<,001	,007	2111,679
GENDER RACE	141476,750	3	47158,917	2686,149	<,001	,026	8058,446
province geotype GENDER	58769,586	4	14692,396	836,872	<,001	,011	3347,487
province geotype RACE	,000	0	.	.	.	,000	,000
province GENDER RACE	46502,100	5	9300,420	529,747	<,001	,009	2648,737
geotype GENDER RACE	,000	0	.	.	.	,000	,000

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
province <i>geotype</i> GENDER RACE	,000	0	.	.	.	,000	,000
Error	5379242,621	306399	17,556				
Total	117799999,000	306466					
Corrected Total	8243135,297	306465					

Note. a. R Squared = ,347 (Adjusted R Squared = ,347)

**Research Question: 1b and 1c**

**Parameter Estimates**

**Figure 11**

*Parameter Estimates RQ1b&1c*

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] [RACE=3] [PROV=2] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	-3.040	0.014	-224.066	0.000	-3.066	-3.013	0.303
[GENDER=1] [RACE=4] [PROV=6] [GEOTYPE=3] [K10Binary=2]	-2.306	0.013	-183.607	0.000	-2.331	-2.282	0.226
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	-1.594	0.005	-349.907	0.000	-1.603	-1.585	0.515
[GENDER=2] [RACE=2] [PROV=5] [GEOTYPE=3] [K10Binary=2]	-1.437	0.012	-118.881	0.000	-1.461	-1.413	0.109
[GENDER=2] [RACE=4] [PROV=7] [GEOTYPE=3] [K10Binary=1]	-1.406	0.003	-420.437	0.000	-1.413	-1.400	0.605
[GENDER=2] [RACE=1] [PROV=7] [GEOTYPE=3] [K10Binary=1]	-1.372	0.004	-367.694	0.000	-1.379	-1.364	0.540
[GENDER=2] [RACE=1] [PROV=9] [GEOTYPE=3] [K10Binary=2]	-1.311	0.003	-416.905	0.000	-1.317	-1.305	0.601
[GENDER=1] [RACE=3] [PROV=7] [GEOTYPE=3] [K10Binary=1]	-1.296	0.004	-300.021	0.000	-1.304	-1.287	0.438
[GENDER=2] [RACE=4] [PROV=2] [GEOTYPE=3] [K10Binary=1]	-1.220	0.002	-488.261	0.000	-1.225	-1.215	0.674
[GENDER=2] [RACE=3] [PROV=3] [GEOTYPE=3] [K10Binary=1]	-1.166	0.006	-190.131	0.000	-1.178	-1.154	0.239
[GENDER=1] [RACE=4] [PROV=4] [GEOTYPE=3] [K10Binary=1]	-1.035	0.005	-192.611	0.000	-1.046	-1.025	0.243

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=2] [K10Binary=1]	-0.979	0.004	-267.826	0.000	-0.986	-0.971	0.383
[GM_INCOME=6000]	-0.910	0.005	-172.011	0.000	-0.920	-0.900	0.204
[GENDER=1] [RACE=4] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	-0.869	0.002	-558.412	0.000	-0.872	-0.866	0.730
[GENDER=1] [RACE=4] [PROV=8] [GEOTYPE=3] [K10Binary=1]	-0.848	0.003	-265.904	0.000	-0.854	-0.841	0.380
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=1] [K10Binary=2]	-0.848	0.003	-254.801	0.000	-0.854	-0.841	0.360
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=2] [K10Binary=1]	-0.829	0.005	-167.386	0.000	-0.838	-0.819	0.195
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=1] [K10Binary=1]	-0.811	0.005	-172.546	0.000	-0.820	-0.802	0.205
[GENDER=1] [RACE=4] [PROV=7] [GEOTYPE=3] [K10Binary=1]	-0.773	0.005	-151.863	0.000	-0.783	-0.763	0.167
[GENDER=1] [RACE=4] [PROV=7] [GEOTYPE=3] [K10Binary=2]	-0.739	0.004	-198.702	0.000	-0.746	-0.732	0.255
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=2] [K10Binary=2]	-0.725	0.006	-116.003	0.000	-0.737	-0.713	0.104
[GENDER=1] [RACE=3] [PROV=3] [GEOTYPE=3] [K10Binary=1]	-0.715	0.004	-198.631	0.000	-0.722	-0.708	0.255
[GM_INCOME=2500]	-0.668	0.008	-82.319	0.000	-0.684	-0.652	0.055
[GM_INCOME=2800]	-0.662	0.007	-90.501	0.000	-0.676	-0.647	0.066
[GENDER=2] [RACE=3] [PROV=6] [GEOTYPE=3] [K10Binary=1]	-0.642	0.007	-97.345	0.000	-0.655	-0.630	0.076
[GENDER=1] [RACE=3] [PROV=3] [GEOTYPE=3] [K10Binary=2]	-0.591	0.004	-159.284	0.000	-0.598	-0.583	0.180
[GENDER=2] [RACE=2] [PROV=5] [GEOTYPE=3] [K10Binary=1]	-0.582	0.009	-66.293	0.000	-0.599	-0.565	0.037
[GM_INCOME=4000]	-0.578	0.006	-93.032	0.000	-0.590	-0.566	0.070
[GENDER=2] [RACE=1] [PROV=3] [GEOTYPE=3] [K10Binary=1]	-0.572	0.010	-55.098	0.000	-0.593	-0.552	0.026
[GM_INCOME=1600]	-0.567	0.005	-107.632	0.000	-0.578	-0.557	0.091

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GM_INCOME=5000]	-0.544	0.006	-93.281	0.000	-0.556	-0.533	0.070
[GENDER=1] [RACE=3] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	-0.542	0.009	-58.329	0.000	-0.560	-0.524	0.029
Intercept	-0.530	0.016	-32.241	0.000	-0.562	-0.497	0.009
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=1] [K10Binary=2]	-0.517	0.003	-159.206	0.000	-0.524	-0.511	0.180
[GM_INCOME=1900]	-0.497	0.004	-115.246	0.000	-0.505	-0.489	0.103
[GM_INCOME=360]	-0.487	0.004	-126.796	0.000	-0.495	-0.480	0.122
[GENDER=1] [RACE=4] [PROV=2] [GEOTYPE=2] [K10Binary=1]	-0.448	0.007	-65.675	0.000	-0.461	-0.435	0.036
[GM_INCOME=2000]	-0.448	0.005	-87.920	0.000	-0.458	-0.438	0.063
[GENDER=1] [RACE=4] [PROV=6] [GEOTYPE=3] [K10Binary=1]	-0.436	0.006	-76.625	0.000	-0.447	-0.425	0.048
[GM_INCOME=2400]	-0.426	0.005	-84.291	0.000	-0.436	-0.417	0.058
[GENDER=2] [RACE=3] [PROV=7] [GEOTYPE=3] [K10Binary=1]	-0.414	0.005	-81.129	0.000	-0.424	-0.404	0.054
[GM_INCOME=6500]	-0.405	0.006	-66.804	0.000	-0.417	-0.393	0.037
[GENDER=1] [RACE=2] [PROV=5] [GEOTYPE=3] [K10Binary=1]	-0.403	0.004	-100.198	0.000	-0.411	-0.395	0.080
[GENDER=1] [RACE=4] [PROV=9] [GEOTYPE=3] [K10Binary=2]	-0.372	0.004	-101.415	0.000	-0.379	-0.364	0.082
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=3] [K10Binary=2]	-0.360	0.005	-69.835	0.000	-0.370	-0.350	0.041
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=3] [K10Binary=2]	-0.347	0.008	-42.350	0.000	-0.363	-0.331	0.015
[GM_INCOME=1700]	-0.336	0.008	-42.978	0.000	-0.351	-0.320	0.016
[GENDER=1] [RACE=3] [PROV=7] [GEOTYPE=3] [K10Binary=2]	-0.326	0.003	-120.142	0.000	-0.331	-0.320	0.111
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=1] [K10Binary=1]	-0.326	0.003	-105.958	0.000	-0.332	-0.320	0.089
[GM_INCOME=1500]	-0.323	0.009	-36.966	0.000	-0.340	-0.305	0.012

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=2] [K10Binary=1]	-0.241	0.005	-53.141	0.000	-0.249	-0.232	0.024
[GENDER=2] [RACE=3] [PROV=3] [GEOTYPE=1] [K10Binary=1]	-0.235	0.005	-44.182	0.000	-0.246	-0.225	0.017
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=1] [K10Binary=1]	-0.227	0.008	-29.403	0.000	-0.242	-0.212	0.007
[IPVEBinary=1]	-0.205	0.003	-63.680	0.000	-0.212	-0.199	0.034
[GM_INCOME=650]	-0.183	0.007	-25.791	0.000	-0.196	-0.169	0.006
[GM_INCOME=3500]	-0.137	0.008	-17.856	0.000	-0.152	-0.122	0.003
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=2] [K10Binary=2]	-0.105	0.007	-14.523	0.000	-0.119	-0.091	0.002
[GM_INCOME=700]	-0.076	0.006	-13.465	0.000	-0.087	-0.065	0.002
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=3] [K10Binary=1]	-0.072	0.005	-15.635	0.000	-0.081	-0.063	0.002
[GENDER=1] [RACE=3] [PROV=9] [GEOTYPE=3] [K10Binary=2]	-0.040	0.004	-9.704	0.000	-0.047	-0.032	0.001
HLEA	-0.020	0.001	-31.723	0.000	-0.021	-0.019	0.009
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	-0.009	0.007	-1.230	0.219	-0.023	0.005	0.000
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	-1.564E-15	0.002	0.000	1.000	-0.005	0.005	0.000
[GENDER=2] [RACE=3] [PROV=5] [GEOTYPE=3] [K10Binary=2]	0.017	0.006	2.677	0.007	0.004	0.029	0.000
[GM_INCOME=800]	0.019	0.004	4.753	0.000	0.011	0.027	0.000
[GENDER=2] [RACE=1] [PROV=5] [GEOTYPE=3] [K10Binary=1]	0.031	0.004	7.908	0.000	0.023	0.038	0.001
[GENDER=1] [RACE=4] [PROV=3] [GEOTYPE=1] [K10Binary=1]	0.082	0.002	33.339	0.000	0.077	0.086	0.010
[GENDER=2] [RACE=3] [PROV=7] [GEOTYPE=1] [K10Binary=1]	0.117	0.003	41.707	0.000	0.112	0.123	0.015
[GM_INCOME=2600]	0.119	0.007	16.617	0.000	0.105	0.133	0.002

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
AGE	0.131	0.001	193.848	0.000	0.130	0.132	0.246
[GM_INCOME=380]	0.140	0.006	22.724	0.000	0.128	0.152	0.004
[GM_INCOME=900]	0.150	0.008	19.369	0.000	0.135	0.165	0.003
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=1] [K10Binary=2]	0.167	0.005	35.593	0.000	0.158	0.176	0.011
[GM_INCOME=3000]	0.180	0.005	37.396	0.000	0.170	0.189	0.012
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=2] [K10Binary=1]	0.186	0.006	30.388	0.000	0.174	0.198	0.008
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=2] [K10Binary=2]	0.193	0.009	22.672	0.000	0.176	0.210	0.004
[GENDER=1] [RACE=3] [PROV=9] [GEOTYPE=3] [K10Binary=1]	0.214	0.010	21.957	0.000	0.195	0.233	0.004
[GENDER=2] [RACE=4] [PROV=1] [GEOTYPE=1] [K10Binary=1]	0.297	0.007	43.044	0.000	0.284	0.311	0.016
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0.333	0.005	69.401	0.000	0.324	0.343	0.040
[GM_INCOME=2450]	0.472	0.008	58.491	0.000	0.456	0.488	0.029
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	0.578	0.005	118.214	0.000	0.568	0.588	0.108
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=3] [K10Binary=2]	0.619	0.005	112.889	0.000	0.609	0.630	0.099
[GM_INCOME=9000]	0.718	0.010	69.119	0.000	0.697	0.738	0.040
[GENDER=2] [RACE=3] [PROV=2] [GEOTYPE=1] [K10Binary=1]	0.724	0.007	107.462	0.000	0.710	0.737	0.091
[GENDER=2] [RACE=2] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0.739	0.009	79.882	0.000	0.721	0.757	0.052
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=3] [K10Binary=1]	0.764	0.008	98.037	0.000	0.749	0.779	0.077
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=3] [K10Binary=1]	0.801	0.008	101.675	0.000	0.785	0.816	0.082
[GENDER=2] [RACE=1] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	1.136	0.005	242.253	0.000	1.126	1.145	0.337

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GM_INCOME=2300]	1.220	0.007	182.109	0.000	1.207	1.233	0.223
[GENDER=2] [RACE=3] [PROV=3] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	1.262	0.004	287.062	0.000	1.253	1.271	0.417
[GM_INCOME=1000]	1.795	0.014	124.690	0.000	1.766	1.823	0.119
[GENDER=1]	0a						
[GENDER=1] * [RACE=2]	0a						
[GENDER=1] [RACE=2] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] * [RACE=3]	0a						
[GENDER=1] [RACE=3] [PROV=3] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=3] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=3] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=1] * [RACE=4]	0a						
[GENDER=1] [RACE=4] [PROV=2] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=3] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=4] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=1] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=6] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=6] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=1] [RACE=4] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=8] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=1] [RACE=4] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2]	0a						
[GENDER=2] * [RACE=1]	0a						
[GENDER=2] [RACE=1] [PROV=3] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=1] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=1] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=1] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] * [RACE=2]	0a						
[GENDER=2] [RACE=2] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] * [RACE=3]	0a						
[GENDER=2] [RACE=3] [PROV=2] [GEOTYPE=1] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=3] [PROV=3] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=3] [PROV=3] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=3] [PROV=5] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=3] [PROV=6] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=3] [PROV=7] [GEOTYPE=1] [Recent_Illicit_Substance_Use=2]	0a						

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] [RACE=3] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] * [RACE=4]	0a						
[GENDER=2] [RACE=4] [PROV=1] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=2] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=1] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=3] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=1] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=4] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=6] [GEOTYPE=2] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=7] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=2] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=2] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=8] [GEOTYPE=3] [Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=1] [Recent_Illicit_Substance_Use=1]	0a						
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=2] [Recent_Illicit_Substance_Use=2]	0a						

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=3] [Recent_Illicit_Substance_Use=1]	0a						
[GEOTYPE=1]	0a						
[GEOTYPE=2]	0a						
[GEOTYPE=3]	0a						
[GM_INCOME=0]	0a						
[GM_INCOME=100]	0a						
[GM_INCOME=10000]	0a						
[GM_INCOME=1200]	0a						
[GM_INCOME=13000]	0a						
[GM_INCOME=14000]	0a						
[GM_INCOME=200]	0a						
[GM_INCOME=20000]	0a						
[GM_INCOME=2060]	0a						
[GM_INCOME=2100]	0a						
[GM_INCOME=2700]	0a						
[GM_INCOME=300]	0a						
[GM_INCOME=3200]	0a						
[GM_INCOME=370]	0a						
[GM_INCOME=400]	0a						
[GM_INCOME=450]	0a						
[GM_INCOME=4500]	0a						
[GM_INCOME=500]	0a						
[GM_INCOME=7000]	0a						

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[IPVEBinary=2]	0a						
[PROV=1]	0a						
[PROV=1] * [GEOTYPE=1]	0a						
[PROV=2]	0a						
[PROV=2] * [GEOTYPE=1]	0a						
[PROV=2] * [GEOTYPE=2]	0a						
[PROV=2] * [GEOTYPE=3]	0a						
[PROV=3]	0a						
[PROV=3] * [GEOTYPE=1]	0a						
[PROV=3] * [GEOTYPE=3]	0a						
[PROV=4]	0a						
[PROV=4] * [GEOTYPE=1]	0a						
[PROV=4] * [GEOTYPE=2]	0a						
[PROV=4] * [GEOTYPE=3]	0a						
[PROV=5]	0a						
[PROV=5] * [GEOTYPE=1]	0a						
[PROV=5] * [GEOTYPE=2]	0a						
[PROV=5] * [GEOTYPE=3]	0a						
[PROV=6]	0a						
[PROV=6] * [GEOTYPE=1]	0a						
[PROV=6] * [GEOTYPE=2]	0a						
[PROV=6] * [GEOTYPE=3]	0a						
[PROV=7]	0a						

Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[PROV=7] * [GEOTYPE=1]	0a						
[PROV=7] * [GEOTYPE=3]	0a						
[PROV=8]	0a						
[PROV=8] * [GEOTYPE=1]	0a						
[PROV=8] * [GEOTYPE=2]	0a						
[PROV=8] * [GEOTYPE=3]	0a						
[PROV=9]	0a						
[PROV=9] * [GEOTYPE=1]	0a						
[PROV=9] * [GEOTYPE=2]	0a						
[PROV=9] * [GEOTYPE=3]	0a						
[RACE=1]	0a						
[RACE=2]	0a						
[RACE=3]	0a						
[RACE=4]	0a						
[Recent_Illicit_Substance_Use=1]	0a						
[Recent_Illicit_Substance_Use=2]	0a						
[GENDER=2] [RACE=4] [PROV=9] [GEOTYPE=3] [K10Binary=1]	0a						
[K10Binary=1]	0a						
[K10Binary=1] * [Recent_Illicit_Substance_Use=1]	0a						
[K10Binary=1] * [Recent_Illicit_Substance_Use=2]	0a						
[K10Binary=2]	0a						
[K10Binary=2] * [Recent_Illicit_Substance_Use=1]	0a						
[K10Binary=2] * [Recent_Illicit_Substance_Use=2]	0a						

Note. DV: Risky Drinking, a. This parameter is set to zero because it is redundant.

