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Migration status and HIV risk perception in metropolitan areas of Gauteng Province

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MIGRATION STATUS AND HIV RISK PERCEPTION IN METROPOLITAN AREAS OF GAUTENG PROVINCE

BY

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A Research Report submitted to the Faculty of Health Sciences in Partial fulfilment of the Requirements for the Degree of

MASTER OF SCIENCE IN EPIDEMIOLOGY IN THE FIELD OF EPIDEMIOLOGY AND BIOSTATISTICS

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THE UNIVERSITY OF THE WITWATERSRAND

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NOVEMBER 2017

Candidate's Declaration

I Melitah Motlhale, hereby declare that this research report is my own work. I have acknowledged and referenced all resources where the work was solicited from elsewhere. I hereby submit this report for the partial fulfilment of Master of Science in Epidemiology in the field of Epidemiology and Biostatistics and this work has never been submitted for any degree at this or any other University before.

Ethics Clearance Number: M170128

Signature:

Date:

Abstract

Background

Risk perception has serious implications for health if the risk assessment informing the risk perception is accurate and well-reasoned. Gauteng Province is characterised by a high concentration of migrants and this sub-population may find themselves in compromising conditions that might heighten their risk of contracting HIV. HIV risk perception research in South Africa has been carried out on several high-risk populations but not among migrants. The aim of this study was to examine the association between migration status and HIV risk perception as well as to identify the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province in 2012.

Methods

This was a secondary data analysis of data collected from a cross-sectional household survey that was conducted to explore the needs and vulnerabilities of the poor urban groups residing in the Metropolitan Municipalities of Gauteng Province in 2012. A total of 1 834 respondents made up of non-migrants, internal and international migrants qualified for this study. Pearson's chi-square test was used to assess the association between migration and HIV risk perception. Unadjusted and adjusted logistic regression models were fitted to identify factors associated with HIV risk perception.

Results

Of the total respondents, 55% considered themselves not to be at risk of HIV infection. There was a strong statistical association between migration status and HIV risk perception (p-value = 0.001). Internal migrants (50.4%) were more likely to perceive themselves as being at risk than international migrants (43.4%) and non-migrants (40.3%). Using the 95% Confidence Interval, from the adjusted logistic regression; age (AOR = 0.97; CI: 0.96, 0.98), Metropolitan area (AOR = 1.31; CI: 1.02, 1.68), common perceived health problem as HIV or TB (AOR = 2.03; CI: 1.55, 2.65) and accessibility to HIV information and treatment (AOR = 0.65; CI: 0.45, 0.98) were associated with HIV risk perception.

Conclusion

This study showed low HIV risk perception among residents of Gauteng Metropolitan area. There is a strong association between migration status and HIV risk perception. Low risk perception despite the presence of HIV risk factors suggests the need for programmes aimed at creating awareness about HIV and promoting adoption of preventive health lifestyle among migrants and non-migrants in Gauteng Metropolitan area.

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List of Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
EAs	Enumerator Areas
EMM	Ekurhuleni Metropolitan Municipality
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
IOM	International Organization for Migration
JMM	Johannesburg Metropolitan Municipality
StatsSA	Statistics South Africa
TMM	Tshwane Metropolitan Municipality
UNAIDS	United Nations Programme on HIV/Acquired Immuno-Deficiency Syndrome
UNDP	United Nations Development Programme
UOR	Unadjusted Odds Ratio

Definition of terms

Areas type: It can be an informal settlement, inner city or township/periphery.

Ex-offender: An individual who has been previously convicted of a crime and imprisoned (Peltzer et al., 2011).

Enumeration Areas: The smallest geographical unit used as a primary sampling unit.

Informal settlement: An illegal settlement on un-surveyed land or proclaimed as residential mainly made up of informal dwellings (shacks) StatsSA, (2012).

Inner city: Deprived area located in the centre of the Metropolitan area.

Internal migrant: An individual born in other parts of South Africa and lived less than ten years in the Metropolitan area.

International migrant: An individual born outside South Africa and lived in the Metropolitan area for a minimum duration of three months.

Metropolitan area: An area made up of a crowded urban core and a less populated surrounding territory. The Metropolitan areas used for this study are Ekurhuleni, Johannesburg and Tshwane (Pretoria).

Non-migrants: An individual born in the Metropolitan area and lived there for ten or more than ten years.

Township/Periphery: Area that is not in the inner city or in the informal settlement and is not an affluent suburb, also as townships or an RDP settlement.

Chapter 1

Introduction

1.0 Introduction

This chapter provides background information on HIV risk perception in South Africa and globally. The problem statement, justification, aim and objectives of this research report are also given. Literature discussing theories behind risk perception, migration in South Africa, migration and health as well as factors associated with HIV risk perception are also reviewed.

1.1 Background

Risk perception can be defined as the perception of the possibility of some future event in which the certainty of a given outcome is unknown (Prohaska et al., 1990). HIV risk perception has largely been operationalised as a cognitive assessment of risk, or the likelihood of becoming infected with HIV (Napper et al., 2012). In studying health and disease, risk perception is considered critical in explaining why people engage in health behaviours that reduce or increase their likelihood of contracting certain diseases (Napper et al., 2012, Becker and Janz, 1987). Most theories and leading models of health behaviour build on the concept of risk perception yet little is known of what determines this perception (Becker and Janz, 1987).

Risk perception differs according to different population groups (Dahal et al., 2013). Several studies on HIV risk perception have been carried out on migrants in Canada, Nepal, China and the Netherlands (Baidoobonso et al., 2013, Dahal et al., 2013, El-Karimy et al., 2001, Sharma et al., 2012, Joshi et al., 2014). Studies on HIV risk perception have also been carried out among adolescents in Northern Laos (Sychareun et al., 2013), University students in Thailand (Khawcharoenporn et al., 2016) and among the British population (Clifton et al., 2016). In Africa, studies have been carried out among college students, University students and among migrants in Ethiopia (Shiferaw et al., 2014, Wasie et al., 2015, Mulugeta et al., 2016), among adolescents and young adults in Mozambique (Prata et al., 2006, Shiferaw et al., 2014, Nkomazana and Maharaj, 2014, Khawcharoenporn et al., 2016). A study was also carried out among sexually active University students in Zimbabwe (Prata et al., 2006, Shiferaw et al., 2014, Nkomazana and Maharaj, 2014, Khawcharoenporn et al., 2016), among men who have

sex with men in Nigeria (Eluwa et al., 2015) and among Secondary School students in Uganda (Osingada et al., 2016).

In South Africa, HIV risk perception studies have been carried out among different target groups. Studies have been carried out among sexually active youth, circumcised men, married and cohabiting couples, ex-offenders, female migrants and refugees; however, evidence is sparse on research carried out among migrant population as a whole (Anderson et al., 2007, Maharaj and Cleland, 2005, Tenkorang, 2014, Peltzer et al., 2011, Kenyon et al., 2010, Macintyre et al., 2004). Post 2005, more than 62% of the South African population were living in urban areas, with the rapid urbanization being attributed to migration (Kok and Collinson, 2006, Turok, 2012). Migration is the process of relocating either across an international border post or within a country due to different reasons (Landau and Wa Kabwe-Segatti, 2009).

Migration is an important and a natural part of the economic and social life of every country and it is a key livelihood strategy (Dahal et al., 2013, Clark et al., 2007). The movement of people from one place to another can be good for human development (Gushulak et al., 2010, UNDP, 2009). Migrants who volunteer to migrate are often healthier and younger than the majority in their places of origin and the populations in the receiving communities. Some people migrate because of a need for protection and treatment especially refugees (Kristiansen et al., 2007) and migration positively impacts their health. These effects may fade out over time because migrants are exposed to risk factors in the recipient communities.

Migrants may differ from the non-migrants with respect to social, linguistic, cultural and economic status (Gushulak et al., 2010). The sizes of the migrant population within the receiving communities can significantly cover-up diverse vulnerability including disease. Several studies exploring the association between migration and health have reported that migration can have a negative impact on health, including heightened risk of HIV exposure (Tansey et al., 2010, Vearey, 2012, IOM, 2008, IOM, 2010). Migration can undermine the stability of families leading to tension in family relationships and it can have vast repercussions on public health (Marks, 2002). Population mobility is an unexpressed factor in emerging public health threats and risks that needs to be understood and addressed (Gushulak et al., 2010).

Migrants usually find themselves in compromising situations. For instance, due to poor living conditions women and girls may engage in multiple and concurrent sexual partnerships, sex work, transactional sex and the use of intravenous drugs to better their lives (Dunkle et al., 2004, Chatterji et al., 2005, Lopman et al., 2007). Separation from a spouse or a sexual partner for a prolonged time may also encourage high risk sexual behaviour and this may play a role in HIV risk perception (Brockerhoff and Biddlecom, 1999, Sanders and Sambo, 1991). The underlying HIV prevalence in South Africa may also present an additional risk for migrants (Giorgio et al., 2016). The above-mentioned activities expose migrants to HIV infection and may have an impact on migrants' HIV risk perception. Thus migrants are a key population to examine when studying HIV risk perception.

