"Factors associated with HIV testing among residents of Johannesburg: Does migration status matter?"

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DECLARATION

I, Nobantu Urbania Ann Mkwanazi, person number 326822, hereby declare that this report, *Factors associated with HIV testing among residents of Johannesburg: Does migration status matter?*, is my own unaided work except where it has been acknowledged and fully cited by means of complete references. It is to be submitted hereof as part of the requirements for the degree of Master of Arts in Demography and Population Studies by Coursework and Research Report at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted for any other degree or for examination purposes at any other University.

Signature: Date:

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To my Lord and Saviour Jesus Christ, it is not through my own intelligence or hard work that I have come this far, but through the favour and grace that you have bestowed upon me.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ACMS	African Centre for Migration and Society
ART	Antiretroviral therapy
CoRMSA	Consortium for Refugees and Migrants in South Africa
DAI	Direct AIDS Intervention programme
HIV	Human Immunodeficiency Virus
HRW	Human Rights Watch
IOM	International Organization for Migration
JHB	Johannesburg
MDG	Millennium Development Goals
MSM	Men who have sex with men
NDoH	National Department of Health
NSP	National Strategic Plan on HIV and AIDS, STI's and TB 2012-2016
PITCT	Provider Initiated Counselling and Testing
RENEWAL	Regional Network on AIDS, Livelihoods and Food security
STATSSA	Statistics South Africa
STI	Sexually Transmitted Infection
TAC	Treatment Action Campaign
TB	Tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
VCT	Voluntary Counselling and Testing
WHO	World Health Organization
WITS	University of the Witwatersrand

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CHAPTER 1

1.1 INTRODUCTION

The HIV/AIDS epidemic is a serious public health concern in sub-Saharan Africa and the rest of the world. Statistics South Africa (Stats SA) estimates that the overall HIV prevalence in the country is 10.6%. In terms of absolute numbers, this translates to 5.38 million people living with HIV (Stats SA, 2011). Thus, South Africa is home to the world's largest population of people living with HIV (UNAIDS, 2011). Millennium Development Goal (MDG) number 6 aims to halt and reverse HIV and its effects by the year 2015 (UNAIDS, 2011). These statistics pose a challenge to achieving this goal. HIV testing is a fundamental aspect of prevention and treatment programmes since the disease has a long latency period. In the asymptomatic period, during which the body's immune system controls the infection, there is no need for immediate treatment with antiretroviral drugs by people living with HIV. Therefore, it is only after some time, at times up to 15 years- when the rapid replication of the virus overwhelms the immune system-that the patient realises they are ill. It is often only at this point, that HIV testing is conducted and other steps are taken toward dealing with the virus including initiating treatment (USAID, 2009; Chasela, 2012; Adeokun, 2006). At this point, there is real possibility that they may have been unintentionally transmitting the infection to others.

The current South African guidelines on the initiation of antiretroviral treatment for people living with HIV stipulate that all HIV patients with CD4 counts below 350 cells/mm are eligible for antiretroviral treatment (Treatment Action Campaign [TAC], 2011). This legislation is progressive as previously only pregnant HIV positive women as well as patients suffering from active Tuberculosis (TB) with a CD4 count below 350 cells/mm3 were allowed to begin antiretroviral treatment (TAC, 2011). However it is problematic in that many people only present for HIV testing very late; when they are sick and when their viral loads are high-this is concerning for onward transmission. Thus, early detection of the virus through the promotion of HIV testing and counselling are imperative to curbing the HIV epidemic. The National Strategic Plan on HIV and AIDS, STI's and TB 2012-2016 (NDoH NSP, 2012-2016) highlights the effective scale-up and implementation of voluntary counselling and testing as part of its goals in combating HIV in South Africa (NDoH MDG country report, 2010). According to the World Health Organization (WHO), more than 10 million people have been tested for HIV in South Africa; 1.7

million of these were found to be living with HIV (WHO, 2011). In a country that has a population of 51 770 560 people, these testing levels are simply not enough.

Although significant strides have been made in creating awareness about the importance of knowing one's HIV status for managing the disease, HIV testing remains a contested subject particularly in sub-Saharan Africa, which bears the highest burden of disease (WHO, 2012). Current policy highlights three principles that need to be adhered to when conducting HIV testing. Testing needs to be "confidential, accompanied by counselling, and only be conducted with informed consent, meaning that it is both informed and voluntary" (WHO, 2012:15). There is however, a disjuncture between policy and the public's experiences in health care facilities as well as their general perceptions on the subject. There remains a lack of trust in the efficiency and privacy of testing facilities (Steinberg, 2011). Furthermore, stigma or anticipated stigma has been found to be a powerful barrier to testing uptake with a negative impact on HIV programmes (UNAIDS, 2011). The fact that HIV is predominantly transmitted through unprotected sexual intercourse exacerbates the moral stigma attached to people living with HIV. The disease is viewed as a consequence of promiscuity (Adeokun, 2006). This moral stigma, which is related to cultural and religious belief systems, is often an avenue through which judgment is placed on men who have sex with men (MSM); sex workers, and other high risk groups.

Migration is an important demographic process in shaping a population and contributing to various developmental aspects, including health. There are 1,692,242 million known non-citizens in South Africa; this is equivalent to 3.3% of the total South African population (Stats SA Census in brief, 2011). Gauteng, the province in which Johannesburg is located, is known as the economic and industrial capital of the country. This province has the smallest land area yet it houses the largest share of the country's total population at 11 933 134 (22.4%) inhabitants, 7.4% of these are non-citizens (Stats SA Census in brief, 2011). As for the period 2006–2011, Gauteng is estimated to have experienced a net inflow of 367 100 internal migrants (Stats SA midyear population estimates, 2011). The role of migration in the spread of HIV is complex and poses a challenge to public health interventions due to difficulty in coverage and measurability of the extent to which HIV affects migrants. This is exacerbated by the convoluted relationship that HIV has with migration (Vearey, 2011). A strong link between various kinds of mobility and a heightened risk of HIV exposure has been established

(UNAIDS, 2011). Furthermore, the social determinants of health; defined as: "the conditions in which people are born, grow, live, work, including the health system" (UNAIDS, 2011: 26); influence the dynamics of migration and HIV. There is a complex relationship between these social conditions and "the distribution of money, power, and resources at global, national, and local levels" (UNAIDS, 2011: 27). This results in inequalities in health, housing and other services both within and between countries (UNAIDS, 2011; Vearey, 2011). Migrants, therefore, are a key population to be examined when studying HIV testing as the extent to which they are able to access health care is inevitably affected by social determinants due to cultural and language barriers, varying belief systems about disease causation, social standing or status and the extent of their social networks and other enabling resources (Adeokun, 2006; Berkman et al, 2000). Apart from determining transmission of HIV and the way people living with HIV are perceived, social and cultural factors are imperative to the success of prevention strategies (Adeokun, 2006). Therefore, it is understanding the role of these factors- within and between countries, amongst citizens and non-citizens-that will facilitate appropriate strategies to deal with the disease.

Linkages between migration and the spread of HIV as well as the bi-directional nature of the spread of the disease have been established (Nunez et al, 2011). That is, the origin and spread of the disease can neither be attributed solely to the host country or province nor the migrant's place of origin. It has also been acknowledged that migrants are key populations at higher risk in terms of acquiring HIV due to the nature of the process of migration (IOM, 2010). However, there remained a need for an investigation into the factors associated with HIV testing. These factors are classified under demographic, socio-economic and behavioural dynamics that facilitate the decision, by migrants and natives, to go for HIV testing. Two main groups- internal migrants (people who have moved to Johannesburg from other provinces within the borders of South Africa) and international migrants (people who have moved into South Africa across international borders), were considered. In addition to this, they were compared to a group of Johannesburg Natives (people who have always resided in Johannesburg).

1.2 PROBLEM STATEMENT

Approximately 16.6% of the adult population aged 15 to 49 is living with HIV. Statistics South Africa estimates that the number of new HIV infections for the year 2011 among the population aged 15 years and older is 316 900 (Stats SA, 2011). These are people in their primary reproductive and economically productive years. Despite the availability of antiretroviral treatment- which provides a better quality of life for people living with HIV (TAC, 2011), this percentage is too high and will have negative implications for the future economic and age structure of the country. The current life expectancy at birth for South Africans is estimated at 54, 9 years for males and 59, 1 year for females (Stats SA, 2011). This has been affected by the HIV epidemic and will continue to have negative implications, should it not be controlled.

Current trends show that in most high HIV prevalence countries, such as South Africa, more women than men get tested and access treatment. At face value this may be considered as a positive factor, as it is a reflection of women's frequent contact with health care facilities as well as the effectiveness of reproductive health interventions such as the scale-up of provider-initiated counselling and testing (PITCT) for pregnant women (WHO, 2012). Yet, on the other hand, it is problematic since a substantial number of men, including migrant men, are not covered. This has undesirable implications for the onward transmission of HIV.

Migration has been identified as a "central determinant of health [and HIV], requiring appropriate policy responses" (Vearey, 2011: 1). It is not known what the levels of testing amongst migrants are and this is a serious concern for public health interventions. Various reports have been written suggesting that international migrants may be afraid of testing due to the consequences that may affect their residency and stability in the host country. These include fears of deportation if found without the documents required to be in the country legally, or denial of entry into future destinations based on their HIV status; as well as discrimination at health care facilities (Amon & Todrys, 2008; HRW, 2009).

A report by Human Rights Watch (2009) in South Africa found that Zimbabwean migrants living with HIV, who were deported, were forced to discontinue treatment (HRW, 2009). This is a demonstration of the health compromising dilemma that migrants face which is characterised by either being ignorant of their status and being assured stability in the host destination; or knowing it and risk being sent home if

they are undocumented and denied the medication to sustain life. Either way, it poses a health threat to the population, economic and social structure of not only the host country, but the country or community of origin. The fact that the South African public health care system is currently under strain in terms of providing the necessary HIV services exacerbates the perception that the rights of international migrants, who comprise a small amount of the population needing healthcare, should be relegated to accommodate those of citizens (Vearey, 2011). The idea that international migrants move to host countries to seek healthcare and other social services without contributing positively towards the socio-economic wellbeing of those countries is problematic (IOM, 2010). It leads to increased vulnerability of migrants and inhibits their access to HIV testing and other forms of healthcare. Importantly, there is no evidence that cross border migrants' move for health care services. Instead, studies have found that healthy individuals are more predisposed to migrate, primarily for economic reasons (Vearey, 2011; Pophiwa, 2009).

Although it may be assumed that international migrants are more vulnerable, internal migrants were examined in this study as they too are at high risk of HIV transmission. This is due to the fact that they face challenges in accessing health care due to the dynamics of moving to a new city. These dynamics include the loss of social networks that were a source of financial, psychological or emotional support in their home towns; as well as adjusting to a new socio-economic and cultural environment (Berkman et al, 2000; Adeokun, 2006). These underlying factors lead to poverty, which places people in a vulnerable position where they are exposed to exploitation (IOM, 2010). Moreover, they are more likely to return to their communities of origin more often due to the proximity, as well as permanently once they fall ill (Bouare, 2007; Vearey, 2008). This creates a double burden for the household of origin as they are forced to take care of a sick individual and lose a primary source of income. HIV prevalence has been found to be twice as high in urban informal settlements (where internal migrants are often located), than in formal urban housing (Vearey, 2008). In addition to this, due to the peripheral location of most of these settlements, migrants often get passed over for essential social and health services, and this is problematic (Vearey et al, 2010; NDoH NSP, 2007-2011).

Few services exist that are sensitive to the needs of migrant populations in South Africa; there is a scarcity of evidence based, purposeful programming. Policy to ensure that all migrant groups have the right to access HIV prevention, treatment, care and support services exists. However, the execution of

these policies is inadequate (Gap Analysis HIV policy brief, 2010). The importance of capturing the movements and experiences of internal migrants in South Africa are centred around gathering information that will enable comparisons between different migrant groups to be done and based on that, design relevant programmes (Vearey, 2012). Therefore, given the evidence at has been established on the vulnerability of migrant groups to HIV due to the process of migration, as well as the other societal and structural problems that have been identified- the migration process as well as the dynamics of residency should be evaluated in order to seek answers about the determinants of the health of migrants.