**Tests of Between-Subjects Effects:**

**Figure 12**

*Test of Between Subjects RQ1b&1c*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	25677,631a	100	256,776	2762,236	<,001,	,239
Intercept	5794,670	1	5794,670	62335,362	<,001,	,066
HLEA	58,632	1	58,632	630,725	<,001,	,001
GM_INCOME	66,772	1	66,772	718,293	<,001,	,001
AGE	186,793	1	186,793	2009,399	<,001,	,002
HIV_STATUS	81,049	1	81,049	871,875	<,001,	,001
province	73,060	8	9,132	98,241	<,001,	,001
geotype	96,820	2	48,410	520,764	<,001,	,001
GENDER	98,813	1	98,813	1062,962	<,001,	,001
RACE	220,455	3	73,485	790,503	<,001,	,003
province * geotype	1260,792	15	84,053	904,186	<,001,	,015
province * GENDER	510,991	8	63,874	687,114	<,001,	,006
province * RACE	1727,521	18	95,973	1032,421	<,001,	,021
geotype * GENDER	226,394	2	113,197	1217,701	<,001,	,003
geotype * RACE	52,144	2	26,072	280,467	<,001,	,001
GENDER * RACE	293,580	3	97,860	1052,714	<,001,	,004
province <i>geotype</i> GENDER	860,350	13	66,181	711,930	<,001,	,010
province <i>geotype</i> RACE	54,082	4	13,521	145,445	<,001,	,001
province <i>GENDER</i> RACE	1061,763	13	81,674	878,598	<,001,	,013
geotype <i>GENDER</i> RACE	8,905	2	4,452	47,897	<,001,	,000
province <i>geotype</i> GENDER * RACE	18,238	1	18,238	196,189	<,001,	,000
Error	81711,672	879002,093				
Total	1254787,000	879103				
Corrected Total	107389,303	879102				

Note. a. R Squared = ,239 (Adjusted R Squared = ,239), b. Computed using alpha = ,05.

**APPENDIX F**

**Research Question: 2a**

*Parameter Estimates*

**Figure 13**

*Parameter Estimates RQ 2a*

Parameter	B	Std. Error	t	Sig.	Partial Eta Squared	
Intercept	1,086	,014	79,322	<,001	,007	
HLEA	-,001	3,828E-5	-25,114	<,001	,001	
GM_INCOME	-1,462E-7	5,456E-9	-26,801	<,001	,001	

AGE	-,008	,000	-44,826	<,001	,002
HIV_STATUS	,037	,001	29,528	<,001	,001
[province=1]	,029	,015	1,955	,051	,000
[province=2]	,023	,015	1,483	,138	,000
[province=3]	,027	,014	1,941	,052	,000
[province=4]	,575	,089	6,444	<,001	,000
[province=5]	,292	,014	21,032	<,001	,001
[province=6]	,041	,015	2,635	,008	,000
[province=7]	,145	,073	1,976	,048	,000
[province=8]	,074	,016	4,609	<,001	,000
[province=9]	0 <sup>a</sup>	.	.	.	.
[geotype=1]	,026	,013	1,924	,054	,000
[geotype=2]	,020	,013	1,530	,126	,000
[geotype=3]	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00]	,014	,014	1,041	,298	,000
[GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[RACE=1,00]	,015	,019	,795	,427	,000
[RACE=2,00]	,638	,067	9,556	<,001	,000
[RACE=3,00]	-,163	,023	-6,958	<,001	,000
[RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=1]	,048	,015	3,118	,002	,000
[province=1] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1]	-,017	,016	-1,082	,279	,000
[province=2] * [geotype=2]	,001	,016	,072	,943	,000
[province=2] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1]	,591	,017	35,255	<,001	,001
[province=3] * [geotype=2]	-,020	,017	-1,180	,238	,000
[province=3] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1]	-,390	,089	-4,374	<,001	,000
[province=4] * [geotype=2]	-,566	,089	-6,330	<,001	,000
[province=4] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1]	-,290	,014	-20,207	<,001	,000
[province=5] * [geotype=2]	-,281	,014	-19,937	<,001	,000
[province=5] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1]	,104	,016	6,506	<,001	,000
[province=6] * [geotype=2]	-,035	,016	-2,230	,026	,000
[province=6] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1]	-,142	,074	-1,938	,053	,000
[province=7] * [geotype=2]	-,126	,074	-1,698	,089	,000
[province=7] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1]	-,051	,016	-3,120	,002	,000
[province=8] * [geotype=2]	,046	,016	2,817	,005	,000
[province=8] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3]	0 <sup>a</sup>	.	.	.	.
[province=1] *	-,009	,019	-,482	,630	,000
[GENDER=1,00]					
[province=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00]					

[province=2] * [GENDER=1,00]	-,014	,017	-,810	,418	,000
[province=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [GENDER=1,00]	,225	,015	14,939	<,001	,000
[province=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [GENDER=1,00]	-,430	,089	-4,822	<,001	,000
[province=4] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=1,00]	-,274	,015	-18,330	<,001	,000
[province=5] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [GENDER=1,00]	,242	,016	14,727	<,001	,000
[province=6] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=1,00]	,266	,011	23,535	<,001	,001
[province=7] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [GENDER=1,00]	-,065	,017	-3,778	<,001	,000
[province=8] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [RACE=1,00]	,114	,068	1,661	,097	,000
[province=1] * [RACE=2,00]	-,640	,067	-9,517	<,001	,000
[province=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [RACE=1,00]	-,156	,075	-2,081	,037	,000
[province=2] * [RACE=2,00]	-,629	,068	-9,246	<,001	,000
[province=2] * [RACE=3,00]	-,148	,028	-5,313	<,001	,000
[province=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [RACE=1,00]	-,361	,075	-4,795	<,001	,000
[province=3] * [RACE=2,00]	-,656	,063	-10,446	<,001	,000

[province=3] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=4] *	-,317	,076	-4,196	<,001	,000
[RACE=1,00]					
[province=4] *	-1,170	,030	-38,422	<,001	,002
[RACE=2,00]					
[province=4] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=5] *	-,319	,057	-5,570	<,001	,000
[RACE=1,00]					
[province=5] *	-,628	,029	-21,597	<,001	,001
[RACE=2,00]					
[province=5] *	,208	,024	8,754	<,001	,000
[RACE=3,00]					
[province=5] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=6] *	-,286	,073	-3,914	<,001	,000
[RACE=1,00]					
[province=6] *	-,659	,027	-24,164	<,001	,001
[RACE=2,00]					
[province=6] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=7] *	-,158	,074	-2,129	,033	,000
[RACE=1,00]					
[province=7] *	-,792	,025	-31,536	<,001	,001
[RACE=2,00]					
[province=7] *	,380	,022	17,198	<,001	,000
[RACE=3,00]					
[province=7] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=8] *	-,167	,077	-2,162	,031	,000
[RACE=1,00]					
[province=8] *	0 <sup>a</sup>	.	.	.	.
[RACE=2,00]					
[province=8] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[RACE=1,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[RACE=3,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[RACE=4,00]					
[geotype=1] *	-,007	,015	-,453	,651	,000
[GENDER=1,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00]					
[geotype=2] *	,105	,014	7,493	<,001	,000
[GENDER=1,00]					
[geotype=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00]					

[geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[geotype=1] * [RACE=1,00]	,137	,071	1,921	,055	,000
[geotype=1] * [RACE=2,00]	,364	,062	5,905	<,001	,000
[geotype=1] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[geotype=3] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] * [RACE=1,00]	,007	,067	,104	,917	,000
[GENDER=1,00] * [RACE=2,00]	-,472	,030	-15,569	<,001	,000
[GENDER=1,00] * [RACE=3,00]	,142	,012	11,972	<,001	,000
[GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=1] * [GENDER=1,00]	-,078	,021	-3,728	<,001	,000
[province=1] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=1,00]	,144	,019	7,778	<,001	,000
[province=2] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=2] * [GENDER=1,00]	,297	,017	17,033	<,001	,000

[province=2] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=2] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=2] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=3] * [geotype=1] * [GENDER=1,00]	-,728	,020	-37,336	<,001		,002
[province=3] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=3] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=3] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=3] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=4] * [geotype=1] * [GENDER=1,00]	,606	,089	6,775	<,001		,000
[province=4] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=4] * [geotype=2] * [GENDER=1,00]	,477	,090	5,323	<,001		,000
[province=4] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=4] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=4] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=5] * [geotype=1] * [GENDER=1,00]	,413	,017	24,628	<,001		,001
[province=5] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=5] * [geotype=2] * [GENDER=1,00]	,375	,016	24,086	<,001		,001
[province=5] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=5] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=5] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=6] * [geotype=1] * [GENDER=1,00]	,034	,018	1,879	,060		,000
[province=6] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=6] * [geotype=2] * [GENDER=1,00]	-,123	,017	-7,204	<,001		,000
[province=6] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=6] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.	.

[province=6] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=1,00]	-,122	,013	-9,098	<,001	,000
[province=7] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=2] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=1,00]	,126	,019	6,613	<,001	,000
[province=8] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=2] * [GENDER=1,00]	,097	,018	5,466	<,001	,000
[province=8] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [GENDER=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [GENDER=2,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=1] * [RACE=1,00]	,666	,036	18,645	<,001	,000
[province=1] * [geotype=1] * [RACE=2,00]	-,324	,062	-5,206	<,001	,000
[province=1] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=3] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.

[province=2] * [geotype=1] * [RACE=2,00]	-,273	,063	-4,321	<,001	,000
[province=2] * [geotype=1] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [RACE=2,00]	-,700	,056	-12,393	<,001	,000
[province=3] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=3] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [RACE=1,00]	,158	,046	3,429	<,001	,000
[province=5] * [geotype=1] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

[province=6] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=1] * [GENDER=1,00] * [RACE=1,00]	-,162	,021	-7,539	<,001	,000
[province=1] * [GENDER=1,00] * [RACE=2,00]	,891	,033	26,693	<,001	,001

[province=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[province=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[province=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=2,00]					
[province=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					
[province=2] *	,458	,024	18,759	<,001	,000
[GENDER=1,00] *					
[RACE=1,00]					
[province=2] *	1,454	,035	41,207	<,001	,002
[GENDER=1,00] *					
[RACE=2,00]					
[province=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=3,00]					
[province=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[province=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[province=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=2,00]					
[province=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					
[province=3] *	,168	,027	6,180	<,001	,000
[GENDER=1,00] *					
[RACE=1,00]					
[province=3] *	,765	,015	52,536	<,001	,003
[GENDER=1,00] *					
[RACE=2,00]					
[province=3] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[province=3] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[province=3] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=2,00]					

[province=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [GENDER=1,00] * [RACE=1,00]	,705	,026	26,778	<,001	,001
[province=4] * [GENDER=1,00] * [RACE=2,00]	,849	,027	31,030	<,001	,001
[province=4] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=1,00] * [RACE=1,00]	,288	,022	12,870	<,001	,000
[province=5] * [GENDER=1,00] * [RACE=2,00]	,111	,019	5,869	<,001	,000
[province=5] * [GENDER=1,00] * [RACE=3,00]	,087	,013	6,541	<,001	,000
[province=5] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=2,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.

[province=6] * [GENDER=1,00] * [RACE=2,00]	-,228	,018	-12,420	<,001	,000
[province=6] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=1,00] * [RACE=1,00]	,236	,021	11,275	<,001	,000
[province=7] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=1,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=2,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

[province=8] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[province=8] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=3,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[province=9] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					
[geotype=1] *	-,090	,064	-1,409	,159	,000
[GENDER=1,00] *					
[RACE=1,00]					
[geotype=1] *	,388	,029	13,279	<,001	,000
[GENDER=1,00] *					
[RACE=2,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=3,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=1,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=2,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=3,00]					
[geotype=1] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					
[geotype=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=1,00] *					
[RACE=4,00]					
[geotype=2] *	0 <sup>a</sup>	.	.	.	.
[GENDER=2,00] *					
[RACE=4,00]					

[geotype=3] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.	.
[geotype=3] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.	.
[geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.	.
[geotype=3] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.	.
[geotype=3] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.	.
[geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	-,458	,033	-14,007	<,001		,000
[province=1] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=3] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=3] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.	.
[province=1] * [geotype=3] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.	.

[province=1] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=1,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=2] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

[province=3] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=3] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

[province=4] * [geotype=3] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=4] * [geotype=3] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=1,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=2,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=3] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=5] * [geotype=3] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.

[province=5] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=3] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=6] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=1,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

[province=7] * [geotype=1] * [GENDER=2,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=2,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=7] * [geotype=3] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=1,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=8] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [GENDER=1,00] * [RACE=3,00]	0 <sup>a</sup>	.	.	.	.

[province=9] * [geotype=1] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=1] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=2] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [GENDER=1,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [GENDER=2,00] * [RACE=1,00]	0 <sup>a</sup>	.	.	.	.
[province=9] * [geotype=3] * [GENDER=2,00] * [RACE=4,00]	0 <sup>a</sup>	.	.	.	.

**Tests of Between-Subjects Effects:**

**Figure 34**

*Test of Between Subjects RQ2a*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	25677,631 <sup>a</sup>	100	256,776	2762,236	<,001	,239
Intercept	5794,670	1	5794,670	62335,362	<,001	,066
HLEA	58,632	1	58,632	630,725	<,001	,001
GM_INCOME	66,772	1	66,772	718,293	<,001	,001
AGE	186,793	1	186,793	2009,399	<,001	,002
HIV_STATUS	81,049	1	81,049	871,875	<,001	,001
province	73,060	8	9,132	98,241	<,001	,001
geotype	96,820	2	48,410	520,764	<,001	,001
GENDER	98,813	1	98,813	1062,962	<,001	,001
RACE	220,455	3	73,485	790,503	<,001	,003
province * geotype	1260,792	15	84,053	904,186	<,001	,015
province * GENDER	510,991	8	63,874	687,114	<,001	,006
province * RACE	1727,521	18	95,973	1032,421	<,001	,021
geotype * GENDER	226,394	2	113,197	1217,701	<,001	,003
geotype * RACE	52,144	2	26,072	280,467	<,001	,001
GENDER * RACE	293,580	3	97,860	1052,714	<,001	,004
province * geotype * GENDER	860,350	13	66,181	711,930	<,001	,010
province * geotype * RACE	54,082	4	13,521	145,445	<,001	,001
province * GENDER * RACE	1061,763	13	81,674	878,598	<,001	,013

geotype * GENDER * RACE	8,905	2	4,452	47,897	<,001	,000
province * geotype * GENDER * RACE	18,238	1	18,238	196,189	<,001	,000
Error	81711,672	879002	,093			
Total	1254787,000	879103				
Corrected Total	107389,303	879102				

Note. a. R Squared = ,239 (Adjusted R Squared = ,239), b. Computed using alpha = ,05.

