

**SUB-DISTRICT VARIATION IN HEALTH ACCESS AND
HEALTH STATUS IN GAUTENG: AN ANALYSIS OF THE
GAUTENG CITY-REGION OBSERVATORY QUALITY OF
LIFE SURVEY**

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A research report submitted to the School of Public Health, Faculty of Health
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In partial fulfilment of the requirements for the degree of Master of Public Health

Johannesburg, June 2023

Declaration

I, Biancha Glyn Mentoor, declare that this Research Report is my own, unaided work. It is being submitted for the Degree of Master of Public Health at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

_____ (Signature of candidate)

_____ day of _____ 20_____ in _____

Dedication

To my husband, Sabelo: thank you for your patience, affirmation, and encouragement throughout this process, which took many hours away from our time together. You have always been my cheerleader and your support and love mean the world to me.

To our not-so-newborn son, Khaya Oliver: your safe arrival is my greatest achievement. I cannot wait for all the adventures we will have together.

To our spotty dog, Oreo: your insistence on keeping me company through many late nights and early mornings is not forgotten. You're one in a million *squeak!*

To my family and friends: your love, encouraging words, and calming presence kept me going when the pressure of juggling everything felt too much. Thank you for always being in my corner. I'm an adult but it still takes a village and you are my village people. Special mention to my parents, Glenda and Eugene, my sisters, Tarryn and Roxanne, and my best friend of 20 years, Sarah Koopman. You are my non-romantic life partner. Thank you #TeamIntrepid

This research was a privilege to conduct and honours our incredible nation's fractured history and complex present. I hope that this contributes to the ongoing conversations about equitable and accessible quality healthcare for all. We deserve nothing less.

Abstract

Background

South Africa's apartheid history gave rise to settlement patterns based on racial classification. Historically and presently disadvantaged regions remain on the fringes of better-resourced urban nodes 29 years into democracy. These disadvantaged regions have varying access to services such as healthcare. This study aimed to determine the association between the sub-district of residence in Gauteng on adult residents' access to and usage of healthcare. Resident health status, encompassed in overall health status and the rate of health preventing work or socialising, was also assessed.

Methods

Data from the 2017/18 Gauteng City Region Observatory Quality of Life survey was used, and all analyses were adjusted for the complex sampling design deployed in the primary study. Choropleth maps were generated to describe sociodemographic and economic resident characteristics by sub-district. Logistic regression was used to determine the association between sub-district, healthcare usage and access, self-reported health status, and the impact of health status on work and social activities. Multiple logistic regression was used to determine the spatial effect before and after accounting for sociodemographic and economic confounders.

Results

Geographic variation in sociodemographic and economic characteristics was noted across Gauteng, with clustering of relative privilege and disadvantage in certain sub-districts. A statistically significant geographical effect on all outcomes remained after accounting for sociodemographic and economic confounders. Healthcare access and usage were significantly higher in the richest quintiles. Health preventing work and socialising was less common for the well-educated and wealthy. Adult residents who had difficulty accessing the healthcare system had a 3.3 percentage point lower rate of "excellent" health status (3.3%; 95% CI = -6.3% – -0.4%; $p < 0.05$) Having medical scheme cover and being wealthy enlarged this effect.

Conclusion

Health in Gauteng remains impacted by historic patterns of apartheid-entrenched racial residential segregation. Despite well-intentioned policy, these patterns have not been

addressed. This failure has resulted in the perpetuation of infrastructure-inequality traps, where well-developed areas simply attract more development, and underdeveloped areas continue to languish. Healthcare access and usage, in the absence of universal healthcare coverage, has tended to the inverse care law which states that the availability of good medical care tends to vary inversely with the need of the population served. In keeping with well-established literature, socioeconomic privilege allows for greater access to better healthcare within a healthcare system that favours the wealthy. The failure to integrate residential settlements and create opportunities for structurally underdeveloped communities has formalised apartheid settlements and has direct consequences for health access, use, and status. There is a need to correct spatial dysfunction and improve healthcare delivery to underserved areas so that every South African can realise access to healthcare based on need and attain the highest possible standard of health.

Acknowledgements

I would like to acknowledge and thank Dr Duane Blaauw, my research supervisor. Your insight, attention to detail, and teaching have been invaluable. You never let me take the easy way out, even when I desperately wanted to. You pushed me to ask more questions and find better answers, and that resulted in me learning an incredible amount. Your dedication to excellence helped me to produce a piece of work I am truly proud of and for that, I express my sincere gratitude and thanks.

I would like to acknowledge and thank the entire Gauteng City Region Observatory (GCRO) team for the work they tirelessly conduct. Thank you for continuing to generate much-needed data to guide policy decisions.

I would like to acknowledge and thank DataFirst, the data custodian, for granting me access to the GCRO Quality of Life V dataset.

I would like to acknowledge and thank the Ekurhuleni Geographic Information System (GIS) team. When I could not locate information I needed, this team generated and shared the needed maps and ward allocations for the various Ekurhuleni sub-districts. This work would not have been able to progress without this and I remain grateful to this team for going the extra mile to assist.

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Nomenclature and Abbreviations

BMI:	Body mass index
BRFSS:	Behavioural Risk Factor Surveillance System
CBD:	Central Business District
CC SA-BY 4.0:	Creative Commons ShareAlike-Attribution 4.0 International License
CDC:	Centers for Disease Control and Prevention
CoJ:	City of Johannesburg metropolitan municipality
CoT:	City of Tshwane metropolitan municipality
COVID-19:	An infectious disease caused by the SARS-CoV-2 virus
DHB:	District Health Barometer
DHS:	Demographic and Health Survey
District municipality:	A municipality that has municipal executive and legislative authority in an area that includes more than one municipality, and which is described in section 155(1) of the Constitution as a category C municipality
EKU:	Ekurhuleni metropolitan municipality
GCRO:	Gauteng City Region Observatory
GIS:	Geographic Information System
GPS:	Global Positioning System
HIV:	Human Immunodeficiency Virus
IES:	Income and Expenditure Survey
KMO:	Kaiser-Meyer-Olkin value
Local municipality:	A municipality that shares municipal executive and legislative authority in its area with a district municipality within whose area it falls, and which is

described in section 155(1) of the Constitution as a category B municipality

Metropolitan municipality:	A municipality that has exclusive executive and legislative authority in its area and which is described in section 155(1) of the Constitution as a category A municipality
NDoH:	National Department of Health
NDP:	National Development Plan
NIDS:	National Income Dynamics Study
NHI:	National Health Insurance
OHSC:	Office of Health Standards Compliance
PCA:	Principal Component Analysis
QGIS:	Quantum Geographic Information System
QoL V:	The fifth iteration of the Quality of Life survey
RDP:	Reconstruction and Development Programme
RSA:	Republic of South Africa
SDB:	Sedibeng district municipality
SDGs:	Sustainable Development Goals
SEER:	American Medicare database on Surveillance, Epidemiology, and End Results
SES index:	Socioeconomic status index
Sub-district:	An operational sub-division of municipalities (district and metropolitan) that is not a legally recognised level of government
UHC:	Universal health coverage
WRD:	West Rand district municipality

Chapter 1 Introduction

1.1 Background

Access to healthcare is impacted by the health system, as well as factors outside of the health system (1). In South Africa, apartheid discriminatory legislation resulted in settlement patterns segregated by race, the legacy of which persists today (2). Consequently, historically disadvantaged population groups are still not integrated into economic and other opportunities that arise from being closer to urban areas (2).

Access to healthcare for all is enshrined in the South African Constitution (3,4). While this access is largely dependent on the functioning of the healthcare system, historic and present-day influences emanating from outside the health sector also result in access not being realised (3,4). Historical patterns of systematic deprivation in access to the healthcare system have not been overcome in their entirety since the advent of democracy, despite well-intentioned policies (5,6). Many have argued that the promise of universal healthcare coverage, which would see protection from financial hardship when healthcare is accessed as and when needed, can only be realised through a well-functioning and supported district health system (7). Although ensuring access to healthcare is the constitutional intention, the variation in availability and quality of healthcare services in present-day South Africa is still noted to have a geographic basis not vastly different from the historic experience (8).

Gauteng, as South Africa's most populous province, comprises 29 sub-districts housing more than 15.5 million people in 2020 (9). The Gauteng City-Region Observatory (GCRO), an academic and provincial government partnership, is an entity that focuses on better understanding the changing urban, commercial, and other dynamics of the province (10). Part of the GCRO's contribution includes undertaking a biennial quality of life survey to investigate adult residents' perceptions of service delivery and quality of life, among other metrics (11).

1.2 Literature review

1.2.1 Apartheid spatial planning and present-day impact

The period from 1948 to 1990 saw the passing of several discriminatory laws in South Africa. The Group Areas Act 41 of 1950 built on the Black Land Act 27 of 1913 and the Black (Urban Areas) Act 21 of 1923 and entrenched many of the spatial disparities that prevail in South Africa nearly three decades after the demise of apartheid (12). Through the establishment of separate residential and urban areas delineated by race, it was

illegal to own or inhabit land in areas outside of those designated for your racial group (12). This Act resulted in the forced displacement of people and demolition of multi-racial and urban settlements, confining most people not classified as White to large townships on the peripheries of urban centres (12).

South African townships, prior to 1994, were designed to be isolated from society and the economy (13). While separating communities based on race was ideologically important to the ruling party of the day, townships were also notably characterised by the marginal provision of services and economic opportunities (13). Attempts to address this historical legacy have been undertaken by the post-apartheid government and have had mixed results since the advent of democracy (13).

The resulting townships and informal settlements founded during apartheid largely remain today, housing more than 40% of South Africa's households, and exhibiting the fastest population growth of all South African settlement types (13,14). Conditions in urban townships have not substantially improved since the advent of democracy, with claims that access to municipal services in these areas in 2009 was worse than in 1996 (13). The provision of health facilities remains challenging due to several factors, including poor coordination between various spheres of government (13).

1.2.2 Spatial and racial variation in health access and health status

Several studies in numerous settings, including the United States of America and South Africa, have demonstrated that residential segregation by race is associated with racial disparities in both socioeconomic and health status (15–17). Where differential access to healthcare is influenced by area of residence, the impact to individuals includes differences in healthcare utilisation and health outcomes (17,18).

This has been an important area of research in the United States of America. For example, Haas and colleagues (15), theorised that differences in access to adequate breast cancer care were impacted by geography in addition to identified racial and ethnic disparities. The research team undertook to determine if residential racial segregation mediated ethnic disparities in breast cancer care and subsequent mortality (15). The research team utilised the American Medicare database on Surveillance, Epidemiology, and End Results (SEER) for women aged 66 to 85 years old diagnosed with and treated for breast cancer between 1992 and 2002 (15). Findings include that Black women were less likely than White women to receive adequate breast cancer care (15). A significant finding was that lower access to care was noted in Black and White women who lived in areas with greater Black segregation (15). While Black

women were noted to experience a higher mortality rate than White women, Haas (15) did not find evidence that residential segregation facilitated this relationship.

An American researcher, Chang (16), hypothesised that weight amongst African Americans is affected by segregation and contributes to explaining the disproportionate effect of weight on health outcomes in this population group. The relationship between racial residential segregation and weight was investigated using a nationally representative American dataset (16). The dataset emanated from the 2000 Behavioural Risk Factor Surveillance System (BRFSS) which is administered by the Centers for Disease Control and Prevention (CDC) (16). Key significant findings were that higher racial isolation was associated with higher body mass index (BMI) for African Americans, even after adjusting for measures of socioeconomic status (16). This association did not extend to White respondents, highlighting the differing impact of spatial organisation on different population groups (16).

The impact of residential segregation and spatial access to healthcare was also assessed by Dai (17), utilising data from the Michigan Cancer Surveillance Program between 1998 and 2002. Dai's (17, pg 1050) significant findings included noting an association between late-stage presentation of breast cancer and living in an area that had "higher Black segregation, higher socioeconomic disadvantages, higher sociocultural barriers, and poorer mammography access".

In South Africa, race-based disparities in health-seeking behaviour have been frequently noted (1,19). The legacy of apartheid results in the partial persistence of historic residential patterns by race, accompanied by various degrees of access to resources, including water, sanitation, and health care services (5,13).

Marais and Cloete (5) published research using the 2008 National Income Dynamics Study (NiDS) to evaluate health outcomes of South African low-income housing programme beneficiaries. This study noted previous research on the location of housing developments in relation to social institutions, such as clinics and schools, and that the higher costs of accessing these services are an important component of the relationship between housing and health (5,20). While Marais and Cloete's (5) findings were not as conclusive as those reported from the United States, a significant relationship between service-related indicators and health indicators was noted. This included the finding that greater distances to water and shared toilet facilities had a negative impact on adult health outcomes (5). The variation extends to accessibility of

health care services, which is determined by distance and cost, as well as by social dimensions of access, such as acceptance and behaviours of those providing healthcare (21).

1.2.3 Socio-economic differences in health care access and benefit realisation

Socio-economic status is a strong determinant of whether medical care will be accessed in South Africa (6). The data collected for the 2002 Afrobarometer: Round II survey of South Africa was utilised by Kon and Lackan (6) to determine post-democracy ethnic disparities in accessing medical care. The key finding of this work was that “marked ethnic disparities in access to healthcare exist across levels of education and income” (6, pg 2275). Low access to food and water was the largest predictor of how often the respondent had gone without healthcare, and this deprivation was concentrated amongst Black and Coloured respondents who are congregated in disadvantaged and underserved regions of the country (6). Income disparities in South Africa were correlated to race as evidenced by the majority of Black and Coloured respondents reporting incomes of less than the poverty cut-off for this analysis of R1 400 per month, representing a majority living in poverty (6).

Most healthcare services in South Africa are noted to benefit the rich significantly more than the poor (22,23). The richest 20% of the population accesses 36% of the total benefits of the health system, despite having a need for health share of under 10% (22,23). Work done by Ataguba and McIntyre (23) utilising the 2005/2006 Income and Expenditure Survey (IES) of 21 144 households was published in 2012. Key findings from this analysis include the conclusion that healthcare financing in South Africa is progressive, with contributions to private medical schemes being the most progressive component (23). Progressive health financing systems are characterised by the proportion of income used to pay for healthcare rising as income rises (24). Despite this progressivity in funding, the distribution of benefits from both public and private healthcare services are pro-rich (23). This is most marked in the use of private healthcare, where the wealthiest 20% of the population enjoy over 55% of the total benefits (23). Of note, the only service found to be pro-poor was the use of public sector, non-hospital, outpatient services, such as community health centres and public clinics (8). This results in great misalignment between “the distribution of benefits from using health care relative to the distribution of need across socio-economic groups” (8, pg 11).

In parallel, the poorest 20% of the population have a health share of greater than 25% but receive only 12.5% of the healthcare benefit (22). This means that the population in the poorest 20% have a healthcare need that is greater than their population size and that, despite this, they receive benefit from accessing healthcare that is smaller than their population size. Barriers to accessing healthcare are greatest for the poorest (1,25,26). This is reaffirmed by the determination that the 12-14% of individuals in the poorest quintile, with a self-reported health status of poor or very poor, did not access a health service in the previous month, while the equivalent was true for only 2.5% of individuals in the wealthiest quintile (8,23). Utilising the IES dataset, Ataguba and McIntyre (23) correlated health service use and self-assessed health status, noting that poorer population quintiles have a greater burden of ill health and a smaller share of service benefits, compared to wealthy population quintiles.

1.2.4 Access and infrastructure variations in health in South Africa

The end of apartheid in 1994 was accompanied by the devising of a country development agenda, placing healthcare reform as a key focus area (27). The post-apartheid government aimed to improve healthcare access for poor and historically marginalised populations through abolishing primary healthcare user fees and expanding the network of healthcare facilities (27). Real per capita public spend on health increased post-1994 and budget allocations prioritised historically poorly endowed provinces and primary healthcare (28).

The abolition of healthcare user fees post-1994 was found to have mixed results on the likelihood of certain vulnerable groups, such as children, accessing public healthcare facilities (29). Broader interventions to improve access were noted to be needed, as perceptions of poor quality may have resulted in users not accessing free or affordable public healthcare services (30).

Access to the public sector has been improved through the building or upgrading of more than 1 600 healthcare facilities across South Africa since 1994 (27). This significant infrastructure investment prioritised primary healthcare facilities in rural areas, and resulted in the number of people who responded that they access primary care at clinics increasing from 44.5% in 2004 to 55.6% in 2012 (28). An additional dimension of access, travel time as a surrogate for geographic proximity, has seldom been noted to hinder health access, with a decline in travel time to healthcare facilities noted between 1993 and 2008 for all but the poorest healthcare users (28). The poorest, mostly rural-dwelling, healthcare users noted relatively little progress

compared to other wealth quintiles in individuals who travelled for more than 30 minutes to access their closest public healthcare facility between 1993 and 2008 (28).

1.2.5 The District Health Barometer and universal healthcare coverage

The District Health Barometer is an annual publication intended to provide insight into the performance of the public healthcare sector of South Africa (31). The annual barometer includes a review of service capacity and access at the provincial and district levels (31). Its fifteenth iteration, covering 2019/2020, focused on progress towards the achievement of the Sustainable Development Goals (SDGs) and tracked performance on the Universal Health Coverage (UHC) index (31). Central to the concept of universal health coverage is that everyone can access the needed health services, at the time and place they are needed, without financial difficulty (32). South Africa aims to realise the constitutionally protected right to access to healthcare, within the available resource constraints, as part of the National Development Plan (22,33). The proposed solution, a National Health Insurance (NHI) system, is essentially focused on meeting the SDGs related to health and achieving UHC (28).

It has been argued that the attainment of UHC cannot be successfully achieved without addressing weaknesses in the national health system (34). Key to the delivery of this health care to all is the district health system, which is used to reach the most vulnerable and isolated communities and improve access to the healthcare system (22,34). As a result, attaining UHC requires that care be available and affordable, and that access to this care be realised (35).

In South Africa, access is not always realised. Although the vast majority (90%) of South Africans live within a seven-kilometre radius of a public sector clinic and two thirds are resident within two kilometres, vulnerable populations experience barriers to accessing care, such as financial and time-related costs associated with travel (22). This contributes to differences in health access and status between districts. Data at the district or lower levels is not readily available, resulting in a dearth of research at this level. More data is available for comparison between provinces and racial groups as this is easier to collect, resulting in these analyses being more frequently undertaken (8).

1.2.6 2017/18 GCRO survey: health results

The biennial GCRO Quality of Life (QoL) survey investigates health as a key dimension of quality of life in the survey (36). The 2017/18 QoL health survey results were published in 2018 and demonstrated a strong relationship between health and income

(36). Affluence was correlated with an increasing likelihood of having medical insurance, using private healthcare facilities, and improved self-reported health status (36). Respondents' reliance on public healthcare facilities varied geographically, but no ward was noted to have all respondents utilising private healthcare exclusively (36).

Self-reported health status varied by age and income, with most respondents reporting excellent or good health (36). Patterns of use of public healthcare facilities mirror historic patterns of socio-economic inequality and segregation (36). Previous work by Hamann and Ballard (36–38) noted that wards with higher proportions of Black and Coloured residents, with lower racial diversity, and with lower household income, were noted to rely more heavily on public healthcare facilities.

1.2.7 Factors impacting healthcare utilisation and self-reported health status in Gauteng

The GCRO dataset from the 2013 QoL survey was used by Abaerei and colleagues (19) to investigate factors associated with healthcare utilisation in Gauteng. This review was conducted at the municipal level and focused on identifying features of those who utilised healthcare, such as sex, population group, and medical insurance status (19). Findings include the establishment of a positive association between being female, White, and having medical insurance, with healthcare utilisation (19).

A 2020 publication by Oguttu and Ncayiyana (39) focused on factors that influenced self-rated health of Gauteng residents at ward level. Through utilising the 2015 GCRO QoL dataset the authors investigated the effect of social capital indicators such as group membership, voter registration status, community safety perceptions, and general trust, on self-rated health status of respondents (39). Positive community safety perceptions were associated with good self-rated health, with the inverse holding true as well (39). Variation in good self-rated health was noted by ward with self-rated health noted to hold predictive validity for morbidity and mortality in longitudinal studies (39,40).

1.3 Statement of the problem

The “spatial embeddedness of race-based disadvantage” (34, pg 4) continues to plague Gauteng, South Africa's most populous province (9). As a result, this geographical disadvantage influences access to healthcare and health status because socio-demographic characteristics and social determinants of health are affected by one's area of residence.

1.4 Justification

Much has been written about the ongoing social legacy of the spatial planning associated with forced removals and displacements of communities throughout apartheid (2,3). Attention has been paid to the impact on town planning and climate change, but less evidence can be found explicitly focusing on the impact on healthcare access and health outcomes (4,19,36,41,42). This work seeks to add to the body of literature by being the first to evaluate the spatial effect of residential sub-districts in Gauteng on current differences in health access, health use, and health status.

South Africa consists of eight metropolitan municipalities and 44 district municipalities (43). These administrative structures are further sub-divided into sub-districts, local municipalities, or regions to serve citizens more effectively. Sub-districts are not a legally recognised level of government. Metropolitan municipalities do not contain local municipalities, which district municipalities do. Sedibeng and the West Rand district municipalities each contain three local municipalities. The specific defined sub-districts or regions within metropolitan municipalities form the operational level for service delivery. Gauteng houses three metropolitan municipalities: the City of Johannesburg, the City of Tshwane, and Ekurhuleni. These metropolitan municipalities are divided into operational sub-districts or regions. Johannesburg (regions A – G) and Tshwane (regions 1 – 7) each have seven regions, while Ekurhuleni has nine sub-districts (North 1-3, East 1-3, and South 1-3). These metropolitan municipalities combine areas that are starkly different. As an example, within the City of Johannesburg metropolitan municipality there are the wealthy Northern suburbs and the historically labour-providing regions in the South (43).

Analysis at the district i.e., metropolitan level conceals the impact of how metropolitan municipalities have intentionally been constructed and the markedly different suburbs they consist of. District level analyses are historically easier to execute because of the availability of data at this level, but the GCRO's datasets enable a more granular investigation. The 529 wards present in Gauteng pose challenges in undertaking meaningful analytical investigation at the ward level. As a result, the sub-district level of analysis across the 29 sub-districts was chosen to uncover the impact of these historical differences on present-day service delivery and health outcomes. Although this is not a defined legal level of government, sub-districts are important within health systems and are acknowledged as functional administrative units. This analysis could

guide policymakers in determining which sub-districts would benefit from additional intervention in the drive for equitable, universal health coverage.

1.5 Research question, overall aim, and specific objectives

1.5.1 Research question

Does the sub-district of residence in Gauteng impact on healthcare use, access to healthcare services, and self-reported health status?

1.5.2 Overall aim

The aim of this study is to assess sub-district variation in access to healthcare and self-reported health status of adult residents of the Gauteng province in 2017/18, using the GCRO 2017/18 Quality of Life (QoL) Survey.

1.5.3 Specific objectives

1. To describe the socio-demographic characteristics by sub-district of residence in Gauteng for participants of the 2017/18 GCRO Quality of Life survey.
2. To determine the difference in healthcare use and access across Gauteng sub-districts for participants of the 2017/18 GCRO Quality of Life survey.
3. To determine the difference in self-reported health status across Gauteng sub-districts for participants of the 2017/18 GCRO Quality of Life survey.
4. To ascertain if there is a variation in health outcomes associated with variation in health access for participants of the 2017/18 GCRO Quality of Life survey.

Chapter 2 Methodology

2.1 Primary study

2.1.1 Study design

The primary study undertaken by the GCRO is a longitudinal study, comprised of repeated biennial cross-sectional studies. The QoL survey is the GCRO's main study and is run to understand the experiences of adult residents of Gauteng of service delivery, their socio-economic circumstances, their values and beliefs, and their quality of life (11).

2.1.2 Study setting

The primary study was set in the province of Gauteng, South Africa. Home to 15 488 137 people, Gauteng is the smallest but most populous province of South Africa (9). Gauteng has an average population density of 737 people per km² and is sub-divided in to 529 municipal wards (11,44). Gauteng consists of three metropolitan municipalities, two district municipalities, six local municipalities, twenty-nine sub-districts, and 529 wards (11,31,45).

2.1.3 Study population

The primary study was a household-based survey of adult residents aged 18 years and older in Gauteng's 529 municipal wards in 2017/18 (46).

2.1.4 Sample

The primary study used multi-stage random sampling (11,47). Thirty households were sampled per ward in the two non-metropolitan district municipalities and 50 households per ward in the three metropolitan municipalities (11). One adult respondent was then sampled at random within the identified household. A total of 28 167 adult interviews were completed and 24 889 respondents' surveys were included in the final 2017/18 dataset (11,46). Weights were calculated to adjust the sample to be representative of the population of Gauteng by gender, race, and ward (11).

2.1.5 Data collection

The primary data was collected for the GCRO's fifth iteration QoL survey (11,46). A team of 526 fieldworkers was trained to conduct the interview verbally. Interviews were conducted with the one identified adult resident per dwelling and the responses documented electronically on a tablet. The survey could be administered in the respondent's chosen language, with each of South Africa's eleven official languages, as well as sign language, available (48). Included data passed automatic and systematic checks by the research team, confirming the location of the interview, the

length of the interview (intended to exceed 30 minutes), live quality assurance by a dedicated team, and telephonic call-backs for 25% of respondents to confirm data (47).

A copy of the 2017/18 GCRO QoL survey questionnaire with 248 questions is included as Appendix I. The data collection tool consisted of ten sections that investigated quality of life, experience of service delivery, values and beliefs, socio-economic circumstances, and other characteristics of the residents of Gauteng older than 18 years (11). Key themes included infrastructure, dwelling, health, socio-political attitudes, and global life satisfaction (11). The scores across themes were used individually and were combined to produce a single quality of life score out of ten (11).

Of the 28 167 interviews completed, 3278 were rejected: a rejection rate of 11.6% (47). Reasons for rejection include failure of the previously detailed automatic and systematic checks by the research team (47). This process resulted in the 24 889 quality-controlled surveys that were included in the final dataset.

2.2 Secondary study

2.2.1 Study design

This secondary data analysis was cross-sectional in design and utilised data collected in 2017/2018 by the GCRO for the QoL survey.

2.2.2 Study setting

The secondary data analysis took place on data collected in Gauteng. The province is divided into three metropolitan municipalities and two district municipalities. The metropolitan municipalities and district municipalities are further sub-divided into several sub-regions, sub-districts, or local municipalities, as detailed in 1.4 above and shown in Table 2.1 below. These regions, sub-districts, and local municipalities are collectively referred to as sub-districts in this report.

Table 2.1: The sub-districts of residence of Gauteng province

Sub-districts of residence of Gauteng (31)		
Region of Gauteng	Number of regions, sub-districts, or local municipalities	Names of sub-regions, sub-districts, or local municipalities
City of Johannesburg Metropolitan	7 regions	Region A, Region B, Region C, Region D, Region E, Region F, and Region G
City of Tshwane Metropolitan	7 regions	Region 1, Region 2, Region 3, Region 4, Region 5, Region 6, and Region 7
City of Ekurhuleni Metropolitan	9 sub-districts	North 1, North 2, North 3, East 1, East 2, East 3, South 1, South 2, and South 3
Sedibeng District	3 local municipalities	Emfuleni, Lesedi, and Midvaal
West Rand District	3 local municipalities	Merafong City, Mogale City, and Rand West City
Total	29	29

The geographic relationship between the five regions of Gauteng and their associated 29 sub-districts is shown graphically in Figures 2.1, 2.2, and 2.3 below.

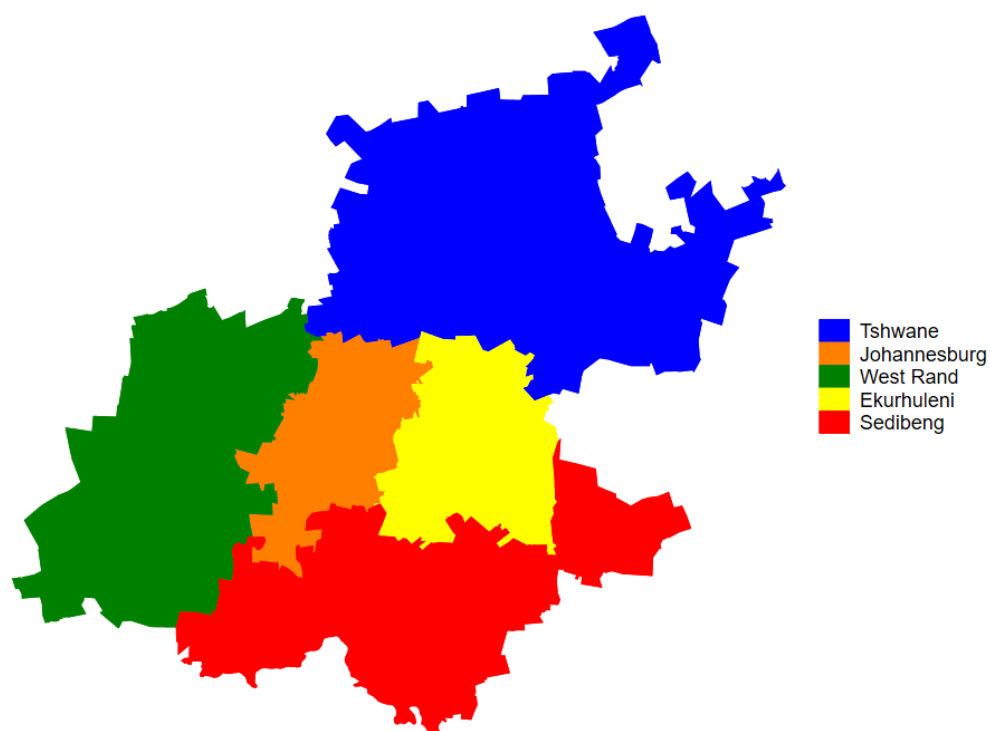


Figure 2.1: The 3 metropolitan municipalities and 2 district municipalities of Gauteng based on the 2016 Municipal Demarcation Board demarcation

To aid the identification of the districts, a selection of specific sub-place names for each metropolitan and district municipality is included in Figure 2.2, below.



Figure 2.2: Notable specific places for each metropolitan and district municipality of Gauteng (45)

To aid the identification of the sub-districts, all 29 are shown in Figure 2.3 by metropolitan and district municipalities.

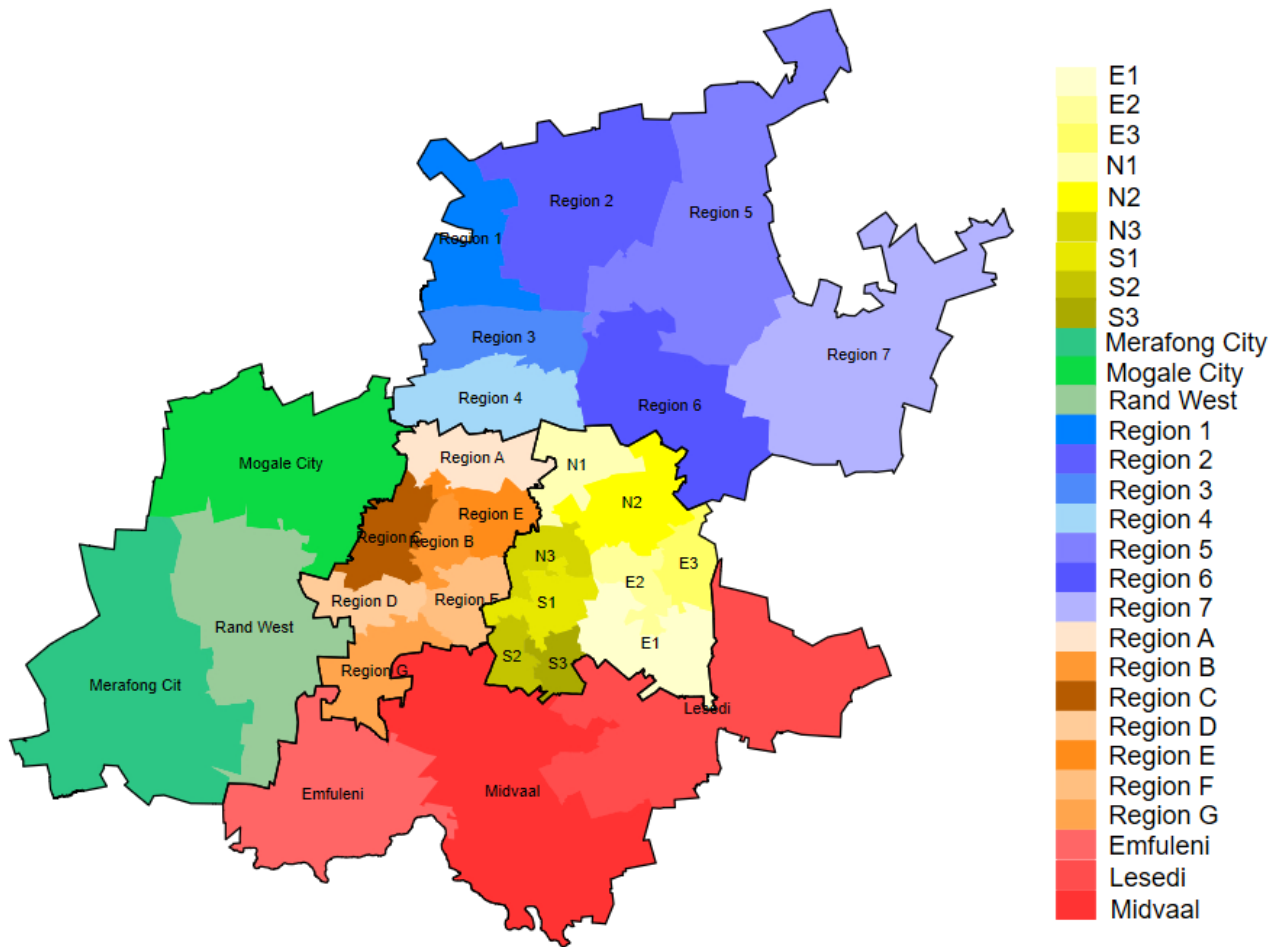


Figure 2.3: The 29 sub-districts of Gauteng Province by metropolitan and district municipality based on the 2016 Municipal Demarcation Board demarcation

2.2.3 Study population

Adult residents aged 18 years and older of Gauteng's 29 sub-districts of residence in 2017/18.

2.2.4 Sample

The GCRO 2017/18 QoL V survey data of 24 889 adult residents aged 18 years and older was used for analysis (46). No further sampling was used. This dataset was chosen because it is the most complete recent GCRO dataset. Due to the COVID-19 pandemic, data collection for the sixth iteration of the GCRO QoL survey was delayed by six months, with results released late in 2021 (49). Also, the sixth iteration of the GCRO QoL survey had a markedly smaller sample size, with 13 616 respondents, and focused more on the impact of the COVID-19 pandemic on adult residents' lives (49).

2.2.5 Data management

DataFirst at the University of Cape Town is the custodian of the GCRO datasets. DataFirst is a research data service dedicated to giving open access to data from African countries, including South Africa, to promote high quality research. The GCRO share their data under a CC SA-BY 4.0 license, meaning the datasets are free for use, provided appropriate credit is given and contributions that build upon the material are distributed under the same license as the original (50). Access to the 2017/18 GCRO QoL survey dataset was granted by DataFirst after submitting the request form and ethical approval for the study. A zip file of version 2 of the dataset was accessed, which included a Stata file of 24 889 respondents who were included in the fifth iteration of the QoL survey (46).