1.3 JUSTIFICATION

The rationale behind comparing international migrants to internal migrants, as well as people who originate from Johannesburg is based on the public health challenges that are associated with migration and HIV. These challenges may be due to the nature of migration during the process, as well as once the migrants have reached the host country which increase migrants' susceptibility to HIV. Migrants often find themselves in "spaces of vulnerability such as border areas, ports, urban and informal settlements and farms" (IOM, 2010: 25). It is at this point that they become even more vulnerable to HIV infection due, partly, to socio-economic factors such as poverty and unemployment (IOM, 2010). Other factors such as limited access to social, education and health services attributable to discrimination, exploitation, isolation, as well as integration challenges related to language and cultural barriers (IOM, 2002), may exacerbate the situation. These underlying determinants eventually lead to the proximate determinants of HIV infection such as risky sexual behaviour in terms of the inability to negotiate condom use by female migrants; forced sex; alcohol and drug abuse; transactional sex and rape (IOM, 2002). It may be argued that internal migrants who move to urban areas have better access to services and information about HIV and health in general as they do not face the same challenges that international migrants face in acclimatising to the cultural, socio-economic and political landscape of the country. However, they also often find themselves in informal settlements on the periphery of urban areas, inevitably increasing their vulnerability (Vearey, 2008). It has been contended that there are intra-urban inequalities that exist, which manifest in differences between rich and poor groups, and are linked to poor population health. This results in urban poor groups, such as those residing in informal settlements experiencing challenges in accessing basic services such as housing and health (Vearey et al, 2010). Therefore, it became increasingly important to investigate the extent to which intra-urban

inequalities faced by internal migrants affect their access to HIV testing and compare this to international migrants and Johannesburg natives.

Key individuals and groups, as are the subjects of this study, are often provided with the least information and attention in terms of targeted public health interventions. The promotion of HIV testing seems to be a neglected factor in HIV prevention and awareness strategies. World Health Organization (WHO) statistics show that, in generalised epidemics - such as the one existing in South Africa- a substantial amount of people living with HIV are still unaware of their HIV status (WHO, 2011). Population policies, interventions and programmes will benefit from information about the determinants of HIV testing, particularly in marginalised groups. Once HIV testing and counselling reaches at risk populations; the levels of early diagnosis and uptake of treatment as well as prevention of infection in those who are negative should increase (assuming that access to ART is not a problem). This is consistent with findings that suggest that people who are informed of their status are more likely to employ preventative measures than those who are unaware of their HIV status (WHO, 2011).

Given the association between migration and the potential for increased vulnerability to acquiring HIV and the importance of early testing for addressing the epidemic, this study has explored the demographic, socio-economic and behavioural factors associated with HIV testing amongst Johannesburg residents.

1.4 OBJECTIVES

1.4.1 General Objective

To examine the factors that influence HIV testing among migrants in Johannesburg.

1.4.2 Specific Objectives

1. To determine levels of HIV testing amongst internal and international migrants and Johannesburg residents

2. To examine behavioural, socio-economic and demographic determinants associated with HIV testing amongst Johannesburg residents.

1.5 KEY WORDS

1. **International Migrants-** People who originate from outside of South Africa and have since moved into Johannesburg more than 3 months prior to the survey (RENEWAL Survey report, 2009).
2. **HIV testing**: Respondents who have been for at least one HIV test. This definition takes into account testing at any facility and does not consider where and when testing occurred.
3. **Duration of Stay**- This variable was used in order to assess the period that a person has been in Johannesburg as it is assumed that those who have been in city for longer have assimilated and are therefore at an increased advantage in terms of accessing health care services.
4. **Internal Migrant**- South African citizens who originate from a province that is outside of Gauteng and have since moved into Johannesburg more than 3 months prior to the survey. This is linked to the increasing industrialisation and urbanisation of the country, which results in, mainly, people moving from rural to urban areas, Johannesburg being the primary destination (RENEWAL Survey report, 2009).

1.6 HYPOTHESES

The following hypotheses were tested in the study:

1. **H_o:** There is an association between migrant status and HIV testing

   H_a: There is no association between migrant status and HIV testing

2. **H_o:** International migrants have a lower likelihood of getting tested for HIV when compared to Johannesburg natives and internal migrants.

   H_a: International migrants have a higher likelihood of getting tested for HIV when compared to Johannesburg natives and internal migrants.

3. **H_o:** There is an association between behavioural, socio-economic and demographic factors and HIV testing amongst migrants living in Johannesburg.

   H_a: There is no association between behavioural, socio-economic and demographic factors and HIV testing amongst migrants living in Johannesburg.

CHAPTER 2

2.1 LITERATURE REVIEW

A review of literature was conducted in order to identify what has already been done in the area of factors associated with HIV testing and HIV and migration, what the gaps in the literature were and the general framework that migration and HIV testing is viewed under. Findings in the literature suggest that the decision to go for HIV testing is still heavily reliant on social perceptions of the disease; HIV remains highly stigmatised. Furthermore, it is influenced by gender and education, which turned out to be a motivator and a barrier at the same time. More importantly, wealth status indicators such as employment, which allow greater access to health care, proved to be relevant. Logistical and psychological reasons such as proximity to services as well as the need for assurance that one will be able to access further health care services in the event that they test positive- all affected the decision to test. The review proceeds with a brief introduction into the context of Johannesburg, HIV and migration followed by a detailed review of literature.

2.1.1 Urbanisation and HIV: The South African context

Although the levels of urbanisation and immigration into South Africa from other countries are increasing since the abolition of restrictions on movements that were enforced by the apartheid government, the country has always had active migration streams due to the demand of labour in the mining and agricultural sectors (Vearey, 2008). Johannesburg in particular, due to its status as the industrial and economic epicentre of the country, has become a prime destination for people from across South Africa and the world (Vearey, 2008). Migration patterns in the country, though circular by nature, are predominantly rural to urban (Vearey, 2008; IOM, 2010).

This influx of people creates spaces for the displacement of people resulting in urban poor groups (Bouare, 2007; Vearey, 2008). This increases vulnerability to HIV due to the increased possibility of engaging in risky sexual behaviour. This risky sexual behaviour may be exacerbated by the effects of long absences from family and stable partners due to the migration of (predominantly men) to the cities from rural areas for better employment opportunities (Bouare, 2007). Furthermore, it has been posited that arteries of HIV infection that are distinct from remote rural areas and are facilitated by urban areas and the network of roads that link them throughout the country have developed, hence the higher HIV

prevalence in urban versus rural areas (Adeokun, 2006:154). The growing urban population, and the subsequent displacement of migrant groups on the periphery of the city, increases the demand on health care services, putting pressure on local government in terms of supplying adequate public health services (Vearey, 2008). HIV prevention strategies, which include testing and counselling, are especially affected due to negative moral perceptions of the disease. Therefore, when taking into account structural and economic barriers, there really seems to be little incentive to access testing.

2.1.2 Housing in the City of Johannesburg

Population growth, rapid urbanisation as well as international migration give rise to challenges related to accommodation in the city. Thus, informal settlements emerge that are not only built on volatile land on the periphery of the city, but in the form of dilapidated buildings within the CBD. These structures, and the environment on which they are founded, are health hazards for the occupants since they are not able to access electricity, sanitation and water. This is exacerbated by the inaccessibility of social and health care services for residents due to the peripheral nature of the settlements. Furthermore, the financial vulnerability of the occupants increases the risks of HIV transmission and places them at a disadvantage in terms of accessing health services, whether they constitute preventative care, or management of the disease (Vearey, 2008; Vearey et al, 2010; Vearey, 2011).

2.1.3 HIV testing among key populations in the Western World

A cross sectional survey of migrants from five sub-Saharan African communities residing in London was carried out by Fenton et al (2002). Their aim was to describe the demographic and behavioural factors associated with migrants' HIV testing. Although this study was conducted in a developed nation, the study population chosen by the authors is particularly significant as it corresponds to the main study population in this study. In their study, Fenton et al (2002) found that 34% of men and 30% of women reported ever having had an HIV test. This is an unusual finding as it is the norm, particularly in high prevalence countries, that women have higher levels of HIV testing due to their frequent contact with health facilities (WHO, 2012). However, it is consistent with findings by Nwachukwu & Odimegwu (2011), on HIV testing amongst youth in Nigeria. Further findings in this study were that HIV testing was significantly associated with age among women. A similar association was found amongst men, in addition to this, nationality was found to be significantly associated with HIV testing in men (Fenton et

al, 2002). Previous sexually transmitted infection (STI) diagnosis for men (OR 2.96, 95% CI 1.63 to 5.38) and women (OR 2.03, 95% CI 1.06 to 3. 8) and perceived risk of acquiring HIV for men (OR 2.28, 95% CI 1.34 to 3.90) remained independently associated (Fenton et al, 2002). Health seeking behaviour and methods of protection against transmission are significant factors when considering HIV testing as they ultimately affect the decision to test. These behaviours are often affected by the perception of risk (Fenton et al, 2002; Castle, 2003; Adeokun, 2006; Steinberg, 2011; Manirankunda et al, 2009).

A study by Delpierre et al (2006) examined key population groups for late diagnosis of HIV infection in order to evaluate the testing policy in France. Their study focused on a cohort of people who had already been diagnosed with HIV. High risk groups were identified as injecting drug users and men who have sex with men. This is a significant study as it deals with reasons behind late diagnosis due to the vulnerable status of the participants. However, it omitted migrants as a high risk group for HIV infection. Furthermore, there is an assumption that HIV is a disease that is dominant amongst men who have sex with men which also holds true for South Africa, as there is a higher prevalence of HIV in men who have sex with men (NDoH NSP, 2012-2016). However, we have seen that in sub-Saharan Africa, in general, HIV is an epidemic that is self-sustaining through heterosexual transmission (UNAIDS, 2011). Furthermore, a study in Nigeria on modes of HIV transmission found that heterosexual transmission accounts for as many as 95% of HIV infections in that country, partly due to, a norm of having multiple sexual partners (Adeokun, 2006). This may be attributed to the traditionalist, patriarchal structure of African society, where multiple sexual partners are considered a testament to masculinity and a rite of passage for young men (Steinberg, 2011). Further findings of the Delpierre et al (2006) study include higher percentages of late testing in heterosexual men (48%) than men who have sex with men at (32%). They also found that the unemployed and those who were older than 30, tended to be candidates for late diagnosis due to late testing (Delpierre et al, 2006).

A qualitative study in Belgium focusing on sub-Saharan African migrants by Manirankunda et al (2009) explored their perceptions, needs, and barriers in relation to HIV testing. They found that although barriers to testing outweighed advantages, participants were predominantly in favour of VCT. Barriers identified included fear of positive test results and the personal and social consequences thereof, lack of information, lack of preventive health behaviour, denial of HIV risk, and missed opportunities (Manirankunda et al, 2009). Additionally, limited financial resources were a concern for some

subgroups namely: youth, asylum seekers, and recent migrants. These findings are significant in that they identify the social determinants of HIV testing, in the context of migrants in Belgium. Furthermore they highlight the compromised position of key populations such as migrants due to, amongst other reasons, financial constraints. It is significant to mention that in South Africa HIV testing is a free service at government facilities. Nevertheless, other factors such as proximity to clinics and inability to pay for transport to get there may be barriers to accessing HIV services (Hutchinson & Mahlalela, 2006; NDoH NSP, 2012-2016; Vearey et al, 2010).

2.1.4 HIV testing in the sub-Saharan African context

A study in Tanzania and Kenya on the cost-effectiveness of voluntary HIV-1 counselling and testing in reducing sexual transmission of HIV-1 established that voluntary counselling and testing is an effective way of changing the sexual behaviour of people (Sweat et al, 2000). The author found that the number of people willing to accept counselling and testing would remain low on the assumption that the testing and counselling process offered them nothing tangible. However, when given an incentive, such as treatment, there was a higher willingness to test. Finding one's health restored led people to inform others that it is possible to lead a healthy life with HIV (Sweat et al, 2000). The significant factor here is that sexual and health seeking behaviour is altered once people are assured that their lives will change for the better.

A study that was conducted in Malawi, which looked at readiness for HIV testing, found that most individuals in the areas that were visited were not quite ready to be tested (Yoder et al, 2004). Reasons cited for lack of readiness included perceiving themselves as having no risk of contracting HIV; being ashamed of being seen going to an HIV testing facility; and having a fear of a positive result (Yoder et al, 2004). Those who were willing to test reported wanting free VCT services, privacy and anonymity while they were doing so (Yoder et al, 2004). Reasons for HIV testing included the fear that they may have been exposed to HIV directly or indirectly; marriage and work requirements (Yoder et al, 2004). This study, once again highlights the effect of stigma associated with HIV, the reasons for lack of readiness mirror those that are seen in South African contexts (Steinberg, 2011; Sibanda 2011).

A qualitative study set in Mali aimed to eventually inform strategies into the implementation of VCT services (Castle, 2003). The author examined the perceptions of the population about HIV, finding that a large number of respondents said they did not believe in the existence of AIDS (Castle, 2003). Highly educated individuals were sceptical of the existence of AIDS, perceiving it to be a Western plot to halt the growth of the African population. Those who were more likely to believe in the existence of AIDS were uneducated people who had personally seen someone suffering from AIDS. Further barriers to HIV testing that were identified included stigma; confusion about mother-to-child transmission; the inability of the virus to be transmitted by mosquitoes; and misconceptions about the existence of AIDs in China (Castle, 2003). These findings should be understood in the context of the time of the study. Although there remains a level of denialism, awareness of HIV and correct knowledge, is better today (Morin et al, 2005; Sibanda, 2011; Buldeo, 2012).