### Research Question: 2b and 2c

#### Parameter Estimates

#### Figure 45

#### Parameter Estimates RQ2b & 2c

Parameter	B	Std. Error	t	Si g.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=3] * [K10Binary=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=2] * [PROV=5] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=3] * [PROV=3] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=2] * [GEOTYPE=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=4] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=6] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=7] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=8] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=1] * [PROV=3] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=1] * [PROV=5] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=1] * [PROV=7] * [GEOTYPE=3]	0a	.	.	.	.	.	.

[RISKYDRINKING=1] * [GENDER=2] * [RACE=1] * [PROV=9] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=3] * [PROV=6] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=2] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=7] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=1] * [RACE=3] * [PROV=7] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=1] * [RACE=4] * [PROV=3] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=1] * [RACE=4] * [PROV=9] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=3] * [PROV=2] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=3] * [PROV=5] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=1] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=2]	0a	.	.	.	.	.	.

[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=3]	0a	.	.	.	.	.	.
[GENDER=1]	0a	.	.	.	.	.	.
[GENDER=2]	0a	.	.	.	.	.	.
[RACE=1]	0a	.	.	.	.	.	.
[RACE=2]	0a	.	.	.	.	.	.
[RACE=3]	0a	.	.	.	.	.	.
[RACE=4]	0a	.	.	.	.	.	.
[PROV=1]	0a	.	.	.	.	.	.
[PROV=2]	0a	.	.	.	.	.	.
[PROV=3]	0a	.	.	.	.	.	.
[PROV=4]	0a	.	.	.	.	.	.
[PROV=5]	0a	.	.	.	.	.	.
[PROV=6]	0a	.	.	.	.	.	.
[PROV=7]	0a	.	.	.	.	.	.
[PROV=8]	0a	.	.	.	.	.	.
[PROV=9]	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[K10Binary=1]	0a	.	.	.	.	.	.
[K10Binary=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2]	0a	.	.	.	.	.	.
[GM_INCOME=100]	0a	.	.	.	.	.	.
[GM_INCOME=200]	0a	.	.	.	.	.	.
[GM_INCOME=300]	0a	.	.	.	.	.	.
[GM_INCOME=370]	0a	.	.	.	.	.	.
[GM_INCOME=400]	0a	.	.	.	.	.	.
[GM_INCOME=450]	0a	.	.	.	.	.	.
[GM_INCOME=500]	0a	.	.	.	.	.	.
[GM_INCOME=1200]	0a	.	.	.	.	.	.
[GM_INCOME=2060]	0a	.	.	.	.	.	.
[GM_INCOME=2100]	0a	.	.	.	.	.	.
[GM_INCOME=2300]	0a	.	.	.	.	.	.
[GM_INCOME=2600]	0a	.	.	.	.	.	.
[GM_INCOME=2700]	0a	.	.	.	.	.	.
[GM_INCOME=3200]	0a	.	.	.	.	.	.

[GM_INCOME=4500]	0a . . . . .
[GM_INCOME=7000]	0a . . . . .
[GM_INCOME=9000]	0a . . . . .
[GM_INCOME=13000]	0a . . . . .
[GM_INCOME=14000]	0a . . . . .
[GM_INCOME=20000]	0a . . . . .
[IPVEBinary=2]	0a . . . . .
[GENDER=1] * [RACE=2]	0a . . . . .
[GENDER=1] * [RACE=3]	0a . . . . .
[GENDER=1] * [RACE=4]	0a . . . . .
[GENDER=2] * [RACE=1]	0a . . . . .
[GENDER=2] * [RACE=2]	0a . . . . .
[GENDER=2] * [RACE=3]	0a . . . . .
[GENDER=2] * [RACE=4]	0a . . . . .
[PROV=1] * [GEOTYPE=1]	0a . . . . .
[PROV=2] * [GEOTYPE=1]	0a . . . . .
[PROV=2] * [GEOTYPE=2]	0a . . . . .
[PROV=2] * [GEOTYPE=3]	0a . . . . .
[PROV=3] * [GEOTYPE=1]	0a . . . . .
[PROV=3] * [GEOTYPE=3]	0a . . . . .
[PROV=4] * [GEOTYPE=1]	0a . . . . .
[PROV=4] * [GEOTYPE=2]	0a . . . . .
[PROV=4] * [GEOTYPE=3]	0a . . . . .
[PROV=5] * [GEOTYPE=1]	0a . . . . .
[PROV=5] * [GEOTYPE=2]	0a . . . . .
[PROV=5] * [GEOTYPE=3]	0a . . . . .
[PROV=6] * [GEOTYPE=1]	0a . . . . .
[PROV=6] * [GEOTYPE=2]	0a . . . . .
[PROV=6] * [GEOTYPE=3]	0a . . . . .
[PROV=7] * [GEOTYPE=1]	0a . . . . .
[PROV=7] * [GEOTYPE=3]	0a . . . . .
[PROV=8] * [GEOTYPE=1]	0a . . . . .
[PROV=8] * [GEOTYPE=2]	0a . . . . .
[PROV=8] * [GEOTYPE=3]	0a . . . . .
[PROV=9] * [GEOTYPE=1]	0a . . . . .
[PROV=9] * [GEOTYPE=2]	0a . . . . .
[PROV=9] * [GEOTYPE=3]	0a . . . . .
[RISKYDRINKING=1] * [K10Binary=1]	0a . . . . .
[RISKYDRINKING=1] * [K10Binary=2]	0a . . . . .
[RISKYDRINKING=2] * [K10Binary=1]	0a . . . . .
[RISKYDRINKING=2] * [K10Binary=2]	0a . . . . .

[GENDER=2] * [RACE=1] * [PROV=5] * [GEOTYPE=3] * [K10Binary=1]	2. 32	0.004	592. 117	00 1	<. 2.315	2.33	0.752
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=3] * [K10Binary=1]	2. 32	0.006	383. 638	00 1	<. 2.311	2.335	0.561
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [K10Binary=2]	2. 27	0.006	393. 393	00 1	<. 2.261	2.283	0.573
[GENDER=2] * [RACE=3] * [PROV=6] * [GEOTYPE=3] * [K10Binary=1]	2. 15	0.007	328. 496	00 1	<. 2.137	2.163	0.483
[GENDER=2] * [RACE=3] * [PROV=5] * [GEOTYPE=3] * [K10Binary=2]	2. 06	0.007	315. 046	00 1	<. 2.051	2.076	0.462
[GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3] * [K10Binary=1]	2. 06	0.007	302. 471	00 1	<. 2.05	2.077	0.442
[GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=2] * [K10Binary=1]	2. 05	0.005	397. 185	00 1	<. 2.044	2.064	0.578
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=1] * [K10Binary=1]	1. 85	0.006	304. 035	00 1	<. 1.841	1.865	0.445
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3]	1. 66	0.008	218. 146	00 1	<. 1.641	1.67	0.292
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=2] * [K10Binary=2]	1. 60	0.005	302. 599	00 1	<. 1.593	1.614	0.442
[GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=2] * [K10Binary=2]	1. 55	0.006	271. 285	00 1	<. 1.542	1.564	0.389
[GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3] * [K10Binary=2]	1. 55	0.008	191. 655	00 1	<. 1.532	1.564	0.241
[GM_INCOME=1000]	1. 53	0.009	174. 47	00 1	<. 1.51	1.545	0.209
[GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=1] * [K10Binary=2]	1. 50	0.005	294. 418	00 1	<. 1.489	1.509	0.429
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [K10Binary=1]	1. 49	0.006	263. 308	00 1	<. 1.481	1.503	0.375
[GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=2] * [K10Binary=1]	1. 32	0.005	255. 618	00 1	<. 1.306	1.326	0.362

[GENDER=1] * [RACE=4] * [PROV=6] * [GEOTYPE=3] * [K10Binary=1]	1. 30	0.009	152. 202	00 1	<. 1.279	1.312	0.167
[GENDER=2] * [RACE=1] * [PROV=7] * [GEOTYPE=3] * [K10Binary=1]	1. 26	0.004	317. 958	00 1	<. 1.247	1.263	0.467
[GENDER=1] * [RACE=4] * [PROV=9] * [GEOTYPE=3] * [K10Binary=2]	1. 26	0.004	298. 996	00 1	<. 1.247	1.263	0.437
[GM_INCOME=2400]	1. 18	0.006	193. 303	00 1	<. 1.168	1.191	0.245
[GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=2] * [K10Binary=2]	1. 17	0.005	258. 07	00 1	<. 1.157	1.174	0.366
[GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=3] * [K10Binary=2]	1. 12	0.004	296. 295	00 1	<. 1.107	1.122	0.432
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=2] * [K10Binary=1]	1. 11	0.008	139. 976	00 1	<. 1.097	1.128	0.145
[GENDER=2] * [RACE=4] * [PROV=1] * [GEOTYPE=1] * [K10Binary=1]	1. 10	0.006	196. 472	00 1	<. 1.086	1.108	0.251
[GM_INCOME=3000]	1. 09	0.005	219. 38	00 1	<. 1.079	1.099	0.294
[GENDER=1] * [RACE=4] * [PROV=7] * [GEOTYPE=3] * [K10Binary=1]	1. 09	0.005	209. 853	00 1	<. 1.079	1.099	0.276
[GM_INCOME=800]	1. 09	0.005	209. 226	00 1	<. 1.076	1.096	0.275
[GENDER=1] * [RACE=3] * [PROV=7] * [GEOTYPE=3] * [K10Binary=2]	1. 08	0.008	137. 248	00 1	<. 1.064	1.095	0.14
[GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=3] * [K10Binary=1]	1. 03	0.006	183. 014	00 1	<. 1.017	1.039	0.225
[GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=1] * [K10Binary=1]	1. 01	0.003	371. 914	00 1	<. 1.003	1.013	0.545
[GM_INCOME=6500]	0. 99	0.007	134. 62	00 1	<. 0.971	1	0.136
[GM_INCOME=3500]	0. 98	0.007	132. 495	00 1	<. 0.963	0.992	0.132

[GENDER=1] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [K10Binary=1]	0. 97	0.005	190. 13	00 1	<. 0.957	0.977	0.239
[GENDER=1] * [RACE=3] * [PROV=7] * [GEOTYPE=3] * [K10Binary=1]	0. 93	0.005	174. 768	00 1	<. 0.921	0.942	0.209
[GENDER=2] * [RACE=3] * [PROV=2] * [GEOTYPE=1] * [K10Binary=1]	0. 92	0.006	148. 063	00 1	<. 0.905	0.93	0.16
[RISKYDRINKING=1] * [GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=3]	0. 88	0.004	223. 687	00 1	<. 0.87	0.886	0.302
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=1] * [K10Binary=1]	0. 87	0.006	157. 21	00 1	<. 0.86	0.882	0.176
[GENDER=2] * [RACE=1] * [PROV=3] * [GEOTYPE=3] * [K10Binary=1]	0. 78	0.008	94.7 34	00 1	<. 0.764	0.796	0.072
[GM_INCOME=380]	0. 70	0.007	100. 094	00 1	<. 0.684	0.712	0.08
[GM_INCOME=2000]	0. 69	0.005	133. 816	00 1	<. 0.68	0.7	0.134
[GENDER=1] * [RACE=4] * [PROV=6] * [GEOTYPE=3] * [K10Binary=2]	0. 68	0.009	75.6 42	00 1	<. 0.666	0.701	0.047
[GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3] * [K10Binary=1]	0. 62	0.01	64.5 66	00 1	<. 0.604	0.642	0.035
[GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3] * [K10Binary=2]	0. 62	0.008	77.7 54	00 1	<. 0.607	0.638	0.05
[GM_INCOME=1700]	0. 62	0.007	91.9 61	00 1	<. 0.607	0.633	0.068
[GM_INCOME=1600]	0. 62	0.006	101. 587	00 1	<. 0.607	0.631	0.082
[GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=3] * [K10Binary=1]	0. 57	0.005	123. 572	00 1	<. 0.556	0.574	0.117
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=3]	0. 52	0.004	142. 338	00 1	<. 0.514	0.528	0.149
[GM_INCOME=10000]	0. 50	0.006	90.8 79	00 1	<. 0.491	0.513	0.067

[GENDER=1] * [RACE=4] * [PROV=8] * [GEOTYPE=3] * [K10Binary=1]	0.	99.4	<.00	50	0.005	48	1	0.489	0.509	0.079
[GM_INCOME=4000]	0.	74.3	<.00	45	0.006	12	1	0.438	0.461	0.046
[GENDER=1] * [RACE=2] * [PROV=5] * [GEOTYPE=3] * [K10Binary=1]	0.	114.	<.00	44	0.004	303	1	0.434	0.449	0.102
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=2] * [K10Binary=1]	0.	86.3	<.00	44	0.005	74	1	0.428	0.448	0.061
[GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=1] * [K10Binary=1]	0.	138.	<.00	43	0.003	724	1	0.428	0.44	0.143
[GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=1] * [K10Binary=1]	0.	74.0	<.00	43	0.006	34	1	0.413	0.436	0.045
[GM_INCOME=2800]	0.	73.6	<.00	37	0.005	94	1	0.357	0.377	0.045
[GENDER=1] * [RACE=3] * [PROV=3] * [GEOTYPE=3] * [K10Binary=1]	0.	76.2	<.00	34	0.004	16	1	0.329	0.347	0.048
[GENDER=2] * [RACE=1] * [PROV=9] * [GEOTYPE=3] * [K10Binary=2]	0.	61.5	<.00	31	0.005	15	1	0.298	0.318	0.032
[GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=1] * [K10Binary=2]	0.	72.1	<.00	29	0.004	87	1	0.277	0.293	0.043
[GENDER=1] * [RACE=4] * [PROV=7] * [GEOTYPE=3] * [K10Binary=2]	0.	57.6	<.00	20	0.003	83	1	0.192	0.205	0.028
[GM_INCOME=650]	0.	29.3	<.00	18	0.006	45	1	0.167	0.191	0.007
[GENDER=1] * [RACE=3] * [PROV=3] * [GEOTYPE=3] * [K10Binary=2]	0.	46.9	<.00	16	0.003	28	1	0.157	0.171	0.019
[GM_INCOME=2450]	0.	39.4	<.00	15	0.004	77	1	0.14	0.155	0.013
[GM_INCOME=1900]	0.	24.7	<.00	13	0.005	99	1	0.122	0.142	0.005
[GM_INCOME=1500]	0.	25.8	<.00	12	0.004	11	1	0.107	0.125	0.006

								<.
Age	06	0	128.48	1		0.06	0.062	0.125
								0.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=2]	02	0.005	3.071	2		0.006	0.027	0
								0.
[GENDER=1] * [RACE=4] * [PROV=2] * [GEOTYPE=2] * [K10Binary=1]	01	0.006	1.778	5		-0.001	0.021	0
	-		-					<.
Education	02	0.001	24.701	1		-0.019	-0.016	0.005
	-		-					<.
[GENDER=1] * [RACE=4] * [PROV=3] * [GEOTYPE=1] * [K10Binary=1]	03	0.003	10.088	1		-0.033	-0.023	0.001
	-		-					<.
[GM_INCOME=700]	09	0.008	10.772	1		-0.1	-0.069	0.001
	-		-					<.
[GM_INCOME=5000]	09	0.004	24.499	1		-0.094	-0.08	0.005
	-		-					<.
[GENDER=2] * [RACE=4] * [PROV=2] * [GEOTYPE=3] * [K10Binary=1]	17	0.002	69.062	1		-0.173	-0.164	0.04
	-		-					<.
[GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3] * [K10Binary=2]	21	0.009	23.586	1		-0.224	-0.19	0.005
	-		-					<.
[GENDER=2] * [RACE=4] * [PROV=7] * [GEOTYPE=3] * [K10Binary=1]	24	0.003	69.857	1		-0.242	-0.229	0.041
	-		-					<.
[GM_INCOME=6000]	33	0.003	128.779	1		-0.336	-0.326	0.126
	-		-					<.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3]	39	0.006	63.567	1		-0.4	-0.376	0.034
	-		-					<.
[GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=1] * [K10Binary=2]	41	0.005	87.388	1		-0.418	-0.4	0.062
	-		-					<.
[GM_INCOME=2500]	46	0.005	86.056	1		-0.475	-0.453	0.06
	-		-					<.
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=1]	47	0.006	73.613	1		-0.484	-0.459	0.045
	-		-					<.
[GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3] * [K10Binary=1]	48	0.006	74.049	1		-0.492	-0.467	0.045

	-	-	<.					
[RISKYDRINKING=1] * [GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3]	0.	48	60.2	44	1	-0.5	-0.468	0.03
	-	-	<.					
Intercept	0.	51	44.0	67	1	-0.528	-0.483	0.017
	-	-	<.					
Absence of Violent Trauma	0.	65	322.	417	1	-0.655	-0.647	0.474
	-	-	<.					
[RISKYDRINKING=1] * [GENDER=1] * [RACE=3] * [PROV=7] * [GEOTYPE=3]	0.	68	88.5	46	1	-0.695	-0.665	0.064
	-	-	<.					
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=3] * [GEOTYPE=1]	0.	71	97.7	99	1	-0.728	-0.699	0.077
	-	-	<.					
[GM_INCOME=360]	0.	79	284.	344	1	-0.796	-0.785	0.412
	-	-	<.					
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=9] * [GEOTYPE=3]	0.	94	689.	485	1	-0.942	-0.936	0.805
	-	-	<.					
[GM_INCOME=0]	1.	00	462.	029	1	-1.004	-0.996	0.649
	-	-	<.					
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=3]	1.	25	377.	586	1	-1.258	-1.245	0.553
	-	-	<.					
[RISKYDRINKING=1] * [GENDER=2] * [RACE=3] * [PROV=2] * [GEOTYPE=1]	1.	30	124.	347	1	-1.317	-1.276	0.118
	-	-	<.					
[GM_INCOME=900]	1.	35	137.	092	1	-1.365	-1.327	0.14

a This parameter is set to zero because it is redundant.