1.2 Problem statement

The rapid urbanization and increase in the urban poor in Metropolitan areas of Gauteng Province, South Africa has become a major public health concern due to its linkage with increased HIV risk (Grief et al., 2011, Thomas et al., 2010). The deplorable living conditions in which most migrants, especially females find themselves, may lead them to engage in risky sexual behaviours and this increases their vulnerability to HIV (Tiruneh et al., 2015, Baidoobonso et al., 2013, Dahal et al., 2013). Although migrants are considered to be highly vulnerable to HIV, little is known about their HIV risk perception and factors associated with HIV risk perception (Prohaska et al., 1990, Anderson et al., 2007).

There is an information gap on HIV risk perception among migrants and non-migrants and this masks the variation as well as the distribution of HIV risk perception that may exist among this population (Baidoobonso et al., 2013). This has a bearing on the delivery and uptake of preventive interventions (GHPWG, 2008) as perceptions influence attitudes and attitudes influence behaviours (Ajzen and Fishbein, 2005). There is a knowledge gap in exploring the relationship between migration status and HIV risk perception in South Africa. This study seeks to explore the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province.

1.3 Justification

As behavioral and lifestyle changes start from risk perception, understanding the factors associated with HIV risk perception is important because if perceptions are logical, they may lead to the preparedness to avoid risky behaviour (Dahal et al., 2013). Furthermore, HIV risk perception informs the design and implementation of target population specific behavioral interventions and programs aimed at preventing and controlling HIV (Peltzer et al., 2011, Tenkorang, 2014). It is important to understand the specific needs of each target population and to be able to address the challenges that each target population face. Understanding factors that determine HIV risk perception in urban Metropolitan areas of Gauteng Province where there are many migrants and a mixture of people from all walks of life is very important. Therefore, looking at HIV risk perception in relation to migration status is important. This can, in the long run, be instrumental in addressing the challenges faced by communities affected by urban migration. It can also help facilitate healthy migration in South Africa, Southern Africa, and across the continent.

1.4 Research question, aim and objectives

1.4.1 Research question

What are the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province?

1.4.2 Aim

To identify the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province.

1.4.3 Objectives

1. To describe the socio-demographic characteristics of residents in Metropolitan areas of Gauteng Province, South Africa in 2012.

2. To examine the association between migration status and HIV risk perception in Metropolitan areas of Gauteng Province in 2012.
3. To identify the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province in 2012.

1.5 Literature review

1.5.1 Theories of behaviour change

There are underlying principles that have been recognized as theories to describe how behavioural change occurs. There are three commonly cited theories on risk perception through the literature (Janz and Becker, 1984, Rogers, 1983, Catania et al., 1990). The Health Belief Model was developed in an attempt to explain and predict human health behaviours. The model postulates that people who have high risk perception for a negative result are more likely to minimize risky behaviour than those who have low risk perception (Janz and Becker, 1984). The Protection Motivational Theory posits that the intention to be protected depends on the risk perception severity and the chance of an event taking place. This eventually influences the intention to engage in risk reduction behaviours and motivates protection from that particular risk (Rogers, 1983).

The AIDS Risk Reduction Model asserts that people need to acknowledge that their behaviours are risky before behavioural change can take place. Acknowledging sexual practices associated with HIV transmission, high HIV risk perception, believing that contracting HIV is undesirable, prevailing social norms and networking are also hypothesised to influence behavioural change (Catania et al., 1990). These theories acknowledge the importance of risk perception in behavioural change (Becker and Janz, 1987). However, how perceived risk assessment relates to risk behaviour still remains unclear, as studies on HIV risk perception have produced mixed results (Baidoobonso et al., 2013, Dahal et al., 2013, El-Karimy et al., 2001, Sharma et al., 2012, Joshi et al., 2014, Zungu et al., 2016).

Accurate risk perception assessment and the factors that may affect HIV risk perception are necessary for behavioural risk reduction (Janz and Becker, 1984, Rogers, 1983, Catania et al., 1990). HIV risk perception plays a critical role in promoting and maintaining protective behaviour.

1.5.2 HIV risk perception in South Africa

HIV risk perception also provides a critical understanding of how people link their sexual practices to their chance of contracting HIV (Dahal et al., 2013). The HIV pandemic has prompted massive efforts to prevent new HIV infections, largely targeted at high risk behaviours (Maharaj and Cleland, 2005). HIV risk perception can serve as an indicator of behaviour and lifestyle as it is considered to be an integral component in motivating avoidance of risk (Peltzer et al., 2011, Gerrard et al., 1996, Mulugeta et al., 2016). Examination of perceived HIV risk may have effects on health outcomes, if the perception is well reasoned and leads to the preparedness to avoid risky behaviour (Sharma et al., 2012, Dahal et al., 2013).

Several studies carried out in South Africa in different populations found different results. A study carried out on risk perception and condom use among couples reported that a woman's HIV risk perception from her partner was the most powerful predictor of condom use (Maharaj and Cleland, 2005). Ex-offenders considered themselves to be at a relatively low risk yet various risky behaviours were found (Peltzer et al., 2011). Among youth, males were less likely to test for HIV due to a change in sexual behaviour compared to females (Tenkorang, 2014). Risk perception varied according to sex among youth who were engaged in concurrent sexual relations (Kenyon et al., 2010). Youth perceived themselves as not being at risk (Anderson et al., 2007).

HIV risk perception is one of the factors that are more likely to influence uptake and use of interventions aimed at prevention of HIV infections (Sharma et al., 2012). Other factors include personal acquaintance with AIDS sufferer, perceived severity of the consequences of HIV infection and perceived risk from a partner (Maharaj and Cleland, 2005). A possible limitation of using HIV risk perception as an outcome variable include respondents reporting inaccurate untruthful perceptions, and this may be due to participants being in denial or trying to fit in.

This was clearly demonstrated in the Ex-offender study where participants considered themselves to be at a relatively low risk yet were found to be engaging in risky behaviours (Peltzer et al., 2011). Therefore, it is important not to solely depend on HIV risk perception when making decisions.

The knowledge gap on HIV risk perception among migrants and non-migrants masks variation in risk perception and its distribution among this population in Gauteng Metropolitan areas. Previous studies carried out on HIV risk perception included variables such as age at first sexual experience, number of current sexual partners, condom use, drug and alcohol use, and other sexual behaviours (Maharaj and Cleland, 2005, Peltzer et al., 2011, Tenkorang, 2014, Kenyon et al., 2010, Anderson et al., 2007, Zungu et al., 2016, Mulugeta et al., 2016). It is difficult to assess the accuracy of HIV risk perception without information on sexual behaviour (Suresh et al., 2014).

1.5.3 Migration in Gauteng Province, South Africa

South Africa is characterised by various old and modern migration arrangements, including people moving from rural areas to urban areas or cross-border seeking better life opportunities and safety (Collinson et al., 2006, Lurie, 2006, Landau and Wa Kabwe-Segatti, 2009, Vearey, 2012). International migration is the movement of individuals from their home country, or the country of residence, to establish themselves in a different country either temporarily or permanently (IOM, 2004). Some international migrants move to South Africa to avoid oppression from their countries of origin or for economic reasons (Vearey, 2012). Gauteng Province accounted for the highest concentration of international and internal migrants in South Africa, approximately 7.4% and 44% respectively (StatsSA, 2012).

These statistics have increased over the years and are believed to keep increasing. Gauteng Province is relatively successful in generating livelihood opportunities in a country faced with a high unemployment rate. From 1994 to 2014 the official unemployment rate for South Africa increased from 22% to 25% (StatsSA, 2012). In 2011 Gauteng Province contributed 35.6% of the national Gross Domestic Product (StatsSA, 2012). This makes Gauteng Province an ideal

hub for migrants who are in search of better livelihood opportunities. This increased influx of people into Gauteng Province has resulted in a lot of urban poor people who find themselves within the edges of health and social welfare provision by local authorities (Vearey, 2010).

1.5.4 Migration and Health

Throughout recorded history, migration has been considered as the main source of epidemics (Mmbaga et al., 2008, Wilson, 1995). Generally, migration may not only cause health threats to migrants but also increases risks for receiving communities (Wolffers et al., 2003, Gushulak et al., 2010, Gushulak and MacPherson, 2004, Zimmerman et al., 2011, Joshi et al., 2014). Accessibility to healthcare services and other factors such as concurrent sexual partnerships, unemployment and poverty may increase migrants' vulnerability to HIV and sexually transmitted infections (IOM, 2014, Tansey et al., 2010, Munyewende et al., 2011, Oliveira and Vearey, 2015). While migration on its own does not contribute to increased HIV infection, the individual's characteristics and behaviours, as well as the social environment in which they find themselves have been reported as drivers of the HIV pandemic (Tiruneh et al., 2015, Brockerhoff and Biddlecom, 1999, Weine and Kashuba, 2012).