Morin et al (2005) conducted a study in Zimbabwe that aimed to assess the acceptability of VCT services. They found that HIV testing is linked with individuals' self-perceived risk as people who took advantage of same day testing services provided as an intervention, thought they fell into the high risk category. Further significant findings associated with barriers to testing were: logistics (25.6%) and proximity of services (20.7%) as well as financial constraints at 8% (Morin et al, 2005). On the other, in rural Zimbabwe, a cohort study by Sherr et al (2007) set out to examine the determinants of uptake of VCT services. Their findings suggest that motivation for VCT uptake was driven by knowledge and education rather than sexual risk. This finding highlights the need for education, not only formal education, but awareness programmes to change perceptions.

Nwachukwu & Odimegwu (2011) examined the regional prevalence, patterns and correlates of VCT uptake for HIV among youths aged 15 to 24 in Nigeria and found the national prevalence of VCT to be low (2.6%) with regional variations (Nwachukwu & Odimegwu, 2011). Factors that were found to be associated with VCT uptake are age as well as education-where the higher the level of education of the respondent, the more likely they were to get tested voluntarily (Nwachukwu & Odimegwu, 2011). Wealth index was also found to be associated with higher uptake of VCT -where the wealthier the respondent, the more likely they were to get tested (Nwachukwu & Odimegwu, 2011). This is not surprising and it further substantiates findings in other studies that identified economic factors as barriers to accessing testing (Delpierre et al, 2006; Manirankunda et al, 2009). Other factors included

varying risk perception between North and South regions (Nwachukwu & Odimegwu, 2011). What is particularly interesting is that males were more likely to volunteer for HIV counselling and testing (7.2%) than females of the same age group across the board at 3.1% (Nwachukwu & Odimegwu, 2011). This finding is unusual as the general trend in other countries, South Africa included, is that females are more likely to go for HIV testing than males (Xulu, 2005; Sibanda, 2011; WHO, 2012). However, it is also consistent with the findings of Fenton et al (2002) who found that male African migrants residing in London were more likely to test than females.

2.1.5 HIV testing in the South African context

In South Africa, a study was conducted on utilisation of voluntary counselling and testing services in rural Eastern Cape by Hutchinson & Mahlalela (2006). They found that while overall use of VCT services in the Eastern Cape is low, utilisation of VCT services is positively associated with age, education and gender (Hutchinson & Mahlalela, 2006). Women with a secondary education were more than five times likely to use VCT than women with no education. For men, the effects of education were considerably smaller (Hutchinson & Mahlalela, 2006). People in a higher socioeconomic status groups, were more likely to test. This finding mirrors the Nwachukwu & Odimegwu (2011) study in Nigeria. The effects of stigma appear considerably stronger for females, while men are more heavily influenced by the characteristics of the VCT services themselves (Hutchinson & Mahlalela, 2006). Closer physical proximity to a clinic increased the probability that males would access testing. This study is relevant as it is located in South Africa; moreover since it focuses on demographic and socio-economic characteristics.

Xulu (2005) set out to identify barriers to HIV testing in eight companies registered on the Direct AIDS Intervention (DAI) Programme. The findings revealed a low utilisation of VCT services with an average uptake of 13% (Xulu, 2005). Race was found to be significantly associated with testing as blacks were more likely to be tested for HIV (OR 1.47, 95% CI 1.24 to 1.74; p=0.0001) when compared to white people. Sex was also significantly associated with testing as was seen in previous studies (Fenton et al, 2002; Nwachukwu & Odimegwu, 2011; Sibanda, 2011; WHO, 2012). Period of employment was also significantly associated with testing as those who had been employed for more than one year were more likely to test (OR 1.83,95% CI 1.37 to 2.43; p=0.0001) than newer employees (Xulu, 2005).

When juxtaposing this study with another one also set within a working environment, using different research methods and a different sample, we see interesting variations in the level of HIV testing. The said study used qualitative research methods in order to investigate the challenges faced by peer educators in trying to convince workers in a mining company in the North West Province of South Africa to test for HIV. The company, as opposed to the ones in the Xulu (2005) study, had an uptake rate of 82% (Sibanda, 2011). However, the workers remained sceptic about testing because of unstable employment contracts and validity of test results. Furthermore, they were concerned about stigma and discrimination as well as others speculating their test results based on the amount of time that they spent in the testing cubicle (Sibanda, 2011). This particular finding mirrors that of Steinberg (2011), where people would assume that others were HIV positive based on them being seen at testing facilities, the length of time they spent there, as well as their demeanour when leaving facilities. Other barriers to testing included cultural beliefs, poor disclosure strategies, perceived racialization of workplace testing centres and male workers relying on results from partner's antenatal test (Sibanda, 2011).

Buldeo (2012) made use of conceptual models of behaviour to explore the factors that shape attitudes towards VCT among first year students at the University of the Witwatersrand (WITS). The study found that students went for VCT mainly due to a desire to know their HIV status as they were aware of the importance of knowing their status, including the benefits thereof (Buldeo, 2012). Factors that stimulated the need to know their status included knowing someone who had either been for VCT or was living with HIV or passed away due to AIDS (Buldeo, 2012). Further motivators for testing were; free availability of and easy accessibility to VCT services on campus and the positive influence of peers through social mobilisation (Buldeo, 2012). Social stigma served as a major barrier to accessing VCT services as some students cited lack of testing due to fears of rejection, blame and discrimination if they were found to be HIV positive (Buldeo, 2012). Structural factors also served as barriers to HIV testing as the gendered dynamics and nature of clinics, together with the poor attitudes of some health service providers were deterrents (Buldeo, 2012). This study is significant even through the study population is not migrants specifically, it looks at university students who come from different backgrounds and that in itself is a form of mobility. All three of these South African studies identified stigma and the need for

education for employees in order to improve the levels of uptake of HIV testing; this finding conquers with findings elsewhere (Castle, 2003; Yoder, 2004; Steinberg, 2011).

2.2 CONCEPTUIAL FRAMEWORK

2.2.1 The Social Network Theory

The conceptual framework applied in this study is adapted from The Social Network Theory. This theory attempts to explain the behaviour of individuals or groups on the basis of traditional categories such as kin, tribes, or villages (Berkman et al, 2000). In this study these groups were internal migrants, who relate to others from their hometowns; international migrants who relate to others from their home countries and the comparison of both groups in relation to Johannesburg natives. The essence of the social network theory is that the social structure of the network itself is mainly responsible for determining individual behaviour and attitudes by influencing the flow of resources, which determine access to opportunities and restrictions on behaviour (Berkman et al, 2000). The main opportunity or behaviour that was the focus in this study is the ability to access HIV testing. Therefore, it was assumed that migrants, depending on the strength of their network and their ability to use their network to overcome structural factors, acquire socio-economic necessities such as employment and decent housing quicker than they would if they did not know anyone. These networks also allow migrants to assimilate in the host society and acquaint themselves with the language, culture and general social structure. More importantly, they are able to access treatment at health facilities with little or no fear being turned away or discriminated against because they would have been taught strategies to overcome attitude from staff at health care facilities as well as other structural factors.

These social networks were assumed to determine if migrants will either have the means to access HIV testing or not. Figure 1 presents a conceptual model of how social networks impact on health. Socio-structural conditions at the macro level such as culture, economics, politics and social change influence the decision to migrate and or where people migrate to. Migration may be internal or international. These socio-structural factors condition the extent, shape and nature of social networks at the mezzo level such as the social network structure, and the characteristics of the network ties. This then provides opportunities for psychosocial mechanisms at the micro level such as access to resources and material

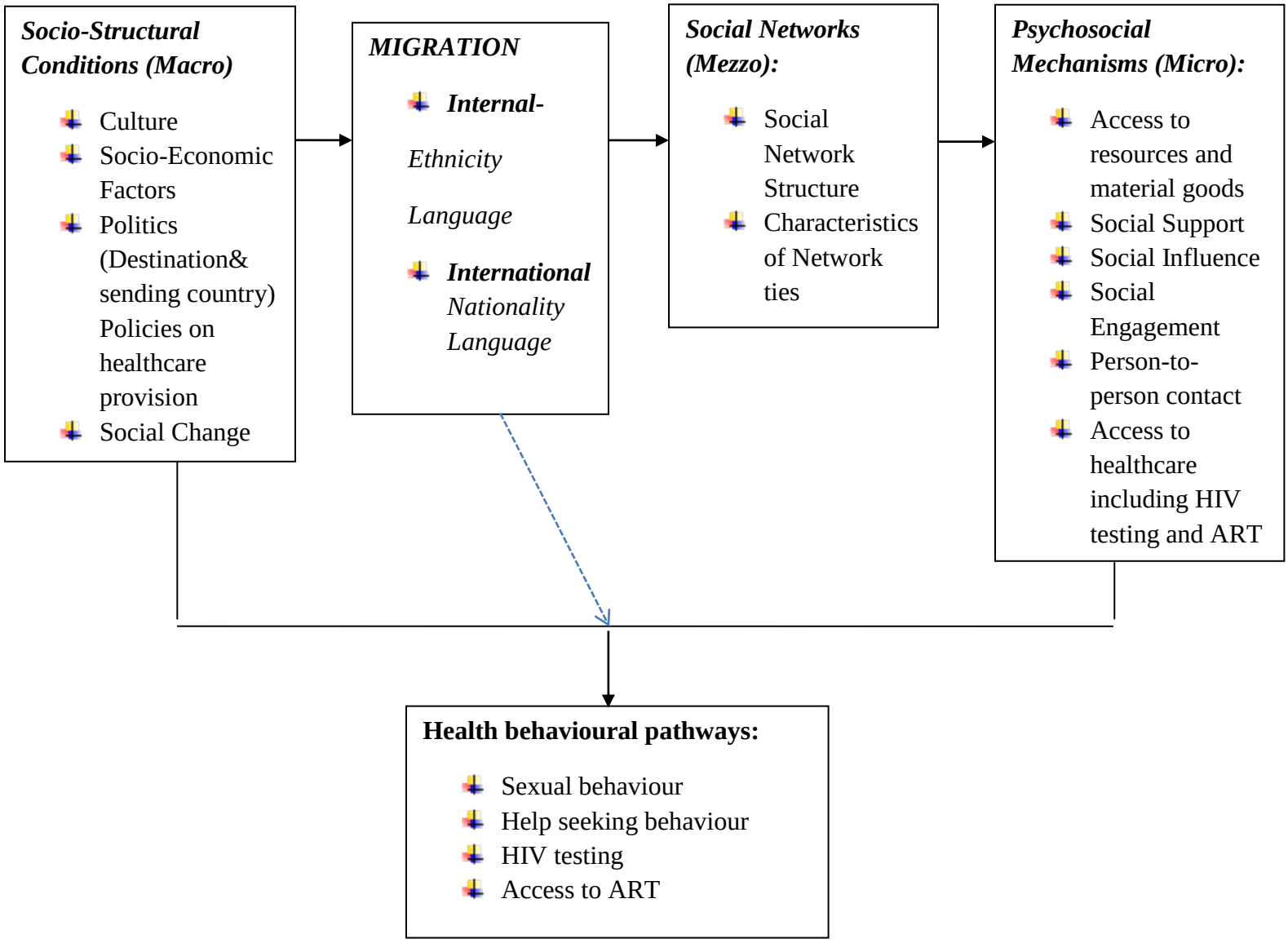
goods; social support; social influence; social engagement and person-to-person contact. This ultimately impacts on health through health behavioural pathways such as sexual conduct, and importantly, help-seeking behaviour, which in this case was accessing HIV testing.

The significant factor that was examined in this study is the role of migration (internal or international) and its effect on HIV testing. Migration mediates health seeking through language, ethnicity and nationality. But before this can happen the decision to migrate has to be taken in the first place. Migration decisions are influenced by demographic and socio-economic factors such as are age, sex, residence, education, marital status, and ethnic identity. These factors have an impact on the spatial and sexual mobility of people, their exposure to infection, and their healthcare–seeking and managing responses (Adeokun, 2006).