The dataset consisted of 415 unique variables, including all responses to the questionnaire included in Appendix I, and composite scores by area of interest for the computation of the overall quality of life score released by the GCRO.

The GCRO dataset included the district, local municipality where applicable, and ward of residence for each respondent, but did not include their sub-district of residence for the metropolitan municipalities. Access to the respondents' GPS coordinates would have enabled allocation to sub-districts, but the public GCRO dataset omits respondents' GPS coordinates for confidentiality. As a result, households in metropolitan municipalities were allocated to the correct sub-district using ward of residence. For the non-metropolitan municipalities (Sedibeng and West Rand), the local municipality was included in the GCRO dataset. For the metropolitan municipalities, information on the wards in each sub-district was compiled from

allocations available on local government websites, or from the metropolitan's Health or Geographic Information System (GIS) teams. The Ekurhuleni GIS department assisted with the Ekurhuleni allocations, which were not publicly available. Ekurhuleni's sub-districts transect wards, a feature that is not present in the other metropolitan municipalities. This required manual review and allocation of transected wards to the sub-districts with which they shared the most land area. Both Tshwane and Johannesburg's sub-districts were obtained from their respective websites (51,52). The Municipal Demarcation Board's (MDB) 2016 ward demarcation was used to allocate each of Gauteng's 529 wards to the correct sub-district (53). The 2016 demarcation was used as the next demarcation took place after the 2017/18 survey and included several changes across Gauteng. This process allowed for the GCRO QoL 2017/18 survey dataset to be merged with the compiled sub-district allocation as both datasets contained the ward of residence. The result was the addition of sub-district of residence to the GCRO 2107/18 dataset for each respondent.

Table 2.2 indicates the variables used in this analysis by study objective and summarises the data recoding for each variable. Variables in the GCRO dataset were recoded to binary where appropriate for analysis (e.g., place of birth, employment status, and medical scheme cover). Additional variables were recoded to simplify the number of categories to derive more meaningful sample allocations (e.g., education level, and household monthly income). Lastly, variables were constructed from the combination of variables within the GCRO dataset (e.g., the socioeconomic index).

Table 2.2: The data management plan carried out by objective

Objective	Variables of interest	Recoding
Objective 1: To describe the socio-demographic characteristics by sub-district of residence in Gauteng for participants of the 2017/18 GCRO Quality of Life survey	Age (numerical)	Recoded by the GCRO in to 18 – 19 (1) 20 – 24 (2) 25 – 29 (3) 30 – 34 (4) 35 – 39 (5) 40 – 44 (6) 45 – 49 (7) 50 – 54 (8) 55 – 59 (9) 60 – 64 (10) 65+ (11)
	Population group (categorical) African (1) Coloured (2) Indian/Asian (3) White (4) Other (5)	Nil
	Country of birth (categorical)	Born in South Africa (0) Born in a country outside South Africa (1)
	Sex (categorical) Male (1) Female (2)	Nil
	Education level (numerical)	Recoded by the GCRO in to No education (1) Primary only (2) Secondary incomplete (3) Matric (4) More (5) Unspecified (6) Recoded Less than matric (0) Matric and higher (1)
	Employment status (categorical) Employed full time, formal sector (1) Employed part time, formal sector (2) Employed full time, informal sector (3) Employed part time, informal sector (4) Self-employed, own business, not working from home (5) Self-employed, own business, working from home (6) Unemployed looking for work (.) Unemployed not looking for work (.)	Unemployed (0) Employed (1)
	Medical scheme cover (categorical) Medical aid – all healthcare in private facilities (1) Medical aid – private primary healthcare/government hospitalisation (2) Hospital plan (3) No medical insurance (4) Other (5) Don't know (6)	No medical scheme cover (0) Have medical scheme cover (1)
	Household monthly income (categorical) 15 categories spanning R1 – R500 000 (1-15) More (16) No income (17) Respondent refused (18)	R1 – R6 400 (1) R6 401 – R38 400 (2) R38 401 – R102 400 (3) R102 401 – R204 800 (4) R204 801 and above (5) No income (0) Respondent refused (9) Based on the Bureau of Market Research (54)

Objective	Variables of interest	Recoding
	Asset ownership variables (9 variables) Characteristics of household dwelling variables (5 variables)	Asset ownership variables Landline (binary) Cellphone (binary) Television (binary) Computer (binary) Soundsystem (binary) Satellite TV (binary) Car (binary) Bicycle (binary) Fridge (binary) Characteristics of household dwelling Water (binary) Own home (binary) Toilet (binary) Electricity (binary) Dwelling (binary)
	Household income per capita	Constructed
<u>Objective 2:</u> To determine the difference in healthcare use and access across Gauteng sub-districts for participants of the 2017/18 GCRO Quality of Life survey	Difficulty accessing care when needed (binary) Yes (1) No (0)	Nil
	Usual healthcare services use type (categorical) Private healthcare facilities (1) Public healthcare facilities (2) Use public and private facilities (3) Traditional healer (Sangoma) (4) Spiritual healer (e.g., faith-related) (5) Not applicable, don't usually need healthcare (6)	Don't use healthcare (0) Use healthcare (1)
<u>Objective 3:</u> To determine the difference in self-reported health status across Gauteng sub-districts for participants of the 2017/18 GCRO Quality of Life survey	Self-reported health status (categorical) Excellent (1) Good (2) Poor (3) Very poor (4)	Not excellent (0) Excellent (1)
	Frequency of health status interfering with daily work (categorical) Always (1) Some of the time (2) Hardly ever (3) Never (4)	Hardly ever (0) Some of the time (1)
	Frequency of health status interfering with social activities (categorical) Always (1) Some of the time (2) Hardly ever (3) Never (4)	Hardly ever (0) Some of the time (1)
<u>Objective 4:</u> To ascertain if there is a variation in health outcomes associated with variation in health access for participants of the 2017/18 GCRO Quality of Life survey.	Difficulty accessing care when needed (binary) No (0) Yes (1) Self-reported health status (binary) Not excellent (0) Excellent (1)	Nil

A socioeconomic (SES) index was calculated from the list of household assets and dwelling characteristics listed in Table 2.2 using principal component analysis (PCA), as detailed by Filmer and Pritchett (55) in 2001. An asset index, such as the one constructed in this study to catalogue ownership of various assets, is noted to be an internally and externally coherent and stable measure of economic status (55). PCA aids in addressing the uncertainty of weighting allocation to included assets, while also being a practical method to overcome the challenges of data constraints as it can be undertaken in the absence of any additional economic data (55).

The PCA was constructed by utilising 14 variables that provided insight into asset ownership and characteristics of the respondents' household dwelling, as detailed in Table 2.2. The PCA construction and results are included in Appendix III. All variables were inspected and recoded to binary variables. The PCA results included three components with eigenvalues > 1 , with the first component accounting for 30.7% of the variance (Appendix III). The Kaiser-Meyer-Olkin (KMO) value of 0.87 exceeded the minimum recommended value of 0.5, justifying the use of PCA (56). A socioeconomic index was generated from the first component. The correlation between the PCA SES index and a simple sum of dwelling characteristics and asset ownership was 0.99. This numerical PCA SES index was categorised into SES quintiles 1 – 5 from poorest to richest. This was also used to categorise the respondent population into the poorest 40% by SES and the richest 60% by SES.

2.2.6 Data analysis

Stata v17.0 was used for all statistical analyses. The binary and categorical dependent variables for all objectives were described using proportions and confidence intervals.

Table 2.3 details the data analysis executed to investigate each study objective, with greater detail included below.

Objective 1

For Objective 1, individual level data from the 24 889 individual respondents was used to construct the means for sociodemographic and economic descriptive variables. The dataset was collapsed to sub-district level and appropriately weighted to account for the complex sampling design. Clustering was not adjusted for, as the GCRO QoL V did not make use of cluster sampling, differing from the previous iterations of the survey (57).

A request to the Gauteng Province Department of Health to be granted access to the Gauteng sub-district drawing file went unanswered over several months. In the absence of this, the MDB's 2016 ward demarcation shape file was used to create the base map of wards of Gauteng. Only data for Gauteng was retained from this national file. In the absence of a sub-district drawing file, ward polygons were created in Stata v17.0 using the *mergepoly* command. This did not work perfectly, resulting in manual editing being required in quantum geographic information systems (QGIS) software. This drawing file was merged with the sub-district level dataset on ward of residence, as this variable was present in both files. The result was a dataset that included all respondent responses to the 2017/18 QoL survey, their ward of residence, their sub-district of residence, and the drawing data required to generate choropleth maps at the sub-district level.

For all choropleth maps, *grmap* was used in Stata v17.0. A choropleth map easily visualises differences in spatially related data across geographies (58). For this analysis, choropleth maps were used to visually represent the geographic concentration of socio-demographic characteristics, patterns of healthcare access, healthcare service use, and self-reported health status by sub-district. The construction of the category cut-offs is arbitrary, and tailored to each mapped variables range of sub-district means. A graded colour scheme from yellow as the lowest value to blue as the highest value was used for all choropleth maps.

Objectives 2, 3 and, 4

For Objectives 2, 3, and 4, summary data for each of the 29 sub-districts in Gauteng was used. Each outcome of interest was then described by sub-district and for Objectives 2 and 3, were illustrated through choropleth maps.

Chi squared tests were used for categorical variables to determine if there was a statistically significant association between independent variables and binary dependent variables. This was followed by logistic regression to determine sociodemographic and economic variables of significance per outcome of interest. Variables of significance ($p < 0.2$) were included in a multiple logistic regression model to determine if the sociodemographic and economic variables described in Objective 1 had an impact on the outcomes across Objectives 2, 3, and 4. The sub-district variable was added as a fixed effect. The logistic regression results (coefficients) were calculated as marginal effects rather than odds ratios, an approach that originates from

econometrics (59). The marginal effect indicates the percentage point change in the binary dependent variable caused by each independent variable. Mathematically, marginal effects are derivatives and within economics, the term “marginal” refers to “additional” or “incremental” (59). Multiple logistic regression was selected for use because the dependent variables of Objectives 2, 3, and 4 are binary (60).

This study was particularly interested in geographic effects. A test for overall sub-district effect was done for each outcome variable of interest after adjusting for significant sociodemographic and economic confounders, with the results included in-text for each outcome. In addition, logistic regressions focusing on the impact of sociodemographic and economic variables on geography were undertaken for each outcome of interest. The results before and after adjustment for Objectives 2 and 3 are included in Appendix IV. These models were constructed to determine if the geographical variation observed was partly determined by variation in other socioeconomic differences, or if a residual geographic effect remained after accounting for these differences. Building a model that focused on variables with the potentially largest impact limited the likelihood of committing a type I error.

The results of the regression models are presented as the contrast from the stipulated base category or as the contrast from the provincial mean when that simplified interpretation (i.e., for sub-district of residence). All analyses were weighted using the sampling weights provided by the GCRO. Analyses of the sample were adjusted for the sampling design which resulted in under-representation in ward population, gender, and race.

Table 2.3: Data analysis completed by objective

Objective	Dependent variables	Independent variables	Confounding variables	Analyses undertaken
<u>Objective 1:</u> To describe the socio-demographic characteristics by sub-district of residence in Gauteng for participants of the 2017/18 GCRO Quality of Life survey	Age (numerical) Population group (categorical) Born in South Africa (binary) Sex (binary) Education level (categorical) Employment status (binary) Medical scheme membership (categorical) Household income (categorical) Income per capita (numeric) SES quintile (categorical)	Sub-district of residence in Gauteng (categorical)		Weighted descriptive analysis of dependent variables. Choropleth plot of the distribution of socio-demographic characteristics by sub-district of residence
<u>Objective 2:</u> To determine the difference in healthcare use and access across Gauteng sub-districts for participants of the 2017/18 GCRO Quality of Life survey	Difficulty accessing healthcare when needed (binary) Usual healthcare service use (binary)	Sub-district of residence in Gauteng (categorical)	Dependent variables of Objective 1	Weighted descriptive analysis of dependent variables. Choropleth plot of the distribution of (1) healthcare access and (2) healthcare service use by sub-district of residence Logistic regression of (1) healthcare use and (2) healthcare access with sub-district of residence as a predictor, before and after adjusting for confounding. Multiple logistic regression to adjust for potential confounding from sociodemographic variables from Objective 1
<u>Objective 3:</u> To determine the difference in self-reported health status across Gauteng sub-districts for participants of the	Self-reported health status (binary) Health preventing work (binary)	Sub-district of residence in Gauteng (categorical)	Dependent variables of Objective 1	Weighted descriptive analysis of dependent variables. Choropleth plot of the distribution of health status by sub-district

<p>2017/18 GCRO Quality of Life survey.</p>	<p>Health preventing social activities (binary)</p>			<p>Logistic regression of (1) self-reported health status (2) health status' impact on daily work and (3) health status' impact on social activities with sub-district of residence as a predictor, before and after adjusting for confounding</p> <p>Multiple logistic regression to adjust for potential confounding from the sociodemographic variables from Objective 1</p>
<p><u>Objective 4:</u> To ascertain if there is a variation in health outcomes associated with variation in health access for participants of the 2017/18 GCRO Quality of Life survey</p>	<p>Self-reported health status (binary)</p>	<p>Difficulty accessing healthcare when needed (binary)</p>	<p>Dependent variables of Objective 1</p>	<p>Scatter plot to visualise relationship between access and outcome.</p> <p>Multiple logistic regression of health status and healthcare access, adjusting for potential sociodemographic confounders</p>

2.3 Ethical considerations

Ethical clearance for the primary study was obtained by the GCRO from the University of the Witwatersrand Human Research Ethics Committee (non-medical).

Informed consent was received from all respondents who voluntarily participated in the QoL survey. The GCRO QoL survey dataset is a deidentified dataset that is access controlled by the data custodian (DataFirst). No Global Positioning System (GPS) coordinates for households are released, respondents' locations are noted only by specific place name, and each respondent has a respondent identity number.

Ethical clearance for this specific research study was obtained from the University of the Witwatersrand Human Research Ethics Committee (medical) on 21/02/2022 (reference number R14/49 and protocol number W-CBP-220221-01) and is included in Appendix II.

Chapter 3 Results

The results of the analyses are presented in this chapter by study objective, with additional analysis included in Appendix IV.

3.1 Objective 1: Sociodemographic and economic profiles of survey sub-districts

3.1.1 Demographic profile of sub-districts

Certain demographic characteristics across all 29 sub-districts are summarised in Table 3.1 and depicted in Figure 3.1 below.

The mean age of adult residents across sub-districts ranged from 37.2 to 43.4 years of age, as detailed in Table 3.1. The overall mean for the province was 40.7 years of age. Johannesburg's Region A (home to Dainfern, Diepsloot, Kyalami, and Waterfall) and Tshwane's Region 5 (including Cullinan, Eersterust, and Rayton) were the sub-districts with the youngest adult residents, on average. Sedibeng's Emfuleni (with Evaton, Vanderbijlpark, and Vereeniging) and Midvaal (home to Vaal Marina, Meyerton, and Eikenhof), were the sub-districts with the oldest adult residents, on average.

The provincial mean of female adult residents was 53.3%. The proportion of female adult residents was highest in Sedibeng's Lesedi (home to Nigel, Heidelberg, and Devon) at 55.8% and lowest in Johannesburg's Region F (including Fordsburg, Nasrec, and Rosettenville) at 41.1%. Figure 3.1 demonstrates that in 11 sub-districts, females were the largest proportion of adult residents.

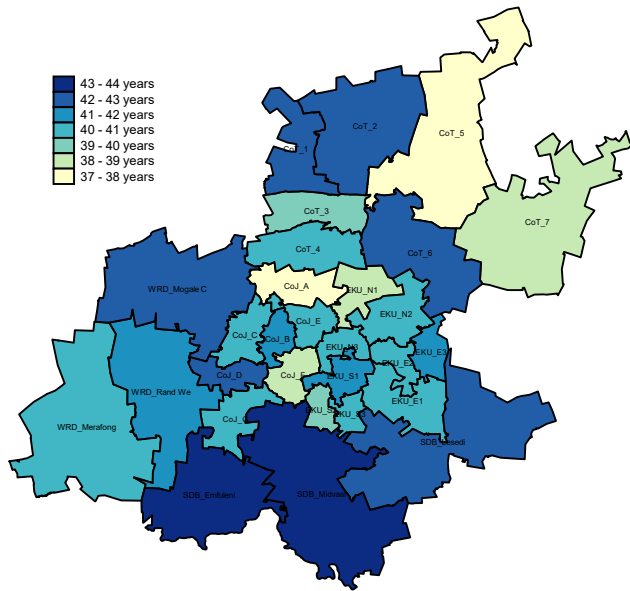
Black African adult residents were the majority demographic across the province at 84.2%, as described in Table 3.1. Ekurhuleni's S3 (including part of Boksburg, Vosloorus, and Zonkizizwe) had 98.6% Black African adult residents, the highest across the province. Only 31.0% of adult residents in Johannesburg's Region B (including parts of Bryanston, Saxonwold, and Auckland Park) were Black African, the lowest across the province. As shown in Figure 3.1, 27 sub-districts had Black African adult residents as the majority.

Adult residents not born in South Africa ranged from 3.2% to 20.0% across sub-districts, with a provincial mean of 8.3%. 3.2% of adult residents in Johannesburg's Region D (including Soweto, Diepkloof, and Klipspruit) indicated that they were not born in South Africa. This contrasts with its neighbouring sub-district, Region F, where the highest rate of adult residents indicated they were not born in South Africa (20.0%).

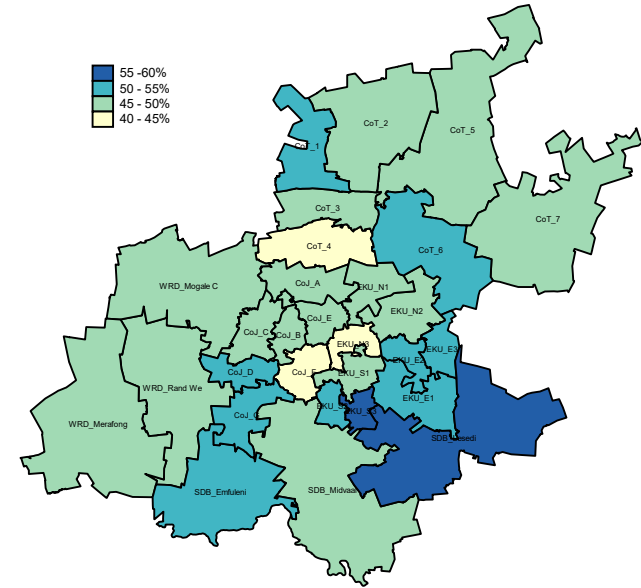
Table 3.1: The sociodemographic and economic profile of the Gauteng sub-districts

Sociodemographic variables used in bivariate analyses for confounding of the outcomes of objectives 2, 3, and 4 are marked with an *

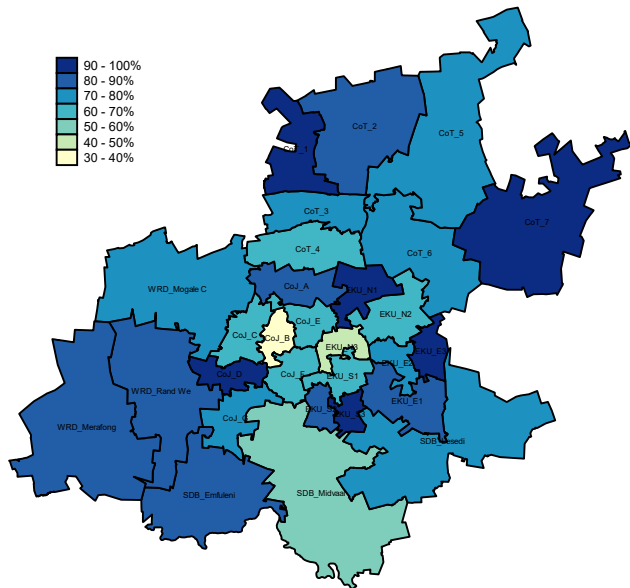
Municipality	Sub-district	Age* (mean)	Female* (%)	Black African* (%)	Not born in RSA* (%)	Matric or more* (%)	Employed* (%)	Medical scheme cover* (%)	Wealthiest quintile* (%)	Poorest 40% (%)	Household income (mean)	Income per capita (mean)
City of Johannesburg	Region A (n = 896)	37.4	45.8%	86.2%	14.3%	61.4%	45.4%	28.0%	18.3%	51.8%	R10,848.69	R4,726.44
	Region B (n = 706)	41.9	49.8%	31.0%	7.6%	82.9%	48.3%	65.1%	55.5%	14.0%	R18,429.77	R7,975.91
	Region C (n = 1160)	40.8	48.2%	67.8%	11.0%	68.0%	41.0%	42.1%	32.4%	31.9%	R12,520.14	R6,040.24
	Region D (n = 2259)	42.2	52.1%	94.8%	3.2%	57.7%	28.9%	15.7%	15.3%	39.3%	R5,346.99	R2,130.42
	Region E (n = 873)	40.7	47.0%	64.2%	9.6%	79.7%	51.0%	48.7%	39.9%	29.2%	R16,250.01	R7,778.80
	Region F (n = 1132)	38.7	41.1%	66.5%	20.0%	76.9%	47.7%	38.6%	29.7%	27.3%	R14,762.83	R6,451.07
	Region G (n = 843)	40.2	52.5%	76.1%	6.8%	54.8%	28.6%	27.8%	15.9%	38.1%	R4,777.72	R1,973.03
City of Tshwane	Region 1 (n = 1173)	42.7	52.3%	95.2%	5.9%	56.8%	36.0%	18.7%	15.0%	43.2%	R7,679.46	R3,137.97
	Region 2 (n = 493)	42.2	50.0%	86.3%	5.6%	58.5%	37.6%	20.9%	16.4%	56.6%	R6,838.48	R2,568.92
	Region 3 (n = 1000)	39.7	47.7%	74.4%	8.8%	79.7%	46.3%	45.8%	26.6%	30.6%	R12,020.36	R5,225.27
	Region 4 (n = 441)	40.4	41.9%	60.6%	13.6%	74.9%	66.5%	59.3%	42.6%	26.8%	R23,307.59	R10,502.43
	Region 5 (n = 104)	37.2	46.7%	79.7%	9.4%	62.8%	45.8%	21.4%	23.3%	59.1%	R9,052.33	R3,535.85
	Region 6 (n = 978)	42.4	50.9%	76.5%	7.1%	69.2%	41.2%	35.2%	25.1%	35.1%	R9,560.45	R4,111.65
	Region 7 (n = 137)	38.3	49.8%	93.6%	10.8%	43.8%	36.5%	13.1%	8.6%	72.2%	R3,431.20	R1,492.32
Ekurhuleni	E1 (n = 947)	40.8	52.6%	83.9%	5.0%	53.1%	34.3%	26.2%	17.5%	40.4%	R7,642.17	R2,855.98
	E2 (n = 622)	40.8	50.3%	75.9%	7.3%	66.1%	33.6%	34.0%	21.7%	40.2%	R6,168.69	R3,034.79
	E3 (n = 500)	41.3	52.5%	91.8%	8.9%	54.1%	26.9%	15.0%	12.3%	45.5%	R5,163.02	R2,050.33
	N1 (n = 1180)	38.2	49.1%	93.5%	7.9%	60.9%	38.4%	20.9%	14.4%	46.8%	R6,454.46	R2,799.70
	N2 (n = 444)	40.7	45.9%	62.5%	12.2%	66.8%	45.4%	45.0%	34.1%	33.8%	R10,015.73	R4,855.67
	N3 (n = 429)	40.3	43.7%	44.1%	14.0%	82.4%	53.3%	59.1%	47.9%	25.0%	R21,953.93	R13,800.72
	S1 (n = 717)	41.2	49.5%	61.3%	7.2%	69.2%	47.0%	41.0%	30.4%	33.6%	R10,546.17	R4,524.71
	S2 (n = 919)	39.6	53.1%	87.7%	6.6%	54.0%	29.8%	15.7%	13.3%	48.3%	R5,523.69	R2,126.45
S3 (n = 542)	40.2	55.4%	98.6%	5.8%	53.9%	32.3%	13.4%	9.5%	49.8%	R6,095.78	R2,814.96	
Sedibeng	Emfuleni (n = 1713)	43.0	52.4%	84.5%	4.3%	53.5%	32.5%	24.1%	13.4%	40.1%	R4,934.09	R2,279.06
	Lesedi (n = 464)	43.0	55.8%	78.0%	4.0%	54.0%	38.3%	23.9%	17.3%	32.8%	R8,162.39	R3,442.36
	Midvaal (n = 518)	43.4	46.3%	55.1%	9.2%	62.7%	45.2%	41.4%	29.2%	38.4%	R11,137.59	R5,024.41
West Rand	Merafong City (n = 1024)	40.7	49.4%	87.5%	14.3%	44.2%	38.0%	33.3%	10.7%	52.6%	R7,521.52	R4,079.43
	Mogale City (n = 1392)	42.2	49.5%	76.0%	9.0%	57.2%	38.0%	29.0%	23.2%	39.5%	R8,255.89	R3,920.85
	Rand West City (n = 1283)	41.9	47.2%	80.4%	10.5%	50.1%	34.2%	24.4%	13.6%	51.8%	R5,384.10	R2,673.36
Provincial mean/total	n = 24 889	40.7	53.3%	84.2%	8.3%	60.7%	38.4%	28.6%	19.9%	40.1%	R8,339.14	R3,753.60



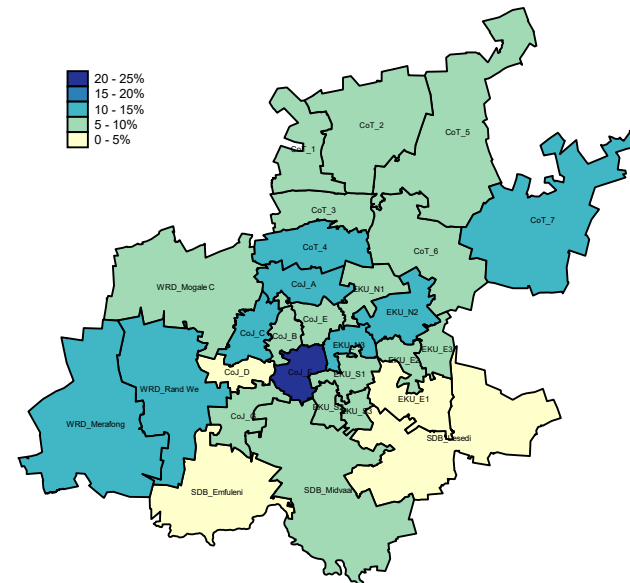
The mean age of adult residents by sub-district



The proportion of female adult residents by sub-district



The proportion of Black adult residents by sub-district



The proportion of adult residents who are not born in South Africa by sub-district

Figure 3.1: Select demographics of Gauteng by sub-district of residence

3.1.2 Social profile of survey respondents

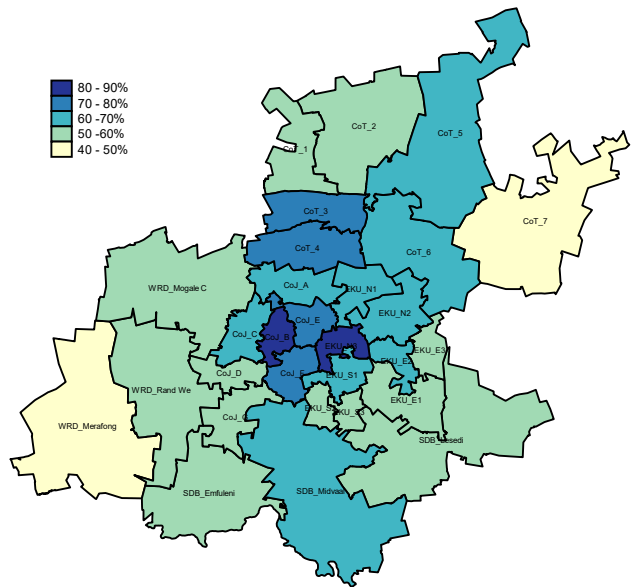
Certain social characteristics across all 29 sub-districts are summarised in Table 3.1 above and depicted in Figure 3.2 below.

The matric completion rate across the province was 60.7% (Table 3.1). Most sub-districts across the province (27/29) reported a resident matric completion rate of > 50%. The completion rate was noted to be highest in Johannesburg's region B at 82.9%, and lowest in Tshwane's Region 7 (home to Bronkhorstspuit) at 43.8%, as depicted in Figure 3.2. West Rand's Merafong City (including Carletonville, Fochville, and Wedela) is the only other sub-district that reported a matric completion rate of less than 50% (44.2%).

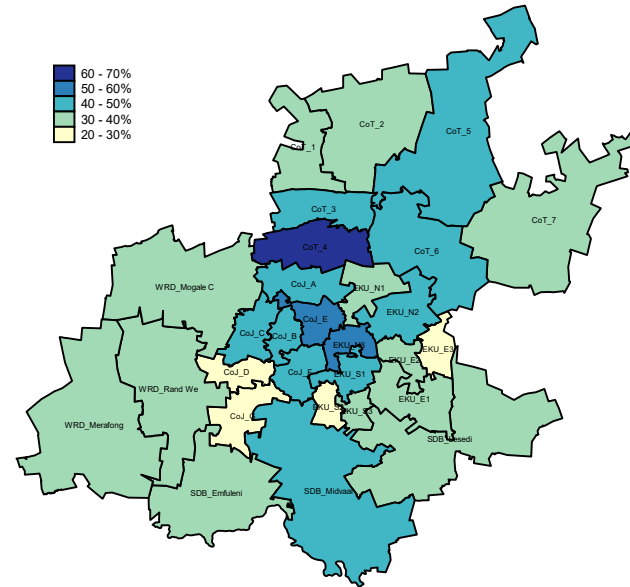
The overall employment rate across the province was low, at 38.4%. Employment rates of the adult residents varied, with Ekurhuleni's region E3 (including Daveyton, Eastvale, and Welgedacht) residents reporting the lowest employment rate of 26.9% (Table 3.1). Tshwane's Region 4 (including Centurion, Olievenhoutbosch, and Laudium) residents reported the highest employment rate of 66.5%. Only three sub-districts (Johannesburg's Region E, Tshwane's Region 4, and Ekurhuleni's N3) had resident employment rates higher than 50% (Figure 3.2).

The overall medical scheme coverage rate was low, at 28.6%, with large differences between sub-districts. Tshwane's Region 7 adult residents had the lowest coverage rate of 13.1% and Johannesburg's Region B adult residents reported the highest coverage rate of 65.1% (Table 3.1). Tshwane's Region 4 and Ekurhuleni's N3 (including Bedfordview, Edenvale, and Rhodesfield) were the only other regions with medical scheme coverage greater than 50% (Figure 3.2).

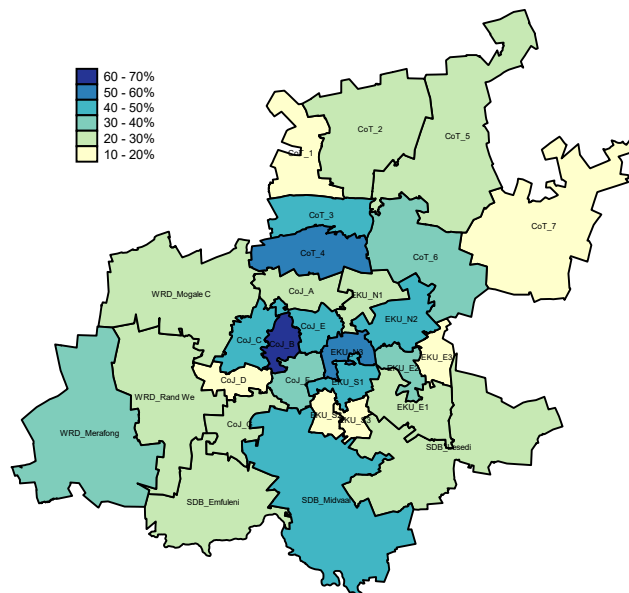
While Johannesburg's Region B medical scheme coverage (65.1%) exceeded its resident proportion who reported being employed (48.3%), Tshwane's Region 7 had medical scheme coverage (13.1%) that was substantially lower than its proportion of adult residents who reported being employed (36.5%).



The proportion of adult residents with matric or more by sub-district



The proportion of employed adult residents by sub-district



The proportion of adult residents who have medical scheme cover by sub-district
Figure 3.2: Select social characteristics of Gauteng by sub-district of residence

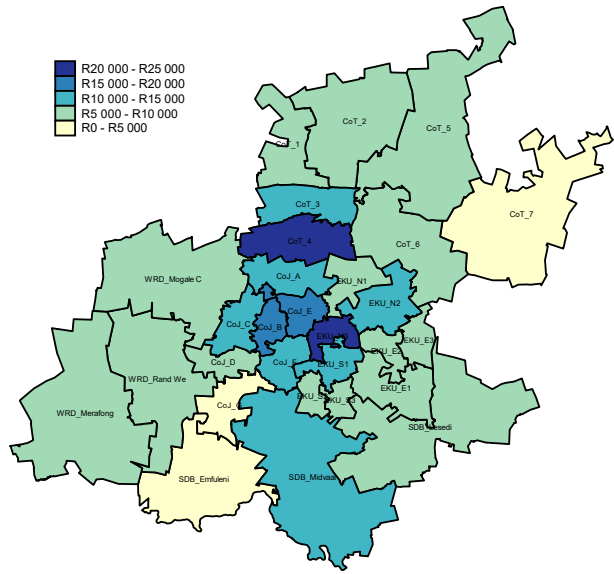
3.1.3 Economic profile of survey respondents

Certain economic characteristics across all 29 sub-districts are summarised in Table 3.1 above and depicted in Figure 3.3 below.

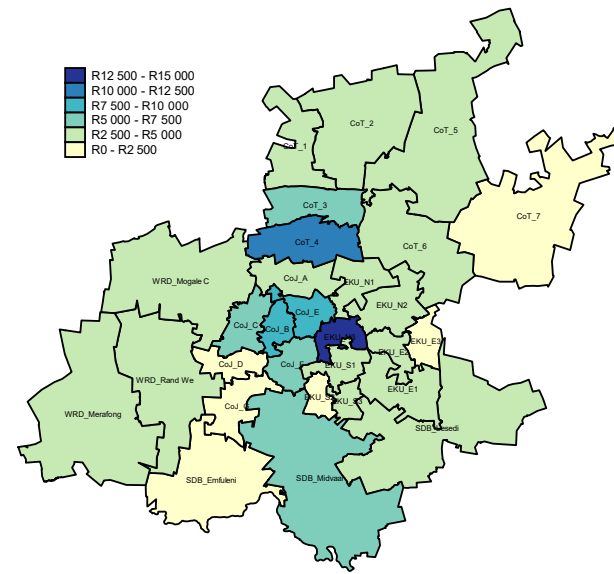
One third of survey respondents chose not to disclose their income. The mean household income and income per capita for those who answered this question are shown. These results may be biased if those who didn't answer were different from those who did, or if the rate of non-disclosure differed by sub-district. With this context, it is still worth noting that average household income and income per capita for respondents who answered were low (Table 3.1). Tshwane's Region 7 had the lowest mean household income of R3,431.20 per month and Tshwane's Region 4 had the highest mean household income of R23,307.59 per month (Table 3.1). The mean household income noted across the province was R8,339.14.