Migration is a main cause of behaviour change as migrants are exposed to behaviours and norms that differ from those in their place of origin (Brummer, 2002, Brockerhoff and Biddlecom, 1999, Wolffers et al., 2003, Saggurti et al., 2011, Dahal et al., 2013). Migration is an important factor in risky sexual behaviours and these have significant implications for HIV transmission and an individual's health in general (Lurie, 2000, Anarfi, 2005, Banati, 2007). Change in individual characteristics due to migration like separation from a spouse or a sexual partner and stable family structure may encourage risky sexual behaviours (Campbell, 1997, Munoz-Laboy et al., 2009, Grieb and Nielsen-Bobbit, 2013).

Being exposed to a new environment with unfamiliar sexual norms, opportunities and challenges that result in behavioral change also have a bearing on risky sexual behavior (Brockerhoff and Biddlecom, 1999). The migrants' health is essentially linked to all the determinants of health, specifically to the unequal distribution of socioeconomic determinants,

including education, economic status, housing and accommodation, nutrition, sanitation and employment opportunities (Gushulak and MacPherson, 2004).

In 2012 the HIV prevalence in South Africa was estimated to be 12.2%. However, the prevalence differs according to provinces. Gauteng Province recorded a prevalence of 12.4% for the year 2012 (UNAIDS, 2016, UNAIDS, 2014). Since HIV prevalence in cities is higher, migrants are more likely to be exposed to HIV and form a link between the high prevalence and low prevalence communities (Brummer, 2002, Brockerhoff and Biddlecom, 1999, Saggurti et al., 2011, Marks, 2002, Morris, 1997, Decosas et al., 1995, Richter, 2001, Weine and Kashuba, 2012, Anglewicz, 2012, Lurie and Williams, 2014).

The association between migration and HIV infection is complicated, the linkage between migration and the spread of HIV has been shown in literature (Lurie, 2000, Anarfi, 2005, Banati, 2007, Vearey, 2012). It has been shown in literature that it is the circumstances associated with migration process that affect the vulnerabilities of people to HIV rather than being a migrant (Banati, 2007).

1.5.5 Factors associated with HIV risk perception

This section summarises the results on factors associated with HIV risk perception from literature.

1.5.5.1. HIV risk perception and migration status

Migration status has been shown to be associated with HIV risk perception (Baidoobonso et al., 2013). Migration has been identified in literature as an explanatory factor associated with HIV risk perception (Gurung, 2004, Dahal et al., 2013).

1.5.5.2 HIV risk perception and sex

Findings from literature about the association between sex and HIV risk perception is inconclusive, some studies reported low HIV risk perception among males, or higher HIV risk perception among females (Mehrotra et al., 2009, Ward et al., 2004, Sarker et al., 2005, Prata et al., 2006), higher risk perception among males (Sychareun et al., 2013), or no sex differences on HIV risk perception (Anderson et al., 2007).

1.5.5.3 HIV risk perception and age

The association between age and HIV risk perception has been established among youth in South Africa, HIV risk perception increases with an increase in age (Macintyre et al., 2004) but not in Malawi and Burkina Faso (Barden-O'Fallon et al., 2004, Sarker et al., 2005).

1.5.5.4 HIV risk perception and type of employment

Type of employment was found to be associated with HIV risk perception. In one study housewives and those who were involved in agricultural work were more likely to have high HIV risk perception compared to those involved in business and service (Sharma et al., 2012). Individuals with lower employment security (students, the unemployed and the underemployed) had a lower HIV risk perception (Baidoobonso et al., 2013).

1.5.5.5 HIV risk perception and educational level

The relationship between higher education level and increased knowledge of HIV risk factors as well as heightened HIV risk perception has been well documented across studies (Dahal et al., 2013, Brown et al., 1998). However, education was not associated with HIV risk perception in Northern Lao (Sychareun et al., 2013). Education may be a critical protective factor leading to increased HIV risk perception (Anderson et al., 2007).

1.5.5.6 HIV risk perception and marital status

Existing literature give different findings on the association between marital status and HIV risk perception. Married people report low HIV risk perception as compared to unmarried people (Shisana et al., 2004). Divorced or separated women considered themselves as at a higher risk of contracting HIV compared to married and never married women (Gregson et al., 1998).

1.5.5.7 HIV risk perception and knowledge about HIV

Knowledge about HIV was demonstrated to be correlated to HIV risk perception. Those knowledgeable about HIV reported high risk perception because they knew that they might get infected (Sychareun et al., 2013). Those who did not have comprehensive HIV knowledge were more likely to report low risk perception (Eluwa et al., 2015).

1.5.5.8 HIV risk perception and duration of stay

Duration of stay in an urban area was found to be associated with HIV risk perception, those who have stayed in a location for a shorter period of time reported high HIV risk perception as compared to those who have been in the location longer (Baidoobonso et al., 2013).

1.5.5.9 HIV risk perception and other factors

Other social environmental factors include physical security, access to healthcare, access to HIV information and perceived common health problems. It is worth noting that healthcare for international migrants is often overlooked due to citizenship, legitimacy, entitlement and resource-constrained healthcare system (Vearey, 2012). Migrants may experience increased risk for poor health in general due to accessibility and availability of healthcare services in the host country. The challenges faced by the host country's healthcare system to cater for the migrants may also heighten the chances of poor health (Dahal et al., 2013).

1.5.6 The conceptual framework

The conceptual framework was informed by literature reviewed on health theories and previous studies on the risk perception and related topics. The Health Belief Model framework was adapted. The original framework included information on individual perception (susceptibility to risk and severity of the risk), modifying factors which included socio-demographic factors such as the respondent's age, sex, marital status and highest level of education level as well as socio-psychological factors and likelihood of action (likelihood of taking recommended action seeking treatment and information) (Janz and Becker, 1984). For this study, only the individual characteristics and social environment factors are included in the framework presented in **Figure 1**.

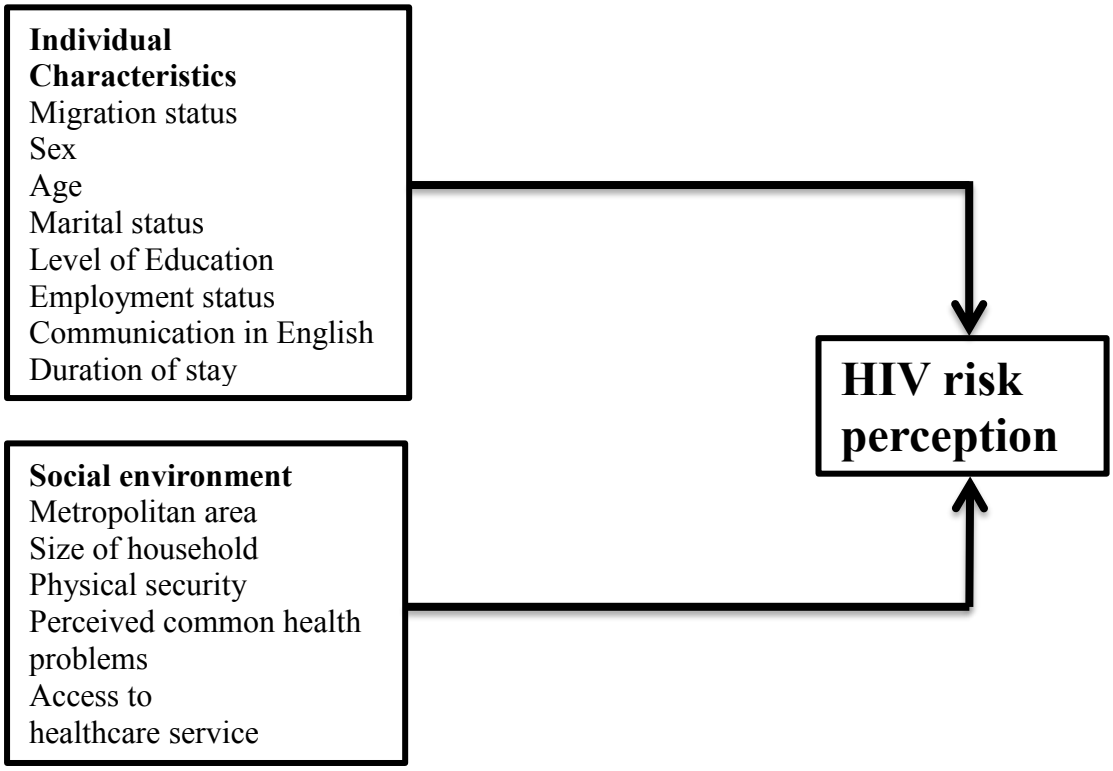


Figure 1: Conceptual Framework of the influence of migration on HIV risk perception.

Chapter 2

Methodology

2.0 Introduction

This chapter provides information on the methodology used in this study. This includes the description of study design, study site, the study population, sample size and the study variables. Data management and how the data was analysed as well as ethical considerations are also outlined.

2.1. Study design

This was a secondary data analysis of data from a cross-sectional household survey obtained from the International Organization for Migration (IOM). The original cross-sectional household survey was conducted to explore the needs and vulnerabilities of the poor urban groups residing in Metropolitan Municipalities of the Gauteng Province in 2012.