2.2.2 Application of the Social Network theory to study design and analysis

The social network theory informed the design and analysis in this study it terms of variables that were chosen. These variables (which are interrogated in detail in the methodology section) fall under three broad themes: demographic, socio-economic and behavioural factors. The socio-structural conditions (macro); Migration; Social Networks (mezzo) and psychosocial mechanisms (micro) are all interconnected and indirectly influence the health behavioural pathway. These mechanisms seek to eventually explain HIV testing. The decision to migrate-which is influenced by socio-structural conditions at the macro level and influences social networks and psychosocial mechanisms, informed the choice of one of the three overall categories of the variables. Migration Sample, a key variable, was evaluated in terms of its influence on the health behavioural pathway through sexual behaviour, which was represented by the 'perception of HIV risk' variable and help seeking behaviour which was represented by the variable 'health seeking practice'. The psychosocial mechanisms pathway that is seen in the diagram informed the socio-economic variables related to access to resources and material goods, through the variables 'education' 'income earner' and 'type of residence'. These variables are indirectly related to access to health care and therefore access to HIV testing. The psychosocial mechanisms pathway further influenced behavioural variables through social influence, which is represented by the variable 'knows HIV positive person'. Access to HIV testing and ART was also influenced by the psychosocial mechanisms pathway through the variables 'HIV testing'; 'knows ART' is free and 'knows testing facility'.

Figure 1: The impact of Network characteristics on health, adapted from Berkman et al (2000)



2.3 CONCLUSION

These studies highlight the contested nature of HIV testing relating to context and social determinants. The effect of stigma that HIV is associated with as well as education on perceptions about risk, access to services, socio-economic status and demographics all play vital roles in the decision to get tested for HIV. What is missing in the literature is a study that focuses on the individual characteristics of migrants living in Johannesburg who have tested for HIV and the demographic, socio-economic, and behavioural factors that justify their decision to test. The present study attempted to fill this gap, using variables that were found to be significant in the studies mentioned above, as well as additional ones which fall under the broad categories of demographic, socio-economic and behavioural factors that are hypothesised to possibly have significant relationships with HIV testing. A detailed description of these variables as well as the rationale behind selecting them follows in the methodology section.

CHAPTER 3

3.1 METHODOLOGY

This chapter serves as a discussion of the methodology that was applied in exploring the demographic, socio-economic and behavioural factors associated with HIV testing amongst migrants living in Johannesburg. A summary of the methodology that the authors of the Regional Network on livelihoods and HIV/AIDS (RENEWAL) survey (2008) applied- as contained in their report and supplemented by related articles- has been provided. This was followed by the methods of the current study; including a detailed description of the variables used in this study; the study hypotheses; ethical considerations and data analysis plan.

3.2 STUDY DESIGN

This study made use of quantitative methods to conduct secondary data analysis of the RENEWAL survey (2008). The survey was acquired from the African Centre for Migration and Society (ACMS) at the University of the Witwatersrand.

3.2.1 About the renewal survey of 2008

The primary objective of the survey was to conduct a "trans-disciplinary study that aimed to explore the linkages between HIV, migration and urban food security" (RENEWAL South Africa report, 2009). The Johannesburg study was one of a trilogy of case studies, the other two being located in Windhoek and Addis Ababa (RENEWAL South Africa report, 2009).

3.2.2 Design of the renewal survey

The RENEWAL survey applied a cross-sectional study design with an eco-health approach, meaning that it was a mixed methods study (RENEWAL South Africa report, 2009). This consisted of:

A household survey, which was the primary data collection tool. This was supplemented by policy and existing data analysis; a standardised interview questionnaire survey; focus group discussions; a case study and key informant interviews (RENEWAL South Africa report, 2009: 45). The survey was conducted across a range of housing types in Johannesburg. Three inner-city suburbs where cross border migrants are known to reside were purposively selected from the inner-city, as well as one informal settlement. The three suburbs selected were: (1) Berea, (2) Hillbrow, and (3) Jeppestown. The informal settlement was Sol Plaatjies (RENEWAL South Africa report, 2009; Vearey et al, 2010; Vearey, 2012).

3.2.3 Sampling and sampling frame

A sampling frame for a household survey in inner-city Johannesburg already existed as a result of previous survey work that was undertaken by ACMS in 2006 within the inner city (Vearey, 2012: 49). This guided the development of the sampling frame that was used in the RENEWAL survey. A residential sampling frame was established. The study population included cross-border and internal migrants, as well as individuals who had been born in Johannesburg (Vearey, 2012). The authors obtained copies of all Stats SA 'Enumerator Areas' (EAs) that are normally used in the census, for each of the three suburbs (Vearey, 2012). The use of the Stats SA EAs allowed comparisons to be made to census data. The EAs have been developed to each contain a similar number of dwellings – up to 300 (Vearey, 2012). They randomly selected three EAs from each suburb. This was done by printing all EAs for each suburb and blindly selecting 3 for each suburb (A, B, and C). In areas with high density (Hillbrow and Berea) information on the number of flats per building were obtained in advance (Vearey, 2012). This enabled the sampling of households to be appropriately weighted relating to building size (Vearey, 2012). The sampling frame involved the selection of the first house in the north-west corner of each cluster as the starting point. For the second household the fieldworker moved in a clockwise direction in the cluster and selected the third house. For each EA, 33 households were selected (RENEWAL South Africa report, 2009; Vearey, 2012).

Due to the fact that there were no existing EAs for Sol Plaatjies, two fieldworkers mapped out the informal settlement with the assistance of residents, making use of aerial photos and a development planner's map from the City of Johannesburg (Vearey, 2012). There exist a range of different housing types within the settlement, grouped spatially including: hostel accommodation, former mine-

management houses, upgraded housing, self-constructed shacks and government-constructed shacks (Vearey, 2012). In order to ensure that they sampled from each housing type, the authors split the settlement into different areas based on different housing types and spatial grouping (Vearey, 2012). This resulted in five areas. Within each area, clusters were identified where a group of households fitted together spatially. Clusters were space based and the number of households within each cluster varied considerably (from 36 to 1,300). The five areas were found to fall into two housing types: (A) shacks and (B) brick structures (Vearey, 2012). For each area, the total number of households and the total number of clusters were identified. Based on this and the desire to interview 50 percent (n=100) households in category (A) and 50 per cent (n=100) in category (B), a sampling strategy was devised, which involved weighting the sample dependent on the size of the cluster. This sampling and weighting enabled a representative sample of all housing types in Sol Plaatjies to be surveyed (Vearey, 2012; RENEWAL South Africa report, 2009).

A cluster-based random sampling technique was applied within each area in an attempt to ensure a good spread of respondents (Vearey, 2012). The recruitment of respondents occurred after the sampling; people did not know they would be asked participate until their household was selected. This was done on a voluntary basis. People who agreed to be interviewed were given information on the study and asked to sign an informed consent form. Participants in the RENEWAL survey were required to preferably be the head of the household. Alternatively, a suitable respondent could be another adult member of the household (older than 18 years) able to provide information on the household and its members, and themselves as the respondents. People who had moved into the area or arrived into the city earlier than three months before the interview was to be conducted, were excluded (RENEWAL South Africa report, 2009; Vearey, 2012).

3.2.5 Substitution criteria

For each cluster, a random starting number was selected. Subsequent households were randomly selected by fieldworkers who knocked on every third door to request an interview. Should there be no response when the fieldworker arrived; the fieldworker would try three times on three separate occasions, before substituting another household. The fieldworker would then move to the household next door. Where access was difficult, the sampling strategy was appropriately modified. In Berea and

Hillbrow, certain selected buildings were inaccessible. Where permission was not granted to access a building, the entire building was replaced by the building next door (RENEWAL South Africa report, 2009; Vearey, 2012).

3.2.6 Sample size

For the household survey, through random sampling across the different areas, a total of 487 individuals were interviewed, providing information on a total of 1,533 individuals. Forty percent of households were interviewed in the informal settlement (Sol Plaatjies) and 60% from the three suburbs in the formal inner-city (Berea, Hillbrow, and Jeppestown). Survey respondents were stratified into one of three migratory categories: 60 per cent (n=293) of the surveyed population were South African internal migrants and 31 per cent were cross-border migrants (n=150). In addition, there was a group (9 per cent; n=44) of non-migrants; respondents who reported always having lived in Johannesburg. The inclusion of these three groups within the survey enabled important comparisons to be made between different types of migrant (internal and cross-border) and in comparison to a non-migrant group (RENEWAL South Africa report, 2009: 16; Vearey, 2012)

3.2.7 Questionnaire design

The survey questionnaire was designed to gather information on all individuals in each household. The migrant status of the respondent, as opposed to the whole household was used. An interview-administered questionnaire was conducted that captured information on the respondents and members of the sampled households. The questionnaire contained 9 sections, namely: socio-demographics of the household and its members (sex, age, education, origin); information on the household infrastructure and assets; household economics and employment; migration and urban links; pre-migration conditions and expectations; remittances and transfers; food security; health and well-being (including HIV/AIDS) and community well-being. The total number of questions was 328 (RENEWAL South Africa report, 2009; Vearey, 2012).

3.2.8 Field work

A team of fieldworkers were recruited and trained in the survey tool, which included the study methods, sampling process and ethical issues (RENEWAL South Africa report, 2009; Vearey, 2012). A total of ten fieldworkers of a range of nationalities (South African, Congolese and Zimbabwean) were trained. These included MA Forced Migration students and other fieldworkers who have previously conducted this type of fieldwork. Three female and 7 male fieldworkers who spoke a range of South African and regional languages conducted the survey questionnaires. In addition, a coordinator for each site was appointed (RENEWAL South Africa report, 2009). Fieldwork team leaders were responsible for identifying the first house in the north-west corner of a given cluster (formal areas) or generating a random starting number (informal area) in order to initiate the sampling (Vearey, 2012: 51). The fieldwork began in Sol-Plaatjies informal settlement in August 2008, the first week was devoted to sampling and the gathering of information was finalised at the end of that month. The following area surveyed was Jeppestown, and the fieldwork began the 1st of September and finalised on the 15th. The third area surveyed was Berea; the fieldwork was initiated on the 16th of September and completed by the end of September 2008. The last area surveyed was Hillbrow and the fieldwork was conducted the first three weeks of October, the same year (RENEWAL South Africa report, 2009).

3.2.9 Ethical considerations

This study made use of secondary data analysis; therefore there was no risk of breaking interviewee confidentiality or any other associated ethical issues. Ethics clearance for the RENEWAL study was granted by the Wits Human Research Ethics Committee (Medical) in 2007. Certificate number: M071125 (RENEWAL South Africa report, 2009; Vearey, 2012).

3.3 STUDY POPULATION

This particular study, which investigated the factors associated with HIV testing amongst Johannesburg residents, used a sample of 487 women and men. The study population were international migrants (n=150), defined as people born outside of South Africa; internal migrants (n=293), defined as people who originate from any other province within South Africa and have since moved to Johannesburg. A

comparative group of Johannesburg natives (n=44), that is, people who have always resided in Johannesburg were also examined.

3.4 DATA MANAGEMENT

Following preliminary descriptive analysis to see the frequency of the categories in each variable, some variables were re-categorised. This was done according to what has been seen in the literature and logical discretion in order to make analysis as simple as possible.

3.4.1 Outcome variable

The outcome variable is HIV testing, and was derived from the question, have you ever been tested for HIV? The variable was re-coded from (1) Yes and (2) No to (1) Yes and (0) No.

3.4.2 Explanatory variables

These consist of the demographic and socio-economic profile of the respondents as well as some of their behavioural patterns in terms of health. The health behaviours were expected to directly impact on whether or not a migrant gets tested for HIV. The demographic and socio-economic variables of the women are the background characteristics that are assumed to predict health behaviours. These variables therefore, were expected to be associated with HIV testing. The variables are presented in table 1. The original variable as it appears in the data set is displayed with the question on the questionnaire; followed by the re-coded variables that have been utilised in the present study.

(a) Main Predictor Variables

The main predictor variables were variables that measured migration. The variable 'Johannesburg residents', was adopted from a variable that was in the original data set called nationality of the respondent. It had three categories: (1) Internal migrant (2) International migrant (3) Always lived in Johannesburg. These categories were shifted around to (1) Johannesburg natives (2) internal migrants and (3) international migrants. This variable was used to compare migrants and those that have always lived in Johannesburg. It is an important variable as nationality has been found to have a significant effect on the ability of people to test for HIV (Fenton et al, 2002). The variable 'Migrant Sample' was

generated from the same variable mentioned above called nationality of the respondent. For the purpose of the main independent variable needed in this study, the last category was dropped, resulting in a binary variable that is labelled: (1) Internal migrant and (2) International migrant.

The third main predictor variable was 'Duration of stay', which was used to determine whether being a migrant and staying for a certain period in the city affects decision or ability to test. This is significant as recent migration has been found to affect access to health services (Manirankunda et al, 2009). It was originally a variable that was arranged in dates. It was then converted into a continuous variable by calculating the number of months since a person has migrated. Following this, it was converted into a categorical variable that has three categories. Recent migrants were considered as those who have migrated within the last 12 months and coded as (1). The second category was labelled 1-4 years and the last category was 5 years and above.