### Tests of Between-Subjects Effects:

#### Figure 165

Test Between Subjects RQ 2b & 2c

Predictors of Illicit Drug Use	MS	S. Err	F	Sig.	Variance
<b>Gender</b>	85.979	.004	21823.96	<.001	15.9%
<b>Race</b>	189.240	.004	48034.7	<.001	55.5%
<b>Province</b>	59.644	.004	15139.45	<.001	51.2%
<b>Geotype</b>	65.831	.004	16709.9	<.001	22.5%
<b>Psychological Distress</b>	1.902	.004	482.677	<.001	.4%

<i>Exposure IPV</i>	409.539	.004	103953	<.001	47.4%
<i>Income</i>	134.330	.004	34096.94	<.001	87.2%
<i>Education</i>	2.404	.004	610.135	<.001	.5%
<i>Geographic Factors (Province * Geolocation)</i>	126.188	.004	32030.09	<.001	71.4%
<i>Demographic Factors (Race * Gender)</i>	28.904	.004	7336.776	<.001	11.3%
<i>Geographic * Demographic * Risky Drinking</i>	117.373	.004	29792.68	<.001	43.7%
<i>Geographic * Demographic * Psychological Distress</i>	70.200	.004	17818.78	<.001	38.2%
<i>Age</i>	65.032	.004	16507.13	<.001	12.5%
<i>Intercept</i>	4.580	4.779	.958	.497	47.1%

Note. Full Factorial, Only Significant interactions shown. Criterion: Illicit Drug Use (N= 9 105 411).

## APPENDIX G

### Research Question: 3a

#### Parameter Estimates

Figure 176: Parameter Estimates RQ3a

Parameter	B	t	Sig.	Partial Eta Squared
Intercept	13.600	53.336	0.000	0.003
HLEA	-0.047	-66.042	0.000	0.005
GM_INCOME	-2.022E-06	-19.896	0.000	0.000
AGE	-0.060	-18.252	0.000	0.000
HIV_STATUS	-0.017	-0.747	0.455	0.000
[province=1]	0.922	3.285	0.001	0.000
[province=2]	-1.200	-4.183	0.000	0.000
[province=3]	-0.722	-2.788	0.005	0.000
[province=4]	11.022	6.641	0.000	0.000
[province=5]	3.884	15.040	0.000	0.000
[province=6]	-1.237	-4.290	0.000	0.000
[province=7]	16.393	11.978	0.000	0.000
[province=8]	2.325	7.789	0.000	0.000
[geotype=1]	0.254	1.018	0.308	0.000
[geotype=2]	-0.852	-3.482	0.000	0.000
[GENDER=1,00]	1.913	7.488	0.000	0.000
[RACE=1,00]	-0.924	-2.614	0.009	0.000
[RACE=2,00]	-10.706	-8.634	0.000	0.000
[RACE=3,00]	-19.003	-42.819	0.000	0.002
[province=1] * [geotype=1]	0.800	2.774	0.006	0.000
[province=2] * [geotype=1]	5.993	20.284	0.000	0.000
[province=2] * [geotype=2]	7.362	25.317	0.000	0.001

[province=3] * [geotype=1]	2.814	9.529	0.000	0.000
[province=3] * [geotype=2]	6.905	22.225	0.000	0.001
[province=4] * [geotype=1]	-5.941	-3.580	0.000	0.000
[province=4] * [geotype=2]	-11.582	-6.960	0.000	0.000
[province=5] * [geotype=1]	-3.812	-14.277	0.000	0.000
[province=5] * [geotype=2]	-1.287	-4.902	0.000	0.000
[province=6] * [geotype=1]	6.473	21.751	0.000	0.001
[province=6] * [geotype=2]	6.562	22.212	0.000	0.001
[province=7] * [geotype=1]	-12.088	-8.825	0.000	0.000
[province=7] * [geotype=2]	-13.436	-9.733	0.000	0.000
[province=8] * [geotype=1]	5.592	18.204	0.000	0.000
[province=8] * [geotype=2]	0.086	0.285	0.776	0.000
[province=1] * [GENDER=1,00]	-4.632	-12.946	0.000	0.000
[province=2] * [GENDER=1,00]	5.894	18.704	0.000	0.000
[province=3] * [GENDER=1,00]	-1.478	-5.278	0.000	0.000
[province=4] * [GENDER=1,00]	-10.294	-6.207	0.000	0.000
[province=5] * [GENDER=1,00]	-2.507	-9.012	0.000	0.000
[province=6] * [GENDER=1,00]	3.470	11.348	0.000	0.000
[province=7] * [GENDER=1,00]	-5.879	-27.964	0.000	0.001
[province=8] * [GENDER=1,00]	-5.309	-16.463	0.000	0.000
[province=1] * [RACE=1,00]	-6.648	-5.212	0.000	0.000
[province=1] * [RACE=2,00]	11.471	9.183	0.000	0.000
[province=2] * [RACE=1,00]	-4.656	-3.331	0.001	0.000
[province=2] * [RACE=2,00]	10.255	8.113	0.000	0.000
[province=2] * [RACE=3,00]	17.635	33.961	0.000	0.001
[province=3] * [RACE=1,00]	-5.147	-3.678	0.000	0.000
[province=3] * [RACE=2,00]	9.538	8.183	0.000	0.000
[province=4] * [RACE=1,00]	-0.726	-0.516	0.606	0.000
[province=4] * [RACE=2,00]	-1.864	-3.286	0.001	0.000
[province=5] * [RACE=1,00]	1.403	1.313	0.189	0.000
[province=5] * [RACE=2,00]	4.470	8.248	0.000	0.000
[province=5] * [RACE=3,00]	22.053	48.969	0.000	0.003
[province=6] * [RACE=1,00]	-2.115	-1.553	0.120	0.000
[province=6] * [RACE=2,00]	4.133	8.129	0.000	0.000
[province=7] * [RACE=1,00]	-6.687	-4.843	0.000	0.000
[province=7] * [RACE=2,00]	5.854	12.516	0.000	0.000
[province=7] * [RACE=3,00]	14.788	35.958	0.000	0.001
[province=8] * [RACE=1,00]	-4.277	-2.979	0.003	0.000
[geotype=1] * [GENDER=1,00]	15.126	52.617	0.000	0.003
[geotype=2] * [GENDER=1,00]	2.549	9.809	0.000	0.000
[geotype=1] * [RACE=1,00]	4.869	3.656	0.000	0.000

[geotype=1] * [RACE=2,00]	5.682	4.964	0.000	0.000
[GENDER=1,00] * [RACE=1,00]	3.181	2.553	0.011	0.000
[GENDER=1,00] * [RACE=2,00]	-0.911	-1.641	0.101	0.000
[GENDER=1,00] * [RACE=3,00]	-0.037	-0.160	0.873	0.000
[province=1] * [geotype=1] * [GENDER=1,00]	-16.223	-41.653	0.000	0.002
[province=2] * [geotype=1] * [GENDER=1,00]	-28.573	-82.706	0.000	0.008
[province=2] * [geotype=2] * [GENDER=1,00]	-14.850	-45.783	0.000	0.002
[province=3] * [geotype=1] * [GENDER=1,00]	-17.918	-51.348	0.000	0.003
[province=4] * [geotype=1] * [GENDER=1,00]	-7.142	-4.297	0.000	0.000
[province=4] * [geotype=2] * [GENDER=1,00]	13.379	8.034	0.000	0.000
[province=5] * [geotype=1] * [GENDER=1,00]	-12.864	-41.206	0.000	0.002
[province=5] * [geotype=2] * [GENDER=1,00]	0.530	1.824	0.068	0.000
[province=6] * [geotype=1] * [GENDER=1,00]	-23.922	-70.407	0.000	0.006
[province=6] * [geotype=2] * [GENDER=1,00]	-7.811	-24.569	0.000	0.001
[province=7] * [geotype=1] * [GENDER=1,00]	-11.950	-47.878	0.000	0.003
[province=8] * [geotype=1] * [GENDER=1,00]	-17.619	-49.732	0.000	0.003
[province=8] * [geotype=2] * [GENDER=1,00]	-0.200	-0.603	0.546	0.000
[province=1] * [geotype=1] * [RACE=1,00]	4.121	6.194	0.000	0.000
[province=1] * [geotype=1] * [RACE=2,00]	-6.581	-5.696	0.000	0.000
[province=2] * [geotype=1] * [RACE=2,00]	-8.022	-6.837	0.000	0.000
[province=3] * [geotype=1] * [RACE=2,00]	-5.867	-5.576	0.000	0.000
[province=5] * [geotype=1] * [RACE=1,00]	1.590	1.850	0.064	0.000
[province=1] * [GENDER=1,00] * [RACE=1,00]	4.254	10.641	0.000	0.000
[province=1] * [GENDER=1,00] * [RACE=2,00]	2.682	4.373	0.000	0.000
[province=2] * [GENDER=1,00] * [RACE=1,00]	6.127	13.462	0.000	0.000
[province=2] * [GENDER=1,00] * [RACE=2,00]	-7.090	-10.918	0.000	0.000
[province=3] * [GENDER=1,00] * [RACE=1,00]	6.225	12.561	0.000	0.000
[province=3] * [GENDER=1,00] * [RACE=2,00]	3.126	12.426	0.000	0.000
[province=4] * [GENDER=1,00] * [RACE=1,00]	-2.596	-5.290	0.000	0.000
[province=4] * [GENDER=1,00] * [RACE=2,00]	8.717	17.102	0.000	0.000
[province=5] * [GENDER=1,00] * [RACE=1,00]	-6.965	-16.707	0.000	0.000
[province=5] * [GENDER=1,00] * [RACE=2,00]	-1.412	-4.018	0.000	0.000
[province=5] * [GENDER=1,00] * [RACE=3,00]	-3.310	-12.796	0.000	0.000
[province=6] * [GENDER=1,00] * [RACE=2,00]	-2.105	-6.148	0.000	0.000
[province=7] * [GENDER=1,00] * [RACE=1,00]	3.722	9.550	0.000	0.000
[geotype=1] * [GENDER=1,00] * [RACE=1,00]	-6.870	-5.783	0.000	0.000
[geotype=1] * [GENDER=1,00] * [RACE=2,00]	1.992	3.728	0.000	0.000
[province=1] * [geotype=1] * [GENDER=1,00] * [RACE=2,00]	-1.496	-2.488	0.013	0.000

*Tests of Between-Subjects Effects*

**Figure 7: Test of Between Subject Effects RQ3a**

Source	Type III Sum of Squares	df	Mean Square	F	Si g.	Partial Eta Squared
Corrected Model	4689953,287a	100	46899.53	1453.4	0.0	0.142
Intercept	793967,891	1	793967.8	24605.	0.0	0.027
HLEA	140738,117	1	140738.1	4361.5	0.0	0.005
GM_INCOME	12773,117	1	12773.11	395.84	0.0	0
AGE	10749,614	1	10749.61	333.13	0.0	0
HIV_STATUS	17,992	1	17.992	0.558	0.4	0
province	59467,483	8	7433.435	230.36	0.0	0.002
geotype	12597,898	2	6298.949	195.20	0.0	0
GENDER	477,439	1	477.439	14.796	0.0	0
RACE	54900,471	3	18300.15	567.13	0.0	0.002
province * geotype	590664,582	15	39377.63	1220.3	0.0	0.02
province * GENDER	265256,919	8	33157.11	1027.5	0.0	0.009
province * RACE	278374,335	18	15465.24	479.27	0.0	0.01
geotype * GENDER	520,874	2	260.437	8.071	0.0	0
geotype * RACE	2876,566	2	1438.283	44.573	0.0	0
GENDER * RACE	3429,706	3	1143.235	35.43	0.0	0
province * geotype * GENDER	649723,718	13	49978.74	1548.8	0.0	0.022
province * geotype * RACE	3474,888	4	868.722	26.922	0.0	0
province * GENDER * RACE	156821,969	13	12063.22	373.84	0.0	0.006
geotype * GENDER * RACE	1631,638	2	815.819	25.283	0.0	0
province * geotype * GENDER * RACE	199,767	1	199.767	6.191	0.0	0
Error	28313214,790	8774	32,268		1	

Total	214149818,000	8775 45
Corrected Total	33003168,076	8775 44

**Research Question: 3b and 3c**

*Tests of Between-Subjects Effects*

**Figure 19:** *Test of Between Subject Effects RQ3b and RQ3c*

Predictors Psych Distress	MS	S.Err	F	Sig.	Variance
Gender	209.4316	0.005	39051.85	<.001	25.287%
Race	66.47651	0.005	12395.6	<.001	24.374%
Province	94.91723	0.005	17698.83	<.001	55.099%
Geotype	0.061471	0.005	11.46222	<.001	0.020%
Recent_Illicit_Substance_Use	23.76969	0.005	482.677	<.001	3.699%
Exposure IPV	20.94654	0.005	103953	<.001	3.274%
Income	197.9489	0.005	34096.94	<.001	88.476%
Education	0.120098	0.005	610.135	<.001	0.019%
Geographic Factors (Province * Geolocation)	139.7968	0.005	32030.09	<.001	67.033%
Demographic Factors (Race * Gender)	80.26002	0.005	7336.776	<.001	20.598%
Geographic * Demographic * Risky Drinking	5.854597	0.005	29792.68	<.001	1.857%
Geographic * Demographic * Drug Use	26.643	0.005	4968.011	<.001	7.929%
Age	25.18818	0.005	4696.737	<.001	3.911%
Intercept	0.010062	0.392	0.025677	0.890233	1.546%

Notes. DV: Psychological Distress, a R Squared = ,142 (Adjusted R Squared = ,142) b Computed using alpha = ,05

*Parameter Estimates*

**Figure 80:** *Parameter Estimates RQ2b and 2c*

Parameter: K10 RQ3	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
[GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3] * [Recent_Illicit_Substance_ Use=2]	2.2 2	,008	287,18 3	<,00 1	2,207	2,237	,417
[GENDER=1] * [RACE=3] * [PROV=9] * [GEOTYPE=3] *	1.7 5	,011	153,91 7	<,00 1	1,727	1,772	,170