2.1.1 Study site

Gauteng Province is the smallest province in South Africa in terms of surface area but the largest in terms of population. The province has an area of 18 178 square kilometres and has a population density of 675 people living within a square kilometre (GCRO, 2012). The province is divided into three District Municipalities namely Sedibeng, West Rand and Metsweding and three urban Metropolitan municipalities (Ekurhuleni Metropolitan Municipality (EMM), Tshwane Metropolitan Municipality (TMM) and Johannesburg Metropolitan Municipality (JMM)) see **Figure 2**. The study was conducted in the three urban Metropolitan areas of Gauteng Province. The three selected Metropolitan areas are from the part of Gauteng Province that is sometimes described as a "city region" due to its mainly urban characteristics as compared to other provinces in the country. This is where 86% of Gauteng population lived (StatsSA, 2012).



Figure 2: A map of Gauteng Province

Source:https://www.google.co.za/search?q=gauteng+province+map&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwi5mqqWnODUAhWrI8AKHWoZDB0QsAQIKA&biw=1600&bih=794#q=gauteng+province+map&tbm=isch&tbs=rimg:CeIrvrgf3g4qIjjbHt17vwy2ldegDLNYUmznqnfNCOsfvgDohtYN

2.1.2 Study population

2.1.2.1 Primary data collection

A multistage sampling approach was adopted during the initial study to ensure representativeness of respondents and study area. For each Metropolitan area three places were selected, one sub-place in the inner-city, periphery and informal settlement. This was done in five phases; phase one was to identify the most deprived areas in the province within each of the selected Metropolitan areas, followed by selection of the sub-areas, then randomly selecting 10 Enumerator Areas (EAs).

Within each EA dwellings were randomly selected (7 cross-border migrants, 7 internal migrants and 7 locals). If the dwelling was multi-household, individual households were randomly selected. Within each household the head of the household or the spouse/partner or the eldest individual in the household was interviewed. The study sample was adjusted to 2 020 to fit the sampling frame, details on how the adjustment was done were not available. Pre-

coded questionnaires were used to collect data. The questionnaires were administered by trained field workers.

2.1.2.2 Secondary data analysis

The data used was from the IOM household survey that was conducted to explore the needs and vulnerabilities of the poor urban groups residing in the Metropolitan Municipalities of the Gauteng Province in 2012. The data were de-identified and assigned new study identification numbers.

Eligibility criteria

Minimum of three months of staying in any of the three Metropolitan areas, not HIV positive and aged 18 years or older.

2.1.3 Sample size

The primary study had 2 020 respondents. Of these 2 020, eight had missing information on age. Fifty of the respondents had missing records on the duration of stay some had been in the Metropolitan for less than 3 months. Thirty-six respondents were already HIV positive and 92 did not have information on HIV risk perception leaving 1 834 respondents in the analysis sample (see **Figure 3** for details). This sample size allows the proportion of residents who consider themselves at risk of HIV to be estimated with a precision of 100% as shown in the following power calculation output.

Power calculation STATA output

Power two proportion 0.4 0.6, test (binomial) n (2020)

Estimated power for a one-sample proportion test

Binomial test

Ho: p = p0 versus Ha: p! = p0

Study parameters:

Alpha = 0.0500

N = 2,020

Delta = 0.2000

p0 = 0.4000

pa = 0.6000

Estimated power and alpha:

Power = 1.0000

Actual alpha = 0.0482

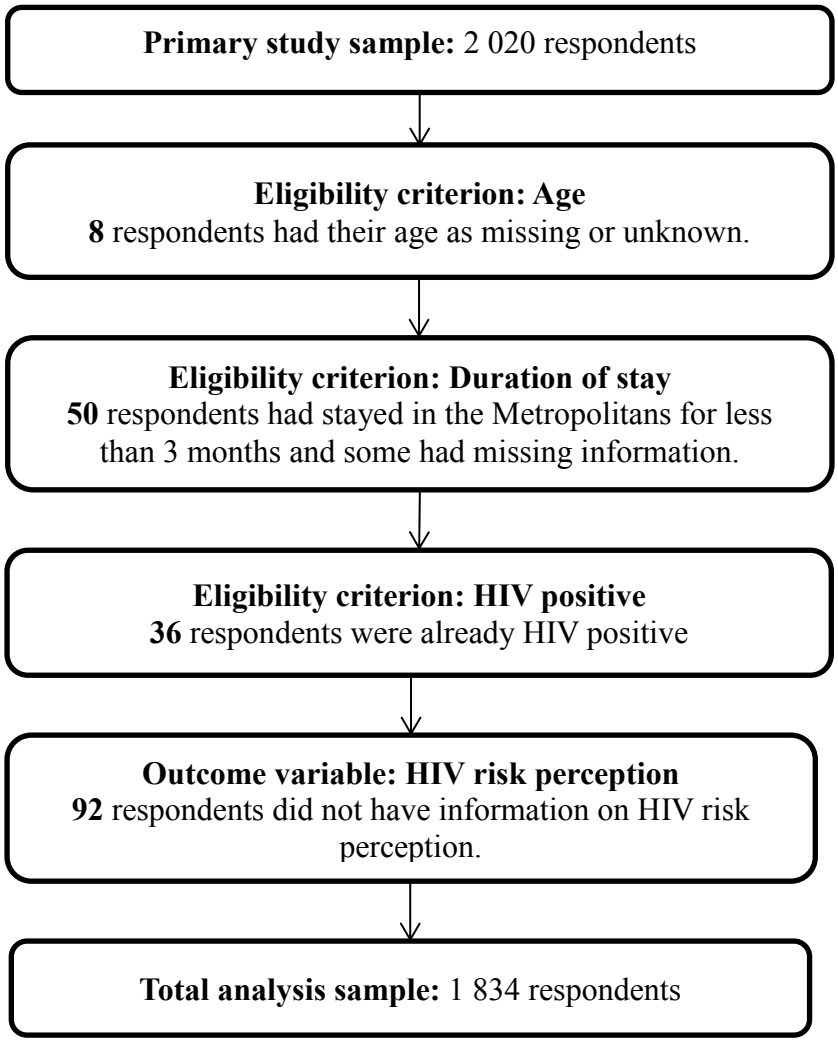


Figure 3: Flow diagram showing how the total analysis sample was arrived at.

2.1.4 Study variables

2.1.4.1 Outcome variable: HIV risk perception

Respondents rated their likelihood that they would get infected with HIV as either being no risk, having some risk or high risk.

2.1.4.2 Explanatory variables

Explanatory variables included migration status, sex, age, marital status, level of education Metropolitan area, duration of stay (months), size of the household, ability to communicate in English, employment status, physical safety, perceived common health problems, access to healthcare service and HIV information and treatment.

2.2 Data Management

The data were cleaned and analysed using STATA version 13.1. Before performing the secondary data analysis the data were inspected for duplicates consistency, completeness (missing values on age and HIV risk perception), outliers and obvious discrepancies (for example, unknown age of the respondent). Confidentiality and privacy of all respondents were maintained by removing the household GPS coordinates of their households. Recoding and generation of new variables was done to suit the current study as indicated in **Table 1**. For example, HIV risk perception was recorded combining risk and some risk to generate risk. No risk was coded 0 and risk was coded 1.

Sex was coded as 1 for males and 2 females. Marital status was coded 1-3: Single = 1, Married/ Cohabiting = 2 and Divorced/Separated/ Widowed = 3. This was done by merging different categories. Educational level of respondents was categorized into 4 categories. This was informed by an individual's highest education level: No education = 1 (made up of those with no education, preschool and primary incomplete), Primary education = 2 (primary complete and secondary incomplete), Secondary education = 3 (secondary complete, college incomplete and University incomplete) and Tertiary education = 4 was made up of those who had completed college, University, post-graduate and those who did not complete post-graduate.

Duration of stay in Metropolitan area was categorized into 3 categories; those who were fairly new to the Metropolitan area (3 months - 1 year), those who had been in Metropolitan area for a year to 5 years and those who had been in the Metropolitan area longer than five years. Respondents who could speak English were considered to be able to communicate in English where 1 was yes and 2 for no. Employment status was divided into two categories, those who were unemployed = 1 and those who were employed = 2. The variable physical security was categorized as safe and unsafe, this was based on whether one has been a crime victim or whether they felt safe or unsafe. There were two questions relating to what the respondent saw as the common health problems. The first was whether or not they considered HIV and or TB to be the common health problem in the area (yes or no) and the second was whether they considered high blood pressure, cholera, diabetes, disabilities or road accidents to be the common health problem in the area (yes or no).

Denied health care service was categorized into two categories (no = 1 and yes = 2). Access to health care service was generated from the duration one takes to walk to the nearest Public health facility, whether it is safe to walk to the facility as well as the availability of transport to the facility. Accessibility to HIV information and treatment was generated based on the respondent's knowledge about where to go for HIV testing and treatment.

Table 1: Variables for the study.