(b) Demographic variables

Demographic variables that were selected include: 'sex', as there are gender dynamics related to HIV susceptibility both biologically and socially (Gilbert et al, 2010); and 'age', which has been found to have an association with HIV testing uptake (Fenton et al, 2002; Adeokun, 2006). Sex of the respondent was left the way it was originally, and just labelled (1) male, (2) female. Sex is significant as it "forms the basis of allocating roles, privileges, and positions open to members of a community" (Adeokun, 2006: 155). Age has previously been found to be significant when studying HIV. The tendency of females' debut intercourse to occur at a relatively young age has been used to explain the spread of HIV among female youths (Adeokun, 2006: 155). A decision was made to re-categorise age groups into 10 year intervals for ease of analysis as one year intervals resulted in too many categories since the ages went up to 78 years. Furthermore, there were small numbers in certain ages, for example 18 years only had 3 respondents accounting for less than a 1% of the data. Ages 40 to 78 only had single digits, with the exception of age 48. The end result was a variable with four categories labelled (1) 18-27; (2) 28-37; (3) 38-47 and (4) 48 and above. Considering that the primary reproductive ages are 15-49, the new categories are justified.

(c) Socio-economic variables

The first socio-economic variable that was used is 'income earner' in order to establish wealth index as employment and wealth status have been found to have an effect on access to HIV testing (Fenton et al, 2002; Morin et al, 2005; Delpierre et al, 2006; Manirankunda et al, 2009). Income earner was re-labelled from (1) Yes and (2) No to (1) Earning (2) Not earning. The second socio-economic variable that was used is 'Education'. This variable originally had values which were categorised 1-15 representing no education, primary education and secondary (with all the grades/standards represented in single numbers) as well as different types of tertiary qualifications (post-matric diploma, technikon degree and university degree). For ease of analysis, they were re-categorised into 4 categories: (1) No education (2) Primary (3) secondary and (3) tertiary. Education is important as it is closely related to the dynamics of HIV infection, prevention, and management in a population (Adeokun, 2006).

A third socio-economic variable selected in the study is 'Type of residence', defined as, formal or informal was used in order to explore intra-urban inequalities in access to health care (Vearey et al, 2010) through examining levels of HIV testing as proxy. Urban HIV prevalence in informal settlements has been found to be double that of rural areas and highest within urban informal settlements in South Africa (Vearey et al, 2010). Furthermore, residence is significant "in urban or rural areas [as it] helps determine people's economic and social options, opportunities, and limitations. It also creates the context for developing the coping mechanisms for sexual needs" (Adeokun, 2006: 155). Type of residence was re-coded (1) informal and (2) formal.

(d) Behavioural variables

'Health seeking practice', adapted from the Gilbert et al (2010) is defined as "the decision making process leading people to seek professional health care. It is not triggered simply by the onset of symptoms, or how severe these are. What is more significant is how the symptoms are perceived and interpreted" (Gilbert et al, 2010: 13). This definition is also related other variables that were used such as 'perception of risk'; 'knowledge of a person who tested positive'; 'knows that antiretroviral treatment is free' and 'knowledge of a testing facility'. These variables have been found to strongly influence the decision to test (Castle, 2003; Morin et al, 2005; Sherr et al, 2007).

The ‘self-reported state of health’ variable was re-coded by combining those people who reported their health being very poor (1) and poor (2) and labelling this category poor (1). Secondly leaving the middle category labelled average that was originally coded (3) and coding it (2). Lastly by combining the fourth (good) and fifth categories (very good) and labelling the category good (3). This re-categorisation is justified as there were only 5 respondents in the original, very poor category, accounting for only 1% of the data. The reason why these categories were reduced was for ease of analysis as too little difference between the categories and the numbers they reflected. In terms of the last category, 10% reported being in very good state of health. Furthermore, this is self-reported state of health, which may be biased taking into consideration the subjective view of the interviewee.

The variable ‘Health Seeking practice’, originally had eight categories, the first category which was labelled as: Nothing (1) was left the way it was. The second category ‘eat well’ (2) was left the way it was the same was done for ‘exercise’ (3). The fourth category, ‘go for doctors check-ups’ was left as it was (4). Categories ‘do not stress’ (5); ‘pray’ (6) and ‘support group’ (7) were combined into one category labelled ‘spiritual/psychological methods’ (5). The reason for this was that only 13 people reported that they do not stress and 12 that they pray. Only one person reported that they are a member of a support group. Therefore, these three categories were added up and made into one category. Four (4) were missing values, thus they were dropped. The ‘knowledge of HIV testing facility’ variable is binary, it was left the way it is, just re-coded as Yes (1) and No (0). The same was done for ‘knowledge of HIV positive person’. The variable ‘perception of HIV risk’ was re-categorised to (1) ‘no risk’ which is a combination of ‘no risk at all’ and ‘I am HIV positive’ which were originally coded 1 and 4. The other categories (2) some risk, (3) high risk were left as they originally were.

Lastly, ‘ever been diagnosed with Tuberculosis’ was used, the original categories were left the way they were, just changed the coding to (0) No and (1) Yes. Tuberculosis is always an important factor when studying HIV and migration as HIV-positive people co-infected with tuberculosis are more likely to die from tuberculosis than from any other condition (AIDS Weekly, 1996). Furthermore, exposure to tuberculosis on long international flights is also a potential link between migration and HIV infection, morbidity, and mortality from AIDS (AIDS Weekly, 1996).

Table 1: List of variables, their definitions and categories, RENEWAL Survey (2008)

TYPE OF VARIABLE	DEFINITIONS AND CATEGORIES	
Outcome variable:	**Dataset**	**Re-coded Variable**
	Have you ever been tested for HIV? (1)Yes; (2)No	**HIV testing** (1)Yes; (0)No
***Main Explanatory*:**	**Dataset**	**Re-coded Variables**
	Has respondent always lived in JHB? (1)Internal migrant ;**(**2)International migrant;(3)Always lived in Johannesburg	**Johannesburg residents** (1)Johannesburg native (2)Internal Migrant ;(2)International migrant
	Has respondent always lived in JHB? (1)Internal migrant **;(**2)International migrant(3)Always lived in Johannesburg	**Migrant Sample:** (1)Internal Migrant ;(2)International migrant *(dropped Always Johannesburg for a pure migrant sample)*
	When did the respondent arrive in JHB? Month_ _ _ Year_ _ _	**Duration of Stay:** (1**)**12 months and less; (2) 1-4 years (3) 5 years and above
***Demographic*:**	**Original Variable and definition**	**Re-coded Variables**
	Respondent's sex (1)Male ; (2)female	**Sex:** (1)Male ; (2)Female
	Age of the respondent Age in continuous numbers starting at18 ending at 78 years.	**Age**: (1)18-27 ; (2) 28-37 ; (3) 38-47 ; (4) 48+
***Socio-Economic*:**	**Original Variable and definition**	**Re-coded Variables**
	Is the respondent currently earning money? (1)Yes; (2)No	**Income:** (1)Earning ; (2) Not earning
	Respondent's Education level (1) None;(2)Grade1-2;(3)Grade3; (4)Grade4	**Education:**

	(5)Grade5; (6)Grade6;(7)Grade7;(8)Grade8; (9)Grade9;(10)Grade10;(11)Grade11; (12)Grade12;(13)Post-matric diploma;(14) Technikon degree; (15)University degree	(1)No education=[(1)None] (2)Primary= [Grade1-2+Grade3+Grade4+Grade5+Grade6+Grade7] (3)Secondary=[Grade8+Grade9+Grade10+Grade11+ Grade12] (4)Tertiary=[Post-matric diploma+ Technikon degree +University degree]
	What type of dwelling does the household live in? (1)Formal house; (2)Informal	**Type of Residence:** (1)Formal ; (2)Informal
Behavioural:	**Original Variable and definition**	**Re-coded Variables**
	For your age, would you describe your state of health as…? (1)Very poor; (2)Poor; (3)Average; (4)Good; (5)Very good	**State of health:** (1) Poor = [Very poor+ Poor] ; (2)Average ; (3) Good= [Good + Very Good]
	What do you do to keep yourself healthy? (1)Nothing ; (2)Eat well ;(3)Exercise (4)Go for doctors check Ups ; (5)Do not stress; (6)I pray; (7)I am a member of a support group	**Health Seeking practice:** (1)Nothing ; (2)Eat well ;(3)Exercise (4)Doctors check Ups ; (5)Spiritual/Psychological methods =[Do not stress+ I pray+ I am a member of a support group]
	Do you know where someone from this community can get tested for HIV (VCT)? (1)Yes; (2)No	**Knows HIV testing facility** (0)No; (1)Yes
	Do you personally know anyone with HIV/AIDS? (1)Yes; (2)No	**Knows HIV positive individual** (0)No; (1)Yes
	Do you know that free ART is available? (1)Yes; (2)No	**Knowledge of free ART** (0)No; (1)Yes
	What do you think your chances of getting HIV/AIDS are? (1)No risk at all; (2)Some risk; (3)High risk (4) I am HIV positive	**Perception of HIV risk** (1)No risk= [No risk at all +I am HIV positive] ; (2)Some risk; (3)High risk
	Have you ever suffered from TB? (1)Yes; (2)No	**Tuberculosis** (0)No; (1)Yes

3.5 DATA ANALYSIS

Three levels of analysis have been carried out using Stata statistical software version 11. All three statistical tests for the study where conducted at a 5 percent level of significance and a 95 percent Confidence Interval. First, Univariate description analysis was done to show frequency distribution of the individual characteristics of the study population. Second, bivariate chi- squared analysis was done to investigate the unadjusted relationship between migration status, residency in Johannesburg and each of other independent variables with HIV testing. Lastly, two multivariate logistic regression models, which are applied when the dependent variable is binary, were conducted. These models were used to investigate the adjusted relationship between migration status, Johannesburg residency and HIV testing. Odds ratios were used in the interpretation of results.

$$\text{Logit (p) [HIV testing]} = b_0 + b_1 X_{i1} + b_2 X_{i2} + b_3 X_{i3} + \ldots + b_{15} X_{15}$$

Where p = dependent variable estimates the probability of HIV testing;

Which is mediated or affected by b_0 $b_1 \ldots b_{10}$ β_i= log odds; X_1 $X_2 \ldots X_{10}$; which are the explanatory variables (Pampel, 2000).

CHAPTER 4

RESULTS

4.1 INTRODUCTION

The following sections present the results of the study which investigated the factors associated with HIV testing amongst Johannesburg residents in an attempt to see whether Migrant status matters. A Univariate model looking at the demographic and socio-economic characteristics of the study population was conducted. Two Bivariate chi-squared analysis models are presented. The first one comprises of Migrants only in an effort to examine their behavioural, socio-economic and demographic determinants that are associated with HIV testing. The second bivariate model looks at Migrants as well as Johannesburg natives to see which of their individual characteristics are associated with HIV testing. The significant variables from these two models were applied in the multivariate models. The 'Migrant sample' and 'Johannesburg residents' variables were taken into the multivariate models regardless of significance for the purpose of evaluating the hypotheses that state that (1) there is an association between migrant status and HIV testing and (2) International migrants have a lower likelihood of getting tested for HIV when compared to Johannesburg natives and internal migrants. Two separate multivariate logistic regression tables are presented looking at significant variables carried over from the respective bivariate models, taking into account migrants on one hand, and Johannesburg natives together with migrants on the other.

4.2 UNIVARIATE ANALYSIS

Table 2 shows the characteristics of the study population. A total of 487 respondents were included in the analysis. Nine percent of the study population were Johannesburg natives (n=44), sixty percent were internal migrants (*n*=293), while 30 percent were international migrants (*n*=150). Most of the sample (63%) had been living in Johannesburg for 5 years and above (*n*=307). Thirty percent had been in the city for one to four years (*n*=150) and 6% percent had been there for less than one year (*n*=30).

The sample had a young age structure with age groups 18-27 and 28-37 accounting for 38% (*n*=183) and 35 % (*n*=172) respectively. The older age groups (38-47 and 48 and above) had a combined

contribution of about 27% to the sample. There were more females (56.6%; *n*=274), than males 43.4% (*n*=210). Most of the respondents had secondary level education (71%; *n*=330); followed by those who had primary level education (17%; *n*=79).Seven and a half percent (*n*=35) percent had tertiary education, while the lowest percentage (4.5%; *n*=21) had no education. There was an equal number of respondents who were not earning (50%; *n*=241) as those who were earning an income (50%; *n*=241). There were less respondents who stayed in informal settlements (40%; *n*=195) than those staying in formal housing (60%; *n*=292).