Respondents' mean income per capita noted Tshwane's Region 7 as the lowest across sub-districts, at R1,492.32, while Ekurhuleni's N3 was noted to be the highest, at R13,800.72 (Table 3.1). The mean income per capita across the province was R3,753.60 (Figure 3.3).

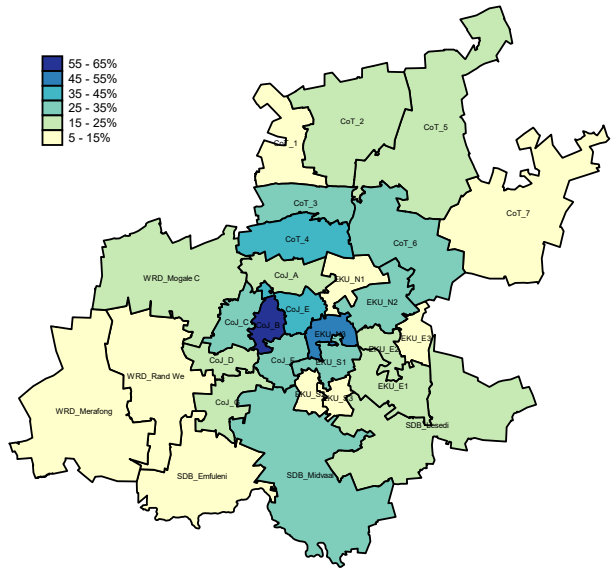
The calculation of wealth quintiles was carried out at a provincial level, rather than within each sub-district, to allow for more meaningful comparison between sub-districts. The proportions for each quintile within each sub-district would be expected to be 20%, if each sub-district was the same. The determination of the proportion of each sub-district's population in the wealthiest quintile of the province was made based on the output of the SES index constructed from PCA. Johannesburg's Region B had the largest proportion of adult residents in the wealthiest quintile of the province, with 55.5%, in stark contrast to Tshwane's Region 7 with the smallest proportion, at 8.6% of adult residents (Table 3.1). As expected, the inverse result was noted when evaluating the proportion of each sub-district's population in the poorest 40% of the province. Tshwane's Region 7 was noted to have the largest resident population in the poorest 40% of the province by SES with 72.2% and Johannesburg's Region B had the smallest proportion of its population in the poorest 40% by SES with 14.0% (Table 3.1).



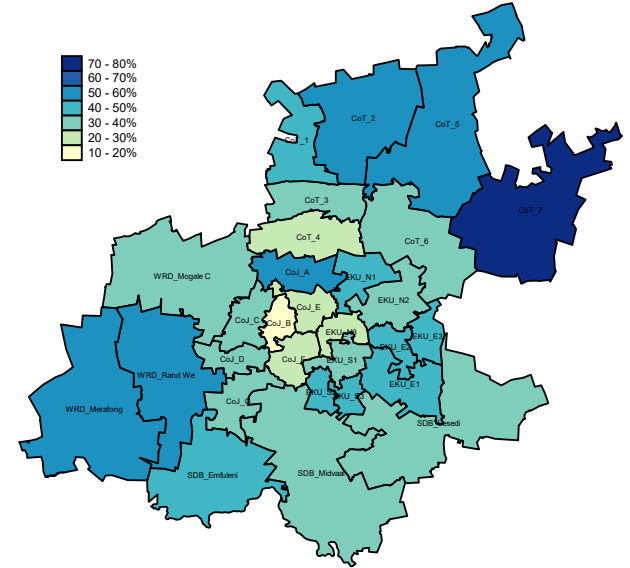
Mean household income by sub-district



Mean income per capita by sub-district



Proportion of respondents in the wealthiest quintile by SES



Proportion of respondents in the poorest 40% of the province by SES

Figure 3.3: Select economic characteristics of Gauteng by sub-district of residence

3.2 Objective 2: Sub-district variation in health care usage and access

3.2.1 Access to healthcare

3.2.1.1 Differences in healthcare access across Gauteng sub-districts

To measure healthcare access, the GCRO QoL V enquired about household difficulty in accessing needed healthcare in a defined period (12 months before the survey).

Variation in responses was noted across sub-districts, as noted in Table 3.2 below.

Table 3.2: Healthcare access difficulty by sub-district of residence

Municipality	Sub-district	Adult residents (%)
		Healthcare access difficulty experienced
City of Johannesburg	Region A	5.9%
	Region B	2.5%
	Region C	4.4%
	Region D	6.9%
	Region E	3.6%
	Region F	4.1%
	Region G	7.0%
City of Tshwane	Region 1	9.7%
	Region 2	6.5%
	Region 3	4.5%
	Region 4	6.2%
	Region 5	5.6%
	Region 6	6.3%
	Region 7	5.2%
Ekurhuleni	E1	6.0%
	E2	4.8%
	E3	7.8%
	N1	7.1%
	N2	5.2%
	N3	2.7%
	S1	5.3%
	S2	5.8%
	S3	8.3%
Sedibeng	Emfuleni	6.3%
	Lesedi	5.7%
	Midvaal	5.9%
West Rand	Merafong City	2.9%
	Mogale City	3.4%
	Rand West City	3.7%
Gauteng mean		5.6%

Overall health access in Gauteng was significant, with 5.6% of adult residents reporting household difficulty accessing healthcare. Johannesburg’s Region B adult residents reported the least household difficulty in accessing healthcare (2.5%). This contrasts with adult residents in Tshwane’s Region 1 (home to Soshanguve, Ga-Rankuwa, and Pretoria North) who reported the most household difficulty at a rate nearly four times higher than Johannesburg’s Region B (9.7%). The distribution of household difficulty in accessing healthcare follows in Figure 3.4.

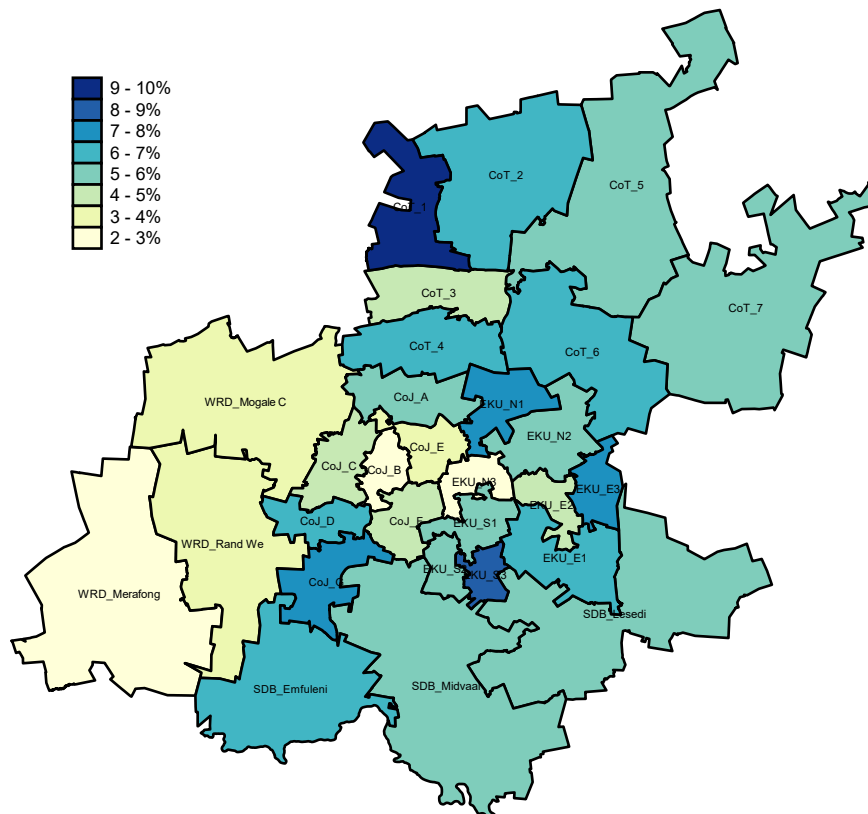


Figure 3.4: Household healthcare access difficulty by sub-district of residence

As noted in Figure 3.4, the distribution of household healthcare access difficulty ranged from 2 – 10%. The West Rand notably had low household difficulty accessing healthcare across all three sub-districts.

3.2.1.2 Factors associated with healthcare access

Regression analysis was used to test whether these differences in household access between sub-districts were statistically significant, while adjusting for other socio-demographic factors that might also be associated with access.

Socio-demographic factors associated with household healthcare access were evaluated through a series of bivariate analyses using the indicated variables in Table

3.1. All indicated variables were found to be statistically significant at p values less than the 0.2 level and were therefore included in the final multiple logistic regression model.

The results of the multiple logistic regression are presented in Table 3.3. The results are presented as marginal effects, which indicates the percentage change in household access associated with each factor. For sub-districts, the results are shown as a contrast against the provincial mean, whereas for other variables the results are shown as a contrast against a stipulated base category.

Given the interest in spatial effects, the results for sub-district before and after adjusting for other sociodemographic factors (confounders) are shown in Appendix IV. After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of household difficulty in accessing healthcare (test for overall sub-district effect, $\chi^2=77.2$, $p<0.001$).

The multiple logistic regression results (Table 3.3) show that six sub-districts had statistically significantly different rates of household access difficulties from the provincial mean. Tshwane's Region 1 had significantly more household difficulty (2.7 percentage points higher than the provincial average). Johannesburg's Regions B and F had significantly less household difficulty, at 2.2 and 1.7 percentage points lower than the provincial average respectively. A similar pattern was noted across the West Rand, with Merafong at 2.8 percentage points lower than the provincial average, Mogale City at 2.5 percentage points lower, and Rand West City at 2.4 percentage points lower.

Residents older than 65 years of age noted significantly lower rates of household difficulty accessing healthcare (-2.6 percentage points) than the 18 – 19-year-old age band, and female adult residents' households had more difficulty accessing healthcare than male adult residents' households (+1.7 percentage points).

Respondents not born in South Africa (-1.6 percentage points), those with medical scheme cover (-1.8 percentage points), and those in the wealthiest 40% (-1.2 percentage points for quintile 4 and -1.9 percentage points for quintile 5) had statistically significantly less household difficulty accessing health care than their base categories.

Table 3.3: Multiple logistic regression of the impact of sociodemographic variables on health access

Statistically significant results are in bold font

Municipality	Sub-district	Coefficient (marginal effect)	95% confidence interval		p value
Sub-district (vs Gauteng mean)					
City of Johannesburg	Region A	0.1%	-1.5%	to 1.6%	0.93
	Region B	-2.2%	-4.0%	to -0.4%	0.02
	Region C	-0.6%	-2.0%	to 0.8%	0.41
	Region D	0.8%	-0.2%	to 1.8%	0.11
	Region E	-1.4%	-2.9%	to 0.1%	0.06
	Region F	-1.7%	-3.1%	to -0.4%	0.01
	Region G	1.0%	-0.7%	to 2.7%	0.25
City of Tshwane	Region 1	2.7%	1.0%	to 4.3%	0.00
	Region 2	0.3%	-1.7%	to 2.3%	0.77
	Region 3	-0.3%	-1.8%	to 1.2%	0.68
	Region 4	2.9%	-0.9%	to 6.8%	0.14
	Region 5	-1.1%	-5.2%	to 3.0%	0.60
	Region 6	0.8%	-0.8%	to 2.4%	0.31
	Region 7	-1.3%	-4.4%	to 1.8%	0.42
Ekurhuleni	E1	0.2%	-1.4%	to 1.8%	0.81
	E2	-0.7%	-2.4%	to 1.1%	0.46
	E3	1.1%	-1.1%	to 3.2%	0.33
	N1	0.5%	-1.1%	to 2.0%	0.54
	N2	0.1%	-2.5%	to 2.6%	0.95
	N3	-1.8%	-4.2%	to 0.7%	0.16
	S1	-0.1%	-2.1%	to 1.9%	0.91
	S2	-0.6%	-1.9%	to 0.8%	0.40
Sedibeng	S3	1.4%	-0.6%	to 3.4%	0.16
	Emfuleni	0.0%	-1.1%	to 1.2%	0.93
	Lesedi	-0.8%	-3.0%	to 1.5%	0.51
West Rand	Midvaal	-0.2%	-2.5%	to 2.2%	0.88
	Merafong City	-2.8%	-3.9%	to -1.8%	0.00
	Mogale City	-2.5%	-3.5%	to -1.5%	0.00
Age band (vs 18-19)	Rand West City	-2.4%	-3.5%	to -1.3%	0.00
	20-24	-0.1%	-2.5%	to 2.3%	0.95
	25-29	-1.1%	-3.5%	to 1.3%	0.36
	30-34	-0.9%	-3.3%	to 1.4%	0.45
	35-39	-1.5%	-3.9%	to 0.8%	0.20
	40-44	-1.7%	-4.1%	to 0.7%	0.16
	45-49	-0.8%	-3.2%	to 1.7%	0.55
	50-54	-1.2%	-3.7%	to 1.3%	0.36
	55-59	-0.7%	-3.3%	to 1.9%	0.61
	60-64	-0.9%	-3.6%	to 1.8%	0.51
65+	-2.6%	-5.0%	to -0.2%	0.03	
Population group (vs Black African)	Coloured	-0.3%	-2.1%	to 1.5%	0.76
	Indian/Asian	-2.7%	-5.4%	to 0.1%	0.06
	White	-0.7%	-2.2%	to 0.9%	0.40
	Other	-1.5%	-8.4%	to 5.3%	0.66
Respondent sex (vs male)	Female	1.7%	1.0%	to 2.4%	0.00
Birth status (vs born in RSA)	Not born in RSA	-1.6%	-2.8%	to -0.4%	0.01
Education level (vs less than matric)	Matric or more	-0.7%	-1.5%	to 0.1%	0.07
Employment (vs unemployed)	Employed	0.1%	-0.7%	to 0.8%	0.90
Medical scheme cover (vs no cover)	Have cover	-1.8%	-2.8%	to -0.9%	0.00
Wealth quintile (vs quintile 1)	Quintile 2	-0.8%	-1.9%	to 0.2%	0.13
	Quintile 3	-0.9%	-2.0%	to 0.2%	0.10
	Quintile 4	-1.2%	-2.4%	to 0.0%	0.05
	Quintile 5	-2.9%	-4.2%	to -1.6%	0.00

3.2.2 Healthcare usage

3.2.2.1 Differences in healthcare usage across Gauteng sub-districts

To determine healthcare usage, the GCRO QoL survey asked respondents about which healthcare service they typically used. This question was not time-bound and included a range of responses, including public healthcare facilities, private healthcare facilities, traditional healers, and spiritual healers. Responses were combined, where applicable, to produce a binary outcome of respondents who report using healthcare and those who do not. The variation in healthcare use pattern follows in Table 3.4.

Table 3.4: Healthcare use by sub-district of residence

Municipality	Sub-district	Adult residents (%)
		Use healthcare
City of Johannesburg	Region A	95.5%
	Region B	96.5%
	Region C	96.5%
	Region D	96.7%
	Region E	95.9%
	Region F	95.5%
	Region G	97.3%
City of Tshwane	Region 1	94.5%
	Region 2	94.0%
	Region 3	94.0%
	Region 4	93.6%
	Region 5	97.5%
	Region 6	96.9%
	Region 7	92.9%
Ekurhuleni	E1	97.5%
	E2	95.5%
	E3	96.3%
	N1	95.1%
	N2	94.5%
	N3	94.1%
	S1	96.4%
	S2	96.7%
	S3	97.2%
Sedibeng	Emfuleni	97.4%
	Lesedi	96.7%
	Midvaal	97.3%
West Rand	Merafong City	97.1%
	Mogale City	96.4%
	Rand West City	96.8%
Gauteng mean		96.2%

Healthcare usage in Gauteng was high, at 96.2%. Tshwane’s Region 7 adult residents noted the least healthcare usage across the province with 92.9% indicating they use healthcare. Tshwane’s Region 5 adult residents, neighbours to Region 7, reported the most healthcare usage, at 97.5%.

The distribution of respondents’ healthcare usage by sub-district of residence follows in Figure 3.5.

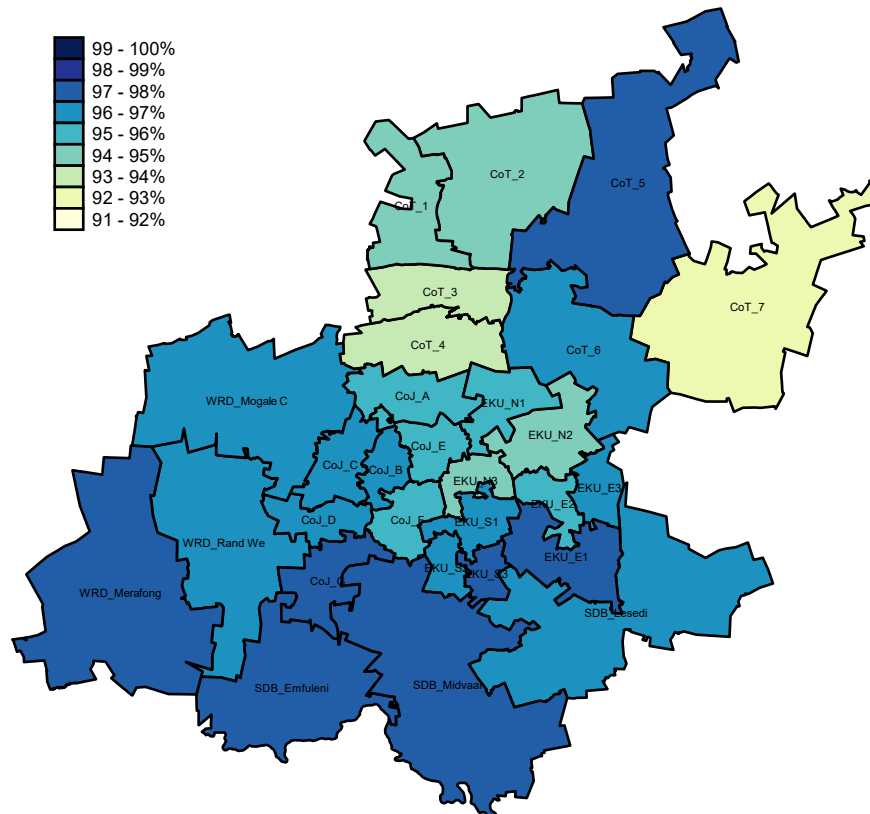


Figure 3.5: Healthcare use by sub-district of residence

As noted in Figure 3.5 above, adult residents who reported healthcare usage ranged from 92 – 98%. Discernible clusters of neighbouring sub-districts are noted at 95 – 96% reported healthcare usage in Johannesburg, 96 – 97% in Johannesburg, Ekurhuleni, and the West Rand, and 97 – 98% in Sedibeng and Ekurhuleni.

3.2.2.2 Factors associated with healthcare usage

As detailed in 3.2.1 and Table 3.1, bivariate analyses preceded multiple logistic regression. The regression results are in Table 3.5. Given the interest in spatial effects, the results for sub-district before and after adjusting for other sociodemographic factors (confounders) are shown in Appendix IV. After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of healthcare usage (test for overall sub-district effect, $\chi^2 = 57.01$, $p < 0.001$).

Multiple logistic regression (Table 3.5) noted three sub-districts with greater healthcare usage, and two sub-districts noted less healthcare usage than the provincial mean. Johannesburg's Region G noted healthcare usage that was 1.5 percentage points higher; Ekurhuleni's E1 was 1.4 percentage points higher; and Sedibeng's Emfuleni was 1.3 percentage points higher. Tshwane's Regions 1 and 3 were 1.7 and 1.6 percentage points lower, respectively. No statistically significant variance was noted on the West Rand.

Three older age bands (45 – 49, 55 – 59, and 65+ years old) had significant increasingly higher healthcare usage than the 18 – 19-year-old age band (+2.3 percentage points, +2.4 percentage points, and +3.1 percentage points respectively).

Females used significantly more healthcare than males (+4.0 percentage points) and the population born outside of South Africa used significantly less healthcare than those born in South Africa (-2.5 percentage points).

Medical scheme cover and being a member of the wealthiest quintile increased healthcare usage significantly by +2.1 percentage points and +1.4 percentage points respectively compared to the base categories detailed in Table 3.5.

Table 3.5: Multiple logistic regression of the impact of sociodemographic variables on healthcare usage

Statistically significant results are in bold font

Municipality	Sub-district	Coefficient (marginal effect)	95% confidence interval		p value	
Sub-district (vs Gauteng mean)						
City of Johannesburg	Region A	-0.2%	-1.5%	to	1.0%	0.74
	Region B	-0.4%	-2.2%	to	1.3%	0.62
	Region C	0.5%	-0.5%	to	1.6%	0.33
	Region D	0.6%	-0.2%	to	1.3%	0.16
	Region E	-0.3%	-1.7%	to	1.1%	0.69
	Region F	0.0%	-1.2%	to	1.2%	1.00
	Region G	1.5%	0.4%	to	2.6%	0.01
City of Tshwane	Region 1	-1.7%	-3.2%	to	-0.2%	0.03
	Region 2	-1.3%	-3.4%	to	0.7%	0.20
	Region 3	-1.6%	-3.1%	to	-0.2%	0.03
	Region 4	-2.5%	-5.3%	to	0.3%	0.08
	Region 5	1.4%	-1.4%	to	4.3%	0.33
	Region 6	0.6%	-0.5%	to	1.8%	0.26
	Region 7	-3.1%	-7.3%	to	1.1%	0.15
Ekurhuleni	E1	1.4%	0.2%	to	2.5%	0.02
	E2	-0.2%	-1.8%	to	1.3%	0.77
	E3	0.4%	-1.4%	to	2.2%	0.66
	N1	-0.4%	-1.6%	to	0.9%	0.57
	N2	-1.7%	-4.1%	to	0.7%	0.17
	N3	-2.2%	-4.7%	to	0.2%	0.08
	S1	0.9%	-0.5%	to	2.3%	0.23
	S2	0.7%	-0.5%	to	1.9%	0.25
Sedibeng	Emfuleni	1.3%	0.4%	to	2.1%	0.00
	Lesedi	0.9%	-1.0%	to	2.8%	0.34
	Midvaal	1.0%	-0.5%	to	2.6%	0.19
West Rand	Merafong City	0.9%	-0.2%	to	2.1%	0.12
	Mogale City	0.4%	-0.7%	to	1.4%	0.53
	Rand West City	0.9%	-0.2%	to	1.9%	0.10
Age band (vs 18-19)	20-24	-0.6%	-2.9%	to	1.7%	0.59
	25-29	0.1%	-2.1%	to	2.3%	0.95
	30-34	0.5%	-1.7%	to	2.7%	0.64
	35-39	1.7%	-0.5%	to	3.9%	0.13
	40-44	2.1%	-0.1%	to	4.4%	0.06
	45-49	2.3%	0.1%	to	4.5%	0.05
	50-54	1.2%	-1.2%	to	3.5%	0.34
	55-59	2.4%	0.1%	to	4.7%	0.04
	60-64	2.3%	-0.1%	to	4.7%	0.06
65+	3.1%	0.9%	to	5.3%	0.01	
Population group (vs Black African)	Coloured	-0.8%	-2.8%	to	1.2%	0.43
	Indian/Asian	-0.8%	-4.1%	to	2.5%	0.63
	White	-0.7%	-2.2%	to	0.9%	0.41
	Other	-0.5%	-4.2%	to	3.2%	0.79
Respondent sex (vs male)	Female	4.0%	3.4%	to	4.5%	0.00
Birth status (vs born in RSA)	Not born in RSA	-2.5%	-3.8%	to	-1.3%	0.00
Education level (vs less than matric)	Matric or more	-0.6%	-1.3%	to	0.0%	0.06
Employment (vs unemployed)	Employed	0.3%	-0.3%	to	0.9%	0.36
Medical scheme cover (vs no cover)	Have cover	2.1%	1.3%	to	2.8%	0.00
Wealth quintile (vs quintile 1)	Quintile 2	-0.1%	-1.0%	to	0.8%	0.79
	Quintile 3	0.6%	-0.3%	to	1.5%	0.19
	Quintile 4	0.4%	-0.6%	to	1.4%	0.46
	Quintile 5	1.4%	0.3%	to	2.5%	0.01

3.3 Objective 3: Sub-district variation in self-reported health status

3.3.1 Overall health status

3.3.1.1 Differences in overall health status

The GCRO's QoL V survey elicited overall health status from respondents. Table 3.6. shows the proportion of respondents who reported their overall health status as "excellent" by sub-district.

Table 3.6: Self-reported "excellent" health status by sub-district of residence

Municipality	Sub-district	Adult residents (%)
		Self-report "excellent" health status
City of Johannesburg	Region A	38.9%
	Region B	33.7%
	Region C	37.9%
	Region D	31.7%
	Region E	34.2%
	Region F	37.3%
	Region G	31.2%
City of Tshwane	Region 1	36.3%
	Region 2	34.4%
	Region 3	42.0%
	Region 4	41.5%
	Region 5	37.3%
	Region 6	39.5%
	Region 7	37.0%
Ekurhuleni	E1	52.3%
	E2	41.2%
	E3	38.5%
	N1	39.8%
	N2	41.8%
	N3	53.0%
	S1	46.2%
	S2	36.4%
	S3	35.5%
Sedibeng	Emfuleni	39.9%
	Lesedi	40.5%
	Midvaal	37.5%
West Rand	Merafong City	34.0%
	Mogale City	31.5%
	Rand West City	33.4%
Gauteng mean		37.8%

Health status self-reported as “excellent” overall was relatively low, at 37.8%.

Ekurhuleni’s N3 had 53.0% “excellent” health status, the highest across the province. Johannesburg’s Region G (home to Eldorado Park, Lakeside, and Lenasia) had the lowest rate of “excellent” overall health status, at 31.2%.

The distribution of overall health status as “excellent” by sub-district of residence follows in Figure 3.6.

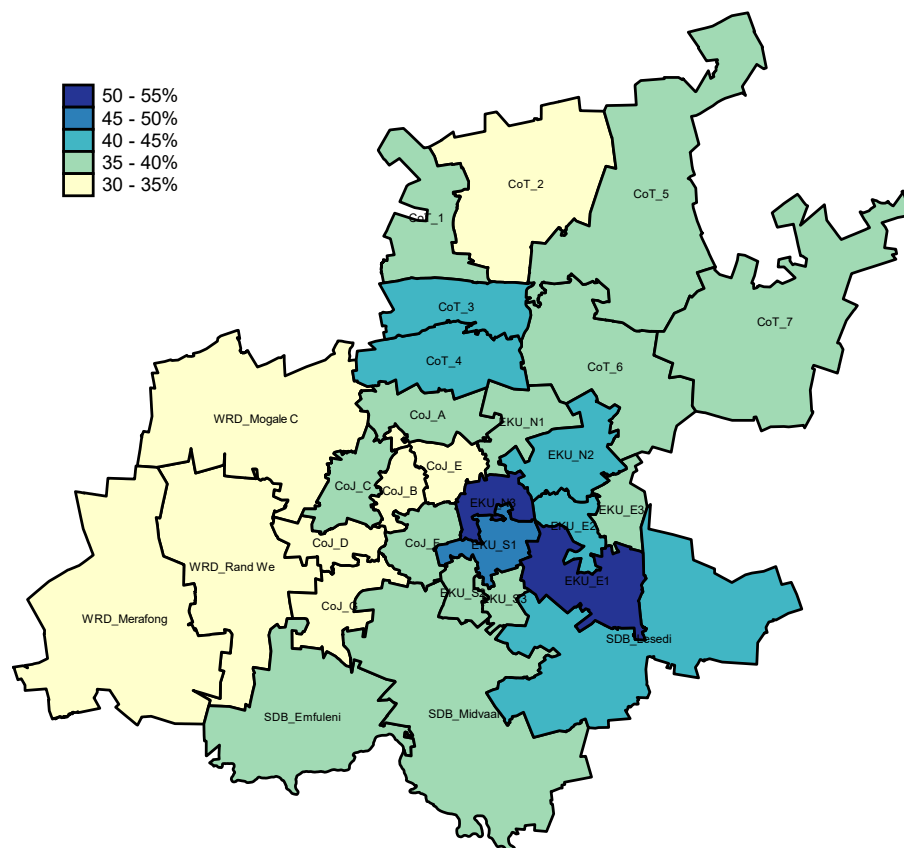


Figure 3.6: Self-reported “excellent” health status by sub-district of residence

As noted in Figure 3.6, adult residents with “excellent” overall health status ranged from 30 - 55%. Discernible clusters of neighbouring sub-districts are noted at 30 – 35% in Johannesburg and the West Rand and 35 – 40% in Sedibeng, Johannesburg, Ekurhuleni, and Tshwane. Ekurhuleni’s E3 and N1 (home to Kopanong, Tembisa, and Birchleigh) are notable as the only sub-districts where more than one in two adult residents report “excellent” health status.

3.3.1.2 Factors associated with overall health status

As detailed in 3.2.1 and Table 3.1, bivariate analyses preceded multiple logistic regression. The regression results are in Table 3.7. Given the interest in spatial effects, the results for sub-district before and after adjusting for other sociodemographic factors

(confounders) are shown in Appendix IV. After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of “excellent” overall health status (test for overall sub-district effect, $\chi^2 = 221.19$, $p < 0.001$).

Table 3.7 demonstrates the results of the multiple logistic regression model for “excellent” overall health status. 14 sub-districts noted a statistically significant difference in adult residents who reported “excellent” overall health status. The eight sub-districts with lower rates of “excellent” overall health status were concentrated in Johannesburg and the West Rand (Region B: -5.1 percentage points; Region D: -4.9 percentage points; Region E: -5.3 percentage points; Region F: -3.1 percentage points; Region G -6.8 percentage points; Merafong City: -3.4 percentage points; Mogale City: -5.3 percentage points; and Rand West City: -3.3 percentage points). The six sub-districts with greater resident “excellent” overall health status were across Ekurhuleni and Sedibeng (E1: +14.5 percentage points; E2: +4.0 percentage points; N3: +13.6 percentage points; S1: +8.2 percentage points; Emfuleni: +3.8 percentage points; and Lesedi: +6.0 percentage points). Notably, no significant differences were present in Tshwane.

After the age of 30, residents had significantly progressively lower rates of “excellent” overall health status compared to the 18-19 age band (-5.1 percentage points for 30 – 34 years old; -8.3 percentage points for 35 – 39 years old; -11.4 percentage points for 40 - 44 years old; -16.5 percentage points for 45 – 49 years old; -20.7 percentage points for 50 – 54 years old; -22.6 percentage points for 55 – 59 years old -30.2 percentage points for 60 – 64 years old; and -30.5 percentage points for ages 65+). White adult residents had significantly lower rates of “excellent” overall health status than Black adult residents (-4.8 percentage points); a trend mirrored by female adult residents compared to male adult residents (-3.7 percentage points). In contrast, adult residents with matric or higher levels of education (+4.1 percentage points), those who were employed (+2.4 percentage points), and those in the wealthiest quintile (+5 percentage points) had significantly higher rates of “excellent” overall health status than their base categories, detailed in Table 3.7.

Table 3.7: Multiple logistic regression of the impact of sociodemographic variables on “excellent” health status

Statistically significant results are in bold font

Municipality	Sub-district	Coefficient (marginal effect)	95% confidence interval		p value
Sub-district (vs Gauteng mean)					
City of Johannesburg	Region A	-0.9%	-4.1%	to 2.3%	0.59
	Region B	-5.1%	-8.8%	to -1.3%	0.01
	Region C	-1.7%	-4.7%	to 1.3%	0.27
	Region D	-4.9%	-6.9%	to -2.8%	0.00
	Region E	-5.3%	-8.5%	to -2.1%	0.00
	Region F	-3.1%	-6.1%	to -0.1%	0.05
	Region G	-6.8%	-10.0%	to -3.5%	0.00
City of Tshwane	Region 1	0.4%	-2.6%	to 3.4%	0.78
	Region 2	-2.3%	-6.9%	to 2.2%	0.32
	Region 3	1.9%	-1.2%	to 5.1%	0.23
	Region 4	1.1%	-3.9%	to 6.1%	0.66
	Region 5	-2.7%	-12.6%	to 7.2%	0.60
	Region 6	1.5%	-1.8%	to 4.7%	0.37
	Region 7	2.6%	-6.0%	to 11.2%	0.56
Ekurhuleni	E1	14.5%	11.1%	to 17.8%	0.00
	E2	4.0%	0.0%	to 8.0%	0.05
	E3	2.3%	-2.3%	to 6.8%	0.33
	N1	0.6%	-2.3%	to 3.5%	0.68
	N2	3.8%	-1.0%	to 8.6%	0.12
	N3	13.6%	8.6%	to 18.6%	0.00
	S1	8.2%	4.4%	to 12.1%	0.00
	S2	-0.8%	-4.0%	to 2.4%	0.62
Sedibeng	S3	-0.9%	-5.1%	to 3.3%	0.68
	Emfuleni	3.8%	1.3%	to 6.4%	0.00
	Lesedi	6.0%	1.1%	to 10.8%	0.02
West Rand	Midvaal	0.9%	-3.9%	to 5.7%	0.71
	Merafong City	-3.4%	-6.7%	to -0.2%	0.04
	Mogale City	-5.3%	-8.0%	to -2.6%	0.00
Age band (vs 18-19)	Rand West City	-3.3%	-6.2%	to -0.3%	0.03
	20-24	-2.3%	-7.3%	to 2.7%	0.36
	25-29	-4.7%	-9.6%	to 0.1%	0.06
	30-34	-5.1%	-10.0%	to -0.3%	0.04
	35-39	-8.3%	-13.1%	to -3.4%	0.00
	40-44	-11.4%	-16.4%	to -6.4%	0.00
	45-49	-16.5%	-21.5%	to -11.5%	0.00
	50-54	-20.7%	-25.9%	to -15.6%	0.00
	55-59	-22.6%	-27.8%	to -17.3%	0.00
60-64	-30.2%	-35.5%	to -24.9%	0.00	
Population group (vs Black African)	65+	-30.5%	-35.5%	to -25.5%	0.00
	Coloured	0.9%	-2.8%	to 4.6%	0.63
	Indian/Asian	1.7%	-4.2%	to 7.5%	0.57
	White	-4.8%	-7.4%	to -2.2%	0.00
Respondent sex (vs male)	Other	-3.1%	-15.3%	to 9.1%	0.62
	Female	-3.7%	-5.1%	to -2.3%	0.00
Birth status (vs born in RSA)	Not born in RSA	1.1%	-1.7%	to 3.8%	0.44
Education level (vs less than matric)	Matric or more	4.1%	2.4%	to 5.7%	0.00
Employment (vs unemployed)	Employed	0.0%	-1.6%	to 1.5%	0.96
Medical scheme cover (vs no cover)	Have cover	2.4%	0.5%	to 4.3%	0.01
Wealth quintile (vs quintile 1)	Quintile 2	-0.2%	-2.3%	to 2.0%	0.89
	Quintile 3	1.6%	-0.6%	to 3.8%	0.14
	Quintile 4	1.7%	-0.6%	to 4.1%	0.15
	Quintile 5	5.0%	2.4%	to 7.7%	0.00

3.3.2 Health status impacting on daily work

3.3.2.1 Differences in health status preventing daily work

The GCRO's QoL V survey enquired if respondents' health status prevented them from carrying out their daily work. The variation in health status' impact on daily work follows in Table 3.8.