Variable Name	Variable as in dataset	Variable as used in this analysis
Outcome variable		
HIV risk perception	No risk at all…….....1 Some risk…….....2 High risk……..……3	No risk …….…….....0 Risk …….....1 (combine 2 and 3 to get risk)
Explanatory variables		
1. Migration status	Locals …….....1 Internal migrants ……2 International migrants……..3	Non-migrants…….....1 Internal migrants …….....2 International migrants…….……3
2. Sex	Male…….....1 Female……2	Male…….…....1 Female…….…....2
3. Age	Age (18 years and above)	Age (continuous)
4. Marital status	Never married/single……...1 Married (Civil, Religious, and Customary)……..2 Living together/ vat-en-sit …..3 Widow/ Widower……4 Divorced/ separated……5	Single…….....1 Married/ Cohabiting ……....2 Divorced/Separated/ Widowed....3
5. Level of Education	Highest Level of education No education……1 Pre-school……2 Primary completed……...3 Primary incomplete……4 Secondary completed……...5 Secondary incomplete……6 Technical/college completed...7 Technical/college incomplete.8 University (first degree) completed……9 University (first degree) incomplete……10 Post-graduate (MA/PhD)…...11 Post-graduate (MA/PhD) incomplete……12	No education……....1 Primary Education……2 Secondary Education……3 Tertiary Education……4
6. Metropolitan area	Ekurhuleni.....1 Johannesburg.....2 Tshwane 3	Ekurhuleni.....1 Johannesburg.....2 Tshwane 3
7. Migration duration	Minimum length of stay was 3 months.	3 months-12 months…….1 13 months - 5years……...2 5+ years…….....3
8. Size of the household	Number of household members	Continuous
9. Communicate in English	Do you speak English?.....1 No……0 Yes……...1	Cannot communicate……0 Can communicate……....1

Variable Name	Variable as in dataset	Variable as used in this analysis
		(Speak = 1 = Ability to communicate, otherwise 0)
10. Employment status	Employed.....1 Unemployed…….....2	Employed .....1 Unemployed …….……...2
11. Physical safety	A = Ever been a victim of crime in this Metro, either at home or on the street? No …….....0 Yes …….....1	Unsafe……...0 Safe……...1 Combining A and B (0 1 = safe, 0 0 = unsafe, 1 1= safe, 1 0 = unsafe) For B (1 and 2 coded as 1= safe, 3 and 4 coded 0 = unsafe).
	B = Compared to other similar areas in this Metro how safe do you think your area is? Very safe……...1 Safe.....2 Unsafe.....3 Very unsafe.....4	
12. Perceived Common Health Problems HIV or TB	What do you think the most common health problems in this area are? A = HIV/AIDS B = Tuberculosis G = Respiratory problem	No...…….....0 Yes…….....1 (Yes to any of the specified conditions)
13. Perceived Common Health (others including NCDs)	What do you think the most common health problems in this area are? D = High blood pressure E = Cholera H = Diabetes I = Disabilities J = Road accidents	No...…….....0 Yes…….....1 (Yes to any of the specified conditions)
14. Denied health care service	A= Have you ever been denied access to a public health facility Yes…….....1 No...…….....0	No...…….....0 Yes…….....1
15. Access to health-care service	B = How long does it take to walk to the nearest public health facility 1 = < 5 minutes 2 = 5-10 minutes 3 = 10-15 minutes 4 = 15-30 minutes 5 = > 30 minutes	Low access (A = 1, B = 0, C = 0, D = 1) ……..0 High access (A = 0, B = 1, C = 1 D = 0,) …….……....1 (B 1- 4 = Yes (1), 5= No (0))
	C = Is it safe to walk to the nearest PH facility Yes ……..1 No...…….....0	

Variable Name	Variable as in dataset	Variable as used in this analysis
	D = Is it difficult to get transport to the nearest facility Yes …….....1 No …….....0	
16. Accessibility to HIV information and treatment	A = Do you know where you or someone can get tested for HIV Yes…….……..1 No…...……0	No…….0 Yes ……...1 Combining A and B (1 1 = yes, 0 1 = yes, 1 0= yes, 0 0 = no).
	B = Do you know where someone can get free treatment for HIV Yes…….……1 No…….…….....0	

2.3 Data Analysis

Objective 1

Explanatory variables

Socio-demographic factors included HIV risk perception, migration status, sex, marital status, level of education, Metropolitan area, duration of stay (months), ability to communicate in English, employment status, physical safety, perceived common health problems as HIV or TB or other diseases, denied health care service, access to healthcare service and HIV information and treatment were treated as categorical variables. Age and size of household were treated as continuous variables.

Statistical analysis

Description of the study population was given stratified by HIV risk perception (No risk and Risk). For the age and size of household appropriate measures of central tendencies were calculated based on distribution. For categorical variables, a descriptive cross tabulation was done; frequencies were calculated and presented as percentages of the total number of respondents.

Objective 2

Analytic cross tabulation was done to determine the association between migration status and HIV risk perception using a Pearson's chi-squared test.

Objective 3

The unadjusted and adjusted logistic regression was used to identify the factors associated with HIV risk perception. The logistic regression models were fitted taking into consideration the design effect due clustering of respondents within the Metropolitan areas, this was addressed using the survey (svy) command in STATA 13. Odds ratios with 95 percent confidence intervals were computed for each explanatory variable.

2.4 Ethical Considerations

Ethical approval of the original study was granted by the University of Witwatersrand Non-Medical Ethics Committee through a certificate of Ethics Approval H120530. A data sharing agreement was granted by International Organization for Migration. Ethics approval for this secondary data analysis study was granted by the University of the Witwatersrand, Faculty of Health Sciences, Medical Ethics Committee and obtained approval through a certificate of Ethics Approval number M170128. Anonymity and confidentiality was maintained throughout the study. The dataset was securely stored in the investigator's computer and backed up in an external hard drive protected by a password. Access to the dataset is limited to the investigator and supervisors and not shared with any other person. The dataset will be kept for two years post publication of this study.

2.5 Limitations

Information on sexual behaviours and type of employment of the respondent was not collected during the primary study. The respondents were not tested for HIV. This missing information on sexual behaviours of respondents, type of employment, sample size adjustment and HIV testing for those who did not know their HIV status at the time of the interview are major limitations in this study.

Chapter 3

Results

3.0 Introduction

In this chapter, results for each objective are presented. Specifically, the descriptive and the analytical cross tabulation results, as well as the unadjusted and adjusted logistic regression results are presented.

Descriptive analysis of the study population was given stratified by HIV risk perception. This analysis provided important information about the sample population. Analytical cross tabulation was done to determine the association between HIV risk perception and migration status using a Pearson's chi-squared test. The unadjusted and adjusted logistic regressions were used to identify the factors associated with HIV risk perception among non-migrants, internal migrants and international migrants.

3.1 Descriptive results

Table 1 presents the distribution of the socio-demographic characteristics of the respondents according to their HIV risk perception. Among the 1 834 respondents, 55% respondents perceived themselves as not at risk (mainly non-migrants). Internal migrants made up the majority of the 45% that perceived themselves to be at risk. The respondents were more or less evenly distributed among the non-migrants, internal migrants and the international migrants. There were 647 non-migrants, 607 internal migrants and 580 international migrants. Most respondents were females (53%).

The median age and size of household were similar between those who perceived themselves to be at risk and those who perceived themselves as not at risk. The overall median age was 31 years (IQR: 25-39) and the median size of household was 3 members (IQR: 2-5). The married or cohabiting made up 49.1% of the total respondents and they made up 51.8% of those who considered themselves as not at risk of HIV infection. Never married respondents made up 48.1% of those who perceived themselves to be at risk. As for the highest educational level,

42.6% had a secondary education and they made up 45.5% of those who perceived themselves as being at risk.

Respondents who stayed in the Tshwane Metropolitan Municipality made up 38% and 33.4% stayed in Ekurhuleni Metropolitan Municipality and 28.6% of the total respondents stayed in Johannesburg Metropolitan Municipality. Those who had stayed in the Metropolitan areas between 3 to 12 months made up 20.8%, 33% had stayed in the Metropolitan areas for a period of more than a year to 5 years and 46.2% of the respondents had stayed in the Metropolitan areas for more than five years. The respondents who were able to communicate in English constituted 92.8% of the study population. The majority of the respondents were employed (64.2%) and 89.9% considered themselves to be safe in their respective Metropolitan areas.

The majority of the respondents did not perceive HIV or TB (57.5%) or any other disease and conditions (82.7%) as a problem in their Metropolitan areas. Only 6.7% of the respondents reported having been denied healthcare service. Regarding access to health care services, 96% reported having high access to healthcare service in their respective Metropolitan areas. Respondents who reported having access to HIV information and treatment constituted 91.5% of the study population.

Table 2: Socio-demographic characteristics of the study respondents.