Table 2: Characteristics of the study population, RENEWAL Survey (2008)

VARIABLE	FREQUENCY (*n=487*)	PERCENTAGE (%)
Migrant sample		
Johannesburg Natives	44	9.0
Internal Migrants	293	60.2
International Migrants	150	30.8
TOTAL	**487**	**100.0**
Duration of stay in Johannesburg		
Less than one year	30	6.2
One to four years	150	30.8
5 years and above	307	63.0
TOTAL	**487**	**100.0**
Age		
18-27	183	37.6
28-37	172	35.3
38-47	65	13.3
48+	67	13.8
TOTAL	**487**	**100.0**
Sex:		
Male	210	43.4
Female	274	56.6
TOTAL	**484**	**100.0**
Education:		
No education	21	4.5
Primary	79	17.0
Secondary	330	71.0
Tertiary	35	7.5
TOTAL	**465**	**100.0**
Income		
Earning	241	50.0
Not Earning	241	50.0
TOTAL	**482**	**100.0**
Type of Residence		
Formal	292	60.0
Informal	195	40.0
TOTAL	**487**	**100.0**

4.3 BIVARIATE ANALYSIS

4.3.1 Characteristics of Migrants who have ever tested for HIV

Table three presents a comparison of only international migrants and internal migrants (*n*=227) who have been for HIV testing. It omits the Johannesburg natives as well as those who did not go for HIV testing in order to investigate the differences in their characteristics and how they influence HIV testing. When comparing international and internal migrants it is discovered that internal migrants have a higher likelihood (72%; *n*=164) of getting tested than international migrants (28%; *n*=63). This finding is statistically significant at the 5% level, with a p-value of 0.004 (chi-square=8.16). In terms of duration of stay, 63% of internal migrants who had been in Johannesburg for less than a year had tested compared to 36% of international migrants. Internal migrants who have been in Johannesburg for one to four years had a higher likelihood of getting tested for HIV (74%) compared to international migrants who had been in Johannesburg for the same period (26%). Internal migrants who had been in Johannesburg for 5 years and more were more likely (72%) to get tested compared to international migrants who had been in Johannesburg for the same amount of time (28%). This finding is not statistically significant. The following variables were also found to be statistically significant against HIV testing: age (chi-square=8.35; p=0.039); education (chi-square=10.84; p=0.013); income (chi-square=5.28; p=0.021); and type of residence (chi-square=30.76; p=0.000). A detailed narrative analysis of this model can be found below table four.

Table 3: Characteristics of Migrants who have ever tested for HIV, RENEWAL Survey (2008)

CHARACTERISTICS	TESTED		TOTAL
	INTERNAL	INTERNATIONAL	
***Migrant Sample:** Internal International **$x^2(1)=8.16$ Pr=0.004**	164(72.3)	63(27.8)	**227**(100)
Duration of Stay: Less than one year One to four years 5 years and above **Total** **$x^2(2)=0.46$ Pr=0.793**	7(63.6) 55(74.3) 103(72.5) **166(72.5)**	4(36.4) 19(25.7) 39(27.5) **63(27.5)**	11(100) 74(100) 142(100) **227(100)**
***Age:** 18-27 28-37 38-47 48+ **Total** **$x^2(3)=8.35$ Pr=0.039**	56(69.1) 54(67.5) 26(72.2) 28(93.3) **164(72.2)**	25(30.9) 26(32.5) 10(27.8) 2(6.7) **63(27.8)**	81(100) 80(100) 36(100) 30(100) **227(100)**
Sex: Male Female **Total** **$x^2(1)=1.59$ Pr=0.207**	40(65.6) 122(74.9) **162(72.0)**	21(34.4) 42(25.6) **63(28.0)**	61(100) 164(100) **225(100)**
***Education:** No Education Primary Secondary Tertiary **Total** **$x^2(3)=10.84$ Pr=0.013**	10(90.9) 34(87.2) 95(65.5) 12(70.6) **151(71.6)**	1(9.1) 4(12.8) 50(34.5) 5(29.4) **60(28.4)**	11(100) 38(100) 145(100) 17(100) **211(100)**
***Income earner :** Not Earning Earning **Total** **x2(1)=5.28 Pr=0.021**	100(78.9) 63(64.3) **163(72.8)**	27(21.1) 34(35.7) **61(27.2)**	127(100) 97(100) **224(100)**
***Type of Residence:** Formal Informal **Total** **$x^2(1)=30.76$ Pr=0.000**	95(89.6) 69(57.0) **164(72.2)**	11(10.4) 52(43.0) **63(27.8)**	106(100) 121(100) **227(100)**
State of Health: Poor Average Good **Total** **$x^2(2)=1.20$ Pr=0.547**	18(81.8) 21(65.6) 125(71.4) **164(72.2)**	4(18.2) 10(34.4) 49(28.6) **63(27.8)**	22(100) 31(100) 174(100) **227(100)**

Perception of HIV risk:			
No risk			
Some risk	74(67.9)	35(32.1)	109(100)
High risk	70(74.5)	24(25.5)	94(100)
Total	16(94.1)	1(5.9)	17(100)
$x^2(2)=5.28$ Pr=0.071	**160(72.7)**	**60(27.3)**	**220(100)**
Health Practice:			
Nothing	82(73.2)	30(26.8)	112(100)
Eat Well	33(68.8)	15(31.2)	48(100)
Exercise	21(87.5)	3(12.5)	24(100)
Doctors check up	12(52.2)	10(47.8)	22(100)
Psychological	7(70.0)	3(30.0)	10(100)
Total	**155(71.8)**	**61(28.2)**	**216(100)**
$x^2(4)=5.93$ Pr=0.204			
Knows testing facility:			
No	33(61.1)	20(38.9)	53(100)
Yes	131(57.7)	43(42.3)	174(100)
Total	**164(72.2)**	**63(27.8)**	**227(100)**
$x^2(1)=3.21$ Pr=0.073			
Knows HIV+ person:			
No	118(69.8)	50(30.2)	168(100)
Yes	46(76.7)	13(23.3)	59(100)
Total	**164(72.2)**	**63(27.8)**	**227(100)**
$x^2(1)=1.39$ Pr=0.238			
Ever had TB:			
No	156(70.9)	62(29.1)	218(100)
Yes	8(88.9)	1(11.1)	9(100)
Total	**164(72.2)**	**63(27.8)**	**227(100)**
$x^2(1)=1.26$ Pr=0.261			
Knows that ART is free:			
No			
Yes	23(74.2)	7(25.8)	30(100)
Total	136(70.8)	56(29.2)	192(100)
$x^2(1)=0.57$ Pr=0.450	**159(71.6)**	**63(28.4)**	**222(100)**

*p<0.05 denotes significance as the test were run using 95% significant level; n=227 Excluded JHB natives and non-testers

Age:

Sixty-nine per cent (69%; *n*=56) of 18-27 year olds who tested are internal migrants. Thirty-one percent of 18-27 year olds who tested are international migrants (31%; *n*=25). Almost 68% (*n*=54) of year olds who tested are internal migrants. While only 32% (*n*=26) of the 28-37 year olds who tested are international migrants. Seventy-two percent 72% (*n*=26) of people in the 38-47 age groups who tested are internal migrants. While 28% (*n*=10) of people aged 38-47 year olds who tested are international migrants. Ninety-Three percent (93%; *n*=28) of people in the 48 and above age group who reported HIV testing are internal migrants, while only 7% (*n*=2) in the same age group who tested for HIV were international migrants. These findings are statistically significant (chi-square=8.35; p=0.039).

Sex:

Of the males who reported going for HIV testing, 66% (*n*=40) were internal migrants, while 34% (*n*=21) were international migrants. Amongst the females 75% (*n*=122) who reported having had an HIV test were internal migrants, while 26% (*n*=42) were international migrants. This finding is not statistically significant (chi-square=1.59; p=0.207).

Education:

Education was found to be significantly associated with HIV testing (chi-square=10.84; p=0.013).Of the number of migrants who reported having no education as well as having ever been for HIV testing, almost 91% (*n*=10) were internal migrants, while 9% (*n*=1) were international migrants. Of those who had primary level education and going for HIV testing, 87% (*n*=34) were internal migrants, while almost 13% (*n*=4) were international migrants. Almost 66% (*n*=95) of those who had secondary level education and reported going for HIV testing were internal migrants, while 34% (*n*=50) of their counterparts were international migrants. Of those who had tertiary level education and went for HIV testing, 71% (*n*=12) were internal migrants, compared to 29% (*n*=5) international migrants.

Income earner:

Of those earning who had tested, 64% (*n*=63) were internal migrants while 36% (*n*=34) were international migrants. Of those not earning and who had tested, 79% (*n*=100) are internal migrants compared to 21% (*n*=27) international migrants. This finding is statistically significant (chi-square=5.28; p=0.021).

Type of residence:

Of those migrants who lived in informal settlements and tested, 90% (*n*=95) were internal migrants, compared to 10% (*n*=11) international migrants. Of those who lived in formal housing and accessed HIV testing, 57% (*n*=69) were internal migrants, while 43% (*n*=52) were international migrants. This finding is statistically significant (chi-square=30.76; p=0.000).

State of Health:

Eighty-two percent 82% (*n*=18) of those who reported being of poor health and ever having been for HIV testing, were internal migrants while 18% (*n*=4) were international migrants. Of those in average

health and tested for HIV, 66% (*n*=21) were internal migrants compared to 34% (*n*=10) international migrants. Seventy-one percent (71%;*n*=125) of migrants who reported being of good health and ever having been for HIV testing were internal migrants while almost 29%(*n*=49) were international migrants. This finding is not statistically significant (chi-square=1.20; p=0.547).

Perception of HIV risk:

Of those who perceived themselves to be of no risk of contracting HIV, but going for HIV testing, 68% (*n*=74) were internal migrants, compared to 32% (*n*=35) of international migrants. Amongst those who perceived themselves to have some risk of contracting HIV and reported ever having been for HIV testing, 74% (*n*=70) were internal migrants, while 26% (*n*=24) were international migrants. Of those who reported being of high risk of contracting HIV and ever going for HIV testing, 94% (*n*=16) were internal migrants compared to 6% (*n*=1) of international migrants. Perception of HIV risk was found to be not significant (chi-square=5.28; p=0.071) against HIV testing.

Health seeking practice:

Of those who reported doing nothing as a health seeking practice but going for HIV testing, 73% (*n*=82) were internal migrants, compared to 27% (*n*=30) international migrants. Amongst migrants who eat well as a health seeking practice, and still went for HIV testing 69% (*n*=33) were internal migrants, while 31% (*n*=15) were international migrants. Of those who reported exercise as a health seeking practice going for HIV testing, 88% (*n*=21) were internal migrants. This is compared to 12% (*n*=3) of international migrants. Those who reported going for doctor's check-ups and HIV testing comprised of 52% (*n*=12) internal migrants and 48% (*n*=10) international migrants. Of those who reported psychological/spiritual methods as a health seeking practice as well as going for HIV testing, 70% (*n*=7) were internal migrants, compared to 30% (*n*=3) international migrants. Health seeking practice is not significantly associated with HIV testing (chi-square=5.93; p=0.204).

Knows testing facility:

Of those who reported knowing a testing facility and HIV testing 58% (n=131) were Internal migrants. This is compared to 42% (n=43) international migrants. Those who reported not knowing a HIV testing facility but going for HIV testing comprised of 61% (n=33) internal migrants compared to 39% (n=20) international migrants. This finding was not statistically significant (chi-sqaure3.21; p=0.073).

Knows HIV positive person:

Amongst those who know an HIV positive person and went for HIV testing, 77% (*n*=46) were internal migrants compared to 23% (*n*=13) international migrants. Those who do not know an HIV positive person but went for HIV testing were accounted for by 70% (n=118) internal migrants and 30% (n=50) international migrants. This finding is not statistically significant (chi-square=1.39; p=0.238).

Ever been diagnosed with Tuberculosis:

Of those who have ever been diagnosed with Tuberculosis and reported having been for HIV testing, 89% (*n*=8) were internal migrants compared to 11% (*n*=1) international migrants. Amongst those who have never been diagnosed with TB but went for HIV testing, 71% (n=156) are internal migrants, while 29% (n=62) are international migrants. This finding is not statistically significant (chi-square=1.26; p=0.261).

Knows that antiretroviral treatment is free:

Of those who know that ART is free, and reported having tested, 71% (*n*=136) were internal migrants compared to 29% (*n*=56) international migrants. Amongst those who do not know that ART is free, but went for HIV testing, 74% (n=23) were internal migrants compared to 26% (n=7) international migrants. This finding was not statistically significant (chi-square=0.57; p=0.450).

4.3.2 HIV testing prevalence among Johannesburg residents

Table four presents the levels of HIV among Johannesburg residents for comparative purposes between migrants and Johannesburg natives. Johannesburg residents who have been for HIV testing are reported on in this section, while referring to the table will give clarity on the numbers of those who did not go for testing. Overall, out of a total of 487 respondents, 251(51.75%) went for HIV testing while 234 (48.25%) did not. When comparing international and internal migrants we see that internal migrants have a higher likelihood (56%; *n*=164) of getting tested than international migrants (42%; *n*=63). Furthermore, when comparing migrants and Johannesburg natives, we see that internal migrants had a slightly higher likelihood of getting tested for HIV (56%; *n*=24) compared to Johannesburg natives (55%; *n*=44) and international migrants (42%). This finding is statistically significant at the 5% level, with a p-value of 0.016 (chi-square=8.32). The variables that are significant against HIV testing are: sex (chi-squared=6.18; p=0.000); income (chi-square=9.71; p=0.002); type of residence (chi-square=15.49; p=0.000), knows testing facility (chi-square=37.21; p=0.000), knows HIV positive person (chi-square =12.55; p=0.000) and knows that ART is free (chi-square=18.24; *n*=0.000). A detailed discussion of the bivariate findings may be found below table 5.