Table 3.8: Health status preventing daily work by sub-district of residence

Municipality	Sub-district	Adult residents (%) Health status prevents daily work
City of Johannesburg	Region A	22.4%
	Region B	19.2%
	Region C	21.2%
	Region D	25.3%
	Region E	22.3%
	Region F	21.6%
	Region G	37.1%
City of Tshwane	Region 1	28.9%
	Region 2	28.8%
	Region 3	24.1%
	Region 4	23.9%
	Region 5	31.0%
	Region 6	26.6%
	Region 7	32.0%
Ekurhuleni	E1	22.3%
	E2	23.4%
	E3	18.3%
	N1	23.6%
	N2	14.9%
	N3	13.1%
	S1	21.9%
	S2	18.6%
S3	25.6%	
Sedibeng	Emfuleni	38.5%
	Lesedi	25.0%
	Midvaal	16.6%
West Rand	Merafong City	22.6%
	Mogale City	25.3%
	Rand West City	30.5%
Gauteng mean		25.3%

A low rate of health status preventing work was observed in Gauteng, with one in four adult residents indicating this effect. As noted in Table 3.8, the Emfuleni sub-district in Sedibeng had the highest rate of adult residents indicating their health prevented them from working at 38.5%. In contrast, Ekurhuleni's N3 had the lowest rate at 13.1%.

The distribution of health status preventing daily work by sub-district of residence follows in Figure 3.7.

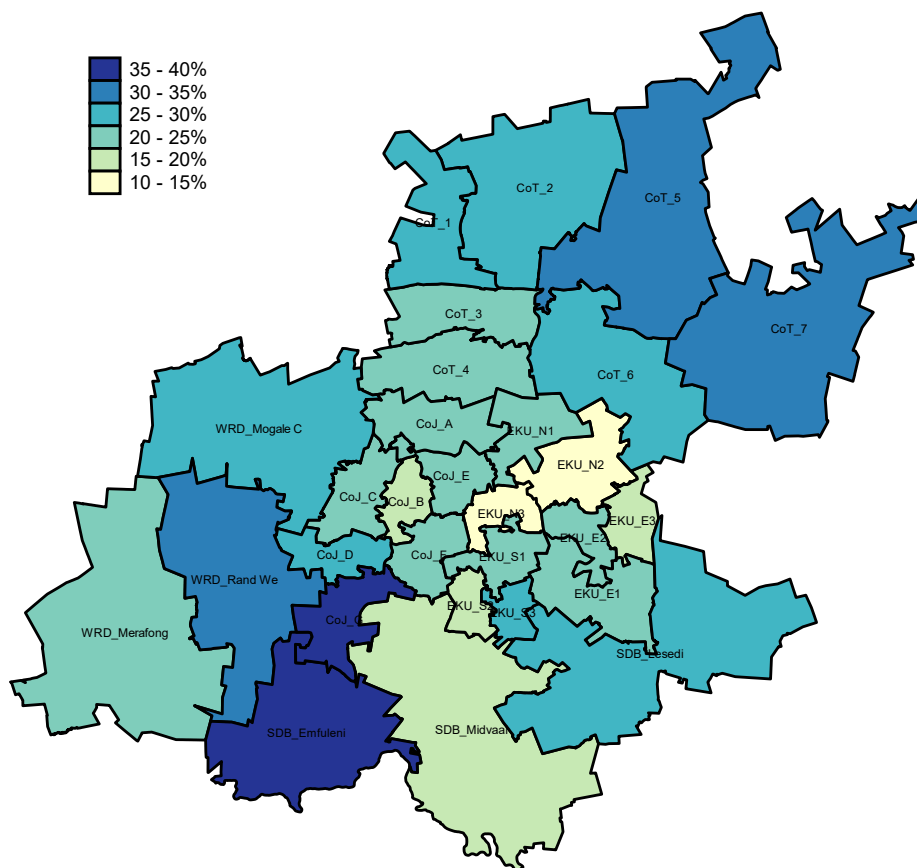


Figure 3.7: Health status preventing daily work by sub-district of residence

As shown in Figure 3.7, the proportion of adult residents who indicated their health status prevented them from working ranged from 10 – 40% across sub-districts. A discernible cluster of neighbouring sub-districts in the 20 – 25% range is noted in Johannesburg and Ekurhuleni, with smaller clusters of 30 – 35% and 35 – 40% noted in Tshwane and Southern Gauteng (Johannesburg’s Region G and Sedibeng’s Emfuleni) respectively.

3.3.2.2 Factors associated with health preventing daily work

As detailed in 3.2.1 and Table 3.1, bivariate analyses preceded multiple logistic regression. The regression results are in Table 3.9. Given the interest in spatial effects, the results for sub-district before and after adjusting for other sociodemographic factors (confounders) are shown in Appendix IV. After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of health status preventing work (test for overall sub-district effect, $\chi^2 = 300.27$, $p < 0.001$).

Table 3.9 below displays the multiple logistic regression model for health preventing daily work. Eleven sub-districts noted a statistically significant relationship between

adult residents' health status preventing work, and their sub-district of residence. Johannesburg's Region G, at +11.3 percentage points compared to the provincial mean, had the highest resident rate of health preventing work. Ekurhuleni's N3, at -9.4 percentage points compared to the provincial mean, had the lowest resident rate of health preventing work. The five statistically significant sub-districts from Ekurhuleni all reported lower rates of health preventing work than the provincial mean (E1: -3.6 percentage points; E3: -8.0 percentage points; N2: -9.3 percentage points; N3: -9.4 percentage points; and S2: -7.0 percentage points). Johannesburg's Regions B and D had -3.6 percentage points and -1.7 percentage points difference to the provincial mean. Sedibeng district had contrasting results, with Emfuleni adult residents reporting an 11.2 percentage point higher rate of health preventing work than the provincial mean; and Midvaal adult residents reporting a 9.0 percentage point lower rate than the provincial mean. Tshwane had no statistically significant variance from the provincial mean. The West Rand's Rand West City was the remaining significant result, with a +4.5 percentage point rate of health preventing work compared to the provincial mean.

Increasing age generally increased the rate at which adult residents' health prevented them from working. Residents aged 25 – 29 years old and 30 – 34 years old had a 3.7 percentage point and 4.2 percentage point higher rate of health preventing them from working, respectively, than residents aged 18-19 years old. After the age of 40, a sequential increase in health preventing work was noted compared to the 18 – 19-year-old age group (from +6.1 percentage points for 40 – 44-year-olds, to +34.3 percentage points for ages 65+). Coloured and White adult residents reported lower rates of health preventing work (-3.7 percentage points and -2.9 percentage points respectively) than Black African adult residents.

Female adult residents and those with medical scheme cover had statistically significantly higher rates of health preventing work (+4.7 percentage points and +4.3 percentage points respectively) than male respondents and those without medical scheme cover.

Adult residents who were not born in South Africa (-4.5 percentage points), adult residents with matric or higher education (-2.5 percentage points), employed adult residents (-4.9 percentage points), and adult residents in wealth quintiles 4 and 5 (-4.3 percentage points and -5.1 percentage points respectively) all reported statistically significantly lower rates of health preventing work compared to their base categories.

Table 3.9: Multiple logistic regression of the impact of sociodemographic variables on health preventing work

Statistically significant results are in bold font

Municipality	Sub-district	Coefficient (marginal effect)	95% confidence interval		p value
Sub-district (vs Gauteng mean)					
City of Johannesburg	Region A	-0.4%	-3.3%	to 2.5%	0.78
	Region B	-3.6%	-7.0%	to -0.3%	0.04
	Region C	-2.1%	-4.7%	to 0.5%	0.11
	Region D	-1.7%	-3.4%	to -0.1%	0.04
	Region E	-0.9%	-3.9%	to 2.1%	0.56
	Region F	1.3%	-1.6%	to 4.2%	0.39
	Region G	11.3%	8.1%	to 14.4%	0.00
City of Tshwane	Region 1	1.5%	-1.1%	to 4.1%	0.25
	Region 2	0.6%	-3.3%	to 4.6%	0.75
	Region 3	0.5%	-2.3%	to 3.4%	0.71
	Region 4	3.0%	-1.9%	to 7.8%	0.23
	Region 5	6.3%	-2.8%	to 15.5%	0.18
	Region 6	0.6%	-2.1%	to 3.4%	0.65
	Region 7	6.4%	-1.7%	to 14.6%	0.12
Ekurhuleni	E1	-3.6%	-6.4%	to -0.9%	0.01
	E2	-1.7%	-5.1%	to 1.7%	0.33
	E3	-8.0%	-11.4%	to -4.7%	0.00
	N1	0.1%	-2.5%	to 2.6%	0.95
	N2	-9.3%	-12.7%	to -5.9%	0.00
	N3	-9.4%	-13.2%	to -5.6%	0.00
	S1	-2.2%	-5.3%	to 1.0%	0.18
	S2	-7.0%	-9.4%	to -4.6%	0.00
Sedibeng	S3	-0.9%	-4.5%	to 2.6%	0.62
	Emfuleni	11.2%	8.9%	to 13.5%	0.00
	Lesedi	-2.5%	-6.2%	to 1.2%	0.18
West Rand	Midvaal	-9.0%	-12.4%	to -5.7%	0.00
	Merafong City	-2.5%	-5.2%	to 0.2%	0.07
	Mogale City	-0.1%	-2.5%	to 2.3%	0.94
Age band (vs 18-19)	Rand West City	4.5%	1.9%	to 7.2%	0.00
	20-24	2.8%	-0.7%	to 6.2%	0.12
	25-29	3.7%	0.3%	to 7.1%	0.04
	30-34	4.2%	0.8%	to 7.5%	0.02
	35-39	3.1%	-0.3%	to 6.5%	0.07
	40-44	6.1%	2.6%	to 9.6%	0.00
	45-49	9.3%	5.6%	to 12.9%	0.00
	50-54	15.1%	11.2%	to 19.1%	0.00
	55-59	19.5%	15.3%	to 23.6%	0.00
	60-64	26.4%	21.8%	to 31.0%	0.00
65+	34.3%	30.2%	to 38.3%	0.00	
Population group (vs Black African)	Coloured	-3.7%	-6.7%	to -0.7%	0.02
	Indian/Asian	-1.2%	-5.9%	to 3.5%	0.62
	White	-2.9%	-5.1%	to -0.7%	0.01
	Other	-4.5%	-16.0%	to 6.9%	0.44
Respondent sex (vs male)	Female	4.7%	3.5%	to 5.9%	0.00
Birth status (vs born in RSA)	Not born in RSA	-4.5%	-6.8%	to -2.2%	0.00
Education level (vs less than matric)	Matric or more	-2.5%	-3.9%	to -1.0%	0.00
Employment (vs unemployed)	Employed	-4.9%	-6.3%	to -3.6%	0.00
Medical scheme cover (vs no cover)	Have cover	4.3%	2.6%	to 6.0%	0.00
Wealth quintile (vs quintile 1)	Quintile 2	-1.5%	-3.5%	to 0.4%	0.12
	Quintile 3	-1.0%	-3.0%	to 0.9%	0.29
	Quintile 4	-4.3%	-6.4%	to -2.2%	0.00
	Quintile 5	-5.1%	-7.4%	to -2.8%	0.00

3.3.3 Health status impacting on social activities

3.3.3.1 Differences in health status preventing social activities

The GCRO's QoL V survey enquired if respondents' health status prevented them from taking part in their usual social activities. The variation in self-reported health status on respondents' ability to take part in their usual social activities follows in Table 3.10.

Table 3.10: Health status preventing social activities by sub-district of residence

Municipality	Sub-district	Adult residents (%)
		Health status prevents social activities
City of Johannesburg	Region A	20.1%
	Region B	19.7%
	Region C	21.1%
	Region D	24.9%
	Region E	19.9%
	Region F	21.5%
	Region G	35.6%
City of Tshwane	Region 1	29.5%
	Region 2	25.8%
	Region 3	24.1%
	Region 4	21.9%
	Region 5	27.4%
	Region 6	25.6%
	Region 7	30.6%
Ekurhuleni	E1	19.5%
	E2	23.4%
	E3	19.1%
	N1	21.6%
	N2	14.8%
	N3	12.0%
	S1	20.3%
	S2	18.2%
	S3	24.8%
Sedibeng	Emfuleni	36.5%
	Lesedi	24.8%
	Midvaal	18.8%
West Rand	Merafong City	22.5%
	Mogale City	24.8%
	Rand West City	28.8%
Gauteng mean		24.4%

A low rate of health preventing social activity was noted across Gauteng, with marginally lower than one in four adult residents reporting this effect (24.4%). As noted in Table 3.10, Sedibeng's Emfuleni sub-district had the highest rate of adult residents reporting their health prevented them from socialising (36.5%). Ekurhuleni's N3

reported the lowest rate of adult residents' health status preventing them from partaking in social activities (12.0%). The overall means for health preventing work and social activities were similar, but with different sub-district patterns.

The distribution of self-reported health status preventing adult residents from taking part in their usual social activities by sub-district of residence follows in Figure 3.8.

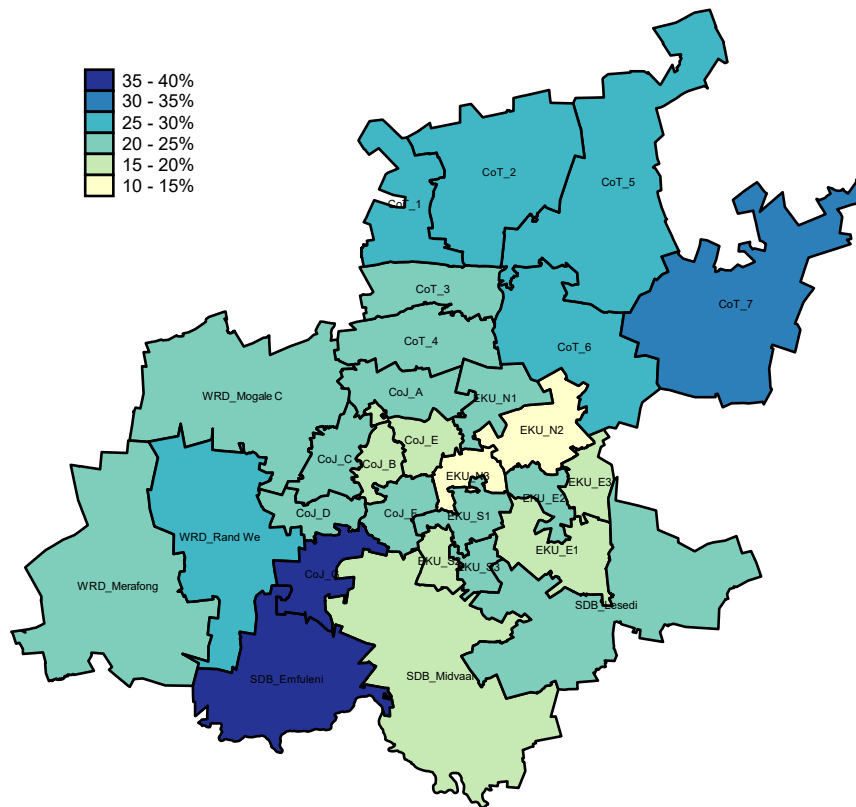


Figure 3.8: Health status preventing social activities by sub-district of residence

As noted in Figure 3.8, the proportion of adult residents who indicated their health prevented them from taking part in their usual social activities ranged from 10 – 40% across sub-districts. Discernible clusters of neighbouring sub-districts are noted in the 25 – 30% range in Tshwane, and in the 20 – 25% range across Johannesburg, Ekurhuleni, and the West Rand. Johannesburg’s Region G and Sedibeng’s Emfuleni form a cluster of 35 – 40% of adult residents indicating their health prevents both work and social activities (Figures 3.7 and 3.8).

3.3.3.2 Factors associated with health status preventing social activities

As detailed in 3.2.1 and Table 3.1, bivariate analyses preceded multiple logistic regression. All indicated variables in Table 3.1 were found to be significant ($p < 0.2$), bar population group and medical scheme membership. The multiple logistic regression results are in Table 3.11. Given the interest in spatial effects, the results for

sub-district before and after adjusting for other sociodemographic factors (confounders) are shown in Appendix IV. After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of health status preventing social activities (test for overall sub-district effect, $\chi^2 = 261.55$, $p < 0.001$).

As shown in Table 3.11, 11 sub-districts had a statistically significant relationship between respondents' self-reported health status preventing them from socialising and their sub-district of residence compared to the provincial mean. Four sub-districts (Johannesburg's Region G: +10.6 percentage points; Tshwane's Region 1: +3.3 percentage points; Sedibeng's Emfuleni: +9.7 percentage points; and West Rand's Rand West City: +3.6 percentage points) had significantly higher rates of adult residents reporting that their health prevented them from socialising compared to the provincial mean. Seven sub-districts noted a significantly lower rate of adult residents reporting their health prevented them from socialising than the provincial mean. Notably, six statistically significant sub-districts with lower rates were concentrated in Ekurhuleni (E1: -5.1 percentage points; E3: -5.9 percentage points; N2 -7.8 percentage points; N3: -9.6 percentage points; S1: -3.3 percentage points; and S2: -6.6 percentage points).

All sociodemographic and economic characteristics included in the multiple regression model were noted to have statistically significant results compared to their base categories for this outcome (Table 3.11).

Age bands from 20 – 65+ years old reported generally sequentially higher rates of health preventing socialising compared to age band 18-19 years old (20 – 24 years old: +3.4 percentage points; 25 – 29 years old: +4.6 percentage points; 30 – 34 years old: +5.6 percentage points; 35 – 39 years old: +5.0 percentage points; 40 – 44 years old: +8.3 percentage points; 45 – 49 years old: +9.8 percentage points; 50 – 54 years old: +15.2 percentage points; 55 – 59 years old: +20.5 percentage points; 60 – 64 years old: +26.2 percentage points). By 65+, more than one in three residents was reporting this impact.

Female adult residents had a 4.5 percentage point higher rate than male respondents of health impacting on social activities. In contrast, adult residents who were not born in South Africa (-3.9 percentage points), those with matric or higher education (-2.4 percentage points), those who were employed (-4.8 percentage points), and those in wealth quintiles 4 and 5 (-2.5 percentage points for both) all reported significantly lower

rates of health preventing socialising compared to their base categories.

Table 3.11: Multiple logistic regression of the impact of sociodemographic variables on health preventing social activities

Statistically significant results are in bold font

Municipality	Sub-district	Coefficient (marginal effect)	95% confidence interval			p value
Sub-district (vs Gauteng mean)						
City of Johannesburg	Region A	-0.1%	-3.0%	to	2.8%	0.95
	Region B	-3.0%	-6.3%	to	0.3%	0.08
	Region C	-2.1%	-4.6%	to	0.4%	0.11
	Region D	-1.3%	-2.9%	to	0.3%	0.10
	Region E	-2.2%	-5.0%	to	0.7%	0.14
	Region F	1.2%	-1.6%	to	4.0%	0.41
	Region G	10.6%	7.6%	to	13.7%	0.00
City of Tshwane	Region 1	3.3%	0.7%	to	5.9%	0.01
	Region 2	-0.7%	-4.5%	to	3.1%	0.71
	Region 3	2.0%	-0.9%	to	4.9%	0.18
	Region 4	2.0%	-2.7%	to	6.8%	0.40
	Region 5	5.0%	-3.8%	to	13.7%	0.27
	Region 6	0.3%	-2.4%	to	2.9%	0.84
	Region 7	6.7%	-1.3%	to	14.7%	0.10
Ekurhuleni	E1	-5.1%	-7.7%	to	-2.5%	0.00
	E2	-0.7%	-4.0%	to	2.5%	0.67
	E3	-5.9%	-9.3%	to	-2.5%	0.00
	N1	-1.1%	-3.5%	to	1.3%	0.37
	N2	-7.8%	-11.4%	to	-4.3%	0.00
	N3	-9.6%	-13.3%	to	-6.0%	0.00
	S1	-3.3%	-6.2%	to	-0.3%	0.03
	S2	-6.6%	-9.0%	to	-4.3%	0.00
Sedibeng	S3	-0.6%	-4.1%	to	3.0%	0.76
	Emfuleni	9.7%	7.4%	to	11.9%	0.00
	Lesedi	-1.5%	-5.2%	to	2.1%	0.41
West Rand	Midvaal	-6.3%	-9.7%	to	-2.9%	0.00
	Merafong City	-1.2%	-3.9%	to	1.5%	0.38
	Mogale City	-0.3%	-2.6%	to	2.1%	0.83
Age band (vs 18-19)	Rand West City	3.6%	1.0%	to	6.2%	0.01
	20-24	3.4%	0.3%	to	6.5%	0.03
	25-29	4.6%	1.6%	to	7.7%	0.00
	30-34	5.6%	2.5%	to	8.6%	0.00
	35-39	5.0%	1.9%	to	8.1%	0.00
	40-44	8.3%	5.1%	to	11.6%	0.00
	45-49	9.8%	6.5%	to	13.1%	0.00
	50-54	15.2%	11.6%	to	18.8%	0.00
	55-59	20.5%	16.6%	to	24.4%	0.00
	60-64	26.2%	21.9%	to	30.4%	0.00
65+	35.3%	31.6%	to	39.1%	0.00	
Respondent sex (vs male)	Female	4.5%	3.3%	to	5.7%	0.00
Birth status (vs born in RSA)	Not born in RSA	-3.9%	-6.2%	to	-1.6%	0.00
Education level (vs less than matric)	Matric or more	-2.4%	-3.8%	to	-1.1%	0.00
Employment (vs unemployed)	Employed	-4.8%	-6.1%	to	-3.5%	0.00
Wealth quintile (vs quintile 1)	Quintile 2	-1.0%	-2.9%	to	0.8%	0.28
	Quintile 3	-0.1%	-2.0%	to	1.8%	0.93
	Quintile 4	-2.5%	-4.4%	to	-0.5%	0.02
	Quintile 5	-2.5%	-4.6%	to	-0.5%	0.02

3.4 Objective 4: The impact of health access on health outcome

3.4.1 The association between health access and “excellent” health status

The GCRO’s QoL V survey elicited responses on both household ability to access healthcare when needed, and individual respondents’ overall health status. Both parameters are impacted by the respondent’s sub-district of residence, as noted in 3.2.1 and 3.3.1 above. A scatter plot depicting the relationship between healthcare access difficulty and overall health status as “excellent” by sub-district is shown in Figure 3.9

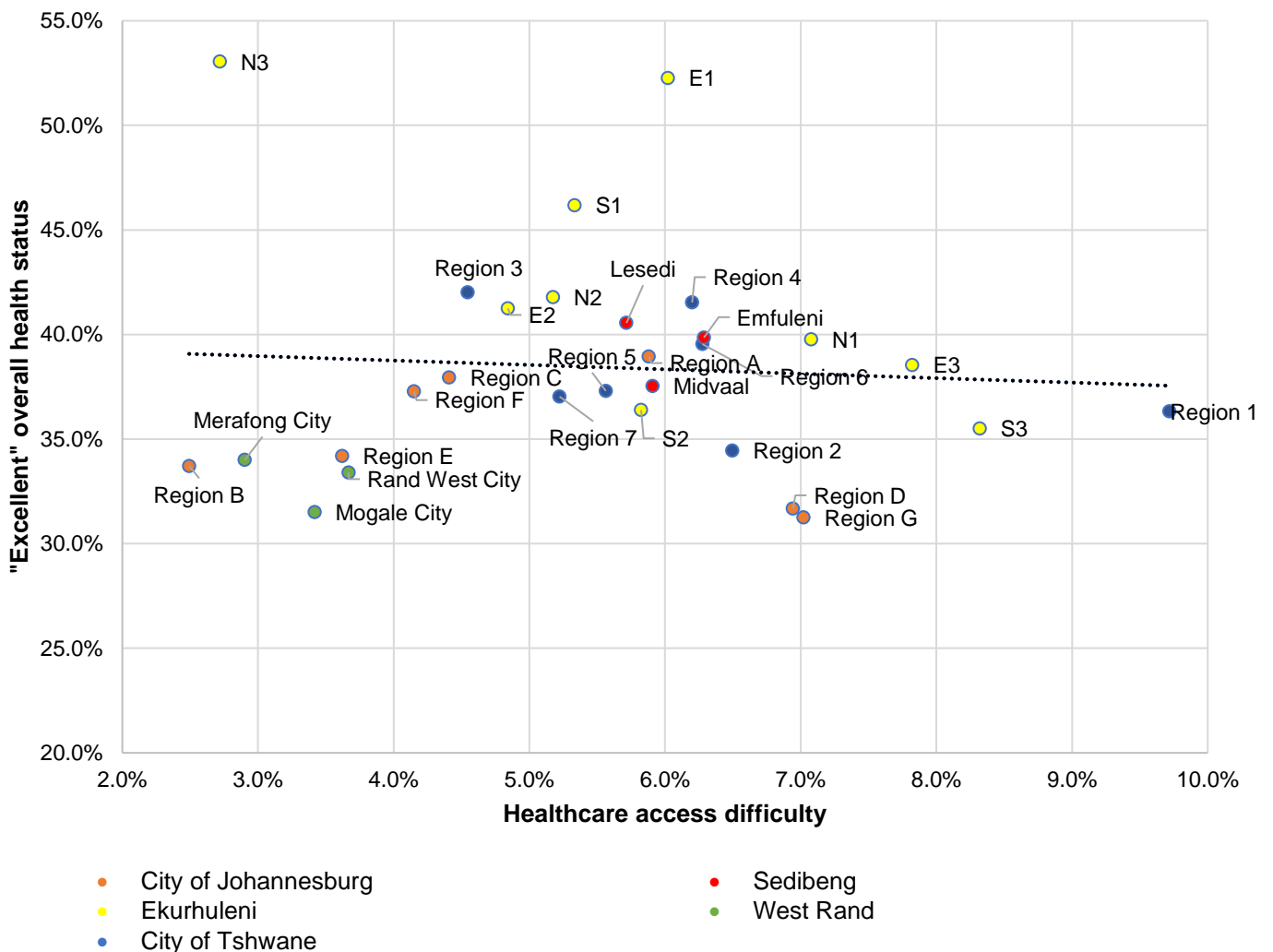


Figure 3.9: The relationship between healthcare access difficulty and “excellent” overall health status by sub-district

As seen in Figure 3.9, the scatter plot shows a weak association between healthcare access difficulty and “excellent” overall health status. Some sub-districts had a low rate of access difficulty but also reported low rates of “excellent” health status, which is the opposite of what would be expected if there was a clear linear association. Notable examples here include Johannesburg’s Regions B and E (home to Norwood, Melrose,

and Alexandra), and all of the West Rand. For other sub-districts, the relationship between access and outcome is more consistent. These sub-districts include Ekurhuleni's S1 (home to Reigerpark, Germiston, and Verwoerdpark) and N3 (low access difficulty and high rates of "excellent" health status). The inverse (high access difficulty and low "excellent" health status) also holds true for Johannesburg's Regions G and D, and Tshwane's Regions 2 (home to Wonderboom, Hammanskraal, and Montana) and 1.

3.4.2 Factors impacting the relationship between health access and "excellent" health status

Table 3.12 shows the results of a multiple logistic regression model evaluating the relationship between health access and "excellent" health status while adjusting for potential confounders.

Table 3.12: Multiple logistic regression of health access and sociodemographic variables on "excellent" health status

Statistically significant results are in bold font

		Coefficient (marginal effect)	95% confidence interval			p value
Health access (vs no difficulty)	Difficulty experienced	-3.3%	-6.3%	to	-0.4%	0.03
	20-24	-2.0%	-7.1%	to	3.0%	0.42
	25-29	-4.4%	-9.3%	to	0.5%	0.08
	30-34	-5.0%	-9.8%	to	-0.1%	0.05
	35-39	-8.0%	-12.9%	to	-3.1%	0.00
Age band (vs18-19)	40-44	-11.3%	-16.2%	to	-6.3%	0.00
	45-49	-16.5%	-21.5%	to	-11.5%	0.00
	50-54	-20.8%	-25.9%	to	-15.6%	0.00
	55-59	-22.5%	-27.8%	to	-17.2%	0.00
	60-64	-30.3%	-35.6%	to	-25.0%	0.00
	65+	-30.4%	-35.3%	to	-25.4%	0.00
Population group (vs Black African)	Coloured	-0.4%	-4.0%	to	3.3%	0.85
	Indian/Asian	0.0%	-5.8%	to	5.7%	0.99
	White	-3.6%	-6.1%	to	-1.1%	0.01
	Other	-2.9%	-15.2%	to	9.3%	0.64
Respondent sex (vs male)	Female	-3.5%	-4.9%	to	-2.1%	0.00
Birth status (vs born in RSA)	Not born in RSA	0.8%	-1.9%	to	3.5%	0.57
Education level (vs less than matric)	Matric or more	3.9%	2.2%	to	5.5%	0.00
Employment (vs unemployed)	Employed	0.2%	-1.3%	to	1.7%	0.78
Medical scheme cover (vs no cover)	Have cover	2.7%	0.8%	to	4.6%	0.01
Wealth quintile (vs quintile 1)	Quintile 2	-1.0%	-3.2%	to	1.2%	0.37
	Quintile 3	1.2%	-1.0%	to	3.3%	0.30
	Quintile 4	1.2%	-1.2%	to	3.5%	0.33
	Quintile 5	4.2%	1.6%	to	6.8%	0.00

As noted in Table 3.12, after adjusting for the impact of confounding sociodemographic and economic variables, a statistically significant relationship between health access and health outcome persists. Adult residents who experienced difficulty accessing healthcare had a 3.3 percentage point lower rate of “excellent” health status compared to those who did not experience the same difficulty in accessing healthcare.

All of the parameters noted to be statistically significant in Table 3.7 remain significant in Table 3.12 after the removal of sub-district and the addition of health access. Health access functions as a mediating variable in the analysis detailed in Table 3.12. The lessened effect between sociodemographic characteristics (i.e., female sex, matric or higher education, and wealth quintile 5) and “excellent” health status in Table 3.12 compared to Table 3.7 is partly attributed to a direct effect of these variables, and partially mediated by the impact of health access on “excellent” health status. Similarly, health access mediates and enhances the positive effect that having medical scheme cover has on “excellent” health status.

Chapter 4 Discussion

This study aimed to determine if the sub-district of residence in Gauteng impacted on adult residents' healthcare access, healthcare usage, and self-reported health status. It also sought to determine if there was a link between healthcare access and health status. Acknowledging South Africa's history of spatial apartheid and structural inequity, this study focused on the geographical effects that may be present due to historic resource allocation and how sociodemographic and economic characteristics continue to reflect these.

4.1 Overview of key results

Gauteng, as South Africa's most populous and affluent province, had a diverse sociodemographic and economic profile. While the matric completion rate was greater than 60%, both employment and medical scheme coverage were low, at 38.4% and 28.6% respectively (Table 3.1). Resident disclosure of income was skewed by a substantial proportion of participants declining to answer, but both household income and income per capita of the respondents who answered were low across the province (Table 3.1). Relative measures of socioeconomic privilege and disadvantage were noted to cluster in sub-districts, such as the privileged Region B in Johannesburg and the disadvantaged Region 7 in Tshwane.

For healthcare access, sub-district of residence was confirmed to be a significant predictor of household difficulty accessing healthcare (3.2.1.2). In addition, measures of relative privilege, such as medical scheme coverage and being in the wealthiest 40% of the provincial population, significantly reduced household healthcare access difficulty (Table 3.3).

Healthcare usage across Gauteng was high, and sub-district of residence was confirmed to be a significant predictor of usage (3.2.2 and Table 3.5). Generally, healthcare usage significantly increased with age after 45 years. Being female, wealthy, and having medical scheme cover each significantly increased healthcare usage, while being born outside of South Africa decreased healthcare usage (Table 3.5).

Marginally more than one in three Gauteng adult residents reported their health status as "excellent", with this rising to one in two adult residents in Ekurhuleni's N3 and E1 (Table 3.6). Statistically significant sub-districts clustered in municipalities, with those

in Johannesburg and the West Rand having lower rates of “excellent” health status, and those in Sedibeng and Ekurhuleni having higher rates of “excellent” health status. “Excellent” health status progressively decreased with age after 30 years, and significantly increased for adult residents with matric or higher education, employed adult residents, and adult residents in the wealthiest quintile (Table 3.7).

Health status prevented work and socialising for one in four Gauteng adult residents, with each impact having a slightly different distribution across sub-districts (Tables 3.8 and 3.10). Sub-district of residence was a significant predictor of both impacts (Tables 3.9 and 3.11). Adult residents of Ekurhuleni’s statistically significant sub-districts all reported lower rates of health preventing work than the rest of the province; a trend that was duplicated for health’s impact on socialising. Female adult residents and those with medical scheme cover had significantly higher rates of health preventing work. Increasing age generally increased the rate at which adult residents’ health prevented them from working, while migration to South Africa and characteristics of relative privilege (i.e., matric or higher education, employment, and being a member of the wealthiest 40% of the province) significantly decreased this (Table 3.9). Increasing age had a significant sequentially increasing effect on health preventing socialising (Table 3.11). As was noted for the impact of health on work, female adult residents had significantly higher rates of health preventing socialising. Migration to South Africa and characteristics of relative privilege (i.e., matric or higher education, employment, and being a member of the wealthiest 40% of the province) significantly decreased the rate of adult residents reporting that health prevented socialising (Table 3.11).

A weak linear association between healthcare access and health outcomes was observed (Figure 3.9) and confirmed by regression analysis. Experiencing difficulty in accessing healthcare significantly reduced “excellent” health status. Health access mediated the relationships between several sociodemographic characteristics and “excellent” health status as a health outcome (Table 3.12).

4.1 Study limitations and strengths

This study makes several useful contributions to the body of literature on the impact of spatial planning on health and healthcare. There is a dearth of analysis available at the sub-district level. This study’s use of sub-districts, as opposed to districts, enables insight into differences and patterns within metropolitan municipalities. Metropolitan municipalities, and particularly those in Gauteng as the most affluent province, contain varying degrees of relative privilege and disadvantage which is not surfaced in analysis

at the district level. By means of an example, the Johannesburg metropolitan municipality's Southern regions have historically been home to poor populations, while the Northern and Central regions have been home to the middle and upper class; a pattern that broadly persists (43). The use of a study population that is representative of Gauteng allows for extrapolation to better understand the health status of South Africa's most populous province. This unique dataset also allowed for the undertaking of more rigorous statistical analyses of variation, such as multiple logistic regressions.

This study also has several limitations. This study included only one province (Gauteng), as this detailed data is due to the GCRO and therefore not available in other provinces. This study's analyses could not be done at ward level, as the study sample size per ward was not big enough, so the sub-district level was treated as the compromise between ward and district level analysis. The choice to utilise the sub-district level does also have weaknesses, including that this level is not a defined legal level. It is also notable for the relative frequency of boundary changes over time. The health measures included in the QoL survey are simple and crude, as opposed to being a full health survey. The Demographic and Health Surveys (DHS) have better health data, but the datasets are not large enough to carry out sub-district analysis.

This study is a secondary data analysis of an existing dataset and is reliant upon the quality of the primary data collected. The GCRO QoL data is collected to assess quality of life of the adult residents of Gauteng, which limits the secondary study to the analysis of variables collected as part of the survey. The absence of enquiring around health states that may have frequent healthcare encounters in the period under question, such as antenatal care, may misrepresent the healthcare use patterns of the general population. Potential bias may be present for some of the variables because individuals may withhold or mis-represent sensitive details, including self-reported health, migration status, or income. This may stem from social desirability bias or recall bias (61). Both social desirability and recall bias are forms of self-reporting bias. While social desirability bias may see respondents' answers affected by a desire for approval, recall bias typically arises from an error in remembering past events (61). The GCRO's QoL methodology includes adult residents in informal settlements but does not accommodate for the inclusion of unhoused people. The rate of homelessness in South Africa is not well-quantified, as the national census conducted by Statistics South Africa does not include unhoused individuals, with various studies up until 2015 estimating that 100 000 – 200 000 people were unhoused across South Africa (62).

4.2 The socioeconomic differences by sub-district

Socioeconomic markers of relative privilege or disadvantage varied by geography and are notably clustered in certain sub-districts. Despite the overall employment, medical scheme coverage, and household income being low across the province, certain sub-districts fared exceptionally well across these parameters. This includes Johannesburg's Region B, home to suburbs such as Craighall, Hyde Park, Rosebank, Sandhurst, and Westcliff. This sub-district is notable for having the highest matric completion rate, the highest medical scheme coverage, and the highest proportion of the population in the wealthiest quintile, while having the fifth highest employment rate (Table 3.1). It also had the lowest proportion of Black African adult residents of all sub-districts across Gauteng (Figure 3.1). Other notable sub-districts that consistently fared favourably on socio-economic parameters included Tshwane's Region 4 and Ekurhuleni's N3 (Table 3.1). Tshwane's Region 4 is an urban area home to Centurion, Laudium, and Olivenhoutbosch. Ekurhuleni's N3 is an urban area that includes Bedfordview and Edenvale.

Conversely to Region B, Tshwane's Region 7 fared poorly in most socioeconomic parameters investigated. Tshwane's Region 7 is a rural, low-density sub-district home to Bronkhorstspuit, Ekgangala, and several low-income farming and residential areas. Region 7 has the lowest matric completion rate in the province, coupled with an employment rate below the mean for the province (Table 3.1). This poor base extends into medical scheme coverage of one in ten adult residents with three out of every four adult residents having a socioeconomic status that results in them being a member of the poorest 40% of the provincial population (Figure 3.1). Tshwane's Region 7 and Johannesburg's Region B differ most strongly demographically in the racial composition of their sub-districts (Johannesburg's Region B has a population that is 31.0% Black African, and Tshwane's Region 7 has a population that is 93.6% Black African).

Within the municipalities of Gauteng, and particularly the metropolitan municipalities, neighbouring sub-districts fare notably differently on socioeconomic parameters. Johannesburg's Regions B and D neighbour each other yet are on opposite ends of the socioeconomic spectrum. Region D, containing the historically disadvantaged suburbs of Soweto, Klipspruit, and Diepkloof, has a low matric completion rate, the lowest medical scheme coverage in Johannesburg, and the smallest population in the wealthiest quintile across the metropolitan. Region B, housing historically wealthy

suburbs in the North, and the predominantly historically Coloured suburbs of Westbury and Coronationville in the South, fared markedly better. Of note, the Southern suburbs of Region B are plagued by low employment and urban decay (63). Considering that this region still triumphs on markers of socioeconomic privilege would suggest that the Northern suburbs are even more privileged than this sub-district level data finds.

Markers of relative socioeconomic disadvantage also clustered in certain neighbouring sub-districts. Ekurhuleni's S2 and S3 had similarly low medical scheme coverage. S2 is home to Katlehong, Palm Ridge, and Thokoza; areas previously designated for Black African and Indian communities. The West Rand's Merafong and Rand West, and Sedibeng's Emfuleni, are neighbours and all have low representation in the province's wealthiest quintile. Lastly, Tshwane's Regions 2, 5, and 7 to the North of the metropolitan are all over-represented in the poorest 40% of the province, with Region 7 faring the worst.

Sub-districts that contain predominantly historically disadvantaged suburbs were anticipated to fare poorly on markers of relative privilege, but there were exceptions. This includes Johannesburg's Region F. Home to the Inner City, Aeroton, and South Gate, this predominantly working-class sub-district exceeded the provincial averages on matric completion, employment, medical scheme coverage, and proportion of the population in the wealthiest quintile. As detailed above, however, the pattern of socioeconomic status determining where one lives, and the corollary of where one lives influencing socioeconomic status, generally holds true across Gauteng.

4.3 The socio-demographic predictors of use, access, and health status

Healthcare access in Gauteng is near-universal (Table 3.2) and relatively few respondents noted difficulties in accessing health care. As noted in Table 3.2, the provincial mean of having difficulty accessing healthcare was 5.6% with the sub-district figures ranging between 2% and 10% of respondents. Respondents not born in South Africa are noted to have statistically significantly less household difficulty accessing healthcare than respondents born in South Africa (Table 3.3) but importantly also use statistically significantly less healthcare than respondents born in South Africa (Table 3.5). Important socio-demographic predictors of access include medical scheme membership and being a member of the wealthiest 40% of the population. Both predictors significantly removed access difficulties for their members, resulting in the relatively privileged and wealthy having easier access to healthcare.

The pro-rich bias exhibited in South Africa's healthcare provision does not necessarily reflect need across socioeconomic groups as was noted by Ataguba and McIntyre (23) based on the use of an IES dataset in 2012. This analysis of the GCRO QoL survey found that the wealthiest groups, and those with medical scheme cover, reported significantly higher access, usage, and health status, suggesting that higher usage is not due to higher need. The absence of a correlation between need and usage for the wealthy is in keeping with Fusheini and Ataguba (22,23) noting that the wealthiest quintile has a need for health share of less than 10% but enjoys 36% of the total health benefits. The work done by Kon and Lackan (6), and Ataguba and McIntyre (23) both in South Africa, noted that SES impacts on access and utilisation. Benefit distribution was found to be skewed toward the wealthy in both public and private sector provision, and income disparities were found to impact on access, with the greatest access barriers being present for the poorest (6,23). This analysis of the GCRO QoL V data noted higher usage based on higher levels of wealth (Table 3.5), and that wealth and medical scheme membership improved access (Table 3.3).

Johannesburg and the West Rand are notable for having significantly lower rates of self-reported "excellent" health status across most of their sub-districts (Table 3.7). This finding is particularly striking for the West Rand, which boasts high health access (Table 3.3). This suggests that, despite being able to access and use the health system, the expected commensurate health outcomes are not achieved. This could be linked to the known variations in quality of healthcare provided and experienced across South Africa's healthcare system (8,64). These variations have been linked to several challenges, including a rapid rate of urbanisation overwhelming healthcare facility capacity, unequal geographical distribution of human resources, equipment shortages, and the dilapidated state of some public healthcare facilities (64). Alternatively, this failure to achieve expected health outcomes could be driven by factors external to the health system.

Poor health impacts on individuals' ability to participate in gainful employment and social activities. Higher education, being employed, and being a member of the wealthiest two quintiles resulted in lower rates of health preventing work and social activities (Tables 3.9 and 3.11). This finding demonstrates the close link between SES and health in South Africa. Public policies on education, housing, social protection, and health in South Africa act as social stratifiers and structural determinants of health (65). These largely determine the socioeconomic position of adult residents and impact on

the attainable education, occupation, and income which in turn determine whether the healthcare system can be accessed and if that is likely to be the public or private healthcare system (65). This finding highlights the relationship between health and socioeconomic status in a setting without universal health coverage.

4.4 The unadjusted and adjusted impact of sub-district on use, access, and health status

As has been detailed throughout Chapter 3 and included in Appendix IV, sub-district of residence was a significant predictor of all the outcomes of interest before and after adjusting for sociodemographic and economic variables. The sociodemographic variables did not change the direction of effect for any sub-district, but significantly increased or decreased the observed effect for many sub-districts across all outcomes of interest.

For health access, most statistically significant sub-districts had less household difficulty with access than the province (Table 3.3). This decrease in difficulty was most significant across all of the West Rand (Table 3.3). The sub-districts of the West Rand did not have notable favourable socioeconomic circumstances relative to the rest of the province (Table 3.1), but the West Rand does have a favourable health resource distribution. The 2019/20 District Health Barometer (DHB) reported that the West Rand had more public sector hospital beds per 10 000 target population than the provincial and national averages (31). This trend continued in the public sector where medical practitioners per 100 000 population and primary healthcare expenditure per capita for the uninsured for the West Rand municipality were both above the provincial and national averages (31). While limited to the public sector, these factors could contribute to the improved household access noted across the West Rand.

Conversely, the DHB noted that the Johannesburg metropolitan ranks far below the national average for public sector medical practitioners per 100 000 population, public sector hospital beds per 10 000 target population, and in provincial and local government primary healthcare expenditure per capita for the uninsured (31), although this did not have a statistically significant impact in this study (Table 3.3). Notably, in the Tshwane metropolitan, the public sector hospital beds per 10 000 target population, public sector medical practitioners per 100 000 population, and provincial and local government primary healthcare expenditure per capita for the uninsured all exceed the national and provincial averages (31). The only statistically significant sub-district in Tshwane in this analysis of the GCRO data is Region 1, where household

access is poorer (Table 3.3) (31). Tshwane's Region 1 is home to Akasia, Ga-Rankuwa, Soshanguve and Mabopane; all historically underdeveloped areas. It is also the sub-district of Tshwane with the largest Black African population, at 95.2% (Table 3.1). Despite Tshwane metropolitan having greater health resources than the average municipality in South Africa, the increased difficulty in household health access for Region 1 suggests that their distribution has not contributed to addressing historical patterns of inequity.

Post-apartheid government social policy has actively acknowledged the need for housing to be developed and provided for citizens, and that this housing contributes toward restructuring society to address structural, social, economic, and spatial dysfunctionalities. The initial phase (1996 – 2005) of government housing focused on ownership and delivered more than two million Reconstruction and Development Programme (RDP) fully-subsided houses nationally, alongside a modest 34 000 partially subsidised houses for rental (66). Between 2007/8 and 2014/15, R4.5 billion was invested in social housing with 18 000 units approved for development and 10 000 delivered (67). Despite this investment, an Impact and Implementation Evaluation of the Social Housing Programme noted that social housing at this scale has made only a minor contribution to spatial restructuring (67). The land that is found closest to predominantly economic opportunities is generally more expensive than the land in peripheral locations. As a result, RDP housing development for previously and presently disadvantaged communities has historically taken place in the periphery, further entrenching apartheid spatial patterns (67). Since 2015, the Gauteng Provincial Government has shifted housing policy away from the RDP model to large-scale integrated human settlements of no fewer than 15 000 units per project (68). These developments are predominantly found near existing townships or informal settlements and far away from current concentrations of business (68). As previously noted by Marais and Cloete (5), the higher cost incurred to access schools and clinics when subsidised housing is relegated to the periphery intrinsically links health and housing. This could be seen to be merely formalising housing in informal settlements, as opposed to driving spatial restructuring and social integration.

Turning attention to healthcare usage, Tshwane's Regions 1 and 3 were the only sub-districts with statistically significantly lower healthcare usage than the provincial average (Table 3.5). Tshwane's Region 3 includes the Central Business District, Hatfield, and Brooklyn. It is the administrative heart of government and houses the

National Government offices. Tshwane's Regions 1 and 3, which are neighbouring sub-districts, have virtually no sociodemographic similarities despite experiencing similar reductions in healthcare usage when compared to the provincial average (Table 3.1). The cause of the healthcare usage reduction, therefore, is external to the sociodemographic characteristics of the sub-districts, and would need to be further unpacked to be better understood. Region 1's socioeconomic profile includes an over-representation of adult residents in the poorest 40% and under-representation of adult residents in the wealthiest quintile of the provincial population (Table 3.1). Based on this, it is likely that this sub-district is demonstrative of Fusheini and Eyles' (22) findings that the poorest 20% of the population receive only 12.5% of the health benefit, despite having a need for health of more than 25%

Conversely, Region G, E1, and Emfuleni all noted significantly higher healthcare usage (Table 3.5). All three sub-districts fare below the provincial mean for markers of relative socioeconomic privilege (Table 3.1) and represent three different municipalities. In the absence of the GCRO enquiring which level of health services were used (i.e., primary vs hospital care), these sub-districts could be theorised to represent progress made through post-apartheid social policy which sought to increase access to primary healthcare in previously disadvantaged communities, noting an 11.1 percentage point increase in access between 2004 and 2012 (28). As shown by the analysis in Table 3.3 and supported by the distribution of healthcare facilities in Appendix V, these three sub-districts do not appear to be healthcare deserts, where residents significantly lack access and access to adequate healthcare.

Post-apartheid South African social policy, inclusive of the White Paper on the Transformation of the Health Care System and the National Health Act, has sought to actively address health inequities (69). By the post-apartheid government's own admission in the White Paper on National Health Insurance, these inequities have not been fully addressed (69). On the contrary, the two-tier health system based on socioeconomic status has been entrenched and the resultant inequalities continue to be perpetuated. Stuckler and colleagues (70) investigated post-apartheid infrastructure-inequality traps in South Africa by reviewing data on healthcare funding allocations from the Health Systems Trust between 1996 and 2007. Their findings included that provinces with greater existing infrastructure and higher proportions of White residents were allocated more resources at the expense of provinces with fewer resources and greater health burdens (70). South Africa's dual health system does not

aid in alleviating these traps. Instead, Stuckler (70) noted that existing private hospital capacity, which is concentrated in wealthier, urban areas in select provinces, also determined healthcare funding allocations and development of infrastructure within the public sector, further widening the divide between the public and private healthcare systems. This finding aids in explaining Burger's (28) findings of the poorest, mostly rural-dwelling South Africans being the only group for which travel time to a public sector clinic increased between 1993 and 2008. While Stuckler's (70) was done at the provincial level, it can be argued that intra-provincial resource distribution also mirrors this trend. As shown in Appendix V, urban sub-districts within the metropolitan municipalities demonstrate a public and private healthcare facility density that is not present in the non-metropolitan West Rand and Sedibeng. The absence of post-1998 allocations being adjusted for historical inequalities has resulted in sustained gaps between resource-rich and resource-deprived regions in health spending, doctors, and hospitals per capita (70). This financial and resource distribution remains consistent with the inverse care law.

The inverse care law states that the availability of good medical care tends to vary inversely with the need of the population served (71). This analysis utilised the variables that were available in the GCRO dataset, which are relatively crude. It is likely that an analysis of other healthcare variables, such as number of healthcare visits, days spent in hospital, or costs per consultation, would demonstrate a more extreme inverse care law. In keeping with the stated intentions of addressing historical health inequities, these infrastructure-inequality traps could have been better addressed through allocating more funding to rural, historically structurally underdeveloped regions to build health infrastructure and attract more healthcare workers. Acknowledging that the population densities of rural areas mean a higher per capita spend on healthcare is required, development could only take place through the allocation of more resources and higher spend on areas with greater need and poorer historic development.

Chapter 5 Conclusions and Recommendations

5.1 Conclusions

This research has found that socioeconomic differences persist in different sub-districts and that these differences affect health. In addition, residual geographic impact remains beyond the socioeconomic variables that were measured and adjusted for, resulting in the conclusion that Gauteng continues to be impacted by historic patterns of apartheid-entrenched racial residential segregation, and that health is not immune to this impact. Concurrently, there are ongoing failures to address long-standing structural inequities in healthcare service provision. This failure creates and sustains infrastructure-inequality traps and results in South African healthcare provision exhibiting the inverse care law. These phenomena widen inequality between regions and between the public and private health sectors. Social determinants of health continue to stratify the South African population allowing socioeconomic status, and not health need, to determine the ease and frequency with which the healthcare system is accessed and used, as well as which health system is accessed. Socioeconomic status determines sub-district of residence, which in turn determines socio-economic status through education and employment and, as demonstrated in this study, health.

5.2 Recommendations

1. The deployment of services across both the public and private healthcare sectors requires a redesign to align resources to greatest need, and not greatest use or greatest ability to purchase access. The allocation of resources in the South African healthcare system requires acknowledgement of the different circumstances present across regions and provinces. Under-served, non-metropolitan, and rural areas need facilities and healthcare workers to meet the population health needs and realise the constitutional rights enshrined in Section 27 of the Constitution of South Africa. Healthcare workers must be supported and incentivised to provide services to underserved communities. Innovative service delivery models must be considered. This includes the broader use of telehealth services, partnering of remote facilities with urban public or private hospitals and their healthcare teams, allowing paramedics and community health workers to operate at their highest scope of practice, and consistently operating well-staffed and resourced mobile clinics. In parallel,

addressing the human resources for health shortage in South Africa is critical to ensuring healthcare can be provided to those in need.

2. Post-apartheid spatial planning has not addressed persistent residential racial segregation. Formalising informal housing in peripheral areas is not adequate to address spatial dysfunction. Land that is located closer to economic hubs in sub-districts that have favourable socioeconomic parameters and access to opportunities (e.g., Johannesburg's Region B, Tshwane's Region 4, and Ekurhuleni's N3) should be procured for social housing to foster integration. This would incur an extra cost but, as shown, would aid in improving socioeconomic circumstances and positively impact on health.
3. The persistent link between healthcare, health, and socioeconomic status means access to healthcare and higher standards of health need social reform, and not merely healthcare system reform. Access to quality education and employment opportunities that afford a living wage are necessities for socioeconomic advancement. Social subsidies in the form of social grants are unsustainable interventions to address the shortfalls that arise from a lack of decent employment opportunities, especially when the majority of working age people are unemployed. Skills and training development is needed but undervalued skills, such as artisans, should be invested in and more opportunities created for employment in sectors of high demand, such as teaching and nursing.
4. Access to quality healthcare should be financially protected, not linked to users' socioeconomic status, and available as and when it is needed within users' communities. This should be pursued through implementing universal healthcare coverage. Prior to the implementation of such a system, resources should be deployed to improve current healthcare service delivery by bolstering deployed human resources to underserved areas and ensuring public health facilities are functional and well-managed.

There is no silver bullet to undoing centuries of entrenched social and structural inequity and its impacts on health and healthcare. In the absence of active, coordinated efforts to address historical patterns of health disadvantage, these patterns have persisted for an additional 30 years into democracy. The changes needed to address these patterns are not confined to healthcare sector reform but require effort to address the many social determinants of health that are present outside of the health system. Reforming healthcare, therefore, should be a broader social objective, and not one to

be placed solely on the healthcare system. Active, engaged citizens should continue to hold leaders accountable for the realisation of a quality healthcare system that is accessible to all and that positively impacts on users' health status. As Coovadia and colleagues (72) stated in *The Lancet* in 2009: "Without concerted efforts to change national thinking on accountability, South Africa will become a country that is not just a product of its past, but one that is continually unable to either address the health problems of the present or to prepare for the future."

Chapter 6 References

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Chapter 7 Appendices

Appendix I: Full Quality of Life 2017/18 questionnaire

Full Quality of Life 2017/18 questionnaire					December 2018
No.	Question	Variable Name	Code	Responses	QoL V (2017/18) Notes
Metadata					
	Unique interview ID	resp_id			
	Municipality	munic_recode		1 Ekurhuleni 2 Johannesburg 3 Tshwane 4 Emfuleni 5 Lesedi 6 Midvaal 7 Merafong 8 Mogale City 9 Rand West	
	Ward ID	ward			
	Number of dwelling units reported at dwelling point	dwelling_count			
	Number of adults resident at dwelling unit	adults_listed			
	Number of female adults resident at dwelling unit	females_listed		numerical	Derived from listing details
	Number of male adults resident at dwelling unit	males_listed		numerical	Derived from listing details
	Interview date	date		date	
	interview duration	duration		numerical (minutes)	
Consent					
0.01	You are about to begin the Quality of Life survey with the selected respondent. Please confirm that they verbally give their consent to participate in the study so you can proceed with the survey <i>DC: Remember to give as much information about the study as the respondent needs for informed consent. You have supporting documents available to help you.</i>			1 The respondent has given verbal consent so I can proceed, 2 The respondent does not give their consent to participate in the survey (Go to FC6.01 'Cannot proceed with respondent')	Not included in dataset; surveys were not completed if the respondent did not provide consent
0.02	Please confirm consent by taking a photograph of the back of the respondent's left hand. <i>DC: If the respondent refuses, but they have given verbal consent, you may continue without this</i>			Goes to camera or allows to push next	Not available for public dissemination
Fieldworker observation					
A1	To which population group does the respondent belong?	A1_Pop_group		1 African 2 Coloured 3 Indian/Asian 4 White 5 Other	
A2	What is the sex of the respondent?	A2_Sex		1 Male 2 Female	
A3	Which type of dwelling does this household occupy?	A3_dwelling		1 House, brick or concrete structure on a separate stand 2 Traditional dwelling, hut or structure made of traditional materials 3 Flat or apartment in a block of flats 4 Cluster house in a complex 5 Townhouse (semi-detached house in a complex) 6 Semi-detached house not in a complex 7 House, flat or room separate from main dwelling in backyard 8 Informal dwelling or shack in backyard 9 Informal dwelling NOT in backyard, e.g., in informal squatter settlement or on a farm 10 Room or flat which is part of main dwelling or property 11 Caravan or tent 12 Unit in a retirement home or barracks etc. 13 Hostel 14 Other	
1 Dwelling					
1.00.01	Let's talk about your dwelling: Please can you provide the address for this dwelling. If the dwelling is in a complex or building, what is the number of the dwelling within the complex or building? <i>DC: If not in a building or complex, press next.</i>			Numerical - optional	Not available for public dissemination
1.00.02	If the dwelling is in a complex or building, what is the name of the building or complex? <i>DC: If not in a building or complex, press next.</i>			Text - optional	Not available for public dissemination

1.00.03	What is the number of the dwelling (or of the complex or building) on its street?			Numerical	Not available for public dissemination
1.00.04	What is the name of the street that the dwelling (or the complex or building) is located on?			Text	Not available for public dissemination
1.00.05	What is the name of the suburb or township that the dwelling is located in?			Text	Not available for public dissemination

1.01.01	How many households live in this dwelling unit? <i>DC: A household is a group of people living in the same dwelling and usually eating together for at least 4 nights per week or more. How many such groups live in this dwelling unit?</i>			Numerical; limited to 1-20	Not available for public dissemination
1.01.02	Let's talk about your dwelling How many people, including you, live in this household? <i>DC: That is the people living in the same dwelling and usually eating together for at least 4 nights per week or more.</i>	Q1.01.02_people		Numerical; limited to 1-30	Training: eating together means eating from same 'pot'; doesn't specifically have to be nights, but at least 4 main meals, across 4 days
1.2	How many rooms does your household occupy? Excluding bathroom, toilet or kitchen. <i>DC: A household is the people living in the same dwelling and usually eating together for at least 4 nights per week or more</i>	Q1.02_rooms		1 1 2 2 (skip to 1.4) 3 3 (skip to 1.4) 4 4 (skip to 1.4) 5 5 (skip to 1.4) 6 6 (skip to 1.4) 7 7 (skip to 1.4) 8 8 (skip to 1.4) 9 9 (skip to 1.4) 10 10+ (skip to 1.4)	Training: Only rooms used exclusively for kitchen/bathroom/garage to be excluded - if they are also slept in, we count them
1.3	How many other households does this household share this room with?	Q1.03_households		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 10 10+	
1.4	Does this household own or rent this dwelling, or live here by some other arrangement?	Q1.04_tenure		1 Owned 2 Renting (skip to 1.6) 3 Allowed to stay rent free by owner (skip to 1.7) 4 Squatting or living rent-free in vacant building/land (skip to 1.7) 5 Dwelling is on tribal or communal land (skip to 1.7) 6 Other (skip to 1.7)	Training: - how to code accommodation provided by employer
1.5	How is the dwelling owned?	Q1.05_ownership		1 Owned, but paying off a bond (skip to 1.7) 2 Owned, fully paid off (skip to 1.7) 3 Free RDP house (skip to 1.7) 4 Built with own or family funds/contributions (skip to 1.7) 5 Used government housing subsidy and own contribution (skip to 1.7) 6 Transfer of title deed of existing government house (skip to 1.7) 7 Inherited (skip to 1.7) 8 Other (skip to 1.7)	Training: - 'Title deeds' are papers which demonstrate ownership of the dwelling. Transfer of title deed option relates to the official transfer of ownership of an old township government house to this particular household - If bought cash, put into 'owned, fully paid off'
1.6	Who do you rent from?	Q1.06_renting		1 Private rental (individual or letting agency) 2 Rent from housing association 3 Public, municipal or council rental 4 Sub tenant or sub let 5 Other	Training: - how to code accommodation rented from employer - Sub-tenant/sub-let - renting from someone else who is not the owner but is renting from the owner.
Dwelling & services					
1.7	Now let talk about the services you have access to. What is the main water source for this household?	Q1.07_water		1 Piped - in dwelling with no meter (Skip to 1.9) 2 Piped - in dwelling with prepaid meter (Skip to 1.9) 3 Piped - in dwelling with standard meter (Skip to 1.9) 4 Piped - yard tap with no meter (Skip to 1.9) 5 Piped - yard tap with prepaid meter (Skip to 1.9) 6 Piped - yard tap with meter (Skip to 1.9) 7 Street taps or stand pipes, free water 8 Street taps or stand pipes, paid for 9 Borehole or well 10 Rainwater tank (e.g., JoJo tank) 11 Flowing river or stream 12 Dam, pool or standing water 13 Water tanker or truck 14 Other (skip to 1.14)	Training - how to differentiate no meter/prepaid meter/standard meter; examples of rainwater tanks & water tankers
1.8	Is the place where you collect water more than 200 meters from your house <i>DC: 200m is just more than the length of a football field</i> Only display if person has not selected a piped option in 1.7	Q1.08_water200m		1 Yes (skip to 1.14) 0 No (skip to 1.14)	
Dwelling & services In the last year there were water restrictions in Gauteng. In response to these shortages, did your household implement any of the following water saving measures?					
1.9	Using grey water <i>DC: e.g., reusing water from the bath or washing</i>	Q1.09_greywater		1 Yes 0 No	Training - explanation & examples; use of examples on an as-needed basis

1.10	Devices that restrict water flow <i>DC: e.g., water efficient showerhead, aerators, flow restrictor</i>	Q1.10_waterflow	1 Yes 0 No	Training - explanation & examples Aerator - a fitting on the tap that aerates the water, to reduce the amount of water coming out of the tap. use of examples on an as-needed basis
1.11	Reducing water for toilet flushing <i>DC: e.g. dual flush toilet, water displacement in cistern</i>	Q1.11_toilet	1 Yes 0 No	Training - explanation & examples; use of examples on an as-needed basis
1.12	Fixing leaks and drips	Q1.12_leaks	1 Yes 0 No	Training - explanation & examples
1.13	Reduced water consumption through changed behaviour <i>DC: e.g., changing how you wash yourself, watering can instead of hose or sprinkler, didn't wash car</i>	Q1.13_behaviour	1 Yes 0 No	Training - explanation & examples; use of examples on an as-needed basis
Dwelling & services				
1.14	Besides the main water source does this household also get water from any of the following: Borehole or well	Q1.14_borehole	1 Yes 0 No 2 Already mentioned as main water source	Training - explanation
1.15	Besides the main water source does this household also get water from any of the following: Rainwater tank <i>DC: Water tank that collects rainwater from roofs e.g., JoJo tank</i>	Q1.15_rainwater	1 Yes 0 No 2 Already mentioned as main water source	Training - explanation & images
1.16	Besides the main water source does this household also get water from any of the following: Water tanker or truck <i>DC: A vehicle that travels around giving emergency supplies of water in communities</i>	Q1.16_water_truck	1 Yes 0 No 2 Already mentioned as main water source	Training - explanation & images
1.17	In the past year, how often, if ever, did you experience water interruptions? <i>DC: Past year refers to past 12 months</i>	Q1.17_interruptions	1 Every week 2 A couple of times a month 3 Once a month 4 A couple of times a year 5 Never	
1.18	How much does your household spend on water per month? <i>DC: Cue card</i>	Q1.18_water_expenditure	1 R0 2 R1 - R50 3 R51 - R100 4 R101 - R250 5 R251 - R500 6 R501 - R1 000 7 R1 001 - R2 000 8 R2 001 or more 9 Don't know	Training - all water for household from all sources; if asked, include bottled water
1.19	Would you say the water you receive is always clean, usually, sometimes, hardly ever, never?	Q1.19_water_clean	1 Always 2 Usually 3 Sometimes 4 Hardly ever 5 Never	
1.20	What type of toilet facility is available to this household? <i>DC: If multiple toilet types available, select the main one</i>	Q1.20_toilet	1 Flush toilet connected to sewage system - full waterborne 2 Flush toilet with septic tank 3 Chemical toilet 4 Ventilated improved pit latrine 5 Basic Pit latrine - pit toilet without ventilation 6 Bucket toilet 7 Neighbour's toilet 8 Communal toilet 9 No access to toilet 10 Other	Training - main type available/used If communal/neighbours, don't worry about type
1.21	How is the refuse or rubbish of this household disposed of? Do NOT read out the options <i>DC: Select main option if there are multiple</i>	Q1.21_removal	1 Refuse removed from the house at least once a week 2 Refuse removed from the house less often 3 Placed on communal refuse dump 4 Placed on own refuse dump 5 Burnt in pit 6 Buried 7 Thrown in the street or veldt 8 No refuse removal service at all 9 Other	

1.22	Thinking about the large rubbish bags often used for household rubbish, how many bags of rubbish does your household throw away each week? EXCLUDE garden waste such as cut grass and waste you separate out for recycling. DC: By large rubbish bags, we mean the same size as a normal large black bag; Even if the respondent does not use these big bags, if they think about the rubbish they do dispose of, how many of these bags would be filled? Add 0.5 to indicate half a bag, for example two and a half is 2.5	Q1.22_rubbish		Numerical, with decimals, limited to 0-20	Training - 'big black rubbish bags', asking respondent to estimate quantity
1.23	Does this household recycle any of its own household waste? DC: This includes paper, glass, tin, plastic etc, but not compost. We are specifically interested in whether the household separates any of this out.	Q1.23_recycle		1 Yes 0 No (skip to 1.25) 2 Don't know (skip to 1.25)	Training - this is about whether they separate their recycling out
1.24	How many large rubbish bags of recycling (all types) does this household produce each week? DC: By large rubbish bags, we mean the same size as a normal large black bag; Even if the respondent does not use these big bags, if they think about the recycling they separated, how many of these bags would be filled?	Q1.24_recycle_bags		Numerical, with decimals, ranging from 0-20	training - 'big black rubbish bags', asking respondent to estimate quantity; compost should not be included
1.25	What type of electricity supply, if any, does this household have? READ OUT DC: You may select multiple responses Coding note: Multiple mention	Q1.25_1 Q1.25_2 Q1.25_3 Q1.25_4 Q1.25_5 Q1.25_6 Q1.25_7 Q1.25_8 Q1.25_9		1 Electricity with prepaid card 2 Electricity with smart meter 3 Electricity with conventional meter 4 Other electricity supply: Solar or wind generators 5 Other electricity supply: petrol or diesel generators 6 Connection from neighbour's house 7 Car battery 8 Connection from elsewhere 9 Do not know	Training - different types of meters (key to differentiating smart & conventional meter is whether someone has to come along and physically read it)
1.26	Which supplier do you get your electricity from?	Q1.26_electricity_supplier		1 Eskom 2 Municipality (e.g., CityPower) 3 Don't know 4 Not applicable	Training - examples of municipality providers
1.27	What energy source is MOST used for lighting in your household?	Q1.27_lighting		1 Electricity 2 Gas or LPG 3 Paraffin 4 Wood 5 Candles 6 Solar Energy 7 Other	
1.28	How much does this household spend on electricity per month? DC: Cue card available for this section	Q1.28_electricity_expenditure		1 R0 2 R1 - R50 3 R51 - R100 4 R101 - R250 5 R251 - R500 6 R501 - R1 000 7 R1 001 - R2 000 8 R2 001 or more 9 Don't know 10 Not applicable	
1.29	In the past year, how often, if ever, did you experience electricity interruptions? DC: Past year refers to past 12 months	Q1.29_interruptions		1 Every week 2 A couple of times a month 3 Once a month 4 A couple of times a year 5 Never 6 Not applicable	
1.30	Do you have a solar water geyser?	Q1.30_geyser		1 Yes 0 No	Training - images and examples
1.31	Does your household have any arrears (unpaid accounts that have built up over time) for payment of municipal services like water and electricity?	Q1.31_arrears		1 Yes 0 No	
1.32	Have you ever had the water cut off for non-payment? DC: If asked, this can be at any dwelling, not just current	Q1.32_water		1 Yes 0 No	Training note: -- Cut off is when the municipality comes and blocks your pipes so you can't get water (which is actually not legal btw) -- Running out of credit is not a cut off
1.33	Have you ever had the electricity cut off for non-payment? DC: If asked, this can be at any dwelling, not just current	Q1.33_electricity		1 Yes 0 No	Training note: -- Cut off is when the municipality comes and disconnects your electricity -- Running out of credit (e.g., prepaid) is not a cut off
1.34	Have you ever been evicted from your dwelling? DC: If asked, this can be at any dwelling, not just current	Q1.34_evicted		1 Yes 0 No	Training note: any dwelling ever
2	Satisfaction with services				

2.1	Let's talk about how satisfied you are, or are not, with your dwelling and government services How satisfied are you with the dwelling which you are currently living in? <i>DC: Cue card is available for this section</i>	Q2.01_dwelling	1 Very satisfied (skip to 2.3) 2 Satisfied (skip to 2.3) 3 Neither satisfied nor dissatisfied (skip to 2.3) 4 Dissatisfied 5 Very dissatisfied	
2.2	What is the main reason for your dissatisfaction with your dwelling? Do NOT read out	Q2.02_dwelling_dissatisfaction	1 It is too small 2 It is poorly designed / badly built 3 It needs maintenance 4 Too cold / too hot 5 Doesn't have access to services 6 Bad landlord 7 Don't like the area 8 Too expensive to maintain 9 Other	
2.3	How satisfied are you with the water you currently have access to?	Q2.03_water	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	Training: How to handle cases where people don't have access to services
2.4	How satisfied are you with the sanitation or sewerage service you currently have access to?	Q2.04_sanitation	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
2.5	How satisfied are you with the waste removal service you currently have access to?	Q2.05_waste	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
2.6	How satisfied are you with the energy sources you currently have access to?	Q2.06_energy	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	Training - clarity around what 'energy sources' means, and that it applies to all types of energy used for cooking, heating, lighting, etc - including electricity, gas, paraffin, candles etc
2.7	How satisfied are you with how much you or your household have to pay for municipal services?	Q2.07_munic_cost	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
2.8	How satisfied are you with the way you are billed for municipal services?	Q2.08_billing	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 I don't have an account with the municipality	
2.9	How satisfied are you with the roads you use every day?	Q2.09_roads	1 Very satisfied (skip to 2.11) 2 Satisfied (skip to 2.11) 3 Neither satisfied nor dissatisfied (skip to 2.11) 4 Dissatisfied 5 Very dissatisfied	
2.10	What is the main reason for your dissatisfaction with the roads? Do NOT read out	Q2.10_roads_dissatisfaction	1 Roads not tarred 2 No road markings 3 Potholes / poor tar patching 4 Dangerous intersection / road 5 Lack of / broken traffic lights 6 Lack of / poor state of stormwater drainage 7 Too much traffic 8 No speed bumps 9 No pavements / sidewalks 10 Pavements / sidewalks dug up for cables, infrastructure repairs etc and not restored properly 11 Other	Training: Take the first response the person gives and code that
2.11	How satisfied are you with the streetlights where you live?	Q2.11_street_lights	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none	
2.12	How satisfied are you with the public schools where you live?	Q2.12_schools	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none	
2.13	How satisfied are you with the health services that government provides where you live?	Q2.13_Health	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none	
2.14	How satisfied are you with the stormwater drains where you live? <i>DC: Stormwater drains are pipes, gutters that drain excess rain and ground water from surfaces such as roads, parking lots, and pavements.</i>	Q2.14_Drainage	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none	

2.15	How satisfied are you with the libraries in your area?	Q2.15_Libraries	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none 	
2.16	How satisfied are you with emergency services (e.g., fire and ambulance) where you live?	Q2.16_EMS	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 	
2.17	How satisfied are you with the traffic/metro police?	Q2.17_metro	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 	
2.18	How satisfied are you with government's initiatives to grow the economy and create jobs?	Q2.18_gov_initiatives	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 	
2.19	How satisfied are you with the parks and public spaces in your area?	Q2.19_Parks	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 There are none 	
3	Migration			
3.1	Let's talk about when and how you came to live here. In which province or country were you born?	Q3.01_birth_place	<ul style="list-style-type: none"> 1 Gauteng (skip to 3.5) 2 Eastern Cape (skip to 3.3) 3 Free State (skip to 3.3) 4 KwaZulu Natal (skip to 3.3) 5 Limpopo (skip to 3.3) 6 Mpumalanga (skip to 3.3) 7 Northern Cape (skip to 3.3) 8 North West (skip to 3.3) 9 Western Cape (skip to 3.3) 10 Country outside South Africa 	
3.2	In which country were you born?	Q3.02_country	Drop down list of countries	
3.3	In which province or country did you live most recently before coming to Gauteng? <i>DC: By this we mean the last province or country they lived in before coming to Gauteng</i>	Q3.03_previous_residence	<ul style="list-style-type: none"> 1 Eastern Cape 2 Free State 3 KwaZulu Natal 4 Limpopo 5 Mpumalanga 6 Northern Cape 7 North West 8 Western Cape 9 Country outside South Africa 	
3.4	When did you move into Gauteng? <i>DC: Please enter the year; if the respondent doesn't know the exact year, please ask for their best guess</i>	Q3.04_year	Written year, limited from 1915-2018	
3.5	Now I would like to talk about your main home. When I say 'main home' I am not necessarily talking about your parents' / family / ancestral home although it could be. I am asking about the home you personally consider to be the main place where you feel at home. Do you consider the area around here to be your main home?	Q3.05_main_home	<ul style="list-style-type: none"> 1 Yes (Skip to 3.11) 0 No 	Training note: main home
3.6	In which province or country is your main home?	Q3.06_home	<ul style="list-style-type: none"> 1 Somewhere else in Gauteng (Skip to 3.8) 2 Eastern Cape (Skip to 3.8) 3 Free State (Skip to 3.8) 4 KwaZulu Natal (Skip to 3.8) 5 Limpopo (Skip to 3.8) 6 Mpumalanga (Skip to 3.8) 7 Northern Cape (Skip to 3.8) 8 North West (Skip to 3.8) 9 Western Cape (Skip to 3.8) 10 Country outside South Africa 	
3.7	In which country is your main home?	Q3.07_home_country	Drop down list of countries	
3.8	How often, if ever, do you visit your main home?	Q3.08_visits	<ul style="list-style-type: none"> 1 Most weeks 2 Once or twice a month 3 Every few months 4 Once or twice a year 5 Every few years 6 Never 	
3.9	How often, if ever, do people who live at your main home visit you here?	Q3.09_visitors	<ul style="list-style-type: none"> 1 Most weeks 2 Once or twice a month 3 Every few months 4 Once or twice a year 5 Every few years 6 Never 7 Nobody lives there 	

3.10	How likely are you to make this area where you are living now your main home in future?	Q3.10_future	<ul style="list-style-type: none"> 1 Very likely 2 Likely 3 Unlikely 4 Very unlikely 5 Don't know 	
3.11	Where do you intend to retire to?	Q3.11_retirement_intention	<ul style="list-style-type: none"> 1 This area 2 My main home elsewhere 3 Somewhere else (not here, nor my main home elsewhere) 4 Don't know 5 I am already retired 	
3.12	<p>Please tell me which of the following family members live with you here:</p> <p>READ OUT</p> <p><i>DC: If the respondent asks what is meant by 'here', ask them what they understand it to mean.</i></p> <p>Coding note: Yes/No list</p>	<ul style="list-style-type: none"> Q3.12_1 Q3.12_2 Q3.12_3 Q3.12_4 Q3.12_5 Q3.12_6 Q3.12_7 Q3.12_8 	<ul style="list-style-type: none"> 1 Spouse / partner 2 Your children (under 18) 3 Your children (18 and older) 4 Your parent(s) and/or spouse's parent(s) 5 Your (or partner's) brother(s) and/or sister(s) 6 Your (or partner's) grandchild(ren) 7 Your (or partner's) grandparent(s) 8 Other relative(s) 	Training - should allow respondents to interpret exactly what 'with you here' means
3.13	<p>What is the main language spoken in this household?</p> <p><i>DC: If asked, the one language that is used the most</i></p>	Q3.13_language	<ul style="list-style-type: none"> 1 Afrikaans 2 English 3 isiNdebele 4 isiXhosa 5 isiZulu 6 Sepedi 7 Sesotho 8 Setswana 9 Sign language 10 SiSwati 11 Tshivenda 12 Xitsonga 13 Other 	Ensure fieldworker knows it's language most spoken, not mother tongue
4 Neighbourhood or Community				
4.1	<p>Now, let's turn our attention to your neighbourhood or community</p> <p>Have you seen an improvement and/or deterioration in this community or neighbourhood in the last 12 months?</p> <p><i>DC: If the respondent says they haven't lived there for 12 months yet, just ask about the time since they've arrived there.</i></p>	Q4.01_change	<ul style="list-style-type: none"> 1 Improvement 2 Deterioration 3 No Change 	Training note - in general, however respondent interprets
4.2	<p>What is the biggest problem facing your community?</p> <p>Do NOT read out the options</p>	Q4.02_major_problem	<ul style="list-style-type: none"> 1 Alcohol abuse 2 Violence against women and children / domestic violence / rape 3 Corruption 4 Crime (e.g., robbery, hijacking, murder, etc.) 5 Disease (e.g., HIV / AIDS, malaria, diabetes, TB) 6 Emergencies or disasters (e.g., fire, flood, drought, natural disaster) 7 Drugs 8 Foreigners 9 Gangs 10 High cost of living 11 Lack of basic services (e.g., housing, water, electricity, roads) 12 Lack of maintenance (e.g. potholes, street lights, leaking pipes) 13 Pollution (e.g. air, water, noise, litter, vandalism) 14 Poverty (e.g., hunger, homelessness, begging) 15 Protests, unrest, strikes 16 Unemployment 17 Other 18 No problem 	
4.3	<p>Generally speaking, do you think that most people in your community can be trusted or that you need to be very careful when dealing with people in your community?</p>	Q4.03_community	<ul style="list-style-type: none"> 1 Most people can be trusted 2 You need to be very careful 3 Don't know 	
4.4	<p>How long in total have you lived in this community or neighbourhood?</p> <p>Do NOT read out</p> <p><i>DC: Can be the total of multiple periods of residence, not only the most recent period of residence</i></p>	Q4.04_length_stay	<ul style="list-style-type: none"> 1 I've always lived here (skip to 4.6) 2 More than 10 years 3 5-10 years 4 3-4 years 5 1-2 years 6 Less than 1 year 	

4.5	<p>What was your main reason for coming to live in this neighbourhood or community?</p> <p>Do NOT read out</p>	Q4.05_reason_coming	<ol style="list-style-type: none"> 1 My family moved here when I was a child 2 I wanted a place with better services (water, electricity, health care options) 3 To access schools/education facilities 4 Housing options are better than where I was before 5 It is safer than where I was before 6 To be close to work 7 To look for work 8 To start a business 9 To join family or people I know (a partner/spouse, family members, friends, people from home town/area) 10 Only place I could afford 11 Only place I knew about 12 Only place I could access housing 13 Other 	
4.6	<p>Imagine there are three friends who are talking about the place where they live:</p> <ol style="list-style-type: none"> 1. The first one says, "In this area there is one group of leaders who most people listen to". 2. The second one says, "In this area there are competing leaders, and different people follow different leaders". 3. The third friend says "There are no leaders in this area". <p>Which one person best describes how you feel about</p>	Q4.06_Leadership_perception	<ol style="list-style-type: none"> 1 First person 2 Second person 3 Third person 	
4.7	<p>Which of the following can you walk to within 15 minutes of this dwelling?</p> <p>READ OUT</p> <p><i>DC: Treat a 'don't know' in the same way as a 'no'</i></p> <p>Coding note: Yes/No list</p>	<p>Q4.07_1</p> <p>Q4.07_2</p> <p>Q4.07_3</p> <p>Q4.07_4</p> <p>Q4.07_5</p> <p>Q4.07_6</p> <p>Q4.07_7</p> <p>Q4.07_8</p> <p>Q4.07_9</p> <p>Q4.07_10</p> <p>Q4.07_11</p> <p>Q4.07_12</p>	<ol style="list-style-type: none"> 1 Creche / daycare 2 Place where I can buy uncooked food (e.g., fresh vegetables, meat etc) 3 Place where I can buy cooked food 4 Hardware/building suppliers 5 Financial services / banks 6 Internet café 7 Business services (printing, photocopying etc.) 8 Bars, taverns, shebeens or liquor store 9 Post office 10 Park or green public space 11 Library 12 Sport or recreation facility 	Training note - don't know should be treated as 'no'
5 Transport				
5.1	<p>Now, let's talk about transport</p> <p>Think about the trip that you make most often, from this dwelling, that involves walking or cycling or other mode of transport such as a taxi, car or train.</p> <p>What is the purpose of this trip that you make most often?</p>	Q5.01_frequent_trip	<ol style="list-style-type: none"> 1 To go to work (skip to 5.3) 2 To look for work (respondent is unemployed and travels looking for work) (skip to 5.3) 3 To go to the place where I study (school, college, university) (skip to 5.3) 4 Shopping (skip to 5.3) 5 Taking children to school (skip to 5.3) 6 To go to a place of leisure or entertainment (skip to 5.3) 7 Other purpose (skip to 5.3) 8 I don't make any trips 	<p>Training - ensure people know what leisure or entertainment can refer to</p> <p>Trip must have a destination - but any kind of trip, even just going to fetch water from the street tap, is fine</p>
5.2	Are you sure you never leave to go anywhere?	Q5.02_non_movement	<ol style="list-style-type: none"> 1 Yes (skip to 5.16) 0 No 	
5.2.1	<p>Think about the trip that you make most often, from this dwelling, that involves walking or cycling or other mode of transport such as a taxi, car or train.</p> <p>What is the purpose of this trip that you make most often?</p>	Q5.02.01_trip	<ol style="list-style-type: none"> 1 To go to work 2 To look for work (respondent is unemployed and travels looking for work) 3 To go to the place where I study (school, college, university) 4 Shopping 5 Taking children to school 6 To go to a place of leisure or entertainment 8 Other purpose 	
5.3	<p>Thinking about this trip that you make MOST often, where do you usually go (in other words, what is your final destination)?</p> <p>This trip can be to a place inside or outside of Gauteng</p> <p><i>DC: Please remember that a subplace is usually a very small area, and there will be many in an area like "Johannesburg". You need to be very specific. If you can't find the subplace you are looking for, please try to choose the closest possible subplace that you can find</i></p>	<p>Q5.03_1</p> <p>Q5.03_2 (Q5.03_2_codes)</p> <p>Q5.03_3 (Q5.03_3_codes)</p> <p>Q5.03_4 (Q5.03_4_codes)</p>	<ol style="list-style-type: none"> 1 Province (Multiple choice) 2 Municipality (Multiple choice) 3 Main place 4 Subplace (predictive text list) 	
5.4	Thinking still about the trip that you make MOST often, what time do you usually leave home for this trip?	Q5.04_time	24h clock	
5.5	How long after leaving home, does it take you to reach your destination?	Q5.05_time_destination	<ol style="list-style-type: none"> 1 Up to 15 minutes 2 From 16 minutes to 30 minutes 3 From 31 minutes to 45 minutes 4 From 46 minutes to 60 minutes (1 hour) 5 From 61 minutes to 90 minutes (1.5 hour) 6 More 	

5.6	<p>Think about the types of transport you use when you make this trip. What are all the different types of transport you use to make this trip?</p> <p>Do NOT read out</p> <p><i>DC: Please prompt the respondent about walking if they do not mention this</i></p> <p>Coding note: Multiple mention</p>	<p>Q5.06_1 Q5.06_2 Q5.06_3 Q5.06_4 Q5.06_5 Q5.06_6 Q5.06_7 Q5.06_8 Q5.06_9 Q5.06_10 Q5.06_11 Q5.06_12 Q5.06_13 Q5.06_14 Q5.06_15</p>	<p>1 Walk 2 Bicycle 3 Motorbike 4 Car as driver 5 Car as passenger 6 Car as passenger though a lift club 7 Minibus Taxi 8 Train 9 Gautrain 10 ReaVaya or A re yeng bus (BRT/TRT) 11 Other bus (e.g., Metrobus, Putco, City of Tshwane, Gautrain bus) 12 School bus 13 Other taxi (e.g., metered taxi, Uber, Taxify) 14 Animal or animal cart 15 Other type transport</p>	
5.7	<p>Thinking about the LONGEST distance travelled as part of your trip, what type of transport do you use for this part of this trip?</p>	<p>Q5.07_longest_mode</p>	<p>1 Walk (skip to 5.9) 2 Bicycle (skip to 5.9) 3 Motorbike 4 Car as driver 5 Car as passenger 6 Car as passenger though a lift club 7 Minibus Taxi (skip to 5.9) 8 Train (skip to 5.9) 9 Gautrain (skip to 5.9) 10 ReaVaya or A re yeng bus (BRT/TRT) (skip to 5.9) 11 Other bus (e.g., Metrobus, Putco, City of Tshwane, Gautrain bus) (skip to 5.9) 12 School bus (skip to 5.9) 13 Other taxi (e.g., metered taxi, Uber, taxify) (skip to 5.9) 14 Animal or animal cart (skip to 5.9) 15 Other type transport (skip to 5.9)</p>	
5.8	<p>What, if anything, would make you consider switching to any other mode of transport</p>	<p>Q5.08_alternative_transport</p>	<p>1 Cost 2 Public transport stops were closer to home 3 Public transport stops were closer to destination (e.g. work, school, shops) 4 Reliability 5 Fast 6 Safety (road safety, accidents) 7 Security (from crime) 8 I wouldn't consider switching modes 9 Other</p>	
5.9	<p>Still thinking about your main type of transport, the one that you travelled the longest distance, how satisfied or dissatisfied were you with it?</p>	<p>Q5.09_longest_travel</p>	<p>1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied</p>	
5.10	<p><i>Question dropped</i></p>			
5.11	<p>How often, if ever, do you use Bus Rapid Transit Systems (e.g., Rea Vaya BRT, A re yeng TRT)</p>	<p>Q5.11_BRT</p>	<p>1 Most days 2 Once or twice a week 3 A few times a month 4 Every few months 6 Never (Skip to 5.14)</p>	
5.12	<p>How satisfied are you with Bus Rapid Transit - BRT - (e.g., Rea Vaya BRT, A re yeng TRT)</p>	<p>Q5.12_satisfaction_BRT</p>	<p>1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied</p>	
5.13	<p>What is the main reason you use BRT?</p> <p>Do NOT read out</p>	<p>Q5.13_why_use_BRT</p>	<p>1 Cost 2 Stops close to home 3 Stops close to destination (e.g. work, school, shops) 4 Reliability 5 Fast 6 Safety (road safety, accidents) 7 Security (from crime) 8 Other</p>	
5.14	<p>What would encourage you to use BRT at all / more frequently?</p> <p>Do NOT read out</p>	<p>Q5.14_encourage_BRT_use</p>	<p>1 Cost less 2 Buses were more reliable (come when they are expected) 3 Trips took less time 4 Easier to get tickets/top up smart card 5 The smart card system worked better 6 Stops were closer to my house 7 Stops were closer to where I need to go (e.g., work, shops) 8 When the BRT currently being built in my area is finished, I will use it 9 It linked better with other transport (public or private) 10 It was safer (Crime) 11 It was safer (Road safety, accidents) 12 Buses ran at times I need it 13 Nothing would encourage me to use it more 14 Other</p>	
5.15	<p>Approximately how much do you personally spend in total every month on transport?</p> <p><i>DC: Cue card is available</i></p>	<p>Q5.15_transport_expenditure</p>	<p>1 R0 2 R1 - R50 3 R51 - R100 4 R101 - R250 5 R251 - R500 6 R501 - R1 000 7 R1 001 - R2 000 8 R2 001 or more 9 Don't know</p>	

5.16	To what extent do you agree or disagree with the following statements: Public transport has improved for me or my household in the last year.	Q5.16_transport_improvement	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 6 Not applicable/don't use	Training: If asked, public transport is whatever the respondent defines as public transport
5.17	I will never pay e-tolls	Q5.17_etoll_payment	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree 6 Not applicable/don't use freeways	
5.18	How far a walk is the closest access point to public transport from your house? (i.e., taxi route, bus stop, train station) Do NOT read out	Q5.18_proximity_public_transport	1 Up to 10 minutes 2 11 to 20 minutes 3 From 21 to 30 minutes 4 From 31 to 40 minutes 5 More than 40 minutes 6 Don't know	
6 Internet				
6.1	Let's talk about the internet Do you access the internet, including websites, e-mail, Facebook, whatsapp, wechat or other apps?	Q6.01_internet	1 Yes, nearly every day 2 Yes, but not often 3 (skip to 6.5)	Training - 'sometimes' should be coded as 'Yes, but not often'
6.2	From where do you access the Internet? READ OUT Coding note: Yes/No list	Q6.02_1 Q6.02_2 Q6.02_3 Q6.02_4 Q6.02_5 Q6.02_6 Q6.02_7 Q6.02_8 Q6.02_9 Q6.02_10	1 Work network 2 Home network 3 University, college or school 4 Library or community centre 5 Internet Café 6 Mobile data on my cell phone/tablet 7 Mobile data on my laptop (e.g. 3G, portable hotspot) 8 Wi-Fi hotspot/free or public Wi-Fi 9 Taxi Wi-Fi 10 Other location	
6.3	How satisfied are you with the internet services you have access to?	Q6.03_internet	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
6.4	In the last 3 months, have you used a web site or mobile app for the following: READ OUT Coding note: Yes/No list	Q6.04_1 Q6.04_2 Q6.04_3 Q6.04_4 Q6.04_5 Q6.04_6	1 To get information about government or to access a government service 2 Public transport 3 Work or business opportunities 4 Health services 5 Internet / online banking 6 For educational purposes	
6.5	Are you aware of any free broadband wi-fi your municipality offers (or any other government entity)?	Q6.05_municipal_broadband	1 Yes, and I use it 2 Yes, but I don't use it at all 3 No	Training - need to find out about usage if they know of these networks.
7 Household				
7.1	Now let's talk about you and your household for a while Many people are in debt at the moment, either from credit cards or bonds or other types of debt. Do you personally owe money to anyone including a bank or a shop or a money lender? <i>DC: If asked, this includes money owed to family and friends, or to institutions, as well as if the respondent owns something that they are still paying off.</i>	Q7.01_debt	1 Yes 0 No (skip to 7.3)	Training: Debt includes money owed to friends & family, loans, store accounts etc. Cell phone contracts, tv licences & other anticipated monthly/annual payments don't count, even if paid in arrears
7.2	In the last 3 months have you missed a debt repayment (e.g., loan repayment, bond, credit card)? <i>DC: If asked, this is a minimum payment only</i>	Q7.02_debt_repay	1 Yes 0 No	
7.3	Does this household have any of the following that are in good working order, that is not broken? READ OUT Coding note: Yes/No list	Q7.03_1 Q7.03_2 Q7.03_3 Q7.03_4 Q7.03_5 Q7.03_6 Q7.03_7 Q7.03_8 Q7.03_9	1 Landline telephone 2 Cell phone 3 Television 4 Personal computer, laptop or Tablet 5 Radio, cd player or music system 6 Satellite TV (e.g., MNET DSTV) 7 Car 8 Bicycle 9 Fridge	
7.4	In the last year, has there ever been a time when you or any other adult in this household had to skip a meal because there was not enough money to buy food?	Q7.04_meal	1 Yes 0 No	
7.5	In the last year, has there ever been a time when there was not enough money to feed the children in the household? <i>DC: This question refers to children under 18 only</i>	Q7.05_child	1 Yes 2 No 3 There are no children in this household (skip to 7.7)	

7.6	Are there any children in this household that benefit from a school feeding scheme? <i>DC: This means free meals provided at schools. If the meals are part of the school fees, this does not qualify as a feeding scheme.</i>	Q7.06_benefit_food_scheme	1 Yes 0 No	
7.7	Do you grow food or vegetables for your household to eat, sell, or not at all?	Q7.07_grow_vegetables	1 To eat 2 To sell 3 To eat and sell 4 Do not grow any	
7.8	How much does this household spend in total on food per month? <i>DC: Cue card is available</i>	Q7.08_food_expenditure	1 R0 - R500 2 R501 - R1 000 3 R1 001 - R2 000 4 R2 001 - R4 000 5 R4 001 +	
7.9	How easy or difficult do you find it to save money?	Q7.09_difficulty_saving	1 Very easy 2 Easy 3 Difficult 4 Impossible	
8 Participation and government I				
8.1	Let's talk about your participation in community processes Are you a registered voter? <i>DC: If respondent has voted before, they are registered</i>	Q8.01_registered	1 Yes 0 No (Skip to 8.5)	
8.2	Did you vote in the 2016 local elections? It doesn't matter who you voted for, just whether or not you voted.	Q8.02_voted	1 Yes (Skip to 8.4) 0 No	
8.3	Why did you not vote? Do NOT read out the options	Q8.03_reason_not_voting	1 Not allowed to vote, for example not RSA citizen (Skip to 8.5) 2 Didn't know who to vote for (Skip to 8.5) 3 Did not think his/her vote will make any difference (Skip to 8.5) 4 Don't care (Skip to 8.5) 5 No ID (Skip to 8.5) 6 Don't like politics, broken promises, waste of time (Skip to 8.5) 7 Local elections don't matter (Skip to 8.5) 8 Was not registered in my current voting district (Skip to 8.5) 9 Other (Skip to 8.5)	Training - difference between vote won't make a difference & broken promises/waste of time Option about 'not allowed to vote' refers specifically to legal reasons; if people aren't allowed to vote for cultural/religious/personal reasons, this should go under other
8.4	Did you change the party you voted for in the 2016 local elections compared to the previous election?	Q8.04_Party_change	1 Yes 2 No 3 I did not vote in a previous election	
8.5	In the last year, have you or any member of your household attended any of the following: READ OUT Coding note: Yes/No list	Q8.05_1 Q8.05_2 Q8.05_3 Q8.05_4 Q8.05_5 Q8.05_6	1 Ward meeting 2 Street committee or resident's association meeting 3 Community development forum meeting 4 Mayoral imbizo meeting 5 School governing body meeting 6 Community policing forum meeting	Training definitions: Ward meeting: meeting convened by ward councillor to discuss development issues in the ward Street committee or resident's association meeting: meeting convened by residents to discuss issues in the area/community Community development forum meeting: Meeting of various smaller organisations in the community to discuss local development Mayoral imbizo: Meeting convened by Mayor regarding a particular area School governing body: Meeting Community policing forum meeting: Meeting convened by SAPS to discuss crime & policing in the area
8.6	Your local municipality is meant to put together a plan for developing your area, called the Integrated Development Plan or IDP, and local people are meant to participate in the planning process. Have you - or an organisation you belong to - participated in the IDP process in your community? READ OUT	Q8.06_idp	1 Never heard of the IDP (skip to 8.8) 2 Have heard of the IDP, but have not participated in it (skip to 8.8) 3 Yes, participated in it	Training - need to ensure fieldworkers know what this is; emphasise use of IDP in all languages; The IDP is a plan for development of the whole municipality put together by municipality, that draws on input of community members
8.7	How satisfied were you with the IDP process you participated in?	Q8.07_satis_idp	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
8.8	Your local municipality is also meant to develop a community based plan for your area, and local people are meant to participate in the planning process. Have you - or an organisation you belong to - participated in the community based plan process in your community? READ OUT	Q8.08_cbp	1 Never heard of the community based plan (skip to 8.10) 2 Have heard of the community based plan, but have not participated in it (skip to 8.10) 3 Yes, participated in it	Training - F165 F157 need to ensure fieldworkers know what this is The community based plan is a plan for development of the whole municipality put together by municipality, that draws on input of community members

8.9	How satisfied were you with the community based plan process you participated in?	Q8.09_satis_cbp	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
Participation and government II				
8.10	Now I'd like to ask you some questions about how satisfied you are with the performance of different levels of government. How satisfied are you with the National Government?	Q8.10_NG	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
8.11	How satisfied are you with the Gauteng Provincial Government?	Q8.11_PG	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
8.12	How satisfied are you with the Local Municipality where you live?	Q8.12_LG	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
8.13	How satisfied are you with your local ward councillor?	Q8.13_councillor	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 Don't know who my councillor is	
8.14	Thinking about the different levels of government, which level of government, if any, do you think has done the most to improve your quality of life?	Q8.14_level_gov	1 National Government 2 Provincial Government 3 Local Government (Municipality) 4 None of them	
8.15	In the last 3 months have you contacted or visited a government department? For example, to visit a clinic, to enquire about something, report a fault, apply for a document etc. <i>DC: If asked, this includes electronic interaction (i.e., through app, website or email)</i>	Q8.15_visit_gov	1 Yes 0 No (skip to 8.20)	
8.16	Which government department/service did you most recently interact with? Do NOT read out <i>DC: Education should not include day-to-day interactions with schools or universities.</i>	Q8.16_dept	1 Clinic / hospital / health services 2 Court / justice / correctional services 3 Education 4 Emergency services 5 Home affairs 6 Housing 7 Labour 8 Municipal customer care centre (in person visit for service faults, billing issues, etc.) 9 Municipal call centre (telephone call for service faults, billing issues, etc.) 10 Municipal app/website (electronic interaction for faults, billing issues, etc.) 11 Police / safety 12 SARS 13 SASSA / social grants 14 Social services / welfare 15 Traffic dept / licensing / transport 16 Other	Training - ensure clarity on what interaction means
8.17	Thinking about that interaction: Were you assisted within a reasonable amount of time?	Q8.17_assistance	1 Yes 0 No	
8.18	Thinking about that interaction: Were you treated with respect and dignity?	Q8.18_respected	1 Yes 0 No	
8.19	Thinking about that interaction: Were they able to meet your needs?	Q8.19_satisfied	1 Yes 0 No	
Participation and government III				
8.20	In general, do you think most government officials are doing their best to service the people according to the principles of Batho Pele? <i>DC: If the respondent does not know what it means, say: Meaning 'People First'. Batho Pele is an initiative to get public servants to be service orientated and strive for excellence in service delivery.</i>	Q8.20_batho_pele	1 Yes 0 No 2 Never interact with government officials	
8.21	Have you ever been asked to pay a bribe to a government official, traffic cop, policeman or other public servant?	Q8.21_bribe	1 Yes 0 No	

8.22	How would you like your municipality to communicate about what they are doing? Do NOT read out	Q8.22_municipal_communication	1 Website 2 SMS 3 Email 4 Social media 5 Mobile phone application 6 Municipal call centre 7 Multipurpose community centres or municipal office 8 Pamphlets or leaflets 9 Newspaper or magazine 10 Radio or TV 11 At a ward meeting 12 In person from ward councillors 13 Through word of mouth from friends and neighbours 14 Other 15 Don't care, do not want to hear from municipality	
8.23	How satisfied are you with the way democracy works in South Africa?	Q8.23_democracy	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
Participation and government IV				
8.24	Listen to the following statements about your municipality, and please tell me for each one if you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree. The municipality listens to people in this area <i>DC: Cue card is available for this section</i>	Q8.24_munic_listens	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.25	The municipality does what it says it will do in its relations with people in this area	Q8.25_munic_does	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.26	The municipality cares for all the people in this area equally	Q8.26_munic_cares	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.27	The municipality and the people in this area want the same things for the future of this area	Q8.27_munic_same_future	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.28	The municipality involves people in this area in making decisions	Q8.28_munic_inclusion	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.29	My municipality stands for the things that I believe in	Q8.29_munic_belief	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
8.30	The municipality openly shares information that is relevant to people in this area	Q8.30_munic_info	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
Participation and government V People are often not sure about which level of government is responsible for different services Please tell me which level of government you think is responsible for providing each of the following things. We aren't interested in whether your response is right or wrong, but rather what you think				
8.31	Grants, such as an old age pension, child care or disability grant	Q8.31_Grants	1 National government 2 Provincial government 3 Municipal government 4 Don't know	
8.32	Water & sanitation	Q8.32_Water_sanitation	1 National government 2 Provincial government 3 Municipal government 4 Don't know	
8.33	Housing	Q8.33_Housing	1 National government 2 Provincial government 3 Municipal government 4 Don't know	
9 Opinions 1				
9.1	Now I'd like to ask some questions about your opinions. Please be as open as you can. Again, please tell me for each one if you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree. Politics is a waste of time <i>DC: Cue card is available for this section</i>	Q9.01_politics	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	Training - government politics, rather than other forms

9.2	People like you cannot influence developments in your community	Q9.02_infl_dev	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.3	The country is going in the wrong direction	Q9.03_country	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	Training - in general not specifically. Try not to prompt with any examples that may lead in any direction
9.4	The 2016 local elections were free and fair	Q9.04_election	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.5	The judiciary (courts, judges, etc.) is free from government influence	Q9.05_judiciary	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.6	It is important to look after the environment	Q9.06_enviro	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.7	It is acceptable to be violent to foreigners	Q9.07_foreigners	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.8	Corruption is the main threat to our democracy	Q9.08_corruption	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.9	The press is free to say or write what it likes	Q9.09_press	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.10	Blacks and whites will never really trust each other	Q9.10_BW_trust	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.11	Nobody cares about people like me	Q9.11_alienation	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	Training - in general not specifically. Try not to prompt with any examples that may lead in any direction
9.12	Imagine that there are three friends who are talking about life in Gauteng. 1. The first one says: "Gauteng should be for South Africans only. They must send the foreigners back to their countries." 2. The second one says: "A lot of foreigners came to work in South Africa for poor wages under apartheid. We all suffered under the same system. They should be allowed to stay." 3. The third one says: "Foreign people living in Gauteng are alright, but only if they have legal permission from the government." Which one person best describes how you feel?	Q9.12_foreigners	1 First Person 2 Second Person 3 Third Person	Training - in general not specifically. Try not to prompt with any examples that may lead in any direction
Opinions II				
9.13	Now I would like to ask you some more questions about your views. Please tell me for each one if you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree Environmental factors (e.g., air and water pollution or dumping sites) have harmed me or my family	Q9.13_Environ_harm	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.14	I am worried that Gauteng is going to run out of water	Q9.14_GP_water_crisis	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.15	Black people have more opportunities in South Africa than white people	Q9.15_Black_opport_more	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.16	It is acceptable to be violent to gay and lesbian people	Q9.16_violence_lgbt	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	

9.17	Which of the following do you most strongly identify with? READ OUT	Q9.17_Identify_self_with	1 Neighbourhood / city 2 Gender 3 Nationality 4 Class 5 Race 6 Religious group 7 Clan / language group 8 No one I'm an individual 9 Other	
Opinions III				
9.18	There are just three more questions about your opinions. Please tell me for each one if you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree The price of resources like water & electricity must go up to encourage people to use less of them	Q9.18_Price_up	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.19	My neighbourhood would be a better place if there were more parks and green spaces	Q9.19_Parks_avail	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
9.20	Inter-racial dating/marriage is acceptable	Q9.20_Interracial_dating	1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Strongly disagree	
10 Life I				
10.1	I am now going to ask you a few questions about your life. Can you tell me how satisfied or dissatisfied you are with the following parts of your life? The amount of money you have available to you personally <i>DC: Cue card available for this section; If asked, we mean all the money that is available to you for all purposes. This includes necessities and luxuries.</i>	Q10.01_money	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	Training - if asked, we mean all money available to that individual for any purposes
10.2	The amount of time you have to do the things you want to	Q10.02_time	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.3	Your marriage or relationship with your partner	Q10.03_marriage	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 6 Not in a relationship	
10.4	Family life - The time you spend with them and the things you do with them	Q10.04_family	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.5	Friends	Q10.05_friends	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.6	Your standard of living	Q10.06_living	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.7	Compared with 5 years ago, is it easier or harder for people like you to find jobs, or is there no change?	Q10.07_job_finding_difficulty	1 Easier 2 No Change 3 Harder 4 Don't Know	
Life II				
10.8	How satisfied are you with the way you spend your leisure time - recreation, relaxation etc.? <i>DC: Cue card available for this section</i>	Q10.08_leisure	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.9	How satisfied are you with the area or neighbourhood where you live now?	Q10.09_neighbourhood	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.10	How satisfied are you with your life AS A WHOLE these days?	Q10.10_life	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
10.11	Is it ever acceptable for a man to hit or beat his partner?	Q10.11_abuse	1 Yes 0 No	

10.12	What religion, if any, do you practice?	Q10.12_religion	<ul style="list-style-type: none"> 1 No religion 2 African traditional religion 3 Buddhist 4 Christian (incl. Catholic, Dutch Reformed, ZCC, Protestant and all other Christian denominations) 5 Hindu 6 Jewish 7 Islam/Muslim 8 Sikh 9 Other 	
11	Business and work			
11.1	Let's talk about employment and work opportunities Are you currently the owner of a business, one that you were responsible for starting up (even if you are not working in this business now)? <i>DC: If someone says they have more than one business, then ask them to think about their main or primary business. We are also interested in micro businesses & informal businesses</i>	Q11.01_business_ownership	<ul style="list-style-type: none"> 1 Yes (Skip to 11.3) 0 No 	Training - clarity regarding who should answer yes vs. no; We are interested in any kind of business, including micro businesses, informal businesses, etc. If respondent seems unsure, DC should probe
11.2	If you have ever tried to start a business in the past, did it fail or succeed?	Q11.02_business	<ul style="list-style-type: none"> 1 Never tried to start a business (Skip to 11.12) 2 I started a business, but it failed (Skip to 11.9) 3 My business was a success and I sold it (Skip to 11.9) 4 My business was a success, but I stopped running it (Skip to 11.9) 	
11.3	How old is this business? <i>DC: Please enter number of years</i>	Q11.03_age	*number of years	
11.4	Is this business in the formal or informal sector? <i>DC: If asked, say informal sector means not registered for VAT or Tax, and typically less than 5 employees</i>	Q11.04_business_type	<ul style="list-style-type: none"> 1 Formal sector 2 Informal sector 	
11.5	What sector is your business involved in? Do NOT read out	Q11.05_sector	<ul style="list-style-type: none"> 1 Agriculture, forestry and fishing 2 Mining and quarrying 3 Manufacturing 4 Electricity, gas, steam and air-conditioning supply 5 Water supply, sewerage, waste management and remediation activities 6 Construction 7 Wholesale and retail trade, repair of motor vehicles and motorcycles 8 Accommodation and food service activities 9 Information and communication 10 Financial and insurance activities 11 Real estate activities 12 Professional, scientific and technical activities 13 Administrative and support service activities 14 Public administration and defence, social security 15 Education 16 Human health and social work activities 17 Arts, entertainment and recreation 18 Other service activities 19 Activities of households as employers, undifferentiated goods-and 20 services-producing activities of households for own use 21 Activities of extraterritorial organizations and bodies, not economically active people, unemployed people etc. 	
11.6	Does your business employ any people besides yourself?	Q11.06_people	<ul style="list-style-type: none"> 0 No, it's just me (skip to 11.8) 1 Yes 	
11.7	How many people does your business employ (excluding yourself)?	Q11.07_employees	*number of people	
11.8	Which statement best describes your business' success or failure:	Q11.08_business_description	<ul style="list-style-type: none"> 1 It's too early to tell whether my business will succeed or fail 2 My business is a success and I have plans to expand it 3 My business is a success, but I don't want to or can't expand it 4 My business is failing 5 My business brings in some money, but not enough, so I have to do other things to earn income 	
11.9	Do you know of any government department or service that provides support for small businesses (also known as SMMEs)?	Q11.09_SMMEs_support	<ul style="list-style-type: none"> 1 Yes 0 No (skip to 11.11) 	
11.10	How satisfied are you with the support that government provides for small business development?	Q11.10_support_SMMEs	<ul style="list-style-type: none"> 1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied 	
11.11	Would you be willing to participate in a follow-up survey which asks you some more questions about your business, such as main costs or constraints you're experiencing, what support you need, and so on? Someone else will phone you for this.	Q11.11_participate_survey	<ul style="list-style-type: none"> 1 Yes 0 No 	

11.12	<p>Now I'm going to ask you a few questions about employment.</p> <p>In the past 7 days, did you do any type of work, business, or activity for which you got paid or expected to be paid (even if just for one hour)? This could include car washing or piece work or selling things and so on.</p> <p><i>DC: If respondent is employed but has been on leave for the past 7 days, the answer to this question should still be 'yes'.</i></p>	Q11.12_working	<p>1 Yes (Skip to 11.20)</p> <p>0 No</p>	
11.13	Have you been appointed to a new job, but have not started yet?	Q11.13_new_job	<p>1 Yes (Skip to 11.20)</p> <p>0 No</p>	
11.14	Are you unemployed and looking for work?	Q11.14_unemployment_status	<p>1 Yes (Skip to 11.16)</p> <p>0 No</p>	
11.15	<p>Why are you not looking for work?</p> <p>Do NOT read out</p>	Q11.15_not_looking	<p>1 I have given up looking for a job (Skip to 11.18)</p> <p>2 Do not need to work (Skip to 12.1)</p> <p>3 Do not want to work (Skip to 12.1)</p> <p>4 Disabled (Skip to 12.1)</p> <p>5 Housewife or homemaker (Skip to 12.1)</p> <p>6 Looking after family members for no pay (Skip to 12.1)</p> <p>7 School pupil or full time student (Skip to 12.1)</p> <p>8 Retired person or pensioner (Skip to 12.1)</p>	
11.16	During the past 7 days, have you taken any action to look for any kind of work?	Q11.16_looked_for_work	<p>1 Yes (Skip to 11.18)</p> <p>0 No</p>	
11.17	During the past 4 weeks, have you taken any action to look for any kind of work?	Q11.17_search_work	<p>1 Yes</p> <p>0 No</p>	
11.18	<p>Would you be able to take up work if offered?</p> <p>READ OUT</p>	Q11.18_availability_emp	<p>1 Yes, immediately</p> <p>2 Yes, within 2 weeks</p> <p>3 Yes, but more than 2 weeks from now</p> <p>4 No</p>	
11.19	How long have you been unemployed for?	Q11.19_unemployed	<p>1 Less than 6 months (Skip to 11.24)</p> <p>2 Six months to less than 1 year (Skip to 11.24)</p> <p>3 One year to less than 2 years (Skip to 11.24)</p> <p>4 Two years to less than 4 years (Skip to 11.24)</p> <p>5 Four years or more (Skip to 11.24)</p> <p>6 Never been employed (Skip to 11.25)</p>	
11.20	<p>What is your employment status?</p> <p><i>DC: If asked, say informal sector means not registered for VAT or Tax, and typically less than 5 employees</i></p>	Q11.20_employment	<p>1 Employed full time, formal sector</p> <p>2 Employed part time, formal sector</p> <p>3 Employed full time, informal sector</p> <p>4 Employed part time, informal sector</p> <p>5 Self-employed, own business, NOT working from home</p> <p>6 Self-employed, own business, working from home</p>	
11.21	<p>Which sector are you employed in?</p> <p>Do NOT read out</p>	Q11.21_sector	<p>1 Agriculture, forestry and fishing</p> <p>2 Mining and quarrying</p> <p>3 Manufacturing</p> <p>4 Electricity, gas, steam and air-conditioning supply Water supply; sewerage, waste management and remediation activities</p> <p>6 Construction</p> <p>7 Wholesale and retail trade; repair of motor vehicles and motorcycles Transportation and storage</p> <p>8 Accommodation and food service activities</p> <p>9 Information and communication</p> <p>10 Financial and insurance activities</p> <p>11 Real estate activities</p> <p>12 Professional, scientific and technical activities</p> <p>13 Administrative and support service activities</p> <p>14 Public administration and defence; compulsory social security</p> <p>15 Education</p> <p>16 Human health and social work activities</p> <p>17 Arts, entertainment and recreation</p> <p>18 Other service activities</p> <p>19 Activities of households as employers; undifferentiated goods-and services-producing activities of households for own use</p> <p>20 Activities of extraterritorial organizations and bodies, not economically active people, unemployed people etc.</p>	
11.22	On the whole, how satisfied are you with the working conditions in your job?	Q11.22_work_satis	<p>1 Very satisfied</p> <p>2 Satisfied</p> <p>3 Neither satisfied nor dissatisfied</p> <p>4 Dissatisfied</p> <p>5 Very dissatisfied</p>	
11.23	How many hours do you work per week in your main job?	Q11.23_hours_work	*number	
11.24	<p>How did you find your last job?</p> <p>Do NOT read out</p>	Q11.24_last_job	<p>1 Employer directly</p> <p>2 Recruitment agency</p> <p>3 Labour broker</p> <p>4 I placed an advert</p> <p>5 Friend/family within household</p> <p>6 Friend/family outside household</p> <p>7 Responded to internet ad / listing</p> <p>8 Responded to newspaper ad</p> <p>9 Responded to pamphlet / neighbourhood info wall</p> <p>10 Other</p> <p>11 I've never had a job</p>	<p>Training - ensure clarity between recruitment agency (agency that helps you find a job with an employer) & labour broker (agency that employs you directly, but sends you out to work for someone else)</p>

11.25	What factor is/was most important to you when you look/looked for a job? Do NOT read out	Q11.25_job_factor	1 Proximity (Transport cost and time) 2 Pay (money) 3 Status attached to job 4 Able to be part time 5 Being full time 6 Job security 7 Benefits (medical aid, pension fund, leave) 8 Skills development 9 Other	
12 Crime				
12.1	Let's talk about issues related to crime and safety for a while During the past year, has the crime situation improved, stayed the same or got worse?	Q12.01_crime	1 Improved 2 Stayed the same 3 Got worse	
12.2	Have you been a victim of crime in the past year?	Q12.02_victim	1 Yes 0 No	
12.3	How safe do you feel walking in the area where you live during the day?	Q12.03_day	1 Very safe 2 Fairly safe 3 Neither safe nor unsafe 4 Bit unsafe 5 Very unsafe	
12.4	How safe do you feel walking in the area where you live after dark?	Q12.04_night	1 Very safe 2 Fairly safe 3 Neither safe nor unsafe 4 Bit unsafe 5 Very unsafe	
12.5	How safe do you feel at home?	Q12.05_home	1 Very safe 2 Fairly safe 3 Neither safe nor unsafe 4 Bit unsafe 5 Very unsafe	
12.6	How satisfied are you with safety and security services provided by government where you live? <i>DC: Cue card available for this question</i>	Q12.06_security_reside	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
13 Community & participation				
13.1	Let's talk about you and your community again. In the past year, have you participated in any of the following groups or associations? READ OUT Coding note: Yes/No list	Q13.01_1 Q13.01_2 Q13.01_3 Q13.01_4 Q13.01_5 Q13.01_6 Q13.01_7 Q13.01_8 Q13.01_9 Q13.01_10	1 Ratepayers, street or block committee, neighbourhood watch 2 Church or religious organisation 3 Choir 4 Social, recreational, sport club 5 Savings club (stokvel), burial society 6 Women's, men's, or youth organisation 7 Political Party 8 Trade Union 9 Business or Professional organisation 10 Any other organisation	Training - provide examples of business/professional organisations
13.2	I would like to ask you about any kind of unpaid activity that you have done. In the past THREE MONTHS have you given any of your time to assist any charity, community organisation, cause, or individual outside this household, in a way that helps them to get something done or make a difference in some way?	Q13.02_particip_charity	1 Yes 0 No (Skip to 13.4)	
13.3	In the past three months, who have you assisted by volunteering your time? Do NOT read out <i>DC: Please select all options that apply</i> Coding note: Multiple mention	Q13.03_1 Q13.03_2 Q13.03_3 Q13.03_4 Q13.03_5 Q13.03_6 Q13.03_7 Q13.03_8 Q13.03_9 Q13.03_10 Q13.03_11 Q13.03_12	1 Friends or family not living with you 2 Neighbours or community members 3 Another individual (e.g., an employee or stranger) 4 Religious organisation or place of worship 5 A school or university (e.g., that you or your child attended) 6 Organising a special social gathering (e.g. wedding or funeral) 7 A self-help organisation (e.g., A home-based care organisation, burial society or savings group) 8 Neighbourhood watch or rate payer's association 9 Activist organisation or movement (e.g., landless people, anti-corruption, anti-rape campaign, better service delivery) 10 Disaster relief cause or organisation (e.g., helping victims of disasters, fire, floods, drought) 11 Other charity or NGO 12 Other	
13.4	Have you taken part in any kind of protest in the past 12 months?	Q13.04_participate_protest	1 Yes 0 No	
13.5	In the last year, have there been any protests of any kind in this neighbourhood or community?	Q13.05_protest	1 Yes 0 No (skip to 14.1) 2 Don't know (skip to 14.1)	

13.6	Think about the last protest that happened in this community. What was the main thing it was about? Do NOT read out	Q13.06_last_protest	1 Water 2 Electricity 3 Schools or health care provision 4 Upgrading informal settlement 5 Evictions 6 Access to/allocation of RDP or other types of public housing 7 Anger against foreign nationals or people from other places 8 Anger against local councillor 9 Anger due to someone being raped or killed or abducted 10 Access to jobs 11 Workplace dispute (wage dispute, unfair dismissal, working conditions, out-sourcing, etc.) 12 Municipal or provincial demarcation 13 Dissatisfaction with national government or national leaders 14 Corruption 15 University/College access (fees, housing, etc.) 16 Other	
13.7	Can you list for me all of the various things that happened at the most recent protests in your neighbourhood or community? READ OUT Coding note: Yes/No list	Q13.07_1 Q13.07_2 Q13.07_3 Q13.07_4 Q13.07_5 Q13.07_6 Q13.07_7 Q13.07_8 Q13.07_9 Q13.07_10	1 People marched / carried banners or posters / Memorandum was delivered 2 Roads were blocked 3 Tyres or other things were burned in street 4 Buildings were damaged or burned Vehicles were damaged or burned 5 were damaged or burned 6 Protestors took things from shops or homes 7 Schools, clinics or other public services were closed 8 People were injured by the police 9 People were injured by the protestors 10 People were killed	
14	Health I			
14.1	Let's chat now about health issues Where do you usually go for health care? Do NOT read out	Q14.01_healthcare_services	1 Private health care facilities 2 Public health care facilities (Skip to 14.3) 3 Use public and private facilities (Skip to 14.3) 4 Traditional healer (Sangoma) 5 Spiritual healer (e.g., faith-related) 6 Not applicable, don't usually need health care (Skip to 14.4)	
14.2	What is the MAIN reason that you don't use public health facilities?	Q14.02_nonuse_public_health	1 Cost 2 Quality of care 3 No public health care facilities close by 4 The queues are usually too long 5 I have been before and they could not help me 6 The staff are too unfriendly or unhelpful 7 The clinic often does not have the medicine I need 8 Other	
14.3	How satisfied are you with health services you usually use?	Q14.03_health_satis	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	
14.4	Are you personally covered by any form of medical aid or other medical insurance?	Q14.04_medaid	1 Medical aid - All health care in private facilities 2 Medical aid - Private primary health care/ government hospitalisation Hospital plan 3 No medical insurance 4 Other 5 Don't know 6	Training - need to ensure fieldworkers understand all these options
14.5	In the past 12 months, was there anybody in this household who needed healthcare but was unable to get it?	Q14.05_access	1 Yes 0 No (Skip to 14.7)	
14.6	What was the main reason that person was unable to get the health care they needed?	Q14.06_health	1 Health care facility too far away 2 Not enough money to get transport to health care 3 Could not afford the time (e.g., because of job or child care commitments) 4 Nobody could accompany the patient / too sick to travel 5 Tried to get health care, but could not afford it 6 Went to health facility but not seen because queues too long 7 Patient turned away from health facility 8 Was seen at health facility but it could not help (no medicines, was referred somewhere else, etc.) 9 Did not think it was worth trying to seek care (health care not good enough, health workers attitudes are bad, thought would get better by oneself, etc) 10 Other	
14.7	How frequently does a mobile clinic come to your area?	Q14.07_mobile_clinic	1 Never 2 Less than once a month 3 Once a month 4 Every two weeks 5 Once a week 6 More than once a week 7 Don't know	

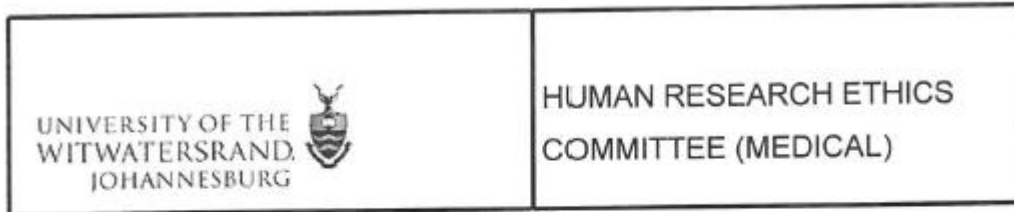
14.8	Have you or anyone in your household been visited by a community health worker in your home in the past year? <i>DC: A community health worker is a person who might come from a local clinic or an NGO to provide basic health services to you in your home. This might include delivering medication, ensuring you are taking medication correctly, testing blood pressure, blood glucose or HIV, checking on the health of children living here, or helping change bandages.</i>	Q14.08_home_visit	1 Yes 0 No	
14.9	In the last year, have you or any other member of this household had any of the following conditions: READ OUT Coding note: Yes/No list	Q14.09_1 Q14.09_2 Q14.09_3 Q14.09_4 Q14.09_5 Q14.09_6 Q14.09_7 Q14.09_8 Q14.09_9 Q14.09_10	1 Cancer 2 Diarrhoea 3 Diabetes 4 Emphysema / Bronchitis 5 Asthma 6 Pneumonia 7 Heart disease/stroke 8 Hypertension 9 HIV / AIDS 10 Tuberculosis (TB)	
14.10	In the past 12 months, have you had an HIV test? It doesn't matter what the result was, I just want to know whether you have had a test.	Q14.10_HIV_test	0 No 1 Yes 2 Not sure/don't remember	
14.11	Would you describe the state of your own health in the past 4 weeks as excellent, good, poor, or very poor?	Q14.11_health_status	1 Excellent 2 Good 3 Poor 4 Very Poor	
14.12	How often, if ever, does the state of your health prevent you from doing daily work?	Q14.12_work	1 Always 2 Some of the time 3 Hardly ever 4 Never	Training - clarity around what daily work means (both paid & unpaid)
14.13	How often, if ever, does the state of your health prevent you from taking part in your usual SOCIAL activities? <i>DC: If asked, social activities means anything done for fun or relaxation, whether alone or in a group.</i>	Q14.13_social	1 Always 2 Some of the time 3 Hardly ever 4 Never	Training - clarity around what social activities means
Health II				
14.14	Over the past two weeks, how many days have you been bothered by any of the following problems? Little interest or pleasure in doing things READ OUT	Q14.14_pleasure	1 Not at all A 2 few days 3 More than half the days 4 Nearly every day	
14.15	Over the past two weeks, how many days have you been bothered by any of the following problems? Feeling down, depressed or hopeless READ OUT	Q14.15_depressed	1 Not at all A 2 few days 3 More than half the days 4 Nearly every day	
14.16	In the past 12 months, have you or a member of your household experienced a mental health problem (e.g., depression, anxiety, bipolar disorder, psychosis)? <i>DC: If respondent doesn't know, select 'No'</i>	Q14.16_mental_health	1 Yes 0 No	Training - doesn't need to be formally diagnosed
14.17	If you ever need emotional support, do you have someone to talk to?	Q14.17_emotional_support	1 Yes 0 No	
15 Personal I				
15.1	We are almost at the end now. I just have a few more questions about you. What is the highest level of school education you have completed? <i>DC: The relevant education had to be completed.</i>	Q15.01_education	1 No Education 2 Grade 0 or Grade R 3 Grade 1 or Sub A 4 Grade 2 or Sub B 5 Grade 3, Std 1 6 Grade 4, Std 2 7 Grade 5, Std 3 or ABET 1 8 Grade 6, Std 4 or ABET 2 9 Grade 7, Std 5 10 Grade 8, Std 6, Form I or ABET 3 11 Grade 9, Std 7, Form II, NQF 1 or ABET 4 12 Grade 10, Std 8, Form III, National Trade Certificate 1 13 Grade 11, Std 9 or Form IV 14 Grade 12, Std 10, Matric 15 A certificate from a college, technikon or university 16 A diploma from a college, technikon or university 17 Technikon or university degree 18 Post graduate degree - e.g., Hons, MA, PhD 19 Unspecified	Training - highest level completed, regardless of when this was completed Be careful of how this is translated - must be completed education
15.2	What is your current age?	Q15.02_age	Number, limited from 18-115	
15.3	Are you currently a registered student at a tertiary learning institution (including part time, distance learning)?	Q15.03_registered_student	1 Yes, full time 2 Yes, part time 3 No	

15.4	Do you have any kind of disability?	Q15.04_disability	<ul style="list-style-type: none"> 1 Not disabled 2 Sight disability 3 Hearing disability 4 Communication or speech disability 5 Physical disability 6 Intellectual disability 7 Emotional disability 8 Multiple disabilities 	
15.5	Who is the head of this household? <i>DC: Remember this is not the dwelling, but the household where you eat together 4 times per week or more</i>	Q15.05_head	<ul style="list-style-type: none"> 1 Respondent 2 Spouse or partner of respondent 3 Spouses, partners or parents together 4 Mother of respondent 5 Father of respondent 6 Grandmother of respondent 7 Grandfather of respondent 8 Other female 9 Other male 	
15.6	How many dependent children, if any, do you have, regardless of whether they currently live with you or not. <i>DC: If asked, we mean dependent in any way, such that the respondent feels the child is still dependent - even if they are an adult already</i>	Q15.06_dependents	<ul style="list-style-type: none"> 0 0 (skip to 15.9) 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 10 10 11 11 12 12+ 	
15.7	How many of these dependent children currently live with you?	Q15.07_dependents_live	<ul style="list-style-type: none"> 0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 10 10 11 11 12 12+ 	
15.8	Who is the primary carer of your dependent children?	Q15.08_primary_carer	<ul style="list-style-type: none"> 1 Self only (Respondent) 2 Self together with other parent, spouse or partner 3 The other parent 4 Spouse or partner of respondent (if not other parent) 5 Child's maternal grandmother 6 Child's maternal grandfather 7 Child's paternal grandmother 8 Child's paternal grandfather 9 Other female 10 Other male 	
15.9	How many members of this household are under 18 years old? <i>DC: Remember a household is made up of the people living in the same dwelling and usually eating together for at least 4 nights per week or more</i>	Q15.09_under18	Number (skip to 15.12 if 0)	
15.10	Think about the oldest child in this household that attends primary or high school, how long does it take them to travel to school? Do NOT read out	Q15.10_time_school	<ul style="list-style-type: none"> 1 Up to 15 minutes 2 From 16 minutes to 30 minutes 3 From 31 minutes to 45 minutes 4 From 46 minutes to 60 minutes (1 hour) 5 From 61minutes to 90 minutes (1.5 hour) 6 More 7 No children attending primary/high school (Skip to 15.12) 	
15.11	Does this eldest child attend a private or government school?	Q15.11_schooling_type	<ul style="list-style-type: none"> 1 Government 2 Private 	
15.12	Does anybody in this household receive a social grant of any type, such as an old age pension, childcare or disability grant?	Q15.12_grant	<ul style="list-style-type: none"> 1 Yes 0 No 	
15.13	Is this household registered with the municipality (or through their ward councillor) on an indigency register to get free services, property rates rebates, etc?	Q15.13_indigency_register	<ul style="list-style-type: none"> 1 Yes 2 No 3 Don't know 	
	Personal II Thinking about everyone in this household please tell me which of the following activities, if any, bring any money into this household?			
15.14	Formal employment	Q15.14_formal	<ul style="list-style-type: none"> 1 Yes 0 No 	
15.15	Informal employment	Q15.15_informal	<ul style="list-style-type: none"> 1 Yes 0 No 	
15.16	Support from family or remittances	Q15.16_remittances	<ul style="list-style-type: none"> 1 Yes 0 No 	
15.17	Support from friends	Q15.17_support	<ul style="list-style-type: none"> 1 Yes 0 No 	
15.18	Renting out a dwelling, flat, room, garage etc	Q15.18_renting	<ul style="list-style-type: none"> 1 Yes 0 No 	

15.19	Savings or returns on investments (including stokvels)	Q15.19_savings	1 Yes 0 No	
	You and your household 3 Fieldworker notes regarding 15.20 - You may show the respondent the options that can be selected on the cue card provided to you. The Total Household Monthly Income should be the sum of ALL money actually brought into the household by all household members from Salaries, Grants, Pensions and any other source of income.			
15.20	Can you tell me what is the total amount of money brought into the household per month by all household members? This is after deductions such as tax, medical aid and pension contributions. Do NOT read out <i>DC: If the respondent says "No income", ask: "Are you absolutely sure that no money comes into the household at all, whether from wages, social grants, help from friends and family or any other source? Only if the answer is "yes" then enter as "No Income" otherwise get a value.</i>	Q15.20_income	1 R1 - R400 2 R401 - R800 3 R801 - R1 600 4 +E276R1 601 - R3 200 5 R3 201 - R6 400 6 R6 401 - R12 800 7 R12 801 - R19 200 8 R19 201 - R25 600 9 R25 601 - R38 400 10 R38 401 - R51 200 11 R51 201 - R76 800 12 R76 801 - R102 400 13 R102 401 - R153 600 14 R153 601 - R204 800 15 R204 801 - R500 000 16 More 17 No Income 18 Respondent refused	
15.21	Very lastly, I would like to ask you something very sensitive and private and remember that you have a right to either answer or not answer but I would be very grateful if you do. We all know that a person's vote is his or her secret but please would you be willing to tell me, if you had the chance to vote in an election tomorrow, which party would you choose? Remember, you don't have to say if you don't want to.	Q15.21_party_choice	1 ANC (African National Congress) 2 ACDP (African Christian Democratic Party) 3 African Independent Congress 4 COPE (Congress of the People) 5 DA (Democratic Alliance) 6 EFF (Economic Freedom Fighters) 7 IFP (Inkatha Freedom Party) 8 PAC (Pan Africanist Congress of Azania) 9 UDM (United Democratic Movement) 10 Vryheidsfront Plus 11 Other party 12 Could not vote (not an SA citizen etc) 13 Would not vote 14 Don't know 15 Respondent refused	Training - if respondent asks why this list say these were the 10 parties with the most votes in 2016 local elections
16	Contact details			
16.1	After conducting our surveys, we have a team who checks that the interviews actually took place. As part of the process, they phone some of our participants and ask them up to 10 questions to validate our work. Can someone from our office contact you for this purpose?		1 Yes 0 No (Skip to Questions to fieldworker)	Not available for public dissemination
16.2	Can you please provide me with your name?		Free text	Not available for public dissemination
16.3	Can you please provide me with a contact phone number?		Free text	Not available for public dissemination
16.4	Who does this number belong to?		Free text	Not available for public dissemination
16.5	Can you please provide me with another contact number		Free text	Not available for public dissemination
16.6	Who does this number belong to?		Free text	Not available for public dissemination
16.7	Can you please provide me with your email address?		Free text	Not available for public dissemination
17	Questions to the fieldworker:			
17.1	Questions to the fieldworker, to be completed after the survey: What was the main language used to conduct this interview?	Q17.01_Interview_language	1 Afrikaans 2 English 3 IsiNdebele 4 IsiXhosa 5 IsiZulu 6 Sepedi 7 Sesotho 8 Setswana 9 Sign language 10 SJSwati 11 Tshivenda 12 Xitsonga 13 Other	

17.2	Which other languages were used?	Q17.02_1 Q17.02_2 Q17.02_3 Q17.02_4 Q17.02_5 Q17.02_6 Q17.02_7 Q17.02_8 Q17.02_9 Q17.02_10 Q17.02_11 Q17.02_12 Q17.02_13 Q17.02_14	1 None 2 Afrikaans 3 English 4 IsiNdebele 5 IsiXhosa 6 IsiZulu 7 Sepedi 8 Sesotho 9 Setswana 10 Sign language 11 SiSwati 12 Tshivenda 13 Xitsonga 14 Other	
17.3	How satisfied are you with the interview?		1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied	Not available for public dissemination
17.4	Would you like to make any comments about any particular aspect of the interview?		Open ended	Not available for public dissemination

Appendix II: Ethics approval



Office of the Deputy Vice-Chancellor (Research & Innovation)

TO: Dr B Mentoor
School: School of Public Health
Department: Department of Health Economics
Medical School
University

E-mail: 2371542@students.wits.ac.za

CC: Supervisor: Dr D Blaauw <Duane.Blaauw@wits.ac.za>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Mr Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 21/02/2022

REF: R14/49

PROTOCOL NO: W-CBP-220221-01 (This is your ethics application study reference number.
Please quote this reference number in all correspondence relating to this
study)

PROJECT TITLE: *Sub-district variation in health access and health status in
Gauteng: an analysis of the GCRO Quality of Life survey*

Please find attached the Ethics Waiver Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.



MSWorks2000/Iain0007/ClearScanWaiver.wps



Office of the Deputy Vice-Chancellor (Research & Innovation)

21/02/2022

Ref: W-CBP-220221-01

TO WHOM IT MAY CONCERN

Waiver: This certifies that the following research does not require clearance from the Human Research Ethics Committee (Medical)

Investigator: Dr B Mentoor
Student No. (if appropriate): 2371542
Staff No. (if appropriate):

Supervisor: Dr D Blaauw

School: School of Public Health
Department: Department of Health Economics
Medical School
University

Project title: *Sub-district variation in health access and health status in Gauteng: an analysis of the GCRO Quality of Life survey*

Reason: Review of information in the public domain
No human participants will be involved in the study

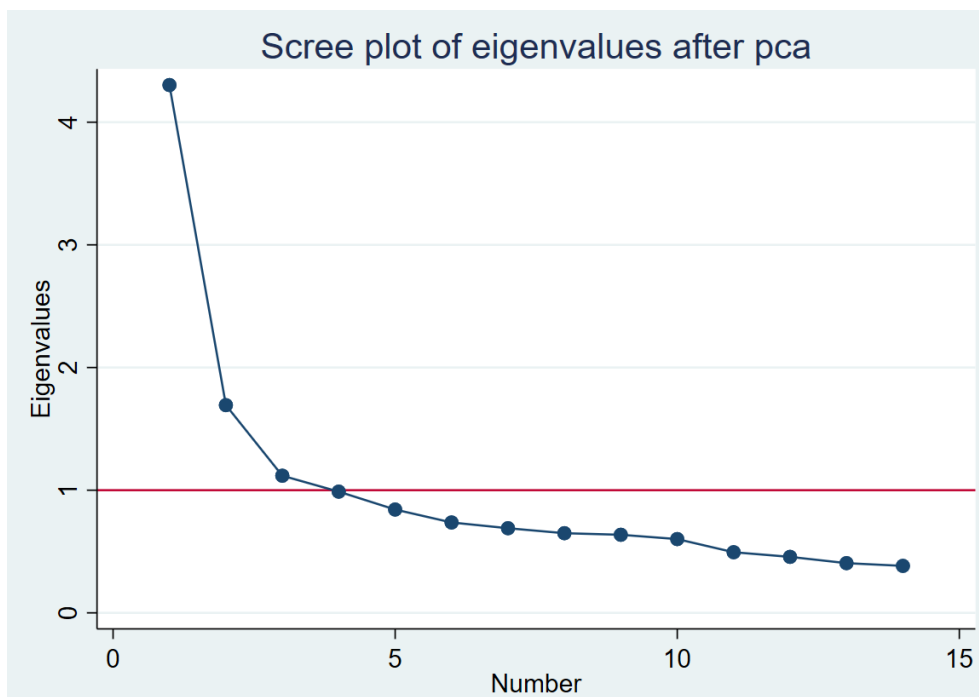
Dr CB Penny
Chairperson: Human Research Ethics Committee (Medical)

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Appendix III: Principal Component Analysis (PCA)

Principal components/correlation		Number of obs	24,889	
		Number of comp	14	
		Trace	14	
Rotation: (unrotated = principal)		Rho	1	
Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.3	2.6	30.7%	30.7%
Comp2	1.7	0.6	12.1%	42.8%
Comp3	1.1	0.1	8.0%	50.8%
Comp4	1.0	0.1	7.1%	57.9%
Comp5	0.8	0.1	6.0%	63.9%
Comp6	0.7	0.0	5.3%	69.2%
Comp7	0.7	0.0	4.9%	74.1%
Comp8	0.6	0.0	4.6%	78.7%
Comp9	0.6	0.0	4.6%	83.3%
Comp10	0.6	0.1	4.3%	87.6%
Comp11	0.5	0.0	3.5%	91.1%
Comp12	0.5	0.1	3.3%	94.4%
Comp13	0.4	0.0	2.9%	97.3%
Comp14	0.4	.	2.7%	100.0%

Principal components Variable	(eigenvectors)														Unexplained
	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9	Comp10	Comp11	Comp12	Comp13	Comp14	
Landline	0.2	0.4	-0.2	-0.1	0.1	0.4	0.1	0.7	0.1	-0.1	0.1	0.1	0.0	0.0	0.0
Cellphone	0.1	0.0	0.7	0.0	0.7	0.2	0.0	-0.1	0.2	-0.1	0.0	0.0	0.0	0.0	0.0
Television	0.3	-0.2	0.2	0.1	-0.2	0.2	-0.1	0.1	-0.4	0.1	-0.1	0.2	-0.7	-0.1	0.0
Computer	0.3	0.3	0.1	-0.2	-0.1	-0.3	-0.2	-0.1	0.2	0.1	-0.5	0.6	0.0	0.0	0.0
Sound system	0.3	0.1	0.4	0.1	-0.4	-0.3	0.6	0.1	0.2	-0.2	0.1	-0.1	0.0	0.0	0.0
Satellite TV	0.3	0.1	0.1	0.0	-0.1	-0.3	-0.4	0.0	-0.1	0.2	0.7	0.1	0.2	0.0	0.0
Car	0.3	0.4	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.1	0.1	-0.2	-0.8	-0.2	0.0	0.0
Bicycle	0.2	0.4	-0.2	0.1	0.0	0.4	0.3	-0.6	-0.3	-0.1	0.1	0.1	0.0	0.0	0.0
Fridge	0.3	-0.2	0.2	0.1	-0.2	0.2	-0.1	0.1	-0.4	0.1	-0.3	-0.1	0.7	0.0	0.0
Dwelling type	0.3	-0.2	-0.2	-0.1	0.2	-0.1	-0.1	-0.1	0.1	-0.6	0.0	0.0	0.0	-0.6	0.0
Piped water	0.3	-0.2	-0.2	-0.3	0.4	-0.2	0.5	0.1	-0.1	0.5	0.0	0.0	0.0	-0.2	0.0
Home ownership	0.1	0.0	-0.3	0.9	0.3	-0.2	0.0	0.1	0.0	0.0	-0.1	0.1	0.0	0.1	0.0
Toilet	0.3	-0.3	-0.2	-0.3	0.1	0.0	0.0	-0.1	0.0	-0.3	0.0	0.0	-0.1	0.7	0.0
Electricity	0.3	-0.3	-0.1	0.1	-0.2	0.4	0.0	-0.2	0.7	0.3	0.1	0.0	0.1	-0.1	0.0



**Kaiser-Meyer-Olkin measure of
sampling adequacy**

Variable	kmo
Landline	0.87
Cellphone	0.85
Television	0.86
Computer	0.86
Sound system	0.92
Satellite TV	0.91
Car	0.85
Bicycle	0.85
Fridge	0.88
Dwelling type	0.87
Piped water	0.91
Home ownership	0.78
Toilet	0.83
Electricity	0.92
Overall	0.87

Appendix IV: Geographic logistic regressions

The marginal effect of sub-district of residence on healthcare access difficulty before and after adjusting for sociodemographic confounders of significance

Statistically significant results are in bold font

Municipality	Subdistrict	Without adjustment			With adjustment				
		Contrast vs provincial mean	95% confidence interval		p value	Contrast vs provincial mean	95% confidence interval		p value
City of Johannesburg	Region A	0.3%	-1.1%	2.1%	0.67	0.1%	-1.5%	1.6%	0.93
	Region B	-3.1%	-2.4%	1.0%	0.00	-2.2%	-4.0%	-0.4%	0.02
	Region C	-1.1%	-0.1%	4.6%	0.08	-0.6%	-2.0%	0.8%	0.41
	Region D	1.4%	-0.4%	1.9%	0.01	0.8%	-0.2%	1.8%	0.11
	Region E	-1.9%	-2.1%	2.5%	0.00	-1.4%	-2.9%	0.1%	0.06
	Region F	-1.4%	-3.7%	-1.6%	0.04	-1.7%	-3.1%	-0.4%	0.01
	Region G	1.5%	-1.8%	2.5%	0.10	1.0%	-0.7%	2.7%	0.25
City of Tshwane	Region 1	4.2%	-3.1%	-1.2%	0.00	2.7%	1.0%	4.3%	0.00
	Region 2	1.0%	-0.1%	3.2%	0.38	0.3%	-1.7%	2.3%	0.77
	Region 3	-1.0%	-2.6%	1.8%	0.13	-0.3%	-1.8%	1.2%	0.68
	Region 4	0.7%	-4.6%	-1.1%	0.66	2.9%	-0.9%	6.8%	0.14
	Region 5	0.0%	-3.0%	-0.8%	0.99	-1.1%	-5.2%	3.0%	0.60
	Region 6	0.7%	2.4%	5.9%	0.35	0.8%	-0.8%	2.4%	0.31
	Region 7	-0.3%	-1.2%	3.1%	0.86	-1.3%	-4.4%	1.8%	0.42
Ekurhuleni	E1	0.5%	-2.3%	0.3%	0.56	0.2%	-1.4%	1.8%	0.81
	E2	-0.7%	-2.3%	3.6%	0.42	-0.7%	-2.4%	1.1%	0.46
	E3	2.3%	-4.4%	4.5%	0.06	1.1%	-1.1%	3.2%	0.33
	N1	1.5%	-0.8%	2.3%	0.07	0.5%	-1.1%	2.0%	0.54
	N2	-0.4%	-3.9%	3.2%	0.74	0.1%	-2.5%	2.6%	0.95
	N3	-2.8%	-1.2%	1.9%	0.00	-1.8%	-4.2%	0.7%	0.16
	S1	-0.2%	-4.3%	-1.8%	0.83	-0.1%	-2.1%	1.9%	0.91
	S2	0.3%	-2.4%	0.1%	0.71	-0.6%	-1.9%	0.8%	0.40
Sedibeng	S3	2.8%	0.4%	2.4%	0.02	1.4%	-0.6%	3.4%	0.16
	Emfuleni	0.7%	-3.2%	-0.7%	0.20	0.0%	-1.1%	1.2%	0.93
	Lesedi	0.2%	-2.7%	-0.1%	0.88	-0.8%	-3.0%	1.5%	0.51
West Rand	Midvaal	0.4%	-0.3%	3.2%	0.74	-0.2%	-2.5%	2.2%	0.88
	Merafong City	-2.6%	-2.1%	1.6%	0.00	-2.8%	-3.9%	-1.8%	0.00
	Mogale City	-2.1%	-1.2%	1.8%	0.00	-2.5%	-3.5%	-1.5%	0.00
	Rand West City	-1.9%	0.5%	5.1%	0.00	-2.4%	-3.5%	-1.3%	0.00

Sociodemographic variables included in the model: age, sex, population group, birth status, education level, employment status, medical scheme cover and wealth quintile ($p < 0.2$)

The result of geographic effect before adjusting for sociodemographic variables showed ten sub-districts for which the sub-district of residence was a statistically significant predictor of healthcare access difficulty ($p < 0.05$). Seven had less difficulty (Region B: -3.1 percentage points, Region E: -1.9 percentage points, Region F: -1.4 percentage points, N3: -2.8 percentage points, Merafong City: -2.6

percentage points, Mogale City: -2.1 percentage points, and Rand West City: -1.9 percentage points). Three had more difficulty (Region D: +1.4 percentage points, Region 1: +4.2 percentage points, and S3: +2.8 percentage points).

After adjusting for other sociodemographic factors, sub-district of residence remained a significant predictor of household difficulty in accessing healthcare (test for overall sub-district effect, $\chi^2=77.2$, $p<0.001$). Overall, statistically significant sub-districts reduced from ten to six. Four sub-districts (Region F, Merafong City, Mogale City, and Rand West City) experienced even less difficulty accessing healthcare after adjusting for sociodemographic variables, and two sub-districts experienced marginally more difficulty, but still fared better than the province (Region B and Region 1). Tshwane's Region 1 was the only statistically significant sub-district that noted more difficulty than the provincial mean (+2.7 percentage points).

The marginal effect of sub-district of residence on healthcare usage before and after adjusting for sociodemographic confounders of significance

Statistically significant results are in bold font

Municipality	Subdistrict	Without adjustment			With adjustment				
		Contrast vs provincial mean	95% confidence interval	p value	Contrast vs provincial mean	95% confidence interval	p value		
City of Johannesburg	Region A	-0.7%	-2.1%	0.7%	0.33	-0.2%	-1.5%	1.0%	0.74
	Region B	0.4%	-1.0%	1.8%	0.58	-0.4%	-2.2%	1.3%	0.62
	Region C	0.4%	-0.7%	1.4%	0.48	0.5%	-0.5%	1.6%	0.33
	Region D	0.5%	-0.2%	1.2%	0.18	0.6%	-0.2%	1.3%	0.16
	Region E	-0.3%	-1.6%	1.1%	0.69	-0.3%	-1.7%	1.1%	0.69
	Region F	-0.6%	-1.9%	0.7%	0.35	0.0%	-1.2%	1.2%	1.00
	Region G	1.2%	0.0%	2.3%	0.05	1.5%	0.4%	2.6%	0.01
City of Tshwane	Region 1	-1.7%	-3.1%	-0.2%	0.02	-1.7%	-3.2%	-0.2%	0.03
	Region 2	-2.1%	-4.3%	0.1%	0.06	-1.3%	-3.4%	0.7%	0.20
	Region 3	-2.2%	-3.7%	-0.6%	0.01	-1.6%	-3.1%	-0.2%	0.03
	Region 4	-2.5%	-5.1%	0.0%	0.05	-2.5%	-5.3%	0.3%	0.08
	Region 5	1.4%	-1.6%	4.3%	0.37	1.4%	-1.4%	4.3%	0.33
	Region 6	0.8%	-0.3%	1.8%	0.15	0.6%	-0.5%	1.8%	0.26
	Region 7	-3.3%	-7.8%	1.2%	0.16	-3.1%	-7.3%	1.1%	0.15
Ekurhuleni	E1	1.3%	0.2%	2.5%	0.02	1.4%	0.2%	2.5%	0.02
	E2	-0.6%	-2.3%	1.1%	0.48	-0.2%	-1.8%	1.3%	0.77
	E3	0.2%	-1.6%	1.9%	0.86	0.4%	-1.4%	2.2%	0.66
	N1	-1.1%	-2.4%	0.3%	0.12	-0.4%	-1.6%	0.9%	0.57
	N2	-1.6%	-3.9%	0.6%	0.15	-1.7%	-4.1%	0.7%	0.17
	N3	-2.0%	-4.4%	0.4%	0.10	-2.2%	-4.7%	0.2%	0.08
	S1	0.3%	-1.2%	1.7%	0.71	0.9%	-0.5%	2.3%	0.23
	S2	0.6%	-0.6%	1.8%	0.35	0.7%	-0.5%	1.9%	0.25
	S3	1.0%	-0.4%	2.5%	0.14	1.1%	-0.3%	2.5%	0.11
Sedibeng	Emfuleni	1.2%	0.4%	2.0%	0.00	1.3%	0.4%	2.1%	0.00
	Lesedi	0.5%	-1.5%	2.5%	0.60	0.9%	-1.0%	2.8%	0.34
	Midvaal	1.2%	-0.2%	2.6%	0.09	1.0%	-0.5%	2.6%	0.19
West Rand	Merafong City	1.0%	-0.1%	2.1%	0.08	0.9%	-0.2%	2.1%	0.12
	Mogale City	0.2%	-0.8%	1.2%	0.70	0.4%	-0.7%	1.4%	0.53
	Rand West City	0.6%	-0.4%	1.7%	0.22	0.9%	-0.2%	1.9%	0.10

Sociodemographic variables included in the model: age, sex, population group, birth status, education level, employment status, medical scheme cover and wealth quintile (p <0.2)

The result of geographic effect before adjusting for sociodemographic variables showed six sub-districts for which the sub-district of residence was a statistically significant predictor of healthcare use (p < 0.05). The three sub-districts with lower use were concentrated in Tshwane (Region 1: -1.7 percentage points, Region 3: -2.2 percentage points, and Region 4: -2.5 percentage points). The sub-districts with higher healthcare use were Region G (+1.2 percentage points), E1 (+1.3 percentage points), and Emfuleni (+1.2 percentage points).

After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of healthcare usage (test for overall sub-district effect, $\chi^2 = 57.01$, p <0.001). Overall statistically significant sub-districts reduced from six to five (Region

4 was no longer significant). The sub-district effect of the sub-districts with higher usage was increased (Region G: +1.5 percentage points, E1: +1.4 percentage points, and Emfuleni: +1.3 percentage points). The sub-district effect of the sub-districts with lower usage remained the same for Region 1 and decreased for Region 3 from -2.2 percentage points to -1.6 percentage points).

The marginal effect of sub-district of residence on overall health status as “excellent” before and after adjusting for sociodemographic confounders of significance

Statistically significant results are in bold font

	Subdistrict	Without adjustment			With adjustment		
		Contrast vs provincial mean	95% confidence interval	p value	Contrast vs provincial mean	95% confidence interval	p value
City of Johannesburg	Region A	1.3%	-2.0% 4.6%	0.44	-0.9%	-4.1% 2.3%	0.59
	Region B	-3.9%	-7.6% -0.2%	0.04	-5.1%	-8.8% -1.3%	0.01
	Region C	0.3%	-2.7% 3.3%	0.84	-1.7%	-4.7% 1.3%	0.27
	Region D	-6.0%	-7.8% -4.1%	0.00	-4.9%	-6.9% -2.8%	0.00
	Region E	-3.4%	-6.7% -0.2%	0.04	-5.3%	-8.5% -2.1%	0.00
	Region F	-0.4%	-3.4% 2.7%	0.82	-3.1%	-6.1% -0.1%	0.05
	Region G	-6.4%	-9.6% -3.2%	0.00	-6.8%	-10.0% -3.5%	0.00
City of Tshwane	Region 1	-1.3%	-4.2% 1.6%	0.37	0.4%	-2.6% 3.4%	0.78
	Region 2	-3.2%	-7.6% 1.2%	0.15	-2.3%	-6.9% 2.2%	0.32
	Region 3	4.4%	1.2% 7.6%	0.01	1.9%	-1.2% 5.1%	0.23
	Region 4	3.9%	-1.3% 9.1%	0.14	1.1%	-3.9% 6.1%	0.66
	Region 5	-0.3%	-10.1% 9.5%	0.95	-2.7%	-12.6% 7.2%	0.60
	Region 6	1.9%	-1.3% 5.1%	0.25	1.5%	-1.8% 4.7%	0.37
	Region 7	-0.6%	-9.0% 7.8%	0.89	2.6%	-6.0% 11.2%	0.56
Ekurhuleni	E1	14.6%	11.3% 17.9%	0.00	14.5%	11.1% 17.8%	0.00
	E2	3.6%	-0.4% 7.7%	0.08	4.0%	0.0% 8.0%	0.05
	E3	0.9%	-3.5% 5.3%	0.68	2.3%	-2.3% 6.8%	0.33
	N1	2.1%	-0.8% 5.0%	0.15	0.6%	-2.3% 3.5%	0.68
	N2	4.1%	-0.6% 8.9%	0.09	3.8%	-1.0% 8.6%	0.12
	N3	15.4%	10.3% 20.5%	0.00	13.6%	8.6% 18.6%	0.00
	S1	8.5%	4.7% 12.4%	0.00	8.2%	4.4% 12.1%	0.00
	S2	-1.2%	-4.4% 1.9%	0.44	-0.8%	-4.0% 2.4%	0.62
Sedibeng	S3	-2.1%	-6.2% 1.9%	0.31	-0.9%	-5.1% 3.3%	0.68
	Emfuleni	2.2%	-0.2% 4.6%	0.07	3.8%	1.3% 6.4%	0.00
	Lesedi	2.9%	-1.8% 7.6%	0.22	6.0%	1.1% 10.8%	0.02
West Rand	Midvaal	-0.1%	-4.6% 4.4%	0.96	0.9%	-3.9% 5.7%	0.71
	Merafong City	-3.6%	-6.7% -0.6%	0.02	-3.4%	-6.7% -0.2%	0.04
	Mogale City	-6.1%	-8.6% -3.6%	0.00	-5.3%	-8.0% -2.6%	0.00
	Rand West City	-4.2%	-7.0% -1.5%	0.00	-3.3%	-6.2% -0.3%	0.03

Sociodemographic variables included in the model: age, sex, population group, birth status, education level, employment status, medical scheme cover and wealth quintile (p < 0.2)

The result of geographic effect before adjusting for sociodemographic variables showed eleven sub-districts for which the sub-district of residence was a statistically significant predictor of “excellent” overall health status (p < 0.05). For seven sub-districts, the sub-district of residence decreased the rate of “excellent” overall health status (Region B: -3.9 percentage points, Region D: -6.0 percentage points, Region E: -3.4 percentage points, Region G: -6.4 percentage points, Merafong City: -3.6 percentage points, Mogale City: -6.1 percentage points, and Rand West City: -4.2 percentage points). The remaining four sub-districts enjoyed higher rates of “excellent” health status (Region 3: +4.4 percentage points, E1: +14.6 percentage points, N3: +15.4 percentage points, and S1: +8.5 percentage points).

After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of “excellent” overall health status (test for overall sub-district effect, $\chi^2 = 221.19$, $p < 0.001$). Overall statistically significant sub-districts increased to 14, with Region 3 no longer significant and four additional regions noted to be significant (Region F: -3.1 percentage points, E2: +4.0 percentage points, Emfuleni: +3.8 percentage points, and Lesedi: +6.0 percentage points). The sub-district effect increased the rate of “excellent” overall health status for E2 (+4.0 percentage points), Emfuleni (+3.8 percentage points), and Lesedi (+6.0 percentage points) after adjusting for sociodemographic factors. The sub-district effect further decreased the rate of overall “excellent” health status for Region B (-5.1 percentage points), Region E (-5.3 percentage points), Region F (-3.1 percentage points) and Region G (-6.8 percentage points) after adjusting for sociodemographic variables. The sub-district effect on decreased rates of overall “excellent” health status was lessened for Region D (-4.9 percentage points), Merafong City (-3.4 percentage points), Mogale City (-5.3 percentage points), and Rand West City (-3.3 percentage points), after adjusting for sociodemographic variables.

The marginal effect of sub-district of residence on health preventing work before and after adjusting for sociodemographic confounders of significance

Statistically significant results are in bold font

	Subdistrict	Without adjustment				With adjustment			
		Contrast vs provincial mean	95% confidence interval	p value	Contrast vs provincial mean	95% confidence interval	p value		
City of Johannesburg	Region A	-2.6%	-5.5% 0.2%	0.07	-0.4%	-3.3% 2.5%	0.78		
	Region B	-5.8%	-9.0% -2.7%	0.00	-3.6%	-7.0% -0.3%	0.04		
	Region C	-3.8%	-6.3% -1.3%	0.00	-2.1%	-4.7% 0.5%	0.11		
	Region D	0.3%	-1.5% 2.0%	0.78	-1.7%	-3.4% -0.1%	0.04		
	Region E	-2.7%	-5.6% 0.3%	0.07	-0.9%	-3.9% 2.1%	0.56		
	Region F	-3.4%	-6.0% -0.7%	0.01	1.3%	-1.6% 4.2%	0.39		
	Region G	12.1%	8.8% 15.5%	0.00	11.3%	8.1% 14.4%	0.00		
City of Tshwane	Region 1	3.9%	1.3% 6.6%	0.00	1.5%	-1.1% 4.1%	0.25		
	Region 2	3.8%	-0.4% 8.0%	0.08	0.6%	-3.3% 4.6%	0.75		
	Region 3	-0.9%	-3.7% 2.0%	0.56	0.5%	-2.3% 3.4%	0.71		
	Region 4	-1.1%	-5.6% 3.5%	0.65	3.0%	-1.9% 7.8%	0.23		
	Region 5	6.0%	-3.5% 15.4%	0.21	6.3%	-2.8% 15.5%	0.18		
	Region 6	1.6%	-1.3% 4.4%	0.28	0.6%	-2.1% 3.4%	0.65		
	Region 7	7.0%	-0.9% 15.0%	0.08	6.4%	-1.7% 14.6%	0.12		
Ekurhuleni	E1	-2.7%	-5.5% 0.1%	0.06	-3.6%	-6.4% -0.9%	0.01		
	E2	-1.6%	-5.1% 2.0%	0.39	-1.7%	-5.1% 1.7%	0.33		
	E3	-6.7%	-10.2% -3.1%	0.00	-8.0%	-11.4% -4.7%	0.00		
	N1	-1.4%	-3.9% 1.1%	0.28	0.1%	-2.5% 2.6%	0.95		
	N2	-10.1%	-13.5% -6.6%	0.00	-9.3%	-12.7% -5.9%	0.00		
	N3	-11.9%	-15.4% -8.4%	0.00	-9.4%	-13.2% -5.6%	0.00		
	S1	-3.1%	-6.3% 0.0%	0.05	-2.2%	-5.3% 1.0%	0.18		
	S2	-6.4%	-8.9% -3.9%	0.00	-7.0%	-9.4% -4.6%	0.00		
	S3	0.6%	-3.1% 4.4%	0.74	-0.9%	-4.5% 2.6%	0.62		
Sedibeng	Emfuleni	13.5%	11.2% 15.9%	0.00	11.2%	8.9% 13.5%	0.00		
	Lesedi	0.0%	-4.0% 4.0%	0.98	-2.5%	-6.2% 1.2%	0.18		
	Midvaal	-8.4%	-11.9% -5.0%	0.00	-9.0%	-12.4% -5.7%	0.00		
West Rand	Merafong City	-2.4%	-5.1% 0.2%	0.07	-2.5%	-5.2% 0.2%	0.07		
	Mogale City	0.3%	-2.0% 2.7%	0.78	-0.1%	-2.5% 2.3%	0.94		
	Rand West City	5.5%	2.8% 8.1%	0.00	4.5%	1.9% 7.2%	0.00		

Sociodemographic variables included in the model: age, sex, population group, birth status, education level, employment status, medical scheme cover and wealth quintile (p < 0.2)

The result of geographic effect before adjusting for sociodemographic variables showed 13 sub-districts for which the sub-district of residence was a statistically significant predictor of health preventing work (p < 0.05). For nine sub-districts, the sub-district of residence lowered the rate of health preventing work for adult residents (Region B: -5.6 percentage points, Region C: -3.8 percentage points, Region F: -3.4 percentage points, E3: -6.7 percentage points, N2: -10.1 percentage points, N3: -11.9 percentage points, S1: -3.1 percentage points, S2: -6.4 percentage points and Midvaal:

-8.4 percentage points). For four sub-districts, the sub-district of residence increased the rate of health preventing work for adult residents (Region G: +12.1 percentage points, Region 1: +3.9 percentage points, Emfuleni: +13.5 percentage points, and Rand West City: +5.5 percentage points).

After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of health status preventing work (test for overall sub-district effect, $\chi^2 = 300.27$, $p < 0.001$). Overall statistically significant sub-districts decreased to 11, with two sub-districts added (Region D and E1) and four no longer significant (Region C, Region F, Region 1, and S1). For six sub-districts, the effect of sub-district on health preventing work was lessened (Region B: -3.6 percentage points, Region G: +11.3 percentage points, N2: -9.4 percentage points, S2: -7.0 percentage points, Emfuleni: +11.2 percentage points, and Rand West City: +4.5 percentage points). For five sub-districts, the effect of sub-district on health preventing work was increased (E1: -3.6 percentage points, E3: -8.0 percentage points, S2: -7.0 percentage points and Midvaal: -9.0 percentage points).

The marginal effect of sub-district of residence on health preventing the respondent social activities before and after adjusting for sociodemographic confounders of significance

Statistically significant results are in bold font

	Subdistrict	Without adjustment			With adjustment				
		Contrast vs provincial mean	95% confidence interval		p value	Contrast vs provincial mean	95% confidence interval		p value
City of Johannesburg	Region A	-4.0%	-6.7%	-1.2%	0.01	-0.1%	-3.0%	2.8%	0.95
	Region B	-4.4%	-7.6%	-1.2%	0.01	-3.0%	-6.3%	0.3%	0.08
	Region C	-3.1%	-5.6%	-0.5%	0.02	-2.1%	-4.6%	0.4%	0.11
	Region D	0.8%	-0.9%	2.5%	0.36	-1.3%	-2.9%	0.3%	0.10
	Region E	-4.2%	-7.0%	-1.4%	0.00	-2.2%	-5.0%	0.7%	0.14
	Region F	-2.7%	-5.3%	0.0%	0.05	1.2%	-1.6%	4.0%	0.41
	Region G	11.5%	8.2%	14.8%	0.00	10.6%	7.6%	13.7%	0.00
City of Tshwane	Region 1	5.4%	2.7%	8.0%	0.00	3.3%	0.7%	5.9%	0.01
	Region 2	1.7%	-2.3%	5.7%	0.40	-0.7%	-4.5%	3.1%	0.71
	Region 3	0.0%	-2.8%	2.8%	1.00	2.0%	-0.9%	4.9%	0.18
	Region 4	-2.2%	-6.6%	2.1%	0.31	2.0%	-2.7%	6.8%	0.40
	Region 5	3.3%	-5.8%	12.4%	0.48	5.0%	-3.8%	13.7%	0.27
	Region 6	1.4%	-1.4%	4.3%	0.32	0.3%	-2.4%	2.9%	0.84
	Region 7	6.5%	-1.4%	14.4%	0.11	6.7%	-1.3%	14.7%	0.10
Ekurhuleni	E1	-4.7%	-7.3%	-2.0%	0.00	-5.1%	-7.7%	-2.5%	0.00
	E2	-0.7%	-4.2%	2.8%	0.69	-0.7%	-4.0%	2.5%	0.67
	E3	-5.1%	-8.7%	-1.4%	0.01	-5.9%	-9.3%	-2.5%	0.00
	N1	-2.5%	-4.9%	-0.1%	0.04	-1.1%	-3.5%	1.3%	0.37
	N2	-9.3%	-12.8%	-5.8%	0.00	-7.8%	-11.4%	-4.3%	0.00
	N3	-12.1%	-15.5%	-8.8%	0.00	-9.6%	-13.3%	-6.0%	0.00
	S1	-3.8%	-6.9%	-0.8%	0.01	-3.3%	-6.2%	-0.3%	0.03
	S2	-5.9%	-8.4%	-3.4%	0.00	-6.6%	-9.0%	-4.3%	0.00
S3	0.7%	-3.0%	4.4%	0.71	-0.6%	-4.1%	3.0%	0.756	
Sedibeng	Emfuleni	12.4%	10.1%	14.7%	0.00	9.7%	7.4%	11.9%	0.00
	Lesedi	0.7%	-3.3%	4.7%	0.74	-1.5%	-5.2%	2.1%	0.41
	Midvaal	-5.3%	-8.9%	-1.7%	0.00	-6.3%	-9.7%	-2.9%	0.00
West Rand	Merafong City	-1.7%	-4.3%	1.0%	0.22	-1.2%	-3.9%	1.5%	0.38
	Mogale City	0.7%	-1.7%	3.0%	0.57	-0.3%	-2.6%	2.1%	0.83
	Rand West City	4.7%	2.1%	7.2%	0.00	3.6%	1.0%	6.2%	0.01

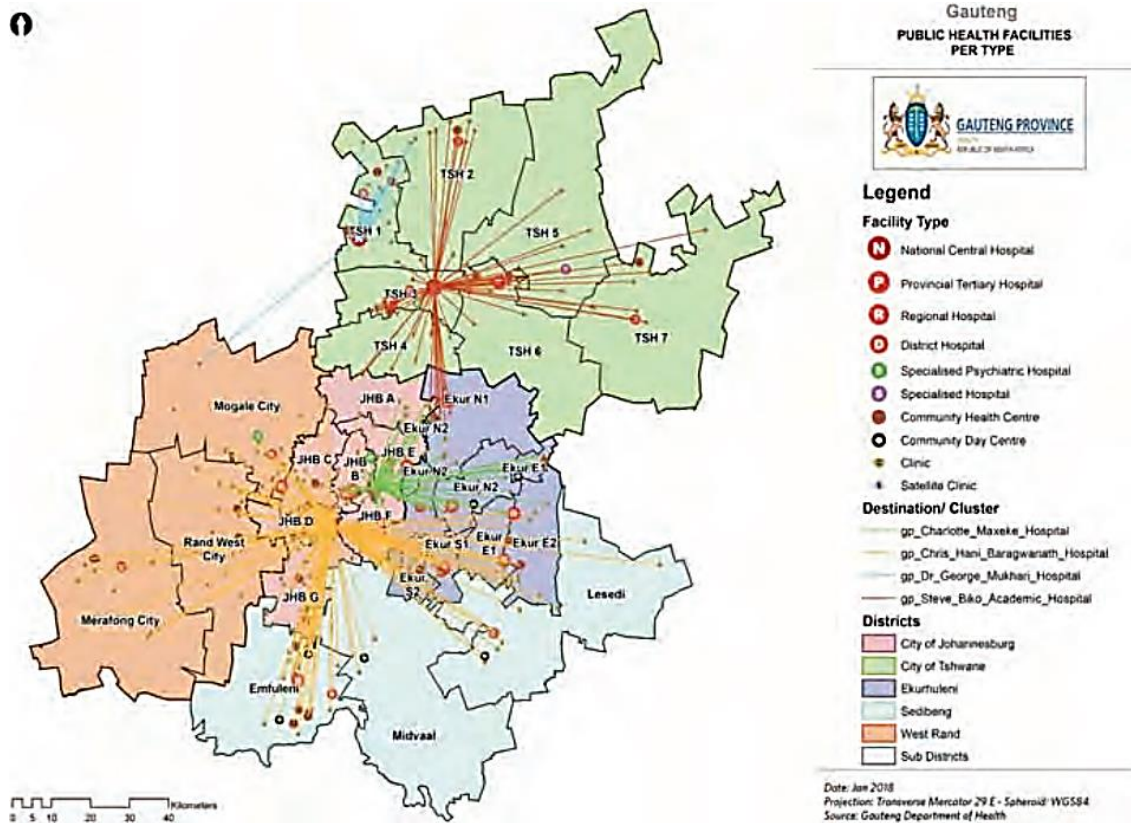
Sociodemographic variables included in the model: age, sex, birth status, education level, employment status, and wealth quintile (p < 0.2)

The result of geographic effect before adjusting for sociodemographic variables showed 17 sub-districts for which the sub-district of residence was a statistically significant predictor of health preventing socialising (p < 0.05). Thirteen sub-districts had lower rates of health preventing socialising (Region A: -4.0 percentage points, Region B: -4.4 percentage points, Region C: -3.1 percentage points, Region E: -4.2 percentage points, Region F: -2.7 percentage points, E1: -4.7 percentage points, E3: -5.1 percentage points, N1: -2.5 percentage points, N2: -9.3 percentage points, N3: -12.1 percentage points, S1, -3.8 percentage points, S2: -5.9 percentage points, and Midvaal: -5.3 percentage points). Four sub-districts had higher rates of health preventing socialising (Region G: +11.5 percentage points, Region 1: +5.4 percentage

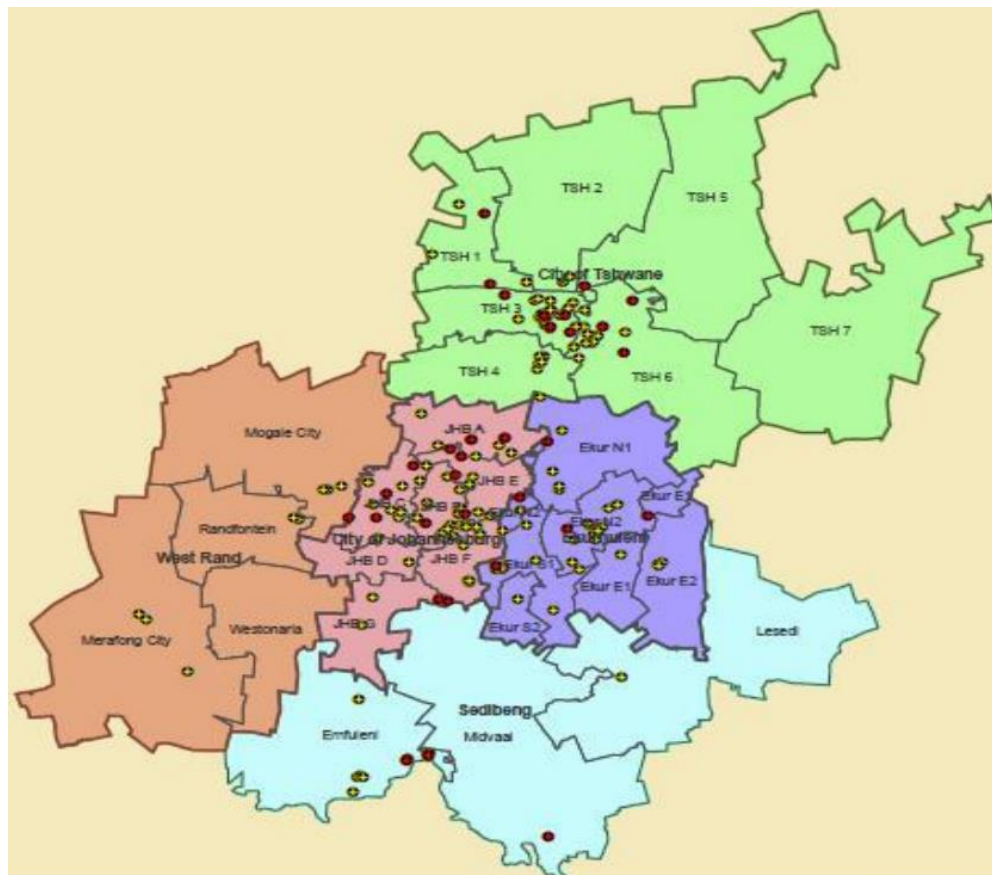
points, Emfuleni: +12.4 percentage points and Rand West City: +4.7 percentage points).

After adjusting for sociodemographic factors, sub-district of residence remained a significant predictor of health status preventing social activities (test for overall sub-district effect, $\chi^2 = 261.55$, $p < 0.001$). Overall statistically significant sub-districts decreased to 11 (Regions A, B, C, E and F, and N1 were no longer significant). All sub-districts that had higher rates of health preventing socialising noted a lessened effect after adjusting for sociodemographic variables (Region G: +10.6 percentage points, Region 1: +3.3 percentage points, Emfuleni: +9.7 percentage points, and Rand West City: +3.6 percentage points). Four sub-districts had their lower rates of health preventing work enhanced after adjusting for sociodemographic variables (E1: -5.1 percentage points, E3: -5.9 percentage points, S2: -6.6 percentage points, and Midvaal: -6.3 percentage points). Three sub-districts had their lower rates of health preventing work mitigated after adjusting for sociodemographic variables (N2: -7.9 percentage points, N3: -9.6 percentage points, and S1: -3.3 percentage points).

Appendix V: Distribution of public and private healthcare facilities in Gauteng by sub-district

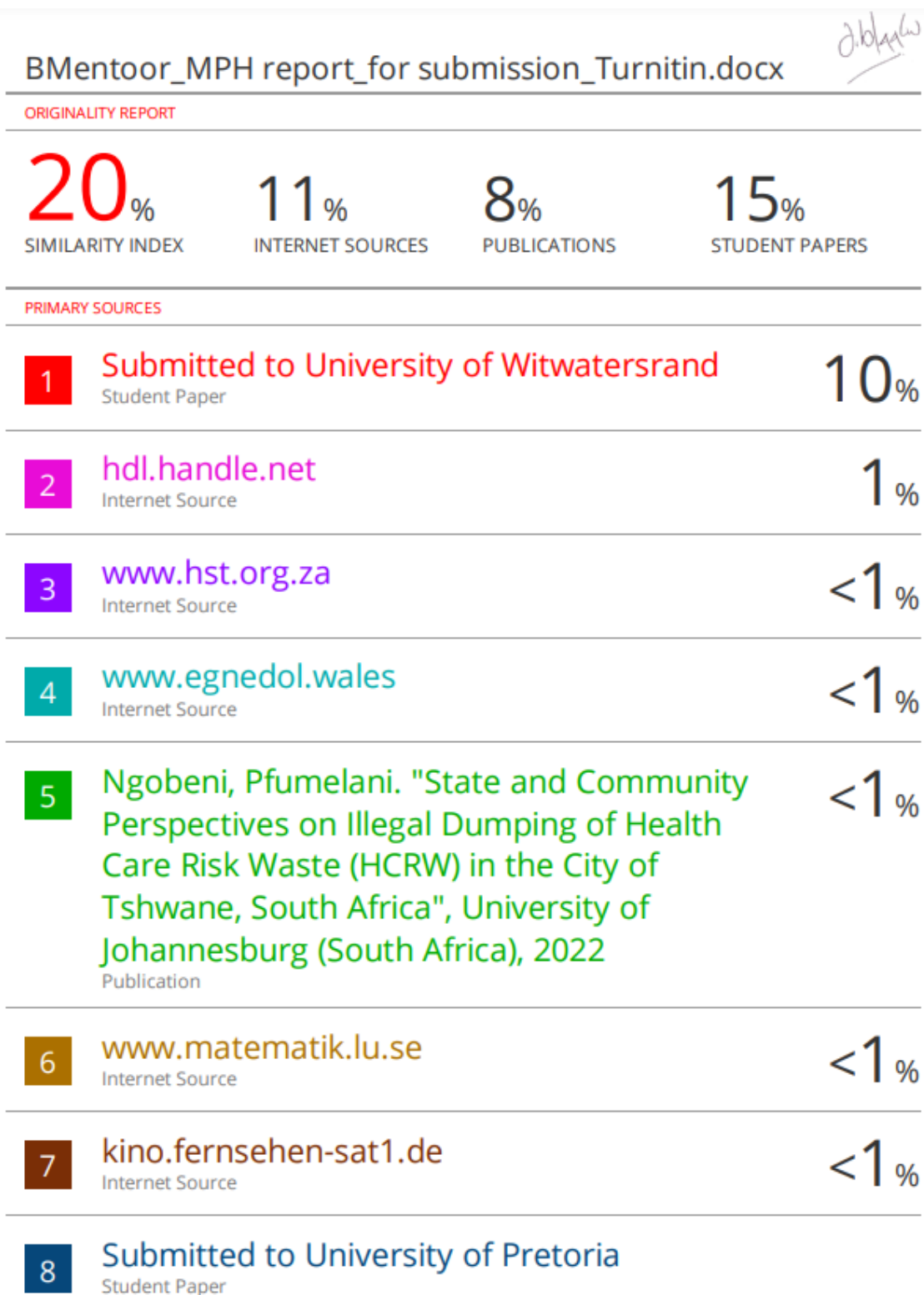


Public healthcare facilities by type in Gauteng in 2018 (73)



Private healthcare facilities in Gauteng before 2016 (74)

Appendix VI: Turnitin report



30 March 2023

Biancha Mentoor Turnitin Report

This is to confirm that I have checked the detailed Turnitin report for Biancha Mentoor's MPH research report, and can confirm that the high similarity index of 20% does not constitute plagiarism.

Yours sincerely



Dr Duane Blaauw
Supervisor

Appendix VII: Plagiarism declaration report



PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Biancha Glyn Mentoor (Student number: 2371542) am a student registered for the degree of Master of Public Health in the academic year 2023.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature: 

Date: 13.06.2023