Variables	HIV risk perception		Total (%)
	No Risk (55.3%)	Risk (44.7%)	
Migration status			
Locals	38.0	31.9	35.3
Internal migrants	29.7	37.4	33.1
International migrants	32.3	30.8	31.6
Total	1 015	819	1 834
Sex			
Male	47.9	45.9	47.0
Female	52.1	54.1	53.0
Total	1 015	819	1 834
Age			
Median (IQR)	32 (26-41)	30 (25-37)	31 (25-39)
Total	1 015	819	1 834
Marital status			
Single	40.2	48.1	43.7
Married/Cohabiting	51.8	45.6	49.1
Divorced/Separated/Widowed	8.0	6.3	7.2
Total	1 003	809	1 812
Level of Education			
No education	8.6	7.3	8.0
Primary Education	30.5	29.9	30.3
Secondary Education	40.3	45.5	42.6
Tertiary Education	20.6	17.2	19.1
Total	1 002	806	1 808
Metropolitan Area			
Ekurhuleni Metropolitan	33.7	33.1	33.4
Johannesburg Metropolitan	25.1	32.8	28.6
Tshwane Metropolitan	41.2	34.1	38.0
Total	1 015	819	1 834
Duration of stay (months)			
3-12	19.7	22.1	20.8
13-60	30.9	35.7	33.0
61+	49.4	42.2	46.2
Total	1 015	819	1 834
Size of Household			
median (IQR)	3 (2-5)	3 (2-4)	3 (2-5)
Total	1 014	816	1 830
Communicate in English			
Cannot communicate	7.8	6.5	7.2
Can communicate	92.2	93.5	92.8
Total	1 015	819	1 834

Variables	HIV risk perception		Total (%)
	No Risk (55.3%)	Risk (44.7%)	
Employment status			
Unemployed	34.9	37.0	35.8
Employed	65.1	63.0	64.2
Total	1 014	819	1 833
Physical security			
Unsafe	9.8	10.5	10.1
Safe	90.2	89.5	89.9
Total	1 015	819	1 834
Perceived common health problems HIV or TB			
No	61.8	52.2	57.5
Yes	38.2	47.8	42.5
Total	958	770	1 728
Perceived common health problems Others			
No	83.7	81.4	82.7
Yes	16.3	18.6	17.3
Total	958	770	1 728
Denied healthcare service			
No	93.9	92.7	93.3
Yes	6.1	7.3	6.7
Total	1 015	819	1 834
Access to Healthcare service			
Low access	3.8	4.2	4.0
High access	96.2	95.8	96.0
Total	990	795	1 785
Accessibility to HIV information and treatment			
No	10.0	6.7	8.5
Yes	90.0	93.3	91.5
Total	1 014	819	1 833

3.2 Migration status and HIV risk perception

Table 3 presents results of the association between migration status and HIV risk perception. Most internal migrants perceived themselves to be at risk (50.4%). Generally, migrants considered themselves to be at risk of contracting HIV as compared to non-migrants. The chi-squared test statistic indicated that there was a strong relationship between migration status and HIV risk perception. There was a statistically significant association between migration status and HIV risk perception among the respondents in the three Metropolitan areas (p-value = 0.001).

Table 3: The association between migration status and HIV risk perception.

Migration status	HIV risk perception		Total (N)
	No risk (%)	Risk (%)	
Non-migrants	59.66	40.34	647
Internal migrants	49.59	50.41	607
International migrants	56.55	43.45	580
Total	55.34	44.66	1 834
Pearson chi2(4) = 13.3557 P-value = **0.001**			

3.3 Logistic regression results

Table 4 shows the results of the unadjusted and adjusted logistic regression analysis. Logistic regression was used to identify factors associated with HIV risk perception among migrants and non-migrants in the three Gauteng Metropolitan areas. For the unadjusted analysis migration status, age, marital status, Metropolitan area, duration of stay, perceived common health problem in the areas as HIV or TB, and accessibility to HIV information and treatment were significantly associated with HIV risk perception.

The odds of internal migrants perceiving themselves as at risk of contracting HIV was 1.50 times the odds among non-migrants (95% confidence interval: 1.20, 1.88). The odds of international migrants perceiving themselves as at risk of HIV infection was 1.14 times the odds among non-migrants (95% confidence interval: 0.91, 1.43). The odds of HIV risk perception decreased by 3% with each one-year increase in respondents' age (95% confidence interval: 0.96, 0.98).

Ever married respondents (married, cohabiting, divorced, separated, or widowed) were less likely to perceive themselves as at risk of HIV infection as compared to never married respondents. The odds of married/cohabiting respondents perceiving themselves as at risk of contracting HIV was 0.74 times the odds among those who were never married (95% confidence interval: 0.61, 0.89). The odds of HIV risk perception among those divorced or separated or widowed decreased by 34% in comparison to those who were never married (UOR = 0.66, 95% confidence interval: 0.45, 0.96).

The Metro area was also associated with HIV risk perception. The odds of HIV risk perception among respondents who stayed in Ekurhuleni Metro was 1.19 times the odds among those who stayed in Tshwane Metro (95% confidence interval: 0.95, 1.48). Those who stayed in the Johannesburg Metropolitan area were more likely to perceive themselves as at risk of contracting HIV as compared to residents of Tshwane Metropolitan area (UOR = 1.58, 95% confidence interval: 1.26, 1.99).

Those who stayed in the Metropolitan areas for 3-12 months and 13 months to 5 years had slightly increased odds of perceiving themselves as being at risk of contracting HIV. The odds of those who stayed in the Metropolitan areas for 3-12 months and 13 months to 5 years perceiving themselves as at risk of HIV infection was 1.31 times (95% confidence interval: 1.03, 1.67) and 1.35 times (95% confidence interval: 1.09, 1.66) respectively, in comparison to those who had been in the Metropolitan areas for more than 5 years but less than 10 years. Respondents who perceived HIV or TB to be the common health problem in their respective Metropolitan areas were more likely to perceive themselves as at risk of contracting HIV as compared to those who did not perceive HIV or TB to be the common health problem (UOR = 1.48, 95% confidence interval: 1.22, 1.78). The odds of HIV risk perception among respondents who reported not having access to HIV information and treatment decreased by 35% in comparison to those who reported having access to HIV information and treatment (UOR = 0.65, 95% confidence interval: 0.46, 0.92).

In the adjusted model (**Table 4, column 4**); age, Metropolitan area, perceived common health problem as HIV or TB and accessibility to HIV information and treatment were significantly associated with HIV risk perception. The odds of HIV risk perception decreased by 3% with each one-year increase in respondents' age (AOR = 0.97, 95% confidence interval: 0.96, 0.98). The odds of respondents who resided in Ekurhuleni Metropolitan area perceiving themselves as at risk of contracting HIV was 1.31 times the odds among Tshwane Metropolitan area residents (95% confidence interval: 1.02, 1.68).

Respondents who stayed in the Johannesburg Metropolitan area were more than twice as likely to perceive themselves as being at risk of HIV infection as compared to those who stayed in the Tshwane Metropolitan area (AOR = 2.03, 95% confidence interval: 1.55, 2.56). The odds of respondents who perceived HIV or TB as a common health problem in their Metropolitan area perceiving themselves as at risk of contracting HIV was 1.41 times the odds among those who did not perceive HIV or TB to be a common health problem (95% confidence interval: 1.14, 1.74). The odds of HIV risk perception among those who reported not having access to HIV information and treatment decreased by 35% in comparison to those who reported that they had access to HIV information and treatment (AOR = 0.65, 95% confidence interval: 0.45, 0.98).

Table 4: Unadjusted and Adjusted logistic regression analysis of factors associated with HIV risk perception among non-migrants and migrants.

	Unadjusted analysis		**Adjusted analysis**	
HIV risk perception	**Odds Ratio**	**95% Confidence interval**	**Odds Ratio**	**95% Confidence interval**
Migration Status	*			
Non-migrants (ref)	1.00		1.00	
Internal migrants	1.50*	1.20 - 1.88	1.18	0.89 - 1.57
International migrants	1.14	0.91 - 1.43	0.99	0.73 - 1.34
Sex				
Male (ref)	1.00		1.00	
Female	1.08	0.90 - 1.30	1.14	0.92 - 1.41
Age	0.97*	0.96 - 0.98	0.97*	0.96 - 0.98
Marital Status	*			
Single (ref)	1.00		1.00	
Married/cohabiting	0.74*	0.61 - 0.89	0.91	0.72 - 1.14
Divorced/separated/widowed	0.66*	0.45 - 0.96	1.04	0.67 - 1.63
Educational Level				
No Education (ref)	1.00		1.00	
Primary Education	1.15	0.79 - 1.67	0.94	0.62 - 1.41
Secondary education	1.32	0.92 - 1.90	1.02	0.67 - 1.54
Tertiary Education	0.98	0.66 - 1.46	0.92	0.59 - 1.45
Metropolitan Area	*		*	
Ekurhuleni Metro	1.19	0.95 - 1.48	1.31*	1.02 - 1.68
Johannesburg Metro	1.58*	1.26 - 1.99	2.03*	1.55 - 2.65
Tshwane Metro (ref)	1.00		1.00	
Duration of Stay (months)	*			
3-12	1.31*	1.03 - 1.67	0.96	0.70 - 1.32
13-60	1.35*	1.09 - 1.66	1.03	0.78 - 1.37
61+ (ref)	1.00		1.00	
Size of household	0.96	0.92 - 1.01	0.94	0.89 - 1.00
Communicate in English				
Can communicate (ref)	1.00		1.00	
Cannot communicate	0.82	0.57 - 1.18	0.81	0.53 - 1.24
Employment Status				
Unemployed	1.09	0.90 - 1.33	0.91	0.73 - 1.15
Employed (ref)	1.00		1.00	
Physical Security				
Unsafe	1.09	0.80 - 1.47	0.93	0.67 - 1.29
Safe (ref)	1.00		1.00	
Perceived common health problem HIV or TB	*		*	
No (ref)	1.00		1.00	
Yes	1.48 *	1.22 - 1.79	1.41*	1.14 - 1.74