[Recent_Illicit_Substance_Use=1]							
[GM_INCOME=0]	1.56	,008	187,006	<,001	1,544	1,576	,233
[GENDER=1] * [RACE=4] * [PROV=6] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	1.56	,008	191,198	<,001	1,541	1,573	,241
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=2]	1.43	,006	223,805	<,001	1,421	1,446	,303
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=2] * [Recent_Illicit_Substance_Use=1]	1.40	,007	194,508	<,001	1,381	1,409	,247
[GENDER=2] * [RACE=3] * [PROV=5] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=2]	1.21	,007	172,305	<,001	1,195	1,222	,205
[GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	1.20	,006	204,927	<,001	1,192	1,215	,267
[GM_INCOME=700]	-1.18	,009	-126,640	<,001	-1,197	-1,160	,122
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=2] * [Recent_Illicit_Substance_Use=2]	1.15	,005	229,184	<,001	1,138	1,158	,313
[GM_INCOME=1000]	1.12	,007	157,848	<,001	1,103	1,130	,178
[GM_INCOME=360]	-1.09	,005	-217,799	<,001	-1,099	-1,079	,291
[GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	1.08	,005	230,957	<,001	1,074	1,092	,316
[GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=1] *	1.04	,004	257,048	<,001	1,028	1,043	,364

[Recent_Illicit_Substance_Use=2]							
[RISKYDRINKING=1] *	-		-				
[GENDER=1] *	1.0	,008	123,57	<,00	-1,022	-,990	,117
[RACE=3] * [PROV=9] *	1		9	1			
[GEOTYPE=3]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=9] *							
[GEOTYPE=3]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=9] *							
[GEOTYPE=2]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=8] *							
[GEOTYPE=3]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=8] *							
[GEOTYPE=1]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=6] *							
[GEOTYPE=2]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=6] *							
[GEOTYPE=1]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=4] *							
[GEOTYPE=3]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=4] *							
[GEOTYPE=1]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=3] *							
[GEOTYPE=3]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=1] *							
[GEOTYPE=1]							
[RISKYDRINKING=2] *							
[GENDER=2] *	0a	.	.	.	.	.	.
[RACE=3] * [PROV=7] *							
[GEOTYPE=1]							

[RISKYDRINKING=2] *						
[GENDER=2] *						
[RACE=3] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2] *						
[GENDER=2] *						
[RACE=3] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2] *						
[GENDER=2] *						
[RACE=3] * [PROV=2] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=2] *						
[GENDER=2] *						
[RACE=2] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2] *						
[GENDER=1] *						
[RACE=4] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2] *						
[GENDER=1] *						
[RACE=4] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=2] *						
[GENDER=1] *						
[RACE=3] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2] *						
[GENDER=1] *						
[RACE=3] * [PROV=7] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=2]	0a	.	.	.	.	.
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=2]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=8] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=8] *	0a	.	.	.	.	.
[GEOTYPE=2]						

[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=7] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=4] *	0a	.	.	.	.	.
[GEOTYPE=2]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=4] * [PROV=2] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=3] * [PROV=7] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=3] * [PROV=6] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=3] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=3] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=3] * [PROV=2] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=1] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=1] * [PROV=7] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RACE=1] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=2] *						
[RISKYDRINKING=1] *	0a	.	.	.	.	.
[GENDER=2] *						

[RACE=1] * [PROV=3] *						
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=9] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=8] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=7] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=6] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=2]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=1]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=4] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=4] * [PROV=2] *	0a	.	.	.	.	.
[GEOTYPE=2]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=3] * [PROV=3] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1] *						
[GENDER=1] *						
[RACE=2] * [PROV=5] *	0a	.	.	.	.	.
[GEOTYPE=3]						
[RISKYDRINKING=1]	0a	.	.	.	.	.
[RACE=4]	0a	.	.	.	.	.
[RACE=3]	0a	.	.	.	.	.
[RACE=2]	0a	.	.	.	.	.

[RACE=1]	0a	.	.	.	.	.	.
[PROV=9] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=9] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[PROV=9] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=9]	0a	.	.	.	.	.	.
[PROV=8] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=8] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[PROV=8] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=8]	0a	.	.	.	.	.	.
[PROV=7] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=7] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=7]	0a	.	.	.	.	.	.
[PROV=6] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=6] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[PROV=6] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=6]	0a	.	.	.	.	.	.
[PROV=5] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=5] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[PROV=5] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=5]	0a	.	.	.	.	.	.
[PROV=4] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=4] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[PROV=4] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=4]	0a	.	.	.	.	.	.
[PROV=3] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=3] *	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=3]	0a	.	.	.	.	.	.
[PROV=2] *	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[PROV=2] *	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.

[PROV=2] *	0a	.	.	.	.	.	.
[GEOTYPE=1]							
[PROV=2]	0a	.	.	.	.	.	.
[PROV=1] *							
[GEOTYPE=1]	0a	.	.	.	.	.	.
[PROV=1]	0a	.	.	.	.	.	.
[IPVEBinary=2]	0a	.	.	.	.	.	.
[GM_INCOME=9000]	0a	.	.	.	.	.	.
[GM_INCOME=7000]	0a	.	.	.	.	.	.
[GM_INCOME=500]	0a	.	.	.	.	.	.
[GM_INCOME=4500]	0a	.	.	.	.	.	.
[GM_INCOME=450]	0a	.	.	.	.	.	.
[GM_INCOME=400]	0a	.	.	.	.	.	.
[GM_INCOME=370]	0a	.	.	.	.	.	.
[GM_INCOME=3200]	0a	.	.	.	.	.	.
[GM_INCOME=300]	0a	.	.	.	.	.	.
[GM_INCOME=2700]	0a	.	.	.	.	.	.
[GM_INCOME=2600]	0a	.	.	.	.	.	.
[GM_INCOME=2300]	0a	.	.	.	.	.	.
[GM_INCOME=20000]	0a	.	.	.	.	.	.
[GM_INCOME=200]	0a	.	.	.	.	.	.
[GM_INCOME=14000]	0a	.	.	.	.	.	.
[GM_INCOME=13000]	0a	.	.	.	.	.	.
[GM_INCOME=1200]	0a	.	.	.	.	.	.
[GM_INCOME=10000]	0a	.	.	.	.	.	.
[GM_INCOME=100]	0a	.	.	.	.	.	.
[GEOTYPE=3]	0a	.	.	.	.	.	.
[GEOTYPE=2]	0a	.	.	.	.	.	.
[GEOTYPE=1]	0a	.	.	.	.	.	.
[Recent_Illicit_Substance_							
Use=2]	0a	.	.	.	.	.	.
[Recent_Illicit_Substance_							
Use=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] *							
[Recent_Illicit_Substance_							
Use=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=1] *							
[Recent_Illicit_Substance_							
Use=2]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] *							
[Recent_Illicit_Substance_							
Use=1]	0a	.	.	.	.	.	.
[RISKYDRINKING=2] *							
[Recent_Illicit_Substance_							
Use=2]	0a	.	.	.	.	.	.
[GENDER=2] *							
[RACE=4] * [PROV=9] *							
[GEOTYPE=3] *	0a	.	.	.	.	.	.
[Recent_Illicit_Substance_							
Use=1]							

[GENDER=2] * [RACE=4]	0a	.	.	.	.	.	.
[GENDER=2] * [RACE=3]	0a	.	.	.	.	.	.
[GENDER=2] * [RACE=2]	0a	.	.	.	.	.	.
[GENDER=2] * [RACE=1]	0a	.	.	.	.	.	.
[GENDER=2] [GENDER=1] *	0a	.	.	.	.	.	.
[RACE=4] [GENDER=1] *	0a	.	.	.	.	.	.
[RACE=3] [GENDER=1] *	0a	.	.	.	.	.	.
[RACE=2] [GENDER=1]	0a	.	.	.	.	.	.
[GENDER=1] *	0a	.	.	.	.	.	.
[RACE=4] * [PROV=7] * [GEOTYPE=3] *	0.9 7	,004	239,57 8	<,00 1	,958	,974	,332
[Recent_Illicit_Substance_Use=1] [GENDER=1] * [RACE=4] * [PROV=5] * [GEOTYPE=2] *	0.9 3	,006	158,21 7	<,00 1	,916	,939	,178
[Recent_Illicit_Substance_Use=1] [GM_INCOME=900]	- 0.9 2	,015	- 60,788	<,00 1	-,947	-,888	,031
[GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=2] *	0.9 1	,007	137,35 4	<,00 1	,901	,927	,141
[Recent_Illicit_Substance_Use=1] [GENDER=1] * [RACE=4] * [PROV=9] * [GEOTYPE=3] *	0.8 7	,004	229,80 2	<,00 1	,866	,881	,314
[Recent_Illicit_Substance_Use=1] [GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3] *	0.8 7	,010	85,120	<,00 1	,845	,885	,059
[Recent_Illicit_Substance_Use=1] [RISKYDRINKING=1] * [GENDER=1] * [RACE=3] * [PROV=7] *	0.8 5	,010	87,862	<,00 1	,829	,866	,063
[GEOTYPE=3] [GENDER=1] * [RACE=4] * [PROV=9] *	0.8 2	,004	195,29 9	<,00 1	,811	,827	,248

[GEOTYPE=3] * [Recent_Illicit_Substance_Use=2] [GENDER=2] * [RACE=1] * [PROV=9] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1] [RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3] [GENDER=1] * [RACE=3] * [PROV=3] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.8 1	,003	242,43 7	<,00 1	,800	,813	,337
[GM_INCOME=380] [GENDER=2] * [RACE=4] * [PROV=6] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	0.7 8	,011	73,245	<,00 1	,763	,805	,044
[GM_INCOME=2100] [GENDER=2] * [RACE=3] * [PROV=2] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1] [GENDER=2] * [RACE=3] * [PROV=2] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=2] [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=2] [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=2] * [Recent_Illicit_Substance_Use=1]	0.7 5 0 0.6 5 0.6 2 0.5 6 0.4 9	,009 ,007 ,007 ,012 ,007 ,007 ,009 ,008	- 84,491 - 106,95 8 - 96,447 - 54,107 - 85,530 59,696 64,423	<,00 1 <,00 1 <,00 1 <,00 1 <,00 1 <,00 1	-,763 ,722 -,710 ,678 ,610 ,540 ,472	-,729 ,749 -,681 -,630 ,638 ,577 ,502	,058 ,090 ,075 ,025 ,060 ,030 ,035

[GM_INCOME=6500]	-						
	0.4	,008	-	<,00	-,496	-,466	,032
	8		62,134	1			
[GM_INCOME=1500]	0.4	,008	-	<,00	,456	,490	,026
	7		55,676	1			
[GENDER=2] *							
[RACE=1] * [PROV=3] *	-						
[GEOTYPE=3] *	0.4	,010	-	<,00	-,489	-,452	,020
[Recent_Illicit_Substance_	7		49,108	1			
Use=1]							
[RISKYDRINKING=1] *	-						
[GENDER=2] *	0.4	,010	-	<,00	-,484	-,445	,018
[RACE=2] * [PROV=5] *	7		46,188	1			
[GEOTYPE=3]							
[GENDER=2] *							
[RACE=4] * [PROV=6] *	0.4	,007	-	<,00	,444	,473	,033
[GEOTYPE=2] *	6		62,770	1			
[Recent_Illicit_Substance_							
Use=2]							
[GM_INCOME=1600]	-						
	0.4	,007	-	<,00	-,418	-,389	,026
	0		56,028	1			
[GENDER=2] *							
[RACE=1] * [PROV=5] *	0.3	,005	-	<,00	,355	,375	,043
[GEOTYPE=3] *	7		71,686	1			
[Recent_Illicit_Substance_							
Use=2]							
[GM_INCOME=2500]	0.3	,007	-	<,00	,329	,358	,019
	4		46,725	1			
[GENDER=2] *							
[RACE=4] * [PROV=1] *	0.3	,008	-	<,00	,321	,354	,014
[GEOTYPE=1] *	4		40,515	1			
[Recent_Illicit_Substance_							
Use=1]							
[GENDER=2] *							
[RACE=3] * [PROV=6] *	0.3	,008	-	<,00	,310	,340	,016
[GEOTYPE=3] *	3		42,666	1			
[Recent_Illicit_Substance_							
Use=2]							
[IPVEBinary=1]	-						
	0.2	,005	-	<,00	-,299	-,280	,033
	9		62,497	1			
[GM_INCOME=2400]	-						
	0.2	,008	-	<,00	-,303	-,270	,010
	9		34,287	1			
[GENDER=2] *							
[RACE=4] * [PROV=8] *	0.2	,007	-	<,00	,262	,289	,014
[GEOTYPE=3] *	8		39,883	1			
[Recent_Illicit_Substance_							
Use=1]							

[GM_INCOME=800]	0.2 7	,005	49,437	<,00 1	,260	,282	,021
[GM_INCOME=3000]	0.2 7	,006	44,999	<,00 1	,259	,283	,017
[RISKYDRINKING=1] * [GENDER=1] * [RACE=4] * [PROV=3] * [GEOTYPE=1] [GENDER=1] * [RACE=4] * [PROV=6] * [GEOTYPE=3] *	0.2 6	,010	26,868	<,00 1	,243	,282	,006
[Recent_Illicit_Substance_Use=2] [GENDER=2] * [RACE=1] * [PROV=7] * [GEOTYPE=3] *	0.2 6	,009	30,157	<,00 1	,245	,279	,008
[Recent_Illicit_Substance_Use=1] [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3] *	0.2 6	,006	44,901	<,00 1	,245	,267	,017
[Recent_Illicit_Substance_Use=1] [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=3] *	0.2 5	,008	- 29,549	<,00 1	-,264	-,231	,008
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=3] [GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=1] *	0.2 3	,005	49,202	<,00 1	,223	,242	,021
[Recent_Illicit_Substance_Use=2] [GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=3] *	0.2 3	,005	43,738	<,00 1	,220	,241	,016
[Recent_Illicit_Substance_Use=1] [GENDER=2] * [RACE=2] * [PROV=5] * [GEOTYPE=3] *	0.2 2	,007	30,881	<,00 1	,203	,231	,008
[Recent_Illicit_Substance_Use=2] [GM_INCOME=1700] [GENDER=1] * [RACE=4] * [PROV=2] * [GEOTYPE=2] *	0.2 1	,007	28,311	<,00 1	,194	,223	,007
[Recent_Illicit_Substance_Use=1] [GM_INCOME=1700] [GENDER=1] * [RACE=4] * [PROV=2] * [GEOTYPE=2] *	0.2 0	,010	20,477	<,00 1	,184	,223	,004
[Recent_Illicit_Substance_Use=1]	0.2 0	,009	- 22,298	<,00 1	-,217	-,182	,004

[GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	0.1 9	,007	26,783	<,00 1	,173	,201	,006
[GENDER=2] * [RACE=1] * [PROV=7] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=2]	- 0.1 8	,004	- 42,465	<,00 1	-,189	-,173	,015
[GM_INCOME=2060]	- 0.1 8	,012	- 15,043	<,00 1	-,202	-,156	,002
[GM_INCOME=2450]	0.1 7	,005	34,308	<,00 1	,161	,180	,010
[GENDER=1] * [RACE=3] * [PROV=7] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.1 7	,008	21,260	<,00 1	,155	,187	,004
Intercept	- 0.1 7	,021	-7,885	<,00 1	-,210	-,126	,001
[GENDER=1] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.1 6	,007	24,038	<,00 1	,149	,176	,005
[GM_INCOME=3500]	0.1 6	,009	17,143	<,00 1	,143	,180	,003
[GM_INCOME=6000]	- 0.1 5	,007	- 22,230	<,00 1	-,165	-,138	,004
[GENDER=2] * [RACE=4] * [PROV=7] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	- 0.1 5	,004	- 37,955	<,00 1	-,157	-,142	,012
[GM_INCOME=2000]	0.1 5	,008	19,021	<,00 1	,131	,161	,003
[GENDER=2] * [RACE=4] * [PROV=2] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	- 0.1 3	,003	- 46,593	<,00 1	-,137	-,126	,018
[GENDER=2] * [RACE=4] * [PROV=9] * [GEOTYPE=2] * [Recent_Illicit_Substance_Use=2]	- 0.1 3	,005	- 25,076	<,00 1	-,137	-,117	,005