Table 4: Characteristics of Johannesburg residence by their HIV testing prevalence, RENEWAL Survey (2008)

CHARACTERISTICS	TESTED [n (%)]	DID NOT TEST [n (%)]	TOTAL [n (%)]
***Johannesburg residents**			
JHB Natives	24(54.5)	20(45.5)	291(100)
Internal migrants	164(56.4)	127(43.6)	150(100)
International migrants	63(42.0)	87(58.0)	44(100)
Total	**251(51.8)**	**234(48.1)**	**485(100)**
$x^2_{(2)}$=8.322 Pr=0.016			
Duration of Stay:			
Last 12 months	17(58.6)	12(41.4)	29(100)
13-59 months	67(50.8)	82(49.2)	132(100)
60 months and above	143(51.3)	120(48.8)	279(100)
Total	**227(51.6)**	**213(48.4)**	**440(100)**
$x^2_{(2)}$=0.62 Pr=0.732			
Age:			
18-27	81(47.9)	88(52.1)	169(100)
28-37	80(51.3)	76(48.7)	156(100)
38-47	36(60.0)	24(40.0)	60(100)
48+	30(53.6)	26(46.4)	56(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(3)}$=2.70 Pr=0.441			
***Sex:**			
Male	61(31.6)	132(68.4)	193(100)
Female	164(66.9)	81(33.1)	245(100)
Total	**225(51.4)**	**213(48.6)**	**438(100)**
$x^2_{(1)}$=6.18 Pr=0.000			
Education:			
No education	11(55.0)	9(45.0)	20(100)
Primary	38(55.1)	31(44.9)	69(100)
Secondary	145(48.5)	154(51.5)	299(100)
Tertiary	17(54.8)	14(45.2)	31(100)
Total	**211(50.4)**	**208(49.6)**	**419(100)**
$x^2_{(3)}$=1.62 Pr=0.654			
***Income**			
Not Earning	127(58.8)	89(41.2)	216(100)
Earning	97(43.9)	124(56.1)	221(100)
Total	**224(51.3)**	**213(48.7)**	**437(100)**
$x^2_{(1)}$=9.71 Pr=0.002			
***Residence**			
Formal	106(63.5)	61(36.5)	167(100)
Informal	121(44.2)	153(55.8)	274(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(1)}$=15.49 Pr=0.000			
State of Health:			
Poor	22(71.0)	9(29.0)	31(100)
Average	31(44.9)	38(55.1)	69(100)
Good	174(51.0)	167(49.0)	341(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(2)}$=5.92 Pr=0.052			

Perception of HIV risk			
No risk	109(48.0)	118(52.0)	227(100)
Some risk	94(53.1)	83(46.9)	177(100)
High risk	17(68.0)	8(32.0)	25(100)
Total	**220(51.3)**	**209(48.7)**	**429(100)**
$x^2_{(2)}$=4.00 Pr=0.135			
Health Seeking practice			
Nothing	112(46.9)	127(53.1)	239(100)
Eat well	48(55.2)	39(44.8)	87(100)
Exercise	24(48.0)	26(52.0)	50(100)
Doctors check ups	22(73.3)	8(26.7)	30(100)
Spiritual/Psychological methods	10(50.0)	10(50.0)	20(100)
Total	**216(50.7)**	**210(49.3)**	**426(100)**
$x^2_{(4)}$=8.40 Pr=0.078			
***Knows testing facility**			
No	53(32.5)	110(67.5)	163(100)
Yes	174(62.6)	104(37.4)	278(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(1)}$=37.21 Pr=0.000			
***Knows HIV+ person**			
No	168(47.3)	187(52.7)	355(100)
Yes	59(68.6)	27(31.4)	86(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(1)}$=12.55 Pr=0.000			
Tuberculosis			
No	218(51.0)	209(49.0)	427(100)
Yes	9(64.3)	5(35.7)	14(100)
Total	**227(51.5)**	**214(48.5)**	**441(100)**
$x^2_{(1)}$=0.95 Pr=0.330			
***Knows that ART is free**			
No	30(31.9)	64(68.1)	94(100)
Yes	192(56.8)	146(43.2)	338(100)
Total	**222(51.4)**	**210(48.6)**	**432(100)**
$x^2_{(1)}$=18.24 Pr=0.000			

*p<0.05 denotes significance as the test were run using 95% significant level; n=487

Duration of stay in the city:

The level of HIV testing decreases in percentage as duration of stay increases in years. Amongst those who have been for HIV testing, the majority (59%; *n*=17) are those who have been in Johannesburg for less than a year. Those who have been in the city for 1-4 years have a lower percentage of testing than those in 12 months and below group at 50% (*n*=67). While those who have 5 years and more in Johannesburg have a 51% (*n*=143) chance of testing, this is less than those in the 12 months and below category. This finding is not statistically significant (chi-square=0.62; p=0.732).

Age differentials of HIV testing:

Those in the youngest age group (18-27) have the lowest percentage of HIV testing at (48%; *n*=81). Those in the (28-37) age group have the second lowest percentage of HIV testing at (51%; *n*=80). Those in the (38-47) have the highest percentage of HIV testing at (60%; *n*=36). Those in the oldest age group (48+) have the second highest percentage of HIV testing (54%; *n*=30). Overall, age is not statistically significant (chi-squared=2.70; p=0.441).

Gender dynamics of HIV testing:

More female migrants reported having been tested (67%; *n*=164) as compared to their male counterparts (33%; *n*=61); this finding is statistically significant (Chi-squared=6.18; p=0.000).

Level of Education and HIV testing:

Those with secondary education reported the lowest percentage (48%; *n*=145). Those with no education, primary and tertiary were almost tied in their levels of HIV testing at 55% (*n*=11), 55% (*n*=38) and 54.8% (*n*=17) respectively. Education was not significantly associated with HIV testing.

Income earning:

Those not earning an income reported a higher percentage (59%; *n*=127) of testing as compared with those earning (44%; *n*=97).Income is significantly associated with HIV testing (Chi-square=9.71; p=0.002).

Type of residence:

People who reside in formal housing reported a higher percentage (64%; *n*=106) of testing for HIV than residents of informal settlements (44%; *n*=121). Type of residence is significantly associated with HIV testing (chi-square=15.49; p=0.000).

Self-reported state of Health:

Of those reporting being of poor health, (71%; *n*=22) have tested. Meanwhile 45% (*n*=31) of those who reported being of average health, and 51% (n=174) of those who reported being in good health had tested. This finding is not statistically significant (chi-square=5.92; p=0.052).

Perceived HIV risk:

Sixty-eight percent (68%; *n*=17) of those who thought they had a high risk of contracting HIV tested. Fifty-three percent (53%; *n*=94) of those who thought they had some risk of contracting HIV tested. Of those who reported having no risk of contracting HIV, 48% (*n*=109) had tested. This finding is not statistically significant (chi-square=4.00; p=0.135).

Health seeking practices:

Fourty-seven percent (47%; *n*=112) of those reporting having done nothing to keep healthy tested for HIV, 55% (*n*=48) of those who reported eating well tested, 48%(*n*=24) of those who reported exercising tested, 73% (*n*=22) who went for doctors check-ups tested, while 50%(*n*=10) who reported spiritual or psychological methods such as praying, being part of a support group and trying not to stress tested. This finding is not statistically significant (chi-square=8.40; p=0.078).

Knows testing facility:

Those who know a testing facility have a higher percentage of HIV testing (63%; *n*=174) than those who do not (33%; *n*=53). Knowing a HIV testing facility is significantly associated with HIV testing (chi-square=37.21; p=0.000).

Knows HIV positive person:

Knowing a HIV positive person was significantly associated with HIV testing (chi-square =12.55; p=0.000). Residents who know a HIV positive person reported a higher percentage of HIV testing at 69% (*n*=59) than those do not 47% (*n*=168).

Ever diagnosed with Tuberculosis (TB):

Those who reported that they have had tuberculosis before were more likely to test (64%; *n*=9). Fifty-one percent (51%; *n*=218) of those who had never had tuberculosis- tested for HIV. This finding was not statistically significant (chi-square=0.95; p=0.330).

Knows that antiretroviral treatment is free (ART):

Knowing that antiretroviral medication is free is significantly associated with HIV testing (chi-square=18.24; p=0.000). Amongst those who reported that they know that antiretroviral medication is free, 57% (*n*=192) tested for HIV, whereas 32% (*n*=30) of those who were not aware that ART is free tested.

4.4 MULTIVARIATE ANALYSIS

Table 5 presents the results of the multivariate logistic regression analysis conducted to examine the factors associated with HIV testing amongst internal and international migrants only. Table 6 presents the results of the multivariate logistic regression analysis conducted to examine factors associated with HIV testing amongst all Johannesburg residents. A decision was made to use separate the multivariate models since migrant sample and Johannesburg residents as variables, proved to be insignificant against HIV testing at the multivariate level. Even though these variables were only significant at bivariate level, they are presented in these two tables because they form part of the main independent variables in the study. Only variables that were significant at the bivariate level were taken into both multivariate models. Variables that seized to be significant at the multivariate level are not presented.

4.4.1 Factors associated with HIV testing amongst internal and international migrants only

Table 5 presents the logistic regression model of Migrants only by factors associated with HIV testing. International migrants were less likely (0.74) to get tested compared to internal migrants. This finding is not statistically significant (95% CI 0.47 to 1.16; p=0.193) Out of all the variables that were significant at the bivariate level, only two were significantly associated with HIV testing in the multivariate analysis model. These are: Income and type of residence. Those who were not earning a salary were less likely (0.60) to get tested for HIV compared to those who were earning a salary. This finding was significant (95% CI 0.40 to 0.90, p=0.016). Migrants who resided in informal settlements were less likely (0.58) to get tested for HIV compared to those who resided in formal housing. This finding was statistically significant (95% CI 035 to 0.94, p=0.028)

Table 5: Logistic regression of Migrants only by their factors associated with HIV testing, RENEWAL Survey (2008)

VARIABLES	ADJUSTED ODDS RATIO (OR)	P > Value	[95% CONFIDENCE INTERVAL]
Migrant Sample			
Internal migrants *(RC)*	1.00		
International migrants	0.74	0.193	0.476 1.161
Income:			
Earning *(RC)*	1.00		
Not Earning	0.60	0.016*	0.404 0.909
Type of Residence			
Formal *(RC)*	1.00		
Informal	0.58	0.028*	0.358 0.942

RC= Reference Category, *p<0.05 denotes significance as the test were run using 95% significant level.

4.4.2 Factors associated with HIV testing amongst Johannesburg residents

Table 6 shows Logistic regression of Johannesburg residents by factors associated with HIV testing. There was no difference between HIV testing in internal migrants and international compared to Johannesburg natives at 1.22 and 1.24 odds, respectively. This finding is not statistically significant (CI 0.56 to 2.65 p=0.609) internal migrants and (CI 0.53 to 2.88 p=0.615) international migrants. Females were found to be three times more likely (3.13) to test for HIV when compared to males. Sex was significantly associated with HIV testing (95% CI 2.01 to 4.88; p=0.000). The odds of getting a HIV test by those who resided in an informal settlement were less (0.48) when comparing with those who stay in formal housing. Type of residence was found to be significantly associated with HIV testing (95% CI 0.29 to 0.76; p=0.003). Residents who knew where to locate a HIV testing facility are 2.22 times more likely to get tested for HIV as compared to those who did not know where to find one. Knows HIV testing facility was found to be significantly associated with HIV testing (95% CI 1.41 to 3.50; p=0.001). Residents who know that anti-retroviral treatment (ART) is free were three times as likely (3.05) to get tested for HIV as compared to those who are not aware that ART is free. Awareness that ART is free is statistically significant (95% CI 1.93 to 4.83; p=0.000).