	Unadjusted analysis		Adjusted analysis	
HIV risk perception	**Odds Ratio**	**95% Confidence interval**	**Odds Ratio**	**95% Confidence interval**
Perceived common health problem others				
No (ref)	1.00		1.00	
Yes	1.17	0.91 - 1.51	1.10	0.83 - 1.45
Denied healthcare service				
No (ref)	1.00		1.00	
Yes	1.22	0.84 - 1.75	1.12	0.74 - 1.69
Access to healthcare service				
Low access	1.08	0.67 - 1.75	1.12	0.67 - 1.85
High access (ref)	1.00		1.00	
Accessibility to HIV information and treatment	*		*	
No	0.65*	0.46 - 0.92	0.65*	0.45 - 0.98
Yes (ref)	1.00		1.00	

*Statistically significant at p-value <0.05

Chapter 4

Discussion

4.0 Introduction

In this chapter, findings of the study are discussed. The chapter also discusses the strengths and limitations of the study and how these may have affected the findings. The chapter ends with conclusion and recommendations.

4.1 Discussion

The aim of this study was to identify the factors associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province in 2012. Gauteng Province is characterized by high level of HIV prevalence (UNAIDS, 2014). Living in Gauteng Province demonstrates many of the problems faced by the urban poor, mainly migrants, who are generally considered to be more vulnerable to HIV infection than non-migrants for countless reasons.

Summary of findings

The majority of the respondents perceived themselves not to be at risk. There was a strong statistical association between migration status and HIV risk perception. Migration status, age, marital status, Metropolitan area, duration of stay, perceived common health problems as HIV or TB and accessibility to HIV information and treatment were significantly associated with HIV risk perception in the unadjusted logistic regression model. The significant explanatory variables in the adjusted logistic regression model were age, Metropolitan area, perceived common health problem HIV or TB as well as accessibility to HIV information and treatment.

4.1.1 HIV Risk Perception

The description of the social and demographic characteristics by HIV risk perception showed that the majority of the respondents perceived themselves not to be at risk. This is consistent with other studies that reported that in spite of the high HIV prevalence and the presence of risky behaviours in South Africa and other sub-Saharan African countries individuals perceive themselves as at low risk or no risk (Maswanya et al., 1999, MacPhail and Campbell, 2001,

Tillotson and Maharaj, 2001, Barden-O'Fallon et al., 2004, Macintyre et al., 2004, Pettifor et al., 2004, Sarker et al., 2005, Nunn et al., 2011).

The reason for reported low risk perception could be a result of respondents not being aware of how to assess their HIV risk perception (Sychareun et al., 2013). One explanation could be that respondents were exhibiting optimistic bias, tending to under-estimate their HIV risk perception due to feelings of being vulnerable (Moore and Rosenthal, 1991, Macintyre et al., 2004). The other possible reason could be that in South Africa HIV/AIDS is stigmatized (Kalichman et al., 2005, Maughan-Brown, 2006). If accepting risk is perceived as placing oneself into a stigmatized group, people may find a way around this by reporting low HIV risk perception (Macintyre et al., 2004). Theoretically, elevated HIV risk perception should encourage people to adopt admissible precautionary measures as well as interventions to refrain from risky behaviours (Pettifor et al., 2004). Attempts to educate the public and increase understanding and HIV risk perception are usual approaches used in HIV prevention programmes and interventions (Prohaska et al., 1990).

4.1.2 Factors associated with HIV risk perception

4.1.2.1 HIV risk perception and migration status

Although the HIV risk perception among residents of Metropolitan areas of Gauteng Province was low, being a migrant or a non-migrant influences HIV risk perception. There was a statistically significant association between migration status and HIV risk perception in the unadjusted analysis and in the adjusted analysis the association was no longer statistically significant. Internal migrants reported a higher HIV risk perception in comparison to international migrants and non-migrants. This may be due to the unfavourable conditions that migrants find themselves in. In other studies migrants have been reported to perceiving themselves as at low risk even though risky sexual behaviours were prevalent (Baidoobonso et al., 2013, Dahal et al., 2013, Wasie et al., 2015). Migration has been recognized as being closely linked to the epidemiology of HIV/AIDS. Findings from literature show that migrants are known as a vulnerable population for HIV infection (Sharma et al., 2012, Suresh et al., 2014). From **Table 3** there was a statistically significant association between migration status and HIV risk perception at 5% level of significance.

Being away from family or long term sexual partners and finding oneself in compromising socio-economic conditions, the effect of socio-cultural practices of the migrants may affect the migrants HIV risk perception (Dahal et al., 2013). Generally, migrants have an increased risk for poor health (Baidoobonso et al., 2013). Migrants could report an increased HIV risk perception because originally they come from high HIV prevalent provinces or countries. This may increase their chance of contracting HIV from the communities that they establish themselves in and this could influence their perceived HIV risk (Mmbaga et al., 2008). HIV risk perception among spouses of migrants was higher than the spouses of non-migrants (Sharma et al., 2012), this also demonstrates the association between migration status and HIV risk perception.

4.1.2.2 HIV risk perception and sex

Females perceived themselves to be at risk compared to males. This was not associated with HIV risk perception in the unadjusted and the adjusted logistic regression models. The findings are similar to several studies with males tending to report lower HIV risk perception as compared to females (Gustafson, 1998, Holtzman et al., 2001, Ward et al., 2004). Gender-based beliefs, oppressive socio-cultural pressures, societal gender-based roles and power may impact the preparedness of males and females to act in ways that correlate with their HIV risk perception. Once females become sexually active they may have less authority over sexual decisions as compared to males (Campbell and MacPhail, 2002, Eaton et al., 2003), in terms of preventive practices like condom use and other protective behaviours, thereby increasing their risk of contracting HIV. Females are also more socialized to care about their health than males (Sychareun et al., 2013). The link between sex and HIV risk perception may be less apparent because the effect of sex on HIV risk perception is likely to depend on its interaction with other factors. There are concerns that male circumcision may also lead to low HIV risk perceptions among males, as some perceive circumcision as a "natural condom" (Bonner, 2001, Williams et al., 2006, Zungu et al., 2016).

4.1.2.3 HIV risk perception and age

The median age of the respondents was 31 years (IQR: 25-39). From the unadjusted and adjusted logistic regression model, an increase in age of an individual resulted in a decreased HIV risk perception. Those who considered themselves to be at risk were slightly younger than those who perceived themselves as not at risk. Young people in sub-Saharan Africa have been identified as vulnerable to HIV infection (Tenkorang et al., 2010). An increase in age by one year resulted in decreased HIV risk perception. This can be attributed to youth being more likely to take part in high risk sexual behaviours as compared to older people (Sychareun et al., 2013). Young adults are reported to be more likely to underestimate their HIV risk perception as compared to older people (Prata et al., 2006). Interventions and programmes aimed at HIV awareness and prevention in this sub-population should be age-group specific and relevant for them to be effective as risk perception decreases with increasing age.

4.1.2.4 HIV risk perception and marital status

Marital status was statistically associated with HIV risk perception in the unadjusted logistic regression model. There were disparities on HIV risk perception in relation to marital status, those who were married or cohabiting and those who were widowed/separated/divorced had reported a decreased HIV risk perception compared to those who were never married. This could be that the respondents reported low HIV risk perception because they had steady sexual partners, it is also possible that the respondents were not well acquainted with their partner's sexual behaviours (Sychareun et al., 2013). Married persons have been noted to have unfamiliar patterns of risk behaviours and different HIV risk perceptions as compared to never married individuals (Zambuko and Mturi, 2005).

4.1.2.5 HIV risk perception and level of education

Most respondents had secondary education and considered themselves as being at risk. There is some proof that academic accomplishment may be associated with HIV risk perception (Tenkorang et al., 2010, Barden-O'Fallon et al., 2004). Educated people may report high HIV risk perception because they are exposed to information on HIV through sex education which is part of the school curriculum. Education also enables individuals to be able to read widely

and to be able to understand the readily available information on HIV communicated through various media campaigns. The level of education was associated with HIV risk perception.