[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.1 3	,006	- 21,095	<,00 1	-,139	-,115	,004
[GM_INCOME=2800]	0.1 3	,010	13,206	<,00 1	,108	,145	,002
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=2]	0.1 2	,009	12,898	<,00 1	,103	,140	,001
[GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	0.1 2	,008	13,799	<,00 1	,100	,134	,002
[GENDER=2] * [RACE=3] * [PROV=3] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=2]	0.1 1	,008	14,314	<,00 1	,094	,123	,002
[GM_INCOME=4000]	0.1 1	,009	12,324	<,00 1	,090	,124	,001
[GM_INCOME=650]	0.1 0	,008	13,227	<,00 1	,086	,116	,002
[GM_INCOME=1900]	0.0 8	,005	14,452	<,00 1	,067	,089	,002
[GENDER=2] * [RACE=4] * [PROV=3] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	0.0 8	,004	17,539	<,00 1	,068	,085	,003
[GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=2]	0.0 7	,004	18,898	<,00 1	,060	,074	,003
AGE	0.0 5	,001	68,533	<,00 1	,053	,056	,039
[GENDER=2] * [RACE=3] * [PROV=7] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.0 4	,006	7,764	<,00 1	,033	,056	,001
[GENDER=1] * [RACE=2] * [PROV=5] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.0 4	,005	8,770	<,00 1	,033	,052	,001

[GENDER=1] * [RACE=4] * [PROV=8] * [GEOTYPE=3] * [Recent_Illicit_Substance_Use=1]	0.0 4	,004	9,095	<,00 1	,028	,043	,001
[GENDER=2] * [RACE=4] * [PROV=4] * [GEOTYPE=2] * [Recent_Illicit_Substance_Use=1]	- 0.0 2	,004	-4,371	<,00 1	-,027	-,010	,000
[GM_INCOME=5000]	0.0 1	,007	2,036	,042	,001	,027	,000
[RISKYDRINKING=1] * [GENDER=2] * [RACE=4] * [PROV=8] * [GEOTYPE=1]	,00 7	,010	,713	,476	-,013	,028	,000
[GENDER=1] * [RACE=4] * [PROV=3] * [GEOTYPE=1] * [Recent_Illicit_Substance_Use=1]	,00 5	,003	1,474	,141	-,002	,012	,000
HLEA	0.0 0	,001	4,732	<,00 1	,002	,006	,000

a This parameter is set to zero because it is redundant.

### Research Question: 3d

#### Parameter Estimates

Figure 21: Parameter Estimates

Dependent Variable	Predictor	B	Std. Error	t	Sig.	Partial Eta Squared
Psychological Distress (Scale)	[GENDER=1,00]	6.3426	0.36782	17.243	1.34E-66	0.000976902
		57	592	64		
Psychological Distress (Scale)	[GENDER=1,00] * [geotype=1]	2.2594	0.37361	6.0474	1.47E-09	0.000120255
		2	815	1		
Psychological Distress (Scale)	[GENDER=1,00] * [geotype=1] * [province=2]	9.1630	0.19575	46.808	0	0.007154111
		2	394	9		
Psychological Distress (Scale)	[GENDER=1,00] * [geotype=1] * [province=6]	0.4753	0.23233	2.0457	0.0407	1.37632E-05
		1	892	5	81	
Psychological Distress (Scale)	[GENDER=1,00] * [geotype=1] * [province=7]	6.6027	0.30505	21.644	8.1E-104	0.001538358
		8	117	83	104	
Psychological Distress (Scale)	[GENDER=1,00] * [geotype=2]	0.0730	0.34940	0.2091	0.8343	1.43896E-07
		9	403	8	1	
Psychological Distress (Scale)	[GENDER=1,00] * [province=1]	4.3152	0.26497	16.285	1.33E-59	0.000871435
		8	883	4	59	

Psychological Distress (Scale)	[GENDER=1,00] * [province=2]	4.0771 4	0.16705 713	24.405 7	2E- 131	0.001955011
Psychological Distress (Scale)	[GENDER=1,00] * [province=3]	6.0928 1	0.39697 187	15.348 2	3.81E- 53	0.000774101
Psychological Distress (Scale)	[GENDER=1,00] * [province=4]	1.9265 33	0.42004 239	4.5865 2	4.51E- 06	6.91758E-05
Psychological Distress (Scale)	[GENDER=1,00] * [province=5]	2.3463 3	0.21068 328	11.136 8	8.41E- 29	0.000407718
Psychological Distress (Scale)	[GENDER=1,00] * [province=6]	13.136 6	0.19088 088	68.821 1	0	0.015337273
Psychological Distress (Scale)	[GENDER=1,00] * [province=7]	12.408 2	0.29589 168	41.934 9	0	0.005749969
Psychological Distress (Scale)	[GENDER=1,00] * [province=8]	8.1505 3	0.15370 051	53.028 6	0	0.009163063
Psychological Distress (Scale)	[geotype=1]	6.1349 79	0.38188 056	16.065 18	4.73E- 58	0.000848048
Psychological Distress (Scale)	[geotype=1] * [province=1]	12.789 2	0.48534 972	26.350 6	7.5E- 153	0.00227828
Psychological Distress (Scale)	[geotype=1] * [province=2]	4.5700 27	0.30133 453	15.165 96	6.21E- 52	0.000755839
Psychological Distress (Scale)	[geotype=1] * [province=3]	4.1007 7	0.17963 201	22.828 7	3E- 115	0.001710951
Psychological Distress (Scale)	[geotype=1] * [province=4]	0.0781 7	0.17361 883	0.4502 3	0.6525 44	6.66638E-07
Psychological Distress (Scale)	[geotype=1] * [province=5]	21.948 4	1.34252 167	16.348 7	4.72E- 60	0.000878215
Psychological Distress (Scale)	[geotype=1] * [province=6]	2.2965 3	0.25538 072	8.9925 6	2.43E- 19	0.00026587
Psychological Distress (Scale)	[geotype=1] * [province=7]	0.0291 34	0.31458 48	0.0926 11	0.9262 13	2.82061E-08
Psychological Distress (Scale)	[geotype=2]	4.9508 3	0.39711 091	12.467 12	1.15E- 35	0.000510891
Psychological Distress (Scale)	[geotype=2] * [province=2]	2.7537 9	0.30054 511	9.1626 6	5.09E- 20	0.000276021
Psychological Distress (Scale)	[geotype=2] * [province=4]	0.6262 8	0.24825 481	2.5227 4	0.0116 45	2.09293E-05
Psychological Distress (Scale)	[geotype=2] * [province=6]	1.4386 3	0.23614 085	6.0922 6	1.11E- 09	0.000122046
Psychological Distress (Scale)	[geotype=2] * [province=8]	5.4620 9	0.22491 984	24.284 6	3.8E- 130	0.001935701
Psychological Distress (Scale)	[province=1]	14.691 34	0.50706 396	28.973 34	2.5E- 184	0.002753073
Psychological Distress (Scale)	[province=2]	3.1051 51	0.33068 342	9.3901 02	6.03E- 21	0.00028989
Psychological Distress (Scale)	[province=3]	4.2431 43	0.42678 445	9.9421 22	2.75E- 23	0.000324964

Psychological Distress (Scale)	[province=4]	-	0.47093	1.5779	0.1145	
Psychological Distress (Scale)	[province=5]	0.7431	58	2	86	8.1881E-06
Psychological Distress (Scale)	[province=6]	21.096	1.35220	15.601	7.47E-	
Psychological Distress (Scale)	[province=7]	49	674	52	55	0.000799842
Psychological Distress (Scale)	[province=8]	12.498	0.29013	43.076	0	0.006065426
Psychological Distress (Scale)	[RACE=1,00]	2	79	74	0	
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00]	6.1961	0.22298	27.787	1E-	
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=1]	77	798	05	169	0.002532802
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	6.8864	0.26002	26.484	2.2E-	
Psychological Distress (Scale)	[RACE=1,00] * [geotype=1]	53	068	25	154	0.002301403
Psychological Distress (Scale)	[RACE=1,00] * [province=1]	-	0.59804	3.8126	0.0001	
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=1]	2.2801	204	1	38	4.78016E-05
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	-	0.24732	43.720	0	
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	10.813	2	707	2	0.006246847
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	7.0729	0.33067	21.389	2E-	
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	72	666	39	101	0.001502318
Psychological Distress (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	15.098	0.60223	25.070	1.4E-	
Psychological Distress (Scale)	[RACE=1,00] * [geotype=1]	5	091	95	138	0.002062826
Psychological Distress (Scale)	[RACE=1,00] * [geotype=1]	12.078	0.50791	23.781	6.8E-	
Psychological Distress (Scale)	[RACE=1,00] * [province=1]	91	42	39	125	0.001856459
Psychological Distress (Scale)	[RACE=1,00] * [province=1]	-	0.31729	26.997	2.5E-	
Psychological Distress (Scale)	[RACE=1,00] * [province=2]	8.5660	8	414	3	0.002391212
Psychological Distress (Scale)	[RACE=1,00] * [province=2]	1.8115	0.41213	4.3955	1.11E-	
Psychological Distress (Scale)	[RACE=1,00] * [province=3]	68	705	48	05	6.35355E-05
Psychological Distress (Scale)	[RACE=1,00] * [province=3]	-	0.59675	19.227	2.43E-	
Psychological Distress (Scale)	[RACE=1,00] * [province=4]	11.474	3	325	8	0.001214365
Psychological Distress (Scale)	[RACE=1,00] * [province=4]	0.5822	0.41598	1.3997	0.1615	
Psychological Distress (Scale)	[RACE=1,00] * [province=5]	8	517	61	86	6.44352E-06
Psychological Distress (Scale)	[RACE=1,00] * [province=5]	0.4973	0.33284	1.4943	0.1350	
Psychological Distress (Scale)	[RACE=1,00] * [province=7]	8	345	4	88	7.34367E-06
Psychological Distress (Scale)	[RACE=1,00] * [province=7]	0.1702	0.39609	0.4298	0.6673	
Psychological Distress (Scale)	[RACE=2,00]	62	965	47	07	6.07639E-07
Psychological Distress (Scale)	[RACE=2,00]	6.1101	0.37468	16.307	9.24E-	
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00]	4	008	62	60	0.000873815
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00]	-	0.18615	21.656	6.3E-	
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=3]	4.0315	7	61	9	0.001540075
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=3]	3.7781	0.47451	7.9620	1.7E-	
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=5]	55	828	85	15	0.00020844
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=5]	0.3551	0.48980	0.7250	0.4684	
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=6]	34	554	51	21	1.72884E-06
Psychological Distress (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=6]	10.643	0.44056	24.159	7.8E-	
Psychological Distress (Scale)	[RACE=2,00] * [geotype=1]	86	494	56	129	0.001915857
Psychological Distress (Scale)	[RACE=2,00] * [geotype=1]	-	0.35831	13.742	5.85E-	
Psychological Distress (Scale)	[RACE=2,00] * [geotype=1] * [province=1]	4.9240	3	581	2	0.000620666
Psychological Distress (Scale)	[RACE=2,00] * [geotype=1] * [province=1]	16.577	0.60623	27.345	1.9E-	
Psychological Distress (Scale)	[RACE=2,00] * [province=1]	95	216	87	164	0.00245321
Psychological Distress (Scale)	[RACE=2,00] * [province=1]	-	0.61594	26.563	2.7E-	
Psychological Distress (Scale)	[RACE=2,00] * [province=2]	16.361	7	755	4	0.00231515
Psychological Distress (Scale)	[RACE=2,00] * [province=2]	-	0.48507	7.2416	4.44E-	
Psychological Distress (Scale)	[RACE=2,00] * [province=2]	3.5127	4	405	6	0.000172433

Psychological Distress (Scale)		-	-	-	-	-
	[RACE=2,00] * [province=3]	2.5600	0.44643	5.7344	9.79E-09	0.000108132
Psychological Distress (Scale)		1.1678	0.40418	2.8895	0.0038	
	[RACE=2,00] * [province=5]	99	07	46	58	2.74578E-05
Psychological Distress (Scale)		4.6275	0.23132	20.004	5.76E-09	
	[RACE=2,00] * [province=6]	1	484	4	89	0.001314305
Psychological Distress (Scale)		2.5288	0.38937	6.4946	8.34E-11	
	[RACE=3,00]	4	47	1	11	0.000138696
Psychological Distress (Scale)		1.5248	0.25595	5.9573	2.57E-09	
	[RACE=3,00] * [GENDER=1,00]	2	556	8	09	0.000116702
Psychological Distress (Scale)		6.1752	0.32596	18.944	5.44E-08	
	[RACE=3,00] * [province=5]	77	404	66	80	0.001178906
Psychological Distress (Scale)		0.0002	3.2959E-06	79.773	0	
	GM_INCOME	63	06	41	0	0.020499295
Psychological Distress (Scale)		0.2794	0.04779	5.8464	5.03E-09	
	HIV_STATUS	4	635	63	09	0.000112397
Psychological Distress (Scale)		0.9754	0.00700	-	-	
	HLEA	3	585	139.23	0	0.059929979
Psychological Distress (Scale)		15.035	0.43402	34.643	1.9E-06	
	Intercept	92	402	06	262	0.003931331
Risky Alcohol Use (Scale)		22.960	0.35010	65.581	-	
	Intercept	57	625	72	0	0.013947094
Risky Alcohol Use (Scale)		-	0.00565	81.893	-	
	HLEA	0.4628	128	1	0	0.02157932
Risky Alcohol Use (Scale)		4.3701	0.03855	113.34	0	
	HIV_STATUS	07	501	73	0	0.040538527
Risky Alcohol Use (Scale)		2.86E-05	2.6587E-06	10.775	4.53E-27	
	GM_INCOME	05	06	72	27	0.00038172
Risky Alcohol Use (Scale)		6.1960	0.48241	12.843	9.51E-09	
	[RACE=1,00]	7	167	9	38	0.000542224
Risky Alcohol Use (Scale)		15.454	0.30223	51.133	0	
	[RACE=2,00]	41	635	54	0	0.00852533
Risky Alcohol Use (Scale)		5.5357	0.31408	17.624	1.72E-09	
	[RACE=3,00]	68	979	79	69	0.001020522
Risky Alcohol Use (Scale)		1.3727	0.29670	4.6265	3.72E-06	
	[GENDER=1,00]	46	743	97	06	7.039E-05
Risky Alcohol Use (Scale)		-	0.30804	11.648	2.38E-03	
	[geotype=1]	3.5882	463	3	31	0.000446017
Risky Alcohol Use (Scale)		7.6300	0.32033	23.819	2.8E-12	
	[geotype=2]	3	022	3	125	0.001862365
Risky Alcohol Use (Scale)		0.7273	0.40902	1.7782	0.0753	
	[province=1]	5	405	5	64	1.03992E-05
Risky Alcohol Use (Scale)		8.5441	0.26674	32.031	9.6E-22	
	[province=2]	7	637	1	225	0.003362775
Risky Alcohol Use (Scale)		6.5988	0.34426	19.167	7.68E-09	
	[province=3]	6	643	9	82	0.001206817
Risky Alcohol Use (Scale)		20.359	0.37988	-	0	
	[province=4]	7	12	53.595	0	0.009357997

Risky Alcohol Use (Scale)	[province=5]	5.5607 9	1.09075 997	5.0980 9	3.43E- 07	8.54665E-05
Risky Alcohol Use (Scale)	[province=6]	16.393 9	0.23404 025	70.047 2	0	0.01587988
Risky Alcohol Use (Scale)	[province=7]	1.0676 82	0.17987 365	5.9357 32	2.93E- 09	0.000115855
Risky Alcohol Use (Scale)	[province=8]	8.0340 3	0.20974 614	38.303 6	0	0.004801827
Risky Alcohol Use (Scale)	[RACE=1,00] * [GENDER=1,00]	18.870 6	0.19950 682	- 94.586	0	0.028581074
Risky Alcohol Use (Scale)	[RACE=2,00] * [GENDER=1,00]	7.8872 1	0.15016 315	52.524 3	0	0.008991148
Risky Alcohol Use (Scale)	[RACE=3,00] * [GENDER=1,00]	13.491 6	0.20646 701	65.345 2	0	0.013848058
Risky Alcohol Use (Scale)	[RACE=1,00] * [geotype=1]	5.0650 82	0.40970 989	12.362 61	4.25E- 35	0.000502365
Risky Alcohol Use (Scale)	[RACE=2,00] * [geotype=1]	12.753 1	0.28903 608	44.122 8	0	0.006361683
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=1]	3.6121 2	0.25594 588	14.112 8	3.27E- 45	0.000654577
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=2]	18.480 96	0.33245 108	55.590 02	0	0.010060514
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=3]	2.3432 53	0.48137 207	4.8678 62	1.13E- 06	7.79221E-05
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=4]	16.834 45	0.33555 517	50.168 93	0	0.008209328
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=5]	5.4281 2	0.26848 876	20.217 31	7.91E- 91	0.001342398
Risky Alcohol Use (Scale)	[RACE=1,00] * [province=7]	14.834 01	0.31951 449	46.426 72	0	0.0070386
Risky Alcohol Use (Scale)	[RACE=2,00] * [province=1]	22.339 1	0.49685 518	44.960 9	0	0.00660406
Risky Alcohol Use (Scale)	[RACE=2,00] * [province=2]	9.2264 9	0.39128 584	23.579 9	8E- 123	0.001825194
Risky Alcohol Use (Scale)	[RACE=2,00] * [province=3]	2.9770 8	0.36011 991	8.2669 2	1.38E- 16	0.000224702
Risky Alcohol Use (Scale)	[RACE=2,00] * [province=5]	0.3984 7	0.32603 308	1.2221 9	0.2216 38	4.91236E-06
Risky Alcohol Use (Scale)	[RACE=2,00] * [province=6]	1.8415 16	0.18659 859	9.8688 63	5.73E- 23	0.000320194
Risky Alcohol Use (Scale)	[RACE=3,00] * [province=5]	5.0151 4	0.26293 947	19.073 4	4.69E- 81	0.001194958
Risky Alcohol Use (Scale)	[GENDER=1,00] * [geotype=1]	2.1638 63	0.30137 974	7.1798 55	6.99E- 13	0.000169502
Risky Alcohol Use (Scale)	[GENDER=1,00] * [geotype=2]	2.3015 7	0.28184 738	8.1660 2	3.2E- 16	0.000219252
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=1]	6.6430 02	0.21374 564	31.079 211	1E- 211	0.003166465

Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=2]	0.0127 02	0.13475 693	0.0942 61	0.9249 02	2.922E-08
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=3]	2.1824 1	0.32021 806	- 6.8154	9.42E- 12	0.000152733
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=4]	11.616 99	0.33882 794	34.285 8	4E- 257	0.003850975
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=5]	11.682 16	0.16994 804	68.739 58	0	0.01530153
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=6]	9.7900 47	0.15397 44	63.582 3	0	0.013120623
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=7]	1.7160 36	0.23868 155	7.1896 46	6.51E- 13	0.000169965
Risky Alcohol Use (Scale)	[GENDER=1,00] * [province=8]	0.2420 4	0.12398 279	1.9522 4	0.0509 11	1.25337E-05
Risky Alcohol Use (Scale)	[geotype=1] * [province=1]	3.2890 7	0.39150 821	8.4010 1	4.45E- 17	0.000232049
Risky Alcohol Use (Scale)	[geotype=1] * [province=2]	5.3975 53	0.24307 203	22.205 57	3.7E- 109	0.001618967
Risky Alcohol Use (Scale)	[geotype=1] * [province=3]	0.5714 6	0.14490 048	3.9437 8	8.02E- 05	5.11472E-05
Risky Alcohol Use (Scale)	[geotype=1] * [province=4]	0.7650 56	0.14004 993	5.4627 4	4.69E- 08	9.81288E-05
Risky Alcohol Use (Scale)	[geotype=1] * [province=5]	2.3526 1	1.08294 748	2.1724 1	0.0298 25	1.55202E-05
Risky Alcohol Use (Scale)	[geotype=1] * [province=6]	11.572 31	0.20600 331	56.175 35	0	0.010271303
Risky Alcohol Use (Scale)	[geotype=1] * [province=7]	6.8679 6	0.25376 039	27.064 7	4E- 161	0.002403149
Risky Alcohol Use (Scale)	[geotype=2] * [province=2]	6.4305 44	0.24243 524	26.524 79	7.5E- 155	0.002308437
Risky Alcohol Use (Scale)	[geotype=2] * [province=4]	12.415 18	0.20025 518	61.996 78	0	0.01248248
Risky Alcohol Use (Scale)	[geotype=2] * [province=6]	13.865 83	0.19048 343	72.792 82	0	0.017127431
Risky Alcohol Use (Scale)	[geotype=2] * [province=8]	8.2473 75	0.18143 199	45.457 12	0	0.006749636
Risky Alcohol Use (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=1]	11.740 17	0.26674 092	44.013 38	0	0.006330375
Risky Alcohol Use (Scale)	[RACE=1,00] * [GENDER=1,00] * [province=3]	16.519 77	0.48579 063	34.005 95	5.5E- 253	0.003788604
Risky Alcohol Use (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=3]	8.2398 47	0.38277 101	21.526 83	1E- 102	0.001521657
Risky Alcohol Use (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=5]	- 3.5802	0.39510 251	9.0614 4	1.29E- 19	0.000269957
Risky Alcohol Use (Scale)	[RACE=2,00] * [GENDER=1,00] * [province=6]	3.2953 2	0.35538 249	9.2726 1	1.83E- 20	0.000282683
Risky Alcohol Use (Scale)	[RACE=2,00] * [geotype=1] * [province=1]	18.817 53	0.48901 824	38.480 22	0	0.004845999
Risky Alcohol Use (Scale)	[GENDER=1,00] * [geotype=1] * [province=2]	- 3.5529	0.15790 526	22.500 2	5.1E- 112	0.001662143
Risky Alcohol Use (Scale)	[GENDER=1,00] * [geotype=1] * [province=6]	10.438 7	0.18741 66	- 55.698	0	0.010099225

Risky Alcohol Use (Scale)	[GENDER=1,00] * [geotype=1] * [province=7]	1.8872 22	0.24607 007	7.6694 5	1.73E- 14	0.000193403
Recent Illicit Substance Use	Intercept	1.5423	466	31	0	0.009496289
Recent Illicit Substance Use	HLEA	0.0564 9	0.00046 108	122.52 2	0	0.047045492
Recent Illicit Substance Use	HIV_STATUS	0.1159 67	0.00314 565	36.865 93	7.4E- 297	0.004449708
Recent Illicit Substance Use	GM_INCOME	-1.2E- 05	2.1692E- 07	54.731 1	0	0.009755033
Recent Illicit Substance Use	[RACE=1,00]	0.3720 4	0.03935 926	9.4524 8	3.33E- 21	0.000293753
Recent Illicit Substance Use	[RACE=2,00]	0.5625 91	0.02465 902	22.814 83	4.1E- 115	0.001708873
Recent Illicit Substance Use	[RACE=3,00]	0.2278 33	0.02562 613	8.8906 6	6.11E- 19	0.00025988
Recent Illicit Substance Use	[GENDER=1,00]	0.2278 1	0.02420 793	9.4106 4	4.96E- 21	0.000291159
Recent Illicit Substance Use	[geotype=1]	0.3841 4	0.02513 291	15.284 3	1.02E- 52	0.000767676
Recent Illicit Substance Use	[geotype=2]	0.1445 1	0.02613 527	5.5292 2	3.22E- 08	0.000100531
Recent Illicit Substance Use	[province=1]	0.0220 3	0.03337 167	0.6599 9	0.5092 6	1.4325E-06
Recent Illicit Substance Use	[province=2]	0.2622 4	0.02176 345	12.049 6	1.98E- 33	0.000477263
Recent Illicit Substance Use	[province=3]	0.1372 8	0.02808 82	4.8876 2	1.02E- 06	7.85557E-05
Recent Illicit Substance Use	[province=4]	1.0441 11	0.03099 395	33.687 56	2.5E- 248	0.003718255
Recent Illicit Substance Use	[province=5]	0.3695 3	0.08899 351	4.1523 1	3.29E- 05	5.66988E-05
Recent Illicit Substance Use	[province=6]	0.0274 8	0.01909 5	1.4388 8	0.1501 86	6.8087E-06
Recent Illicit Substance Use	[province=7]	0.1887 77	0.01467 563	12.863 28	7.41E- 38	0.000543857
Recent Illicit Substance Use	[province=8]	0.3189 19	0.01711 288	18.636 22	1.81E- 77	0.001140874
Recent Illicit Substance Use	[RACE=1,00] * [GENDER=1,00]	0.9532 87	0.01627 747	58.564 82	0	0.011153732
Recent Illicit Substance Use	[RACE=2,00] * [GENDER=1,00]	0.2675 1	0.01225 159	21.834 4	1.3E- 105	0.001565383
Recent Illicit Substance Use	[RACE=3,00] * [GENDER=1,00]	0.3924 87	0.01684 534	23.299 43	5.7E- 120	0.001782107
Recent Illicit Substance Use	[RACE=1,00] * [geotype=1]	0.3438 06	0.03342 763	10.285 08	8.3E- 25	0.000347762
Recent Illicit Substance Use	[RACE=2,00] * [geotype=1]	0.2446 6	0.02358 203	- 10.375	3.25E- 25	0.000353867

Recent Illicit Substance Use	[RACE=1,00] * [province=1]	1.1141 56	0.02088 225	53.354 22	0 0	0.009274886
Recent Illicit Substance Use	[RACE=1,00] * [province=2]	- 1.2334	0.02712 42	45.472 4	0 0	0.00675414
Recent Illicit Substance Use	[RACE=1,00] * [province=3]	0.9451 65	0.03927 444	24.065 64	7.5E- 128	0.001901018
Recent Illicit Substance Use	[RACE=1,00] * [province=4]	- 0.7835	0.02737 5	28.620 746	6.5E- 180	0.002686565
Recent Illicit Substance Use	[RACE=1,00] * [province=5]	0.1253 92	0.02190 561	5.7241 98	1.04E- 08	0.000107746
Recent Illicit Substance Use	[RACE=1,00] * [province=7]	- 0.9174	0.02606 6	35.193 872	8.8E- 271	0.004056821
Recent Illicit Substance Use	[RACE=2,00] * [province=1]	0.4240 95	0.04053 769	10.461 74	1.31E- 25	0.000359807
Recent Illicit Substance Use	[RACE=2,00] * [province=2]	0.6987 9	0.03192 444	21.888 88	4E- 106	0.00157319
Recent Illicit Substance Use	[RACE=2,00] * [province=3]	0.5700 24	0.02938 166	19.400 67	8.56E- 84	0.001236272
Recent Illicit Substance Use	[RACE=2,00] * [province=5]	0.7768 53	0.02660 056	29.204 38	3.1E- 187	0.002797032
Recent Illicit Substance Use	[RACE=2,00] * [province=6]	0.0553 68	0.01522 431	3.6368 23	0.0002 76	4.34954E-05
Recent Illicit Substance Use	[RACE=3,00] * [province=5]	- 0.1312	0.02145 1	9.61E- -6.116	10 10	0.000122998
Recent Illicit Substance Use	[GENDER=1,00] * [geotype=1]	0.6674 32	0.02458 913	27.143 36	4.7E- 162	0.002417097
Recent Illicit Substance Use	[GENDER=1,00] * [geotype=2]	0.3661 63	0.02299 552	15.923 23	4.61E- 57	0.00083314
Recent Illicit Substance Use	[GENDER=1,00] * [province=1]	0.0273 59	0.01743 919	1.5688 06	0.1166 94	8.09381E-06
Recent Illicit Substance Use	[GENDER=1,00] * [province=2]	0.3163 59	0.01099 462	28.774 01	8E- 182	0.002715424
Recent Illicit Substance Use	[GENDER=1,00] * [province=3]	0.4942 64	0.02612 612	18.918 4	8.94E- 80	0.001175644
Recent Illicit Substance Use	[GENDER=1,00] * [province=4]	- 0.9184	0.02764 1	33.222 448	1.4E- 3	0.003616634
Recent Illicit Substance Use	[GENDER=1,00] * [province=5]	- 0.2889	0.01386 3	20.837 581	2.32E- 3	0.001425868
Recent Illicit Substance Use	[GENDER=1,00] * [province=6]	0.5161 62	0.01256 255	41.087 37	0 0	0.005521156
Recent Illicit Substance Use	[GENDER=1,00] * [province=7]	0.3471 26	0.01947 368	17.825 4	4.88E- 71	0.001043862
Recent Illicit Substance Use	[GENDER=1,00] * [province=8]	- 0.2465	0.01011 557	24.368 2	5E- 131	0.001949022
Recent Illicit Substance Use	[geotype=1] * [province=1]	0.3070 25	0.03194 258	9.6117 76	7.18E- 22	0.000303734
Recent Illicit Substance Use	[geotype=1] * [province=2]	0.2532 75	0.01983 189	12.771 08	2.43E- 37	0.000536093
Recent Illicit Substance Use	[geotype=1] * [province=3]	- 0.4564	0.01182 9	38.612 222	0 6	0.004879243
Recent Illicit Substance Use	[geotype=1] * [province=4]	0.2753 25	0.01142 647	24.095 38	3.7E- 128	0.001905711
Recent Illicit Substance Use	[geotype=1] * [province=5]	0.5839 32	0.08835 61	6.6088 51	3.88E- 11	0.000143618

Recent Illicit Substance Use	[geotype=1] * [province=6]	0.7098	0.01680	42.232			
		25	751	61	0	0.005831411	
Recent Illicit Substance Use	[geotype=1] * [province=7]	0.1367	0.02070	6.6045	3.99E-		
		39	394	14	11	0.000143429	
Recent Illicit Substance Use	[geotype=2] * [province=2]	0.3609	0.01977	18.247	2.37E-		
		37	994	63	74	0.001093844	
Recent Illicit Substance Use	[geotype=2] * [province=4]	0.1475	0.01633	9.0304	1.72E-		
		44	853	31	19	0.000268113	
Recent Illicit Substance Use	[geotype=2] * [province=6]	0.0801	0.01554	5.1584	2.49E-		
		69	127	45	07	8.75019E-05	
Recent Illicit Substance Use	[geotype=2] * [province=8]	0.1329	0.01480	8.9813	2.69E-		
		49	277	36	19	0.000265207	
Recent Illicit Substance Use	[RACE=1,00] * [GENDER=1,00] * [province=1]	1.6912	0.02176	77.711			
		4	3	6	0	0.01947369	
Recent Illicit Substance Use	[RACE=1,00] * [GENDER=1,00] * [province=3]	1.8840	0.03963	-			
		5	495	47.535	0	0.007376159	
Recent Illicit Substance Use	[RACE=2,00] * [GENDER=1,00] * [province=3]	0.2422	0.03122	7.7577	8.67E-		
		7	973	3	15	0.00019788	
Recent Illicit Substance Use	[RACE=2,00] * [GENDER=1,00] * [province=5]	0.1828	0.03223	5.6722	1.41E-		
		49	584	17	08	0.000105798	
Recent Illicit Substance Use	[RACE=2,00] * [GENDER=1,00] * [province=6]	0.3690	0.02899	12.727	4.26E-		
		32	514	37	37	0.000532432	
Recent Illicit Substance Use	[RACE=2,00] * [geotype=1] * [province=1]	0.5769	0.03989	14.459	2.27E-		
		1	828	4	47	0.000687101	
Recent Illicit Substance Use	[GENDER=1,00] * [geotype=1] * [province=2]	0.1866	0.01288	14.488	1.48E-		
		6	326	7	47	0.000689888	
Recent Illicit Substance Use	[GENDER=1,00] * [geotype=1] * [province=6]	-	0.01529	-			
		0.8192	105	53.574	0	0.009350729	
Recent Illicit Substance Use	[GENDER=1,00] * [geotype=1] * [province=7]	0.4210	0.02007	-	1.42E-		
		2	65	20.971	97	0.001444197	

**Tests of Between-Subjects Effects:**

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Psychological Distress (Scale)	3210287,741 <sup>a</sup>	64	50160.746	1847.869	0.000	0.280
	Risky Alcohol Use (Scale)	2696788,953 <sup>b</sup>	64	42137.327	2385.624	0.000	0.334
	Recent Illicit Substance Use	21791,810 <sup>c</sup>	64	340.497	2895.943	0.000	0.379
Intercept	Psychological Distress (Scale)	776645.280	1	776645.280	28610.788	0.000	0.086
	Risky Alcohol Use (Scale)	322062.447	1	322062.447	18233.709	0.000	0.057
	Recent Illicit Substance Use	4216.422	1	4216.422	35860.855	0.000	0.105
HLEA	Psychological Distress (Scale)	526209.825	1	526209.825	19385.012	0.000	0.060
	Risky Alcohol Use (Scale)	118456.621	1	118456.621	6706.474	0.000	0.022
	Recent Illicit Substance Use	1765.027	1	1765.027	15011.635	0.000	0.047

HIV_STATUS	Psychological Distress (Scale)	927.853	1	927.853	34.181	0.000	0.000
	Risky Alcohol Use (Scale)	226927.766	1	226927.766	12847.617	0.000	0.041
	Recent Illicit Substance Use	159.799	1	159.799	1359.097	0.000	0.004
GM_INCOME	Psychological Distress (Scale)	172746.482	1	172746.482	6363.797	0.000	0.020
	Risky Alcohol Use (Scale)	2050.961	1	2050.961	116.116	0.000	0.000
	Recent Illicit Substance Use	352.202	1	352.202	2995.492	0.000	0.010
RACE	Psychological Distress (Scale)	33309.101	3	11103.034	409.024	0.000	0.004
	Risky Alcohol Use (Scale)	17560.228	3	5853.409	331.393	0.000	0.003
	Recent Illicit Substance Use	1222.643	3	407.548	3466.212	0.000	0.033
GENDER	Psychological Distress (Scale)	22487.416	1	22487.416	828.413	0.000	0.003
	Risky Alcohol Use (Scale)	31.359	1	31.359	1.775	0.183	0.000
	Recent Illicit Substance Use	508.837	1	508.837	4327.686	0.000	0.014
geotype	Psychological Distress (Scale)	1067.627	2	533.814	19.665	0.000	0.000
	Risky Alcohol Use (Scale)	10567.958	2	5283.979	299.155	0.000	0.002
	Recent Illicit Substance Use	211.142	2	105.571	897.885	0.000	0.006
province	Psychological Distress (Scale)	178247.314	8	22280.914	820.805	0.000	0.021
	Risky Alcohol Use (Scale)	87110.500	8	10888.813	616.475	0.000	0.016
	Recent Illicit Substance Use	921.720	8	115.215	979.909	0.000	0.025
RACE * GENDER	Psychological Distress (Scale)	11946.089	3	3982.030	146.694	0.000	0.001
	Risky Alcohol Use (Scale)	191681.397	3	63893.799	3617.376	0.000	0.034
	Recent Illicit Substance Use	38.462	3	12.821	109.041	0.000	0.001
RACE * geotype	Psychological Distress (Scale)	5261.542	2	2630.771	96.915	0.000	0.001
	Risky Alcohol Use (Scale)	35067.452	2	17533.726	992.680	0.000	0.006
	Recent Illicit Substance Use	986.473	2	493.236	4194.997	0.000	0.027
RACE * province	Psychological Distress (Scale)	57947.058	12	4828.922	177.892	0.000	0.007
	Risky Alcohol Use (Scale)	234727.525	12	19560.627	1107.434	0.000	0.042
	Recent Illicit Substance Use	2527.022	12	210.585	1791.036	0.000	0.066
GENDER * geotype	Psychological Distress (Scale)	32359.054	2	16179.527	596.037	0.000	0.004
	Risky Alcohol Use (Scale)	6343.184	2	3171.592	179.561	0.000	0.001
	Recent Illicit Substance Use	50.543	2	25.272	214.937	0.000	0.001

GENDER * province	Psychological Distress (Scale)	120382.839	8	15047.855	554.347	0.000	0.014
	Risky Alcohol Use (Scale)	181846.205	8	22730.776	1286.913	0.000	0.033
	Recent Illicit Substance Use	812.933	8	101.617	864.254	0.000	0.022
geotype * province	Psychological Distress (Scale)	161968.091	11	14724.372	542.430	0.000	0.019
	Risky Alcohol Use (Scale)	236210.040	11	21473.640	1215.740	0.000	0.042
	Recent Illicit Substance Use	938.945	11	85.359	725.979	0.000	0.026
RACE * GENDER * geotype	Psychological Distress (Scale)	0.000	0				0.000
	Risky Alcohol Use (Scale)	0.000	0				0.000
	Recent Illicit Substance Use	0.000	0				0.000
RACE * GENDER * province	Psychological Distress (Scale)	42032.252	4	10508.063	387.106	0.000	0.005
	Risky Alcohol Use (Scale)	35333.199	4	8833.300	500.101	0.000	0.007
	Recent Illicit Substance Use	764.180	4	191.045	1624.847	0.000	0.021
RACE * geotype * province	Psychological Distress (Scale)	0.000	0				0.000
	Risky Alcohol Use (Scale)	0.000	0				0.000
	Recent Illicit Substance Use	0.000	0				0.000
GENDER * geotype * province	Psychological Distress (Scale)	100801.933	3	33600.644	1237.812	0.000	0.012
	Risky Alcohol Use (Scale)	64277.057	3	21425.686	1213.025	0.000	0.012
	Recent Illicit Substance Use	354.056	3	118.019	1003.753	0.000	0.010
RACE * GENDER * geotype * province	Psychological Distress (Scale)	0.000	0				0.000
	Risky Alcohol Use (Scale)	0.000	0				0.000
	Recent Illicit Substance Use	0.000	0				0.000
Error	Psychological Distress (Scale)	8254200.798	304076	27.145			
	Risky Alcohol Use (Scale)	5370901.824	304076	17.663			
	Recent Illicit Substance Use	35752.427	304076	0.118			
Total	Psychological Distress (Scale)	74841741.000	304141				
	Risky Alcohol Use (Scale)	116203519.000	304141				
	Recent Illicit Substance Use	535375.000	304141				
Corrected Total	Psychological Distress (Scale)	11464488.539	304140				
	Risky Alcohol Use (Scale)	8067690.777	304140				
	Recent Illicit Substance Use	57544.237	304140				



## APPENDIX H

### race\_q

		Value
Standard Attributes	Position	9
	Label	Race
	Type	Numeric
Valid Values	1	African
	2	Coloured
	3	Indian
	4	White

### sex\_q

		Value
Standard Attributes	Position	10
	Label	Sex of the respondent
	Type	Numeric
Valid Values	1	Male
	2	Female

### q1\_10

		Value
Standard Attributes	Position	296
	Label	Q1.10 What is your gross monthly income?
	Type	Numeric

**q1\_15c**

		Value
Standard Attributes	Position	307
	Label	Q1.15c What is the highest educational level that you obtained?
	Type	Numeric
Valid Values	0	Pre-school/ Gr R
	1	Grade 1/Sub a/ Class 1
	2	Grade 2/ Sub b/ Class 2
	3	Grade 3/ Standard 1/Abet 1
	4	Grade 4 / Standard 2/ Abet 2
	5	Grade 5 / Standard 3/ Abet 2
	6	Grade 6 / Standard 4/Abet 3
	7	Grade 7/ Standard 5/ Abet 3
	8	Grade 8 / Standard 6/Abet 3
	9	Grade 9 / Standard 7 Abet 3
	10	Grade 10/ Standard 8/ Ntc 1
	11	Grade 11/ Standard 9/ Ntc 2
	12	Grade 12/ Standard 10/ Ntc 3
	13	Further studies incomplete
	14	Diploma/other post school completed
15	Further degree completed	
98	Do not know	

**q14\_1**

		Value
Standard Attributes	Position	1052
	Label	Q14.1 During the last 30 days, about how often did you feel tired out for no good reason?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

199

## SABSSM 2017 Combined Code book

**q14\_2**

		Value
Standard Attributes	Position	1053
	Label	Q14.2 During the last 30 days, about how often did you feel nervous?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_3**

		Value
Standard Attributes	Position	1054
	Label	Q14.3 About how often did you feel so nervous that nothing could calm you down?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_4**

		Value
Standard Attributes	Position	1055
	Label	Q14.4 About how often did you feel hopeless?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_5**

		Value
Standard Attributes	Position	1056
	Label	Q14.5 During the last 30 days, about how often did you feel restless or fidgety?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time

SABSSM 2017 Combined Code book

**q12\_1b**

		Value
Standard Attributes	Position	1022
	Label	Q12.1b Cocaine (coke, rocks, crack, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1c**

		Value
Standard Attributes	Position	1023
	Label	Q12.1c Amphetamine-type stimulants (speed, ecstasy, tik, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1d**

		Value
Standard Attributes	Position	1024
	Label	Q12.1d Inhalants (nitrates, glue, petrol, paint thinners, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1e**

		Value
Standard Attributes	Position	1025
	Label	Q12.1e Sedatives or sleeping pills (Valium, Mandrax, Serepax, Rohypnol, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly

**q12\_1f**

Value

Standard Attributes	Position	1026
	Label	Q12.1f Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1g**

Value

Standard Attributes	Position	1027
	Label	Q12.1g Opiates (heroin, morphine, methadone, codeine, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1h**

Value

Standard Attributes	Position	1028
	Label	Q12.1h Whoonga (mixture of heroin, dagga and ARVs), Nyaope
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

**q12\_1i**

Value

Standard Attributes	Position	1029
	Label	Q12.1i Other
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly

**q11\_5**

Value

Standard Attributes	Position	1018
	Label	Q11.5 Have you or someone else been injured as a result of your drinking?
	Type	Numeric
Valid Values	1	No
	2	Yes, but not in the past 12 months
	3	Yes, during the past 12 months

**q11\_6**

Value

Standard Attributes	Position	1019
	Label	Q11.6 As a result of your drinking, have you and others been involved in violence actions and aggression?
	Type	Numeric
Valid Values	1	No
	2	Yes, but not in the past 12 months
	3	Yes, during the past 12 months

**q11\_7**

Value

Standard Attributes	Position	1020
	Label	Q11.7 Has a concerned relative, friend, doctor, or other health worker ever suggested that you should cut down on your drinking?
	Type	Numeric
Valid Values	1	No
	2	Yes, but not in the past 12 months
	3	Yes, during the past 12 months

**q12\_1a**

Value

Standard Attributes	Position	1021
	Label	Q12.1a Cannabis (dagga, marijuana, pot, grass, hash, etc.)
	Type	Numeric
Valid Values	1	Never
	2	Once or twice
	3	Monthly
	4	Weekly
	5	Almost daily

### q11\_2

		Value
Standard Attributes	Position	1010
	Label	Q11.2 How often did you have a drink containing alcohol in the past 12 months?
	Type	Numeric
Valid Values	1	Not in the past 12 months
	2	Once a month or less
	3	2-4 times a month
	4	2-3 times a week
	5	4 or more times a week

### q11\_3

		Value
Standard Attributes	Position	1011
	Label	Q11.3 How many drinks containing alcohol do you have on a typical day when you are drinking?
	Type	Numeric
Valid Values	1	1 or 2
	2	3 or 4
	3	5 or 6
	4	7 to 9
	5	14 or more

### q11\_4a

		Value
Standard Attributes	Position	1012
	Label	Q11.4a How often do you have (for men) five or more and (for women) four or more drinks on one occasion?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

### q11\_4b

		Value
Standard Attributes	Position	1013
	Label	Q11.4b How often during the past 12 months were you not able to stop drinking once you had started?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

**q11\_4c**

Value

Standard Attributes	Position	1014
	Label	Q11.4c How often during the past 12 months did you fail to do what was normally expected of you because of drinking?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

**q11\_4d**

Value

Standard Attributes	Position	1015
	Label	Q11.4d How often during the past 12 months did you need a first drink in the morning to get yourself going after a heavy drinking session?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

**q11\_4e**

Value

Standard Attributes	Position	1016
	Label	Q11.4e How often during the past 12 months did you feel guilty or remorse after drinking?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

**q11\_4f**

Value

Standard Attributes	Position	1017
	Label	Q11.4f How often during the past 12 months were you unable to remember what happened the night before because of your drinking?
	Type	Numeric
Valid Values	1	Never
	2	Less than monthly
	3	Monthly
	4	Weekly
	5	Daily or almost daily

SABSSM 2017 Combined Code book

**q14\_10**

Value

Standard Attributes	Position	1061
	Label	Q14.10 About how often did you feel worthless?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

SABSSM 2017 Combined Code book

**q12\_2**

Value

Standard Attributes	Position	1030
	Label	Q12.2 Besides drugs prescribed by a health professional, have you ever used a drug by injection?
	Type	Numeric
Valid Values	1	No
	2	Yes, but not in the past 3 months
	3	Yes, during the past 3 months

**q12\_3**

Value

Standard Attributes	Position	1031
	Label	Q12.3 Have you ever shared injection needles?
	Type	Numeric
Valid Values	1	No
	2	Yes, but not in the past 3 months
	3	Yes, during the past 3 months

SABSSM 2017 Combined Code book

**ibreal12\_district**

Value:

Standard Attributes	Position	1090
	Label	Benchmarked weight: This weight should be used when analysing questionnaire data/interview data for the district level analysis
	Type	Numeric

**ibreal1\_sabssm**

Value:

Standard Attributes	Position	1091
	Label	Benchmarked weight: This weight should be used when analysing specimen data for the national sampling framework
	Type	Numeric

**ibreal12\_sabssm**

Value:

Standard Attributes	Position	1092
	Label	Benchmarked weight: This weight should be used when analysing questionnaire data/interview data for the national sampling framework
	Type	Numeric

**ibreal1\_combined**

Value:

Standard Attributes	Position	1093
	Label	Benchmark weight: This weight should be used when analysing specimen data
	Type	Numeric

**ibreal12\_combined**

Value:

Standard Attributes	Position	1094
	Label	Benchmarked weight: This weight should be used when analysing questionnaire data/interview data
	Type	Numeric

SABSSM 2017 Combined Code book

**q14\_6**

Value

Standard Attributes	Position	1057
	Label	Q14.6 About how often did you feel so restless you could not sit still?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_7**

Value

Standard Attributes	Position	1058
	Label	Q14.7 About how often did you feel depressed?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_8**

Value

Standard Attributes	Position	1059
	Label	Q14.8 During the last 30 days, about how often did you feel that everything was an effort?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**q14\_9**

Value

Standard Attributes	Position	1060
	Label	Q14.9 About how often did you feel so sad that nothing could cheer you up?
	Type	Numeric
Valid Values	1	None of the time
	2	A little of the time
	3	Some of the time
	4	Most of the time
	5	All of the time

**province**

Value

Standard Attributes	Position	5
	Label	Province
	Type	Numeric
Valid Values	1	Western Cape
	2	Eastern Cape
	3	Northern Cape
	4	Free State
	5	KwaZulu-Natal
	6	North-West
	7	Gauteng
	8	Mpumalanga
	9	Limpopo

**geotype**

Value

Standard Attributes	Position	6
	Label	Geographical location
	Type	Numeric
Valid Values	1	Urban
	2	Rural informal (tribal areas)
	3	Rural (farms)

**age\_q**

Value

Standard Attributes	Position	7
	Label	Age of respondents
	Type	Numeric

**agecat\_13**

Value

Standard Attributes	Position	8
	Label	Age groups of respondents
	Type	Numeric
Valid Values	1	0-4
	2	5-9
	3	10-14
	4	15-19
	5	20-24
	6	25-29
	7	30-34
	8	35-39
	9	40-44
	10	45-49
	11	50-54
	12	55-59
	13	60+