Table 6: Logistic regression of Johannesburg residents by factors associated with HIV testing, RENEWAL Survey (2008)

VARIABLES	ADJUSTED ODDS RATIO (OR)	P > Value	[95% CONFIDENCE INTERVAL]	
Johannesburg residents:				
JHB Natives *(RC)*	1.00			
Internal migrants	1.22	0.609	0.563	2.655
International migrants	1.24	0.615	0.534	2.886
Sex:				
Male *(RC)*	1.00			
Female	3.13	0.000*	2.013	4.888
Type of Residence				
Formal *(RC)*	1.00			
Informal	0.48	0.003*	0.296	0.780
Knows testing facility				
No *(RC)*	1.00			
Yes	2.22	0.001*	1.417	3.500
Knows that ART is free				
No *(RC)*	1.00			
Yes	3.05	0.000*	1.933	4.833

CHAPTER 5

5.1 DISCUSSION

This section serves as the discussion of the findings of the study: Factors associated with HIV testing among residents of Johannesburg. A synthesis of the findings was done, significant findings and interesting observations discussed. Overall, factors that are significantly associated with HIV testing amongst residents are: sex (95% CI 2.01 to 4.88; p=0.000); type of residence (95% CI 0.29 to 0.78; p=0.003) and (95% CI 0.35 to 0.94; p=0.028) ; knows where to locate a testing facility (95% CI 1.41 to 3.50; p=0.001) and awareness that ART is free (95% CI 1.93 to 4.83; p=0.000); Income (95% CI 0.40 to 0.90; p=0.016). Therefore the hypotheses that state that: there is an association between sex; type of residence; knowing a HIV testing facility; awareness that anti-retroviral treatment is free, income and HIV testing are accepted and found to be true. Importantly, migrant status was not significantly associated with HIV testing.

COMPARISON ON INTERNAL MIGRANTS AGAINST INTERNATIONAL MIGRANTS

The hypothesis stating that international migrants have a lower likelihood of getting tested for HIV when compared to internal migrants was tested and proven correct at the bivariate level as levels of HIV testing were found to be higher amongst internal migrants (56%) when compared to international migrants (42%), ($x^2_{(1)}$ =0.62; Pr=0.004). Furthermore, those migrants who were not earning a salary were less likely (0.60) to get tested for HIV compared to those who were earning a salary. This finding was significant (95% CI 0.40 to 0.90, p=0.016). The differentials in the uptake of HIV testing may be attributed to the conditions that lead people to migrate internationally in the first place, keeping in mind that migration may not always be voluntary (Quinn, 1994). In some cases, those very conditions such as, for example famine, war and poverty in the country of origin that forced migrants to move, may result in low use of health services as they may not be fully prepared financially (Soskolne & Shtarkshallc, 2002). International migrants face loss of social network which affects the resources that they have at their disposal (Berkman et al, 2000). In the absence of a strong social network to cushion them when in need of financial or other forms of assistance; the finances that would be used for accessing health care are re-directed to acquiring resources that will ensure that they settle well in the

host country. These findings are consistent with those in the literature in London by Fenton et al (2002), as well in Belgium where limited financial resources were a concern for some subgroups namely youth, asylum seekers, and recent migrants (Fenton et al, 2002; Manirankunda et al, 2009)

Furthermore, international migrants may be afraid of testing due to the consequences that may affect their residency and stability in the host country (Amon & Todrys, 2008; HRW, 2009). Other factors may be due to intimidation, xenophobia and victimisation of migrants when they try and access health care services (Amon & Todrys et al, 2008; HRW, 2009). This is exacerbated by the moral stigma that a positive HIV diagnoses carries, regardless of nationality or community of origin (Yoder, 2004; Steinberg, 2011; Buldeo, 2012). Therefore when weighing ones options, migrants may be choosing not to access testing due to the risk of being discriminated against not only for their nationality but also if the test comes out positive.

Another possible explanation for lower levels of HIV testing may be due to the fact that international migrants do not actually take the step to test as their perception of risk is low as they arrive in the host community in a healthy state. This relates to the theory of the "healthy migrant effect" (Pophiwa, 2009: 5) that has been discussed in some literature, suggesting that in most cases, healthy people migrate from their communities of origin for economic reasons, not as disease carriers (Adeokun, 2006; Pophiwa, 2009; Vearey, 2011). This finding is consistent with that of a study investigating whether migrants move for health seeking or not. The study, which was looking at Zimbabwean migrants in South Africa found that most Zimbabwean migrants, who were relatively newly arrived, did not seek healthcare in South Africa neither did they report ever falling ill (Pophiwa, 2009). Furthermore, migrants tend to be in their most economically productive years (Adeokun, 2006).

It is important to note that at the multivariate level, when taking into account other variables, migrant status was found to be insignificant against HIV testing. This finding is contrary to that of Fenton et al (2002), who in their study of HIV testing amongst African migrants living in London found that nationality was significantly associated with HIV testing in men (Fenton et al, 2002).

COMPARISON OF MIGRANTS AGAINST JOHANNESBURG NATIVES

There was only a slight difference between Johannesburg natives and internal migrants who reported 55% chance of HIV testing ($x^2_{(2)}$ =8.32; Pr=0.016). These findings were significant at the bivariate level and not at the multivariate level. Though there is very little difference between these two groups, it remains an important point to consider as it relates to the hypothesis that states that there would be higher levels of HIV testing amongst Johannesburg natives, when compared to migrants. This hypothesis is accepted when it comes to international migrants, yet it is rejected when looking at internal migrants. Possible explanations are related to stigma that HIV has. Johannesburg natives, although they may have access to health services, may not be actively trying to access HIV testing due to a fear of the effect that a positive result may have on other peoples view of them. This is consistent with findings in the rural Eastern Cape by Hutchinson & Mahlalela (2006); in the North West Province by Sibanda (2011) and in Johannesburg by Buldeo (2012) in all these studies, though set in different contexts using different study populations, stigma emerged as a barrier to HIV testing.

OTHER FACTORS ASSOCIATED WITH HIV TESTING AMONGST MIGRANTS

Gender is an important determinant of HIV testing as females are more likely to go for HIV testing as compared with males with 67% versus 31% at the Bivariate level. At multivariate level, following adjusting for other characteristics, females were three times (OR 3.13; 95% CI 2.01 to 4.88; p<0.000) more likely to get tested for HIV as compared to males. These findings are understandable as women generally have more contact with health care systems, especially reproductive health care services as they attend antenatal care in case of pregnancies as well as other scans and examinations for diseases such as cancer. These findings are consistent with those of studies conducted by WHO (2002) which found that current trends show that in most high HIV prevalence countries, such as South Africa, more women than men test and access treatment. However, they are the opposite of the findings in the Fenton et al (2002) study which found that 34% of men and 30% of women reported ever having had an HIV test as well as those of Nwachukwu & Odimegwu (2011), on HIV testing amongst youth in Nigeria who found that males had higher uptake of VCT than females in all regions of that country.

Type of place of residence is an important aspect to consider when studying determinants of health as there are places that are known as spaces of vulnerability (IOM,2010) in which migrants find themselves that increase their susceptibility to disease and decrease their chances of accessing adequate healthcare. Urban HIV prevalence has previously been found to be double that of rural areas and highest within urban informal settlements in South Africa (Vearey et al, 2010). Bivariate findings in the present study show that migrants who reside in informal settlements have a 44% of getting tested for HIV as compared with those who reside in formal housing at 63%. Multivariate results show that Johannesburg residents who reside in informal settlements are less likely (0.48) to get tested for HIV when comparing with those who stay in formal housing (95% CI 0.29 to 0.78; $p<0.003$). When looking at migrants only, we see that type of residence is also significant as migrants who reside in informal settlements are less likely (0.58) to get tested compared to those who reside in formal housing(95% CI 0.35 to 0.96; $p<0.028$).

Location or knowledge of an HIV testing facility has been found to have a positive association with the uptake of testing. Bivariate findings in this study reveal that migrants who know where to find a testing facility are three times more likely to get tested for HIV at 63% as compared to those who do not know where to find one at 33%. At multivariate level, the chances of residents who know where to locate a HIV testing facility of getting tested for HIV are twice (OR 2.22; 95% CI 1.41 to 3.50; $p<0.001$) as high as those who do not know where to find one. These findings are consistent with those observed in a study on utilization of voluntary counselling and testing services in the Eastern Cape by Hutchinson & Mahlalela (2006). In that particular study the authors found that proximity to a clinic increased the probability that males would access testing (Hutchinson & Mahlalela, 2006). A similar outcome was found in Zimbabwe, where it was found that amongst others, barriers to HIV testing included proximity of services (Morin et al, 2005). Another possible explanation could be that they know a testing facility elsewhere, before coming to Johannesburg.

Knowledge that one can get treatment for a disease improves their outlook towards it and helps them deal with the possibility of being diagnosed with it. In the case of HIV, a disease that has no cure, treatment is the only hope in sustaining life. At bivariate level, findings of this study show that residents who know that ART is free are more likely to have been for HIV with 57% as compared with those who are unaware at 32%. At multivariate level, residents who know that ART is free are three times as likely

(95% CI 1.93 to 4.83; p<0.000) have been tested for HIV as compared to those who are not aware that ART is free.

The findings in this study particularly the significant associations found between HIV testing and 'knows HIV testing facility' and 'knows that ART is free'-coincide with the erroneous belief in most countries, particularly poor ones, that HIV is a death sentence. People often wonder what the point of testing is if the only 'benefit' is to gain knowledge of one's own premature death-with the added likelihood of discrimination and stigma (Cameron, 2005). Conversely, if treatment is provided as part of the voluntary counselling and testing, people see the 'benefit' of getting tested (Cameron, 2005).This is notwithstanding migrant status, it is across all nationalities and social statuses. It is particularly important to note this as it has been demonstrated in this study that nationality is individually associated with HIV testing at the bivariate level, however when it is viewed in conjunction with other factors, at the multivariate level, it seizes to be significant.

5.2 CONCLUSION AND RECOMMENDATIONS

The extent to which migration increases vulnerability to HIV is context-specific and depends upon numerous overlapping individual, socio-economic and epidemiological factors (Roberts & Patel, 2010). This study has looked demographic, socio-economic and behavioural factors which serve as categories for explanatory variables for accessing HIV testing. It has found some interesting associations. Specifically, overall significant associations between HIV testing and: knowledge that anti-retroviral treatment is free, knows testing facility, residence, income earner, sex were found. The predominance of behavioural factors in the significant associations observed reinforces the importance of social determinants of health. These behaviours are essentially based on knowledge and familiarity with people and facilities that encourage health seeking behaviour.

However, it is important to note that even though residents knew that antiretroviral medication is free and where to locate a testing facility, this did not automatically translate to hundred percent uptake of HIV testing. A possible explanation for the fact that the numbers of HIV testers are low even though there are a more people who know that ART is free is that people may have tested and then found out that ART is free afterwards. Furthermore, they may know that ART is free in the places of origin and

may not be sure if the same policy applies in Johannesburg. This highlights a need for the translation of knowledge of health seeking behaviour and resources that enhance it to action. Public health interventions are needed to bridge that gap between knowledge and action. This gap is often caused by the fear of positive results as well as stigma and discrimination that follows this. This is a trend that is common across all communities. Therefore there needs to be interventions that are targeted and purposively designed to change perceptions about HIV and educate people about the disastrous population impact that HIV has in the long run and how this can be curbed by higher uptake of testing and initiation of antiretroviral medication in order to prevent onward transmission.

Other societal factors that are related to patriarchal norms such as multiple sexual partners for men and their tendency to shy away from health care facilities in order to assert their masculinity need to be addressed. Furthermore, the fact that there is a disjuncture between policy on HIV services and implementation also needs to be addressed-especially relating to key populations such as migrants, women and children, people living in informal settlements as well as those of lower socio-economic status. There needs to be more purposeful research into HIV testing and other interventions into urban informal settlements as 'any attempt to improve the health of urban populations in the context of migration and HIV requires an understanding that place matters' (Vearey et al, 2010). This study has demonstrated this fact. More importantly, this study has demonstrated that HIV has no bounds; it transcends the man-made boundaries of nationality; therefore prevention strategies and further studies into HIV testing that do the same, are needed.

5.3 LIMITATIONS OF THE STUDY

Since this study is based on secondary data analysis it has no control over purpose, choice, or method of data collection. Therefore, some variables that are needed had to be derived or proceeded without. This is a cross-sectional study design, it collects the exposure and the outcome at the same time and it cannot tell us about causal relationships, meaning it cannot tell us if behavioural, demographic and socio economic factors result in a person testing but can only tell us about association between the above mentioned factors and HIV testing. Therefore it is not easy to know which action came first. For instance the numbers in the survey reveal that there are less people who tested than there is who knew that ART is free. At face value this does not make sense as one would expect that knowledge that

treatment is free would be a motivating factor for testing uptake. However a possible explanation could be that people may have tested and then found out that ART is free afterwards. Therefore the numbers reflect the true reflection of testers and those that knew that ART is free, but not exactly how many amongst those did and did not and when exactly they found out that ART is free. Another point to consider is that the definition of HIV testing in this study takes into account testing at any facility and does not consider where and when testing occurred. Lastly, the data is centred on Johannesburg; therefore it might be difficult to generalise the findings to the whole country. Migrants are a dynamic, heterogeneous population therefore the full extent of the levels of HIV testing and the reasons for it can never be captured.

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