4.1.2.6 HIV risk perception and Metropolitan area

Metropolitan area was statistically associated with HIV risk perception in the unadjusted and the adjusted logistic regression model. The majority of respondents resided in the Tshwane Metropolitan area followed by residents of Ekurhuleni Metropolitan area and the least number of respondents stayed in the Johannesburg Metropolitan area. Respondents who stayed in Ekurhuleni Metropolitan area and Johannesburg Metropolitan area had increased HIV risk perception compared to Tshwane Metropolitan area. This could be because Johannesburg is the economic centre of South Africa and a premier destination for both international and internal migrants. Johannesburg maintains its status as the largest Metropolitan area in the country (StatsSA, 2012). The challenges faced by migrants and non-migrants may differ according to the different Metropolitan areas.

4.1.2.7 HIV risk perception and duration of stay

HIV risk perception may be related to the duration of stay in an area (Baidoobonso et al., 2013). For this study, this holds true in the unadjusted logistic regression model. Individuals who stayed in the Metropolitan area for over five years but less than ten years reported lower risk perception. Respondents who stayed in the Metropolitan area for 3 months to 5 years reported increased HIV risk perception. The length of stay in South Africa among female migrants was significantly associated with HIV risk perception (Giorgio et al., 2016). The longer the household stay in the city the more likely is it that social networks are expanded and solidified overtime, local language ability also improves and assets are accumulated (Jacobsen and Nichols, 2011). Those who stayed in the Metropolitan area for less than 5 years reported having a significantly higher HIV risk perception than any other groups. This reiterates the need to target new migrants in order to combat the spread of HIV (Mmbaga et al., 2008).

4.1.2.8 HIV risk perception and size of household

The median size of household was 3 members (IQR: 2-5). Those with smaller household sizes perceived themselves as at risk compared to those with slightly larger households. There was no statistical association between size of household and HIV risk perception. The reviewed literature did not explored this variable.

4.1.2.9 HIV risk perception and ability to communicate in English

Most respondents were able to communicate in English and there was no statistical association between ability to communicate in English and HIV risk perception. This was expected since most of the respondents had a secondary school qualification as their highest level of education.

4.1.2.10 HIV risk perception and Employment status

Most respondents were employed and there was no statistical association between employment status and HIV risk perception. Employment status appears to have an important impact on HIV risk perception. Respondents who were employed reported low HIV risk perception as compared to the unemployed. Unemployment may result in risky sexual behaviours that might heighten HIV risk (Baidoobonso et al., 2013). The type of employment has been reported to influence HIV risk perception. In a study carried out in Nepal, unskilled employees reported high HIV risk perception (Sharma et al., 2012). This was not explored further because the type of employment for the respondents was not specified in the primary study.

4.1.2.11 HIV risk perception and physical security

Most respondents considered their respective Metropolitan areas to be safe. This was the opposite of what was expected. Migrants are expected to be more vulnerable due to reasons such as non-familiarity with the new area. Previous literature has shown that migrants are more vulnerable due to language barrier, lack of awareness of the environment (Jacobsen and Nichols, 2011).

4.1.2.12 HIV risk perception and perceived common health problems

Most respondents did not perceive HIV or TB to be a common health problem in their respective Metropolitan areas. This may have influenced their personal risk perception as people who are in denial about the presence of HIV in their communities tend to have low HIV risk perception (Eaton et al., 2003, Anderson et al., 2007). Respondents did not perceive any specific disease as being a common health problem.

4.1.2.13 HIV risk perception and access to health care services

The majority of the respondents reported that they were never denied health care service and they had access to healthcare services. Most residents rely on healthcare service delivered by the government.

4.1.2.14 HIV risk perception and access to HIV information and treatment

Respondents reported having access to HIV information and treatment in their respective Metropolitan areas. Respondents who perceived HIV or TB to be a common health problem in their respective Metropolitan areas perceived themselves to be at a high risk of getting infected with HIV. Increased knowledge about HIV is considered to be a form of self-empowerment that may influence an individual's HIV risk perception and create awareness and encourage behaviour change (Zellner, 2003). However, one study found that having increased knowledge about HIV did not correspond significantly with HIV risk perception (Sychareun et al., 2013). Knowing more about HIV/AIDS may influence the increased awareness of infection pathways, reduced stigma towards the disease and heightened HIV risk perception (Anderson et al., 2007). Respondents with high access to HIV knowledge might have reported high HIV risk perception because they were aware that they might get infected with HIV. This could be reverse causality (Akwara et al., 2003). This could be that respondents with high risk perception were more knowledgeable about HIV because they had to seek the information because they were at risk or their knowledge about HIV could be informing their high HIV risk perception.

Respondents who reported no access to HIV information and treatment had decreased HIV risk perception. Limited knowledge on HIV can contribute to low HIV risk perception (Zihindula et al., 2016). This group of respondents may be exposed to a lot of misconceptions about HIV,

they might believe that only those appearing to be unwell and the terminally ill individuals are the only ones infected with HIV. This may increase their chances of contracting HIV and this perception is potentially hazardous (Sychareun et al., 2013). This may have implications on public health programmes and policy. A lack of information on HIV prevention and inadequate knowledge about HIV can expose these respondents to HIV despite the low HIV risk perception (Zihindula et al., 2016). This finding accentuates the need for more programmes and campaigns on HIV awareness and prevention among the residents of Metropolitan areas of Gauteng Province.

The findings of this study support the conceptual framework guiding this study. Individual characteristics (migration status, age, duration of stay) and the social environmental factors (perceived common health problem as HIV or TB and accessibility to HIV information and treatment) were associated with HIV risk perception among migrants and non-migrants in Metropolitan areas of Gauteng Province in 2012.

4.2. Strengths and limitations

The missing data on the sexual behaviour of the respondents was a major limitation, another key limitation of the study was missing information on the clusters (EAs). Sexual behaviour usually influences the accuracy of HIV risk perception. Since the original study was cross-sectional survey we could only detect associations and not make conclusions about causal associations (Zungu et al., 2016). It is worth noting that it was difficult to assess the accuracy of self-reported HIV risk perception without information about respondents' sexual behaviours (Suresh et al., 2014) as there is a difference between risk perception and actual behavioural risk (Baidoobonso et al., 2013).

The study relied on the respondents having been truthful and accurate on their self-reported HIV risk perception and their current HIV status. This may be affected by social desirability bias. While interviews were confidential, there is potential for bias due to the fact that the data was self-reported. There may be high desirability bias where some respondents tend to under-report their risk perception in order to be viewed favourably by the interviewer. Some of our variables had few individuals in some categories this could affect the precision of the effect

estimates and make it difficult to find statistical significance. There were missing values for some variables and the type of employment of the respondents was not specified.

The study used a population from a large Metropolitan area, it could be generalized to such settings. Despite the limitations, the analysis provided some significant insight to high-risk populations and issues discussed. The study adds to the pool of knowledge on HIV risk perception of an under-studied sub-group with emphasis on possible risk of HIV infection. Generalization from the findings of this study should be done with caution.

4.3 Conclusion and recommendations

HIV Risk perceptions are critical in HIV research and interventions. It is important to understand the ways in which migrants assess their HIV risk perception for development and implementation of interventions that are relevant and effective. The high HIV prevalence in Gauteng and the low risk perception found in this study, especially among the respondents who reported no knowledge of where to seek HIV information and treatment. This suggests the need for programmes aimed at creating awareness about HIV and promoting adoption of preventive health lifestyle among migrants and non-migrants alike in Gauteng Metropolitan areas. The findings are important for informing formulation of interventions and programmes that are aimed at increasing the accuracy in individuals gauging their risk perception relative to their sexual behaviour. Public health programmes on HIV information and preventative measures in South Africa should take into consideration how the circumstances and social environments that individuals find themselves in may affect their perspectives, perceptions and behaviours pertaining to HIV/AIDS. HIV risk perception evaluation along with interventions to correct risk perception are required and should be included in prevention programmes.

During HIV testing and counseling it is important that the health service providers should provide education to empower individuals to improve their HIV risk perception assessment. More research on HIV risk perception is justified in generating a deeper understanding of HIV risk perception. A prospective cohort could be used to assess and identify the factors influencing HIV risk perception. A more qualitative study could provide more information on

of the association between HIV risk perception, risk taking behaviour and factors shaping HIV risk perception. Qualitative research on structural and environmental conditions that influence HIV risk perception is needed in order to successfully reduce the risk of contracting HIV.

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Appendices

Appendix 1: Plagiarism declaration report

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Melitah Motlhale (Student number: 1439195) am a student registered for the degree of MSc (Epidemiology and Biostatistics) in the academic year 2017.

I hereby declare the following:

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

Signature: _____ Date: 27/07/17

Appendix 2: Ethics clearance certificate

R14/49 Miss Melitah Motlhale

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M170128

NAME: (Principal Investigator)	Miss Melitah Motlhale
DEPARTMENT:	Epidemiology and Biostatistics School of Public Health
PROJECT TITLE:	Migration Status and HIV Risk Perception in Metropolitan Areas of Gauteng Province
DATE CONSIDERED:	27/01/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Latifat Ibisomi and Mrs Nkechi Obisie-Nmehielle
APPROVED BY:	Prof P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	03/02/2017

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 301, Third floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in January and will therefore be due in the month of January each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date 06/02/17

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES