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Factors associated with acceptance of HIV testing among adolescents in the city of Johannesburg South Africa

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UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

SCHOOL OF PUBLIC HEALTH

FACTORS ASSOCIATED WITH ACCEPTANCE OF HIV TESTING AMONG ADOLESCENTS IN THE CITY OF JOHANNESBURG SOUTH AFRICA

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A research report submitted to the faculty of health sciences in partial fulfilment of the requirement for the degree of Master of Science in Epidemiology in the field of Infectious Diseases at the University of the Witwatersrand, Johannesburg

Supervised by:

Prof. Peter Nyasulu

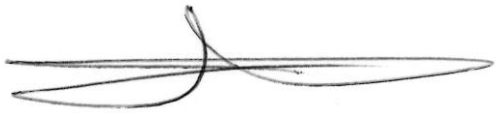
Dr. Ndumiso Tshuma

June 2020

DECLARATION

I, Dr Raymond Kibonge Longolongo, confirm that this research report presented for the Degree of Master of Science in Epidemiology and Biostatistics (Infectious Diseases) at the University of Witwatersrand, has:

- Been composed exclusively by myself.
- Been only the result of my own work.
- Not been submitted in whole or in part for any other degree or proficient qualification in this or any other University.



Signature of candidate

15 June 2020

Date

DEDICATION

This research report is dedicated to:

- The Lord Jesus Christ for his death and resurrection that gave me hope and strength for this present world and that to come.
- My mother, Safi Talukengwe, for showing me the way of life through education and attachment to the higher God.
- My loving wife, Theresa Nyandeli, and my children Rebecca, Elie, Deborah and Ketsia for their love and support.
- My brothers Fabrice Lusungu, Charles Lusangi, and my sisters Antoinette and Jeanne Mbaku for their eternal love.
- All who have been assisting and supporting me along the way since I had left my parent's house.

ACKNOWLEDGEMENTS

I would first give thanks to my Lord Jesus Christ, who by his Grace and Mercy has delivered me from my sin by His only blood and guaranteed me eternal life with Him in His Heavenly Kingdom.

I would also like to thank Prof. Peter Nyasulu and Dr. Ndumiso Tshuma for their patience and guidance which has been very inspiring and precious. This accomplishment would not have been possible without them. Many thanks to you.

I acknowledge Wits University and all my lecturers, particularly Prof. Levin, Dr. Zodwa, Dr. Latifat, and Dr. Jabu, for their support during my three years studying towards this degree. I also acknowledge the assistance from the former CARe non-governmental organisation for providing me with the research data for this study.

Finally, my profound gratitude to my family for their unconditional love and prayers, without which this achievement would not be possible. Thank you.

ABSTRACT

Background: Adolescents have emerged as an important group affected by the Human Immunodeficiency Virus(HIV) infection. Key to decreasing the HIV incidence in this population is HIV counselling and testing (HCT), particularly in countries with high prevalence such as South Africa (SA). Although there is data related to the HCT uptake and factors which influence rural SA adolescents' decision to undergo HCT, there is limited data available for urban SA adolescents. This information has implications related to the design of HCT interventions targeting adolescents in urban SA settings. This study aimed to determine factors of low HCT uptake amongst adolescents in the city of Johannesburg, SA.

Methods: This was a secondary analysis of data from a survey of adolescents (aged 10-19 years old), which was conducted by a non-governmental organisation in two regions of Johannesburg, SA during 2016 and 2017. The proportion of adolescents who subsequently consented to HCT (community-based outreach) was determined. Data from the survey was analysed with bivariate and multivariate statistical methods to identify factors associated with the decision to undergo HCT.

Results: The final study sample consisted of 114 sexually active adolescents. A total of 97 out of the 114 study participants (85.1%) had subsequently consented to undergo HCT. In the multivariate model (adjusted for age), two factors were independently associated with HCT uptake: lack of support from friends and family (Odds ratio (OR): 0.20, 95% CI: 0.05-0.80, p=0.023) and belief that one was at risk of HIV infection (OR: 3.93, 95% CI: 1.03-14.96, p=0.045).

Conclusions: The level of HCT uptake amongst adolescents in this study was 85%. Lack of support was associated with a lower odds of consenting to HCT, whereas self-perceived risk of HIV infection associated with higher odds of consenting to HCT. The findings of this study require confirmation, but nonetheless provide information which can be useful for designing future HCT campaigns in this urban setting.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
CARe	Community AIDS Response
CI	Confidence interval
HCT	HIV Counselling and Testing
HBCT	Home-based counselling and testing
HIV	Human Immunodeficiency Virus
HREC	Human Research Ethics Committee
N/A	Not applicable
OR	Odds ratio
PITC	Provider-Initiated HIV Testing and Counselling
PLWH	People living with HIV
SA	South Africa
SCT	Social Cognitive Theory
SD	Standard deviation
SSA	Sub-Saharan Africa
VCT	Voluntary Counselling and Testing
YAP	Youth Advocacy Project

CHAPTER 1: INTRODUCTION

1.1 Background

Amongst the most pressing global health issues in adolescent populations is the Human Immunodeficiency Virus (HIV) and the associated Acquired Immunodeficiency Syndrome (AIDS). In 2018, adolescents accounted for 4% of all people living with HIV globally (PLWH) globally *(UNICEF, 2019)*. Almost 80% of all adolescents living with HIV reside in sub-Saharan Africa (SSA) *(Sam-Agudu et al., 2016)*.

South Africa (SA) has been extremely affected by HIV with an estimated 7.97 million PLWH in 2019, and an overall HIV prevalence rate of 13.5%. This confirms SA as the epicentre of HIV infection globally *(Wechsberg et al., 2018)*, with adolescent girls and young women aged between 15-24 years old accounting for 31% of all horizontally transmitted HIV infection *(StatsSA., 2018).* Despite adolescents' high risk of exposure to HIV infection and an increased awareness of HIV counselling and testing (HCT) in this group, their access to this service remains low. This hinders global efforts in expanding HIV treatment and prevention programmes in this specific population *(Inwani et al., 2017).* Consequently, HCT in younger age groups needs to be prioritized by policy makers, particularly in SA .

1.2 Problem statement

In 2014, a SA National HIV Survey showed an increase in the uptake of HCT services, with 65.5% of the national population tested for HIV *(Shisana et al., 2014)*. It is generally accepted however that HCT uptake amongst children and adolescents remains lower when compared with that of adults *(Lightfoot et al., 2017)*. Despite widespread of HIV prevention initiatives in schools and media campaigns, the SA National HIV Prevalence, Incidence, and Behaviour Survey found that less than half of adolescent respondents knew that condoms were effective in preventing HIV. Furthermore, the essential knowledge on HIV infection was found to be very poor in adolescent responders *(Shisana et al., 2014)*.

A 2014 UNAIDS document reported that in SSA, only 10 and 15 percent of young women and men respectively knew their HIV status *(UNAIDS., 2015).* While a recent survey of adolescents from Soweto in SA reported a much higher percentage of respondents (47%) knowing their HIV status *(Miller et al., 2017)*, they remains room for improvement of this statistic. Based on the lack of knowledge of HIV and the poor uptake of HCT in SSA and SA studies *(Govindasamy et al., 2015; Miller et al., 2017; Shisana et al., 2014)*, it is possible to identify factors that hamper the uptake of HCT services in these regions *(Asaolu et al., 2016).*

1.3 Justification

There has been research carried out that explored different factors associated with HCT uptake amongst rural SA adolescents *(Strauss et al., 2015)*. Studies which have investigated the effect of HIV knowledge, related-attitudes, and behavior on HCT uptake amongst adolescents in a large urban setting such as the City of Johannesburg SA are rare.The current study sought to determine the factors that affect HCT uptake amongst adolescents in Johannesburg, provide insight for HIV programme managers in the city with evidence regarding the causes of low HCT among HIV-positive adolescents, and provide some recommendations to address these. In order to establish what constitutes youth friendly HCT services from the perspective of urban youth, it is crucial to understand urban youth preferences regarding HCT services. Understanding of the drivers of choice and preferences for HCT provides a platform for designing service delivery models and developing policies to reduce barriers to testing and increase the appeal of available services *(Michaels-Igbokwe et al., 2015).*

1.4 Research question

What were the determinant factors of low uptake of HCT among adolescents in the City of Johannesburg, SA between 2016 and 2017?

1.5 Research aim

This study aimed to determine factors associated with low HCT uptake among adolescents in the City of Johannesburg, SA.

1.6 Research objectives

The objectives of this study were:

- To determine the HCT uptake amongst a sample of adolescents residing in the City of Johannesburg, SA.
- To describe the characteristics of adolescents who accept or decline HCT.
- To determine which personal, behavioral, and social/environmental are associated with HCT amongst these adolescents.

CHAPTER 2: LITERATURE REVIEW

2.1 HIV in adolescents

HIV/AIDS has emerged as one of the most important global health challenges in the past few decades since its discovery in 1983, reaching a global prevalence of 37.9 million in 2018 (Figure 1).

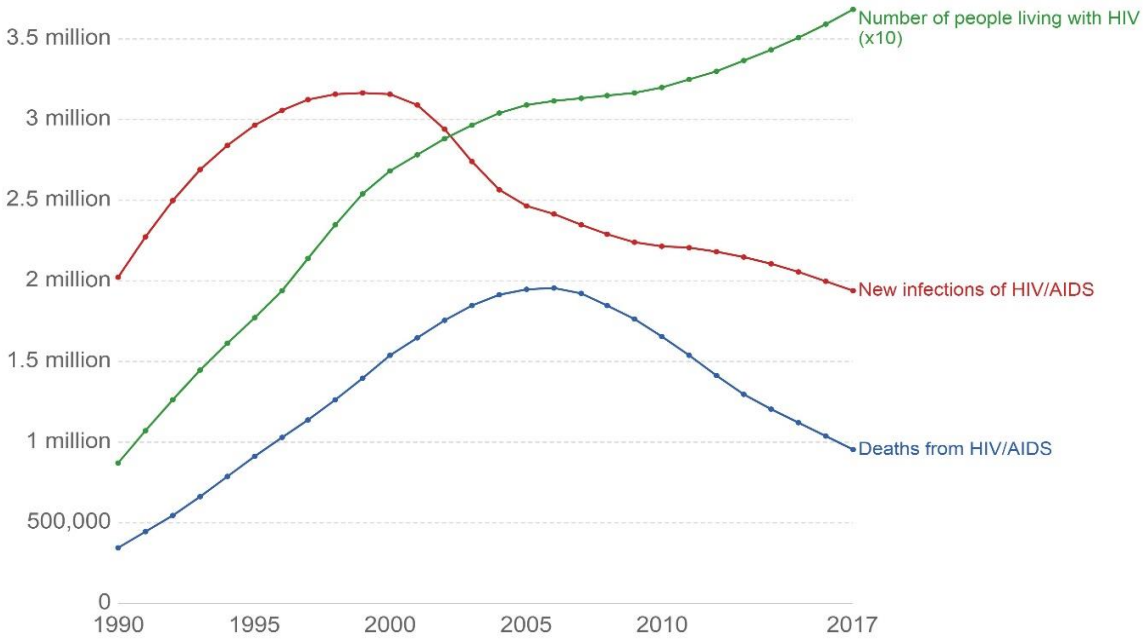


Figure 1. HIV global trends (1990-2018)

From: *(Roser & Ritchie, 2019)*.

New infections and HIV-related mortality have declined significantly since 1990 due to the antiretroviral therapy (ART) rollouts and strengthening of HIV prevention and screening programmes, particularly in regions most affected by the virus. However, SSA still bears the brunt of the global HIV epidemic. It is estimated that just over two-thirds of all PLWH globally reside in SSA countries *(Roser & Ritchie, 2019)*. In 2018, SA alone accounted for 7.7 million PLWH, with 240 000 newly infected among them *(AVERT, 2019).*

Although the majority of persons living with HIV worldwide are adults, children and adolescents are also impacted by this global epidemic *(UNICEF, 2019)*. Recent reports show a similar declining trend in HIV incidence and HIV-related mortality in children and adolescents (Figure 2). Furthermore, the prevalence of HIV in

adolescents has now surpassed that of children (Figure 2), highlighting the potential importance of this group in future strategies to combat the global HIV epidemic.

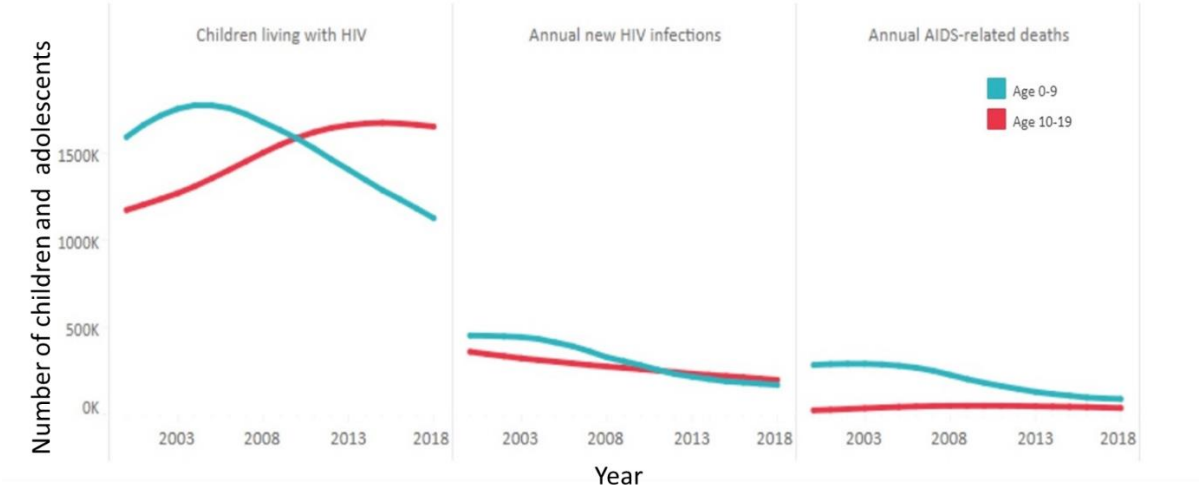


Figure 2. Global trends in children and adolescents living with HIV, HIV incidence, and HIV-related mortality (1998-2018)
From: *(UNICEF, 2019)*.

In 2018, there were an estimated 1.6 million adolescents living with HIV around the world, of which 970 000 were girls. Based on absolute numbers, adolescent girls appear to be disproportionately affected by HIV infection, with the 2018 global HIV infection estimates suggesting that there were almost three times as many new infections in adolescent girls when compared with adolescent boys (Table 1). *(UNICEF, 2019)*.

Table 1. Global statistics for adolescents living with HIV infection in 2018

	Adolescents 10-19	**Girls 10-19**	**Boys 10-19**
Estimated number of adolescents living with HIV	1.6 [1.1 million – 2.3 million]	970,000 [540,000 – 1.4 million]	680,000 [510,000 – 950,000]
Estimated number of adolescents newly infected with HIV	190,000 [59,000 – 380,000]	140,000 [29,000 – 280,000]	50,000 [8,600 – 120,000]
Estimated number of adolescents dying of AIDS-related causes	33,000 [22,000 – 47,000]	16,000 [10,000 – 24,000]	16,000 [12,000 – 23,000]

From: *(UNICEF, 2019)*.

Adolescence constitutes a period of transition to adulthood, which is characterised by rapid growth, enhanced cognition, and associated with newly emerging abilities, strengths and skills *(Committee.on.the.Rights.of.the.Child., 2016; Strauss et al., 2015)*. During this period, adolescents are characterized by an impulsive sexual interest and a sense of invulnerability *(Committee.on.the.Rights.of.the.Child., 2016; Strauss et al., 2015)*. This contributes toward increased risky behaviour in these individuals, such as unprotected sexual intercourse, intravenous drug use, or alcohol consumption. These are well established risk factors for a multitude of infectious diseases, including HIV *(Kresina & Lubran, 2017; Ssewanyana et al., 2018)*.

2.2 Variations of HCT and processes involved

HCT and raising awareness of HIV status is crucial for preventing infection, and these aspects are also key steps in the pathway of linking HIV-infected individuals to care services *(Inwani et al., 2017)*. The settings in which HCT can be performed include the general community, healthcare facilities and schools. Strategies for HCT include voluntary counselling and testing (VCT), provider-initiated testing and counselling (PITC), self-HIV testing, family-cantered counselling and testing, home-based counselling and testing (HBCT) integrated to outreach services *(Kurth et al., 2015)*. The HIV test itself can be performed as a point-of-care rapid test, or alternatively blood samples can be drawn and sent to an accredited laboratory to test for the presence of HIV. “Opt-in” HIV testing can be offered, but only done once informed consent is obtained. “Opt-out” HIV testing is routinely done (without the requirement for informed consent), but an individual should be made aware of the test and be allowed to opt-out if he/she wishes to do so. A general overview of the HCT process is shown in Figure 3. In addition to the actual test for HIV, the process also includes an educational component on HIV and its risk factors as a risk reduction strategy, and information on where to go for follow-up care and treatment if the individual tests positive for HIV.

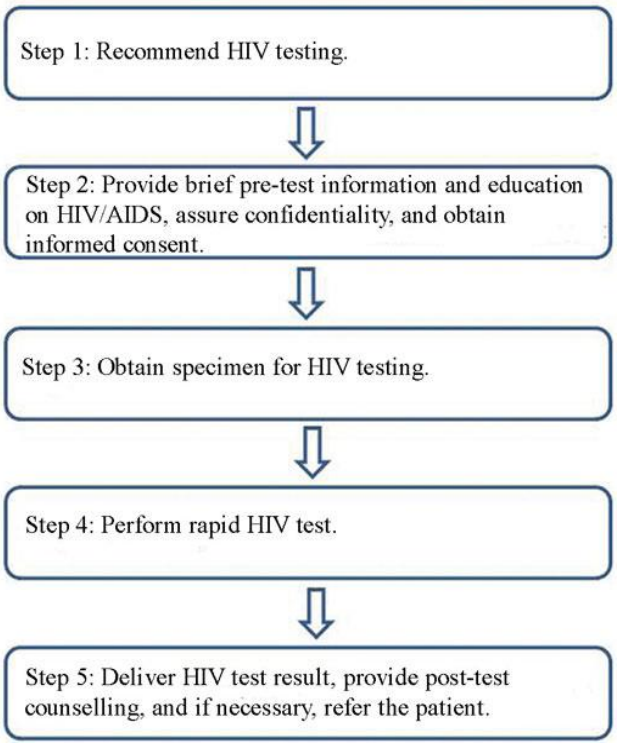


Figure 3. General overview of the HCT process

HIV testing capacity has increased over time in SA, resulting in more people knowing their status *(Shisana et al., 2014)*. However, there are some hyperendemic SA communities where there is still an unacceptably high level of undiagnosed HIV infection *(Vandormael et al., 2018)*. While adolescents have emerged as a key population, efforts to improve awareness of HIV status as well as access to HCT and uptake of HCT have proven to be difficult in this target group *(Inwani et al., 2017)*. The early integration of HCT in a paediatric healthcare system remains a priority for policy makers, particularly if SA is to achieve the UNAIDS 90-90-90 target toward the elimination of the HIV epidemic as global threat by 2030 *(Bain et al., 2017)*. Furthermore, the repercussions of HIV in adolescents also appear to be more severe in comparison to other age groups, particularly the high rate of loss to follow-up *(Auld et al., 2014)*, poor adherence to ART resulting in treatment failure *(Nachega et al., 2009)*, and increased requirements for psychosocial support *(Ramaiya et al., 2016).*

2.3 Factors to consider when designing HCT services for adolescents

HIV prevention among adolescents remains particularly important, given their growing needs and risk-taking behaviour as they transition to adulthood. There are various factors which might influence adolescent engagement in HIV primary and secondary

prevention activities in the SSA context, many of them being components of Bandura's Social Cognitive Theory (SCT, Figure 4), which is a theoretical framework widely used in the field of applied health psychology and in behavior change campaigns. It is comprised of five constructs: reciprocal determinism, behavioral capability, observational learning, reinforcement, expectation, and self-efficacy. As shown in Figure 4, this theoretical framework is often adopted during the design of HIV prevention campaigns *(Bandura, 1994).*

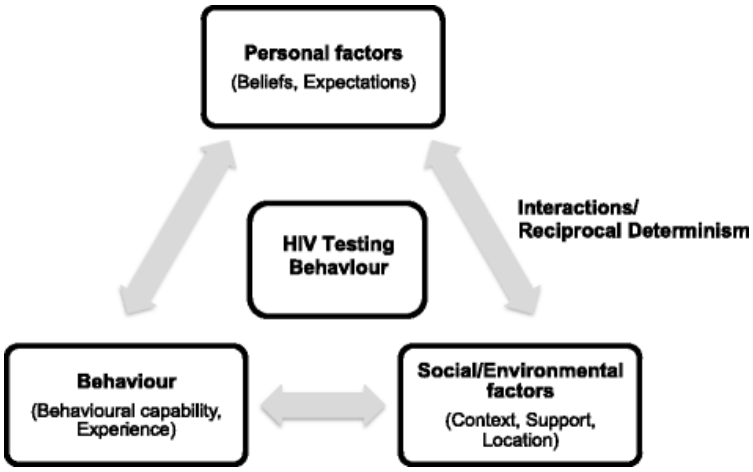


Figure 4. SCT in the context of HIV prevention
Adapted from: (Bandura, 1994; Strauss et al., 2015).

The vital considerations of this theory is described by Bandura's design of triadic reciprocal causation, showing that the reproduction of an observed behaviour is predisposed by the interaction of personal, behavioural and social/environmental determinants *(Bandura, 1994)*. It is to be noted that these factors, particularly their related determinism can impact positively or negatively on the utilization of HCT services. An understanding of these factors can inform the design and implementation of an HIV services targeting adolescents and young people *(Strauss et al., 2015)*.

2.3.1 Personal factors

Personal factors which might impact HCT uptake amongst adolescents include low self-perceived risk of HIV infection and fear of a positive HIV testing result *(Mohlabane et al., 2016; Musheke et al., 2013)*. Some of these factors are heavily dependent on the individual's knowledge of HIV.

In general, a low level of HIV knowledge and awareness has been described amongst youth in SSA *(Asaolu et al., 2016)*, with a study on predictors of HIV testing among youth aged 15-24 years reporting that only between 25% (Nigeria) to 33% (Uganda) of youth were able to demonstrate adequate knowledge of HIV *(Asaolu et al., 2016)*. Furthermore, a survey conducted in southwest Nigeria reported a poor attitude and utilization of HCT services amongst adolescents *(Alabi et al., 2018).* Some of the adolescents (14.3%) strongly agreed that HCT was only for married people, while others (12.5%) strongly agreed that knowledge of one's HIV status is not beneficial. Considering that this study was conducted in a rural area, the low socioeconomic class of the respondents may have significantly impacted on the knowledge and practices of the adolescents to HCT. The majority of respondents got information about HCT from television and radio *(Alabi et al., 2018)*. Adolescents' behaviour can influence their personal beliefs and intention to test for HIV. Those adolescents who perceive themselves to be at high-risk of infection due to unsafe sexual practices, or those who are skeptical/fearful of the consequences of testing positive are less likely to agree to have a test done *(Fako, 2006; Strauss et al., 2015)*. Internalized stigma may affect HIV testing behaviours, while anticipated stigma may have especially strong effects on post-testing activities such as care-seeking and adherence to ART *(Kurth et al., 2015).*

2.3.2 Behavioural factors

Behavioural factors are defined as those factors which affect adolescents' experiences, with age of sex debut (defined as any sexual intercourse before the age of 15), condom use and multiple sexual partners being important factors in the global context *(Idele et al., 2014)*. In SSA, 13% of girls and 9% of boys of similar age reported having sex before the age of 15. This is much higher than that reported for other settings with high HIV incidence such as South Asia, where only 8% of girls and 3% of boys accounted for sexual debut before the age of 15 *(Idele et al., 2014)*. Furthermore, having multiple sexual partners amongst adolescent boys aged 15-19 years is common in both low and high HIV prevalence countries (Strauss et al., 2015). Although condom use is an effective way of preventing HIV transmission, there is often low use of condoms in countries with high HIV prevalence *(Strauss et al., 2015).*

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2.3.3 Social/environmental factors

Defined as the economic, social, policy and organizational contexts that "structure" the context in which risk occurs, the environment is increasingly recognised as important determinant in the acquisition and transmission of HIV *(Kaufman et al., 2014)*. Multiple factors related to health-care delivery systems contribute to delays in ART initiation, mainly diagnosing HIV at an advanced or late stage (as determined by the clinical stage of the disease progression), loss to follow up, and poor linkage to ART care after testing positive *(Enane et al., 2018)*. In addition, judgemental attitudes of nursing staff are another barrier towards HIV testing among adolescents, with some being concerned about the absence of confidentiality in testing services *(Chikwari et al., 2018).*

The interaction between personal factors and the context in which adolescents find themselves influences their willingness to undergo HIV testing *(Strauss et al., 2015)*. Fear of HIV-related stigma and discrimination is a generally considered to be the most important barrier to HCT *(Young et al., 2010)*. With specific reference to adolescents, lack of support from the community, family and friends, has also been identified as barrier to HCT *(Strauss et al., 2015)*. Other relevant social or environmental factors which can influence uptake of HCT in adolescents are age, gender, education level. housing, location of HCT site, perceived competency of healthcare workers performing HCT, and perceived unreliability of test results *(Mohlabane et al., 2016).*

The role of economic factors cannot be ignored, as a school-based study of learners aged 16 to 25 years conducted in KwaZulu-Natal, SA reported that offering an incentive to the value of US$7.50 had increased the odds of HIV testing by over 100% *(Strauss et al., 2015)*. The authors of this study later described a cash incentive as the only statistically significant variable that increased the odds of an adolescent choosing an HCT service package. Offering free HCT itself does not necessarily eliminate the cost of HCT to learners, as there may be transportation costs and other incidental expenses required to access the HCT service facility *(Strauss et al., 2015)*.

2.4 Gap in the knowledge

Research has already been conducted to understand factors and reasons for adolescents' decision to agree to undergo HCT in rural SA settings *(Strauss et al., 2015)*. However, there have been fewer studies on this topic from urban SA settings. This lack of studies from urban SA settings has important implications for the design of HCT interventions targeting urban SA adolescents. One must consider that most of the population in SA are concentrated in urban settings. There are several inherent socioeconomic and environmental differences between rural and urban populations which might influence adolescents' intent to undergo HCT in these two settings. As such, it might not be entirely appropriate to apply findings from rural settings to urban settings. It is also likely that even traditionally rural areas in SA will undergo some degree of urbanization in the coming years, and the population of urban adolescents will rise. It is therefore imperative that research on factors which influence the uptake of HCT in an urban SA adolescent population be conducted.

CHAPTER 3: METHODOLOGY

3.1 Study design

This was a secondary analysis of data from a cross-sectional survey conducted by a former non-governmental organisation, Community AIDS Response (CARe), in 2016-2017 as part of their programme implementation under the Youth Advocacy Project (YAP). The HCT offered by CARe was community-based, involved an outreach strategy, and was “opt-in”.

3.2 Study setting

The survey took place in Regions E and F of the City of Johannesburg (Figure 5), located in Gauteng Province, SA.

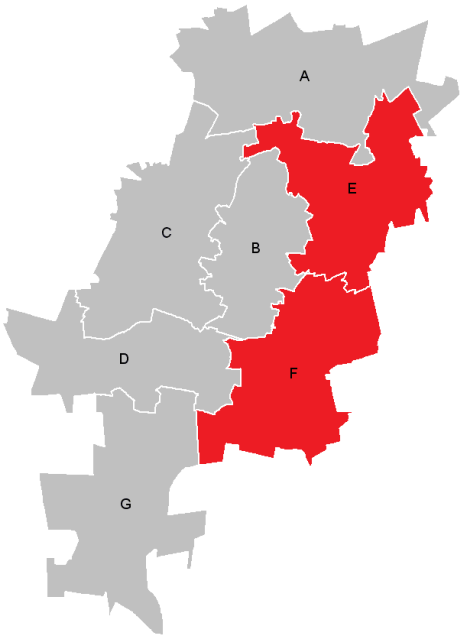


*Figure 5. Locations where the main survey was conducted, Regions E and F of the City of Johannesburg**

*Regions E and F highlighted in red colour.

Region E is comprised of many older suburbs of the city of Johannesburg, most of them located along Louis Botha Avenue and the old main road between Johannesburg and Tshwane. However, the region does include some newer suburbs in and around central Sandton. Region F, known as well as the Greater Alexandra, is situated on the banks of the Jukskei River, 16km long from central Johannesburg. It is very well

located in terms of key arterial roads and the main highway that links the city of Johannesburg to the City of Tshwane. There are 35 000 people currently living in Alexandra. Dwellings include informal houses, shacks, and hostel complexes. Both regions E and F are characterized by a dense population, high unemployment rate, a skewed age profile of more young people, low monthly income, and low literacy levels.

3.3 Study population

Sexually active urban SA adolescents (aged 10-19 years old).

3.4 Study sample

Sexually active adolescents engaged by CARe in the city of Johannesburg in 2016 and 2017 (n=114, Figure 6).

3.5 Sampling

This was a sub-analysis of a larger cross-sectional, community-based survey conducted by CARe. The community survey (the primary study) sought to establish attitudes and perceptions towards HCT in urban young people aged between 10 and 25 years old. For the primary study, the sampling was performed randomly by fieldworkers who approached young people in Regions E and F of the City of Johannesburg to participate. We only included survey participants who met the eligibility criteria given in section 3.6 below for this secondary analysis.

3.6 Eligibility criteria

Inclusion criteria:

- Adolescents (aged 10-19 years old) identified from the demographic information section of the questionnaire

Exclusion criteria:

- Not sexually active/ no sexual debut
- Missing data or missing questionnaire responses

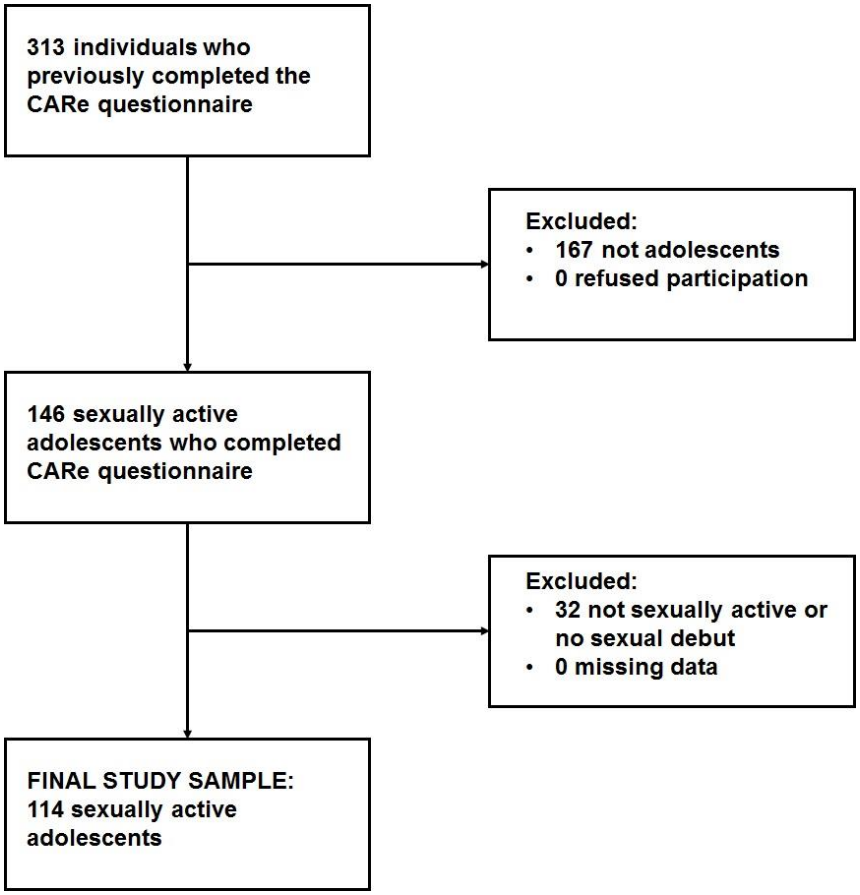


Figure 6. Flow diagram showing how the study sample was derived

3.7 Data collection

The data used in this sub-analysis was sourced from the completed CARe questionnaires. Individuals who consented to participation in the main CARe survey were given a paper-based questionnaire (Appendix 1) to complete. The questionnaire consisted of several items which covered personal, behavioural, and social/environmental factors potentially associated with HCT uptake in the study population. The responses to the questionnaire were in the form of a five-point Likert Scale (Strongly disagrees, disagree, neutral, agree, and strongly agree). Participants were only allowed to select one Likert response per questionnaire item. CARe workers were on standby to provide support to participants who had any challenges in answering the questions. All questionnaire responses were subsequently entered onto the Microsoft Excel database. Participants were also offered free voluntary HCT after completion of the questionnaire, and acceptance levels of HCT after the survey were also tracked by CARe fieldworkers and entered on the Microsoft Excel database.

3.8 Data management

The data for this secondary analysis was provided by CARe as a Microsoft Excel database. The database file had a password protection system, and only the student and supervisors had access to it. A backup copy of the password-protected database was stored on a separate computer to protect against data loss.

3.9 Data analysis

Data was analysed using quantitative methodologies with steps including: an initial analysis of the data with descriptive statistical methods, followed by a bivariate statistical analysis, and finally a multivariate logistic regression analysis. All data analysis was performed using the Statistical Package for the Social Sciences (SPSS) Version 26.0 (IBM Corporation, USA).

Due to the large number of similar items in the questionnaire administered by CARe, it was decided to collapse some of these into one variable group to simplify the data analysis. This included “Fearful of HIV test or its possible consequences” (a composite of expressed fear of dying from HIV, fear of HIV-associated tuberculosis, fear of rejection by partner, etc.), and “Lack of support from friends and family” (no support from family, no support from friends and colleagues). Some items on the questionnaire were also dichotomized as there were some categories where there were no, or few responses recorded. This resulted in the creation of the following variables from the pre-existing data: black African ethnicity, Christian religion, Number of people in household and Number of sexual partners in lifetime (dichotomized using cut-point of 4 partners). For the Likert responses, a Likert response of “agree” or “strongly agree” was a positive response to the specified questionnaire item (“Yes”). All other Likert responses were considered as negative responses to the specified questionnaire item (“No”). Whether or not a participant consented to a subsequent counselling and a HIV rapid test at the CARe site, hereafter referred to HCT uptake (the study outcome), was recorded as a separate variable on the database and did not require recoding.

The study variables were first analysed using descriptive statistical methods. This involved determining the mean (standard deviation, SD) for the continuous variable “Age” and the frequencies and percentages of the other study variables, which were all categorical. During this process the percentage of survey participants who

subsequently consented to HIV rapid test at the CARe site (HCT uptake) was also established.

Bivariate statistical analysis was then used to determine the crude associations between various study variables and the study outcome. For this component of the statistical analysis, the unpaired T-test was used to analysed continuous variables, while categorical variables were analysed using the chi-squared test or Fisher's test where applicable. The results of the bivariate statistical analyses are presented as means and standard deviation (SD) for continuous variables, and as frequencies and percentages for categorical variables, with the corresponding p-value. A p-value of <0.050 in the bivariate statistical analysis was used to select variables for inclusion in a multivariate statistical analysis, that being an adjusted statistical analysis which sought to control for the effects of possible confounders. The multivariate statistical method used to analyse the data in this study was binary logistic regression. The method of using a p-value threshold in the unadjusted statistical analysis for choosing variables to include in a subsequent multivariate statistical analysis is known as "purposeful selection" *(Bursac et al., 2008)*. This approach serves two functions. The first is that it can be used to ensure that statistical rules of thumb for multivariate regression analyses, specifically the "10 events per variable" rule *(Peduzzi et al., 1996)*, are not violated by selecting only the most promising variables for the analysis. Secondly, it ensures that a parsimonious model is obtained at the end of a multivariate regression analysis *(Bursac et al., 2008).* Although the criteria of p<0.05 in the univariate analysis for inclusion in the multivariate analysis might be considered strict, it was necessary to identify the most likely factors which should be included in the regression model while ensuring that we did not violate the statistical rule of thumb of "10 events per variable entered into a regression analysis" in light of our small sample size.

All variables with a significant p-value (p<0.050) in the bivariate analysis were entered as independent variables in the regression analysis, with HCT uptake being the dependent variable. The results of the binary logistic regression analysis are presented as odds ratios (OR) with 95% confidence intervals (CI). Statistical significance in the binary logistic regression analysis was set at p<0.050. Statistically significant variables with OR>1.00 were considered characteristics associated with

higher odds of accepting HCT. Statistically significant variables with OR<1.00 were considered characteristics associated with lower odds of accepting HCT.

3.10 Ethics

Authorization to use primary study data was provided by CARe. The data was de-identified, ensuring that participant confidentiality was maintained. The research protocol was approved by the Wits Human Research Ethics Committee, Ethics Clearance Number M180478 (Appendix 2).

CHAPTER 4: RESULTS

4.1 Description of the study sample characteristics

Table 2 provides a description of the personal, behavioural, and social/environmental characteristics of the final study sample.

Table 2. Frequency distribution of the sample characteristics

Characteristic	**Study sample n (% of N=114)**
Mean age in years (SD)	16.8 (1.4)
Gender	
Female	65 (57.0)
Male	49 (43.0)
Black African ethnicity	
No	19 (16.7)
Yes	95 (83.3)
Christian religion	
No	11 (9.6)
Yes	103 (90.4)
Number of people in household	
<4	28 (24.6)
≥4	86 (75.4)
Number of sexual partners in lifetime	
<4	86 (75.4)
≥4	28 (24.6)
Condom use during last sexual intercourse	
No	7 (6.1)
Yes	107 (93.9)
Age in years when first sexually active	
10-14	25 (21.9)
15-19	89 (78.1)
Believe that they are at risk for HIV	
No	26 (22.8)
Yes	88 (77.2)
Fearful of HIV test or it's possible consequences	
No	3 (2.6)
Yes	111 (97.4)
Lack of support from friends and family	
No	51 (44.7)
Yes	63 (55.3)
Feel that healthcare workers will be judgmental	
No	63 (55.3)
Yes	51 (44.7)
Testing canters or clinics too far	
No	39 (34.2)
Yes	75 (65.8)
Waiting times at testing centres or clinics are too long	
No	49 (43.0)
Yes	65 (57.0)
Cannot afford to travel to testing centre or clinic	
No	46 (40.4)
Yes	68 (59.6)
Subsequently consented to HCT at CARe site	
No	17 (14.9)
Yes	97 (85.1)

Commonly reported characteristics of potential importance in this study included: fear of HIV testing and its consequences (97.4%); self-perceived risk of acquiring HIV (77.2%), lack of support (55.3%), and distance to HCT services (65.8%). Most of the study sample consented to subsequent HCT (85.1%).

4.2 Bivariate analysis

Table 3 shows results of the bivariate statistical analysis. There were statistically significant (p<0.050) bivariate associations noted for age (p=0.023), perceived risk of HIV infection (p=0.003), and lack of support from friends and family (p=0.015). There were no other characteristics which showed a statistically significant bivariate relationship with HCT uptake,

*Table 3. Bivariate statistical associations between various characteristics and HCT uptake**

Characteristic	Level	Study sample n (% of N=114)	Consented to HCT n (% of N=97)	Did not consent to HCT n (% of N=17)	p
Mean age in years (SD)	N/A	16.8 (1.4)	17.0 (1.2)	15.9 (1.6)	0.023
Gender	Female	65 (57.0)	55 (56.7)	10 (58.8)	0.870
	Male	49 (43.0)	42 (43.3)	7 (41.2)	
Black African ethnicity	No	19 (16.7)	16 (16.5)	3 (17.6)	0.999
	Yes	95 (83.3)	81 (83.5)	14 (82.4)	
Christian religion	No	11 (9.6)	11 (11.3)	0 (0.0)	0.366
	Yes	103 (90.4)	86 (88.7)	17 (100.0)	
Number of people in household	<4	28 (24.6)	25 (25.8)	3 (17.6)	0.558
	≥4	86 (75.4)	72 (74.2)	14 (82.4)	
Number of sexual partners in lifetime	<4	86 (75.4)	71 (73.2)	15 (88.2)	0.234
	≥4	28 (24.6)	26 (26.8)	2 (11.8)	
Condom use during last sexual intercourse	No	7 (6.1)	6 (6.2)	1 (5.9)	0.999
	Yes	107 (93.9)	91 (93.8)	16 (94.1)	
Age in years when first sexually active	10-14	25 (21.9)	19 (19.6)	6 (35.3)	0.201
	15-19	89 (78.1)	78 (80.4)	11 (64.7)	
Believe that they are at risk for HIV	No	26 (22.8)	17 (17.5)	9 (52.9)	0.003
	Yes	88 (77.2)	80 (82.5)	8 (47.1)	
Fearful of HIV test or it's possible consequences	No	3 (2.6)	3 (3.1)	0 (0.0)	0.999
	Yes	111 (97.4)	94 (96.9)	17 (100.0)	
Lack of support from friends and family	No	51 (44.7)	48 (49.5)	3 (17.6)	0.015
	Yes	63 (55.3)	49 (50.5)	14 (82.4)	
Feel that healthcare workers will be judgmental	No	63 (55.3)	55 (56.7)	8 (47.1)	0.461
	Yes	51 (44.7)	42 (43.3)	9 (52.9)	
Testing centres or clinics too far	No	39 (34.2)	33 (34.0)	6 (35.3)	0.919
	Yes	75 (65.8)	64 (66.0)	11 (64.7)	
Waiting times at testing centres are too long	No	49 (43.0)	45 (46.4)	4 (23.5)	0.079
	Yes	65 (57.0)	52 (53.6)	13 (76.5)	
Cannot afford to travel to the testing centre or clinic	No	46 (40.4)	39 (40.2)	7 (41.2)	0.940
	Yes	68 (59.6)	58 (59.8)	10 (58.8)	

Continuous variables analysed with t-test. Categorical variables analysed with chi-squared test.
*Characteristics with p<0.050 selected for inclusion in multivariate logistic regression analysis.

4.3 Multivariate analysis

Table 4 shows the results of the multivariate logistic regression analysis. Two independent predictors of HCT uptake were identified: Lack of support from friends and family, and self-perceived risk of HIV infection. Specifically, lack of support from friends and family was associated with lower odds of consenting to HCT when compared with a reference group (received support from friends/family). Believing that one was at risk for HIV infection was associated with a higher odds of consenting to HCT when compared with a reference group (did not perceive any risk of HIV infection).

Table 4. Results of the multivariate statistical analysis investigating factors independently associated with increased HCT uptake

Characteristic	**OR (95% CI)**	**p**
Age (per year increase)	1.37 (0.84-2.23)	0.202
*Lack of support from friends and family**	0.20 (0.05-0.80)	0.023
*Believe that they are at risk for HIV**	3.93 (1.03-14.96)	0.045

*When compared with reference group “No” (OR: 1.00).

CHAPTER 5: DISCUSSION

5.1 Reiteration of key findings

The first key finding of this research was that HCT uptake amongst adolescents in the urban setting of Johannesburg, SA was 85.1%. The second key finding was that lack of support from friends and family reduced the odds of an adolescent going for HCT. The last key finding of this research was that a self-perceived risk of HIV infection increased the odds of an adolescent going for HCT.

5.2 HCT uptake amongst adolescents in the City of Johannesburg, SA

When compared with the findings of a recent systematic review *(Govindasamy et al., 2015)*, the uptake of community-based outreach HCT in this study (85.1%) fell within the general range reported for HCT outreach interventions in SSA adolescents (9.9-90.2%). Of the five studies included under HCT outreach in the systematic review, three were based in urban community settings and two were based in rural community settings *(Govindasamy et al., 2015)*. Acceptance of outreach HCT was higher in urban settings (60.4-90.2%) when compared to rural settings (9.9-56.6%). Of the urban, opt-in HCT outreach studies included in the review, our study findings were most like that of the study by *Kranzer et al.,* (2011). In that study, conducted in Cape Town (N=140), overall acceptance of HCT was 85.0% *(Kranzer et al., 2011)*.

While the findings for HCT uptake from our study and the study of *Kranzer et al.,* (2011) suggest that most urban SA adolescents are agreeable to outreach HCT and knowing their HIV status, we are still short of making 90% of our study population know their HIV status as recommended by UNAIDS. As part of a 2014 resolution, UNAIDS had set an ambitious“90-90-90 targets” which countries should aim to achieve by the year 2020 for the elimination of HIV as global public health threat by the year 2030 *(UNAIDS., 2014)*. The resolution requires that 90% of all PLWH know their HIV status, that 90% of those who tested positive be initiated on ART, and finally 90% of those started on treatment, achieve viral suppression (HIV viral load <50 copies/ml). A recent systematic analysis of whether countries were able to meet these targets revealed that although no country was able to meet the any of the three targets, the greatest breakpoint globally was for HIV diagnosis *(Bain et al., 2017).*

Since the data from the CARe survey suggested a good baseline of 85% of participants subsequently knowing their HIV status during 2016-2017, it is very likely that the UNAIDS target of identifying 90% of all those with HIV infection in this target population of urban SA adolescents would be reached, or even exceeded by end 2020. However, this would be dependent on the continued implementation and progress of youth-friendly HIV and HCT awareness campaigns targeting adolescents in urban SA settings.

More recently, the SA Government has considered offering HCT in schools *(Lawrence et al., 2015)*. There are ethical challenges with this approach *(Lawrence et al., 2015)*. Nevertheless, if HCT is to be offered in SA schools it would serve as an additional mechanism through which adolescents can determine their HIV status *(Madiba & Mokgatle, 2015)*. This would be relevant for adolescents who might not be able to go for HCT at community-based sites (such as that which was operated by CARe) due to financial or logistical barriers.

5.3 Association between lack of support and HCT uptake

The provision of a psychosocial support structure is known to positively influence an adolescent's decision to agree to HCT *(MacPhail et al., 2008).* Conversely, perceived lack of support might deter an adolescent from seeking HCT *(Strauss et al., 2015)*.
A study of adolescents and young people in Kenya found that 71% of adolescents who presented for HCT had been influenced by a support person *(Neary et al., 2019)*. Support persons were involved throughout the HCT process during that study, and most adolescents were accompanied by someone when they went for HCT, usually a parent *(Neary et al., 2019)*. A study from Ndola, Zambia reported a 6-fold higher odds of accepting HCT in those adolescents who discussed HCT with their families when compared with those adolescents who did not discuss HCT with their families *(Denison et al., 2009)*.

The role played by parents in adolescents' decisions to agree to undergo HCT is not limited to the provision of psychosocial support. Current legislation in SA states that any child aged >12 years old can consent to HCT *(Van Rooyen et al., 2016).* Younger adolescents (between 10 and 12 years old) could potentially consent to HCT, provided they demonstrate adequate understanding of risks/benefits of the HCT *(Van Rooyen*

et al., 2016). Although older adolescents might demonstrate the maturity and independence to go for HCT, it would be highly likely that most younger adolescents would need their parents or guardians to provide permission before being allowed to undergo HCT *(Van Rooyen et al., 2016)*. In addition, younger adolescents might require the financial or logistical assistance of a parent or guardian to access HCT services *(Neary et al., 2019).* Besides the provision of psychosocial support, friends can also encourage and motivate other adolescents to undergo HCT and well-informed peers can be also be used to deliver information on where and how to access HCT services *(Massey et al., 2012)*.The support of friends and family is also crucial once the result of the HIV test is known, particularly if this result is positive. Individuals who test HIV-positive and disclose this result to their partners can face abuse or abandonment from their partners *(WHO., 2004)*, and friends/family remain the only viable option for support. A positive HIV test result can be a source of great anxiety and depression in adolescents, as there are long-term negative consequences for their future *(MacPhail et al., 2008; Mkandawire, 2017).* This includes finding a marriage partner, having their own children, or the attainment of other important future goals they have set for themselves. Depression and anxiety might also drive adolescents who test positive for HIV to contemplate suicide *(MacPhail et al., 2008)*. Depression and anxiety are often manifested in behavioural changes *(Bernaras et al., 2019)*, which might be noticed by friends and family and this can serve as a trigger for them to intervene.

Friends and family members can also play an important role during HIV status disclosure by adolescents who may do this to alleviate anxiety or seek support. A qualitative study conducted in a sample of adolescents from a SA township revealed that a positive HIV test result would be considered “a disgrace” by their family members who would also be angry. However, adolescents felt that their family members would still offer psychosocial support and would maintain their confidentiality *(MacPhail et al., 2008)*. Furthermore, adolescents in the same study expressed that they would also disclose their HIV status to a close friend. Nevertheless, there were concerns related to whether the friend would be able to maintain confidentiality and some adolescents felt that they could trust their families more than their friends to maintain the confidentiality of their HIV status *(MacPhail et al., 2008)*.

Considering the importance of the support structure provided by friends and family in the lives of adolescents and during the HCT process, it is unsurprising that the current study found a significantly lower odds of consenting to HCT in adolescents who reported a lack of support from friends and family. Awareness of HIV should be raised in potential support persons and the general community. This could eliminate negative attitudes and misconceptions around HIV in these persons, thereby fostering a more understanding and compassionate attitude toward those contemplating HCT or those who are already infected *(Visser et al., 2009)*. Efforts should be made to include support persons during the HCT process. It has been suggested that advertising campaigns for adolescent HCT services should include images of support persons accompanying the adolescents for HCT *(Neary et al., 2019)*. This would also indicate to adolescents that they are encouraged to include an appropriate support person, such as a family member or close friend, during their HCT appointment.

5.4 Association between self-perceived risk of HIV infection and HCT uptake

The strongest predictor of increased HCT uptake in this study was self-perceived risk of HIV infection. The overall finding of perceived risk of HIV being a predictor of HCT uptake in this study is not unique to SA settings. A Zambian study involving 439 adolescents, reported that a perceived risk of HIV infection was independently associated with a 2.7-fold increase in the odds of agreeing to HCT *(Denison et al., 2009)*.

The perceived risk of HIV infection is closely linked to knowledge and awareness of HIV *(Strauss et al., 2015)*. Indeed, awareness of HIV itself appears to be a key determinant of adolescents agreeing to HCT in SSA settings. A cross-sectional study in adolescents from Congo, Mozambique, Nigeria, and Uganda found significantly higher levels of consent for HCT in those adolescents who demonstrated a comprehensive knowledge of HIV versus those who did not *(Asaolu et al., 2016)*. Bandura stated that “Heightened awareness and knowledge of health risks are important pre-conditions for self-directed change” *(Bandura, 1994)*. This is also relevant to the construct of “behavioural capability” within the generalized SCT model. “Behavioural capability” is an individual’s actual ability to perform an activity, such as

seeking HCT, by drawing up on the essential knowledge or skills they have attained *(Bandura, 1994)*.

Adolescents who lack adequate knowledge of HIV, those who are misinformed, or those who have misconceptions around HIV might underestimate the degree of their HIV risk exposure. For instance, SA has a disparity in HIV infection between various racial groups *(Shisana et al., 2014)*. The most severely affected are the Black Africans, whilst HIV prevalence is far lower in SA Caucasians and SA Asians *(Shisana et al., 2014).* As such, some SA Caucasian and SA Asians feel that HIV in SA is only a disease of the Black African racial group *(Ntsepe et al., 2014)*. Even though the prevalence of HIV infection is much lower in these racial groups, it cannot be truly stated that no SA Caucasians and SA Asians are infected with HIV. Misconceptions based on a poor/inappropriate knowledge of HIV and how these impact self-perceived HIV risk represent barriers to HCT in SA adolescents. HIV knowledge and awareness campaigns for adolescents should continue to be a priority for policymakers in SA.

5.5 Strengths and limitations of this study

The study had several strengths; It was conducted in an urban setting with high HIV prevalence. Secondly, our sample size of 114 participants allowed for an adjusted/multivariate statistical analysis to be performed in order to control for confounding variables and identify independent predictors of HCT uptake amongst urban SA adolescents. Lastly, data for all adolescents comprising the final study sample was also complete (i.e. No missing data).

This study also had limitations. This study was conducted in adolescents from a single city in SA, and the findings of this study might therefore not be generalizable to adolescents in other SA cities. This research did not involve a control group of adolescents from a rural SA setting, and no direct comparisons for HCT uptake could be made with adolescents from rural SA settings. There might have been some participant recall bias for some of the items on the CARe survey questionnaire. In order to maintain the confidentiality of study participants, the results of the HIV tests were not linked to the dataset analysed in this study. No analysis is presented regarding the incidence of HIV infection amongst those adolescents who consented to HCT at the CARe campaign site. This was a secondary analysis of survey data and there were

some relevant characteristics, such as knowledge levels around HIV, which could not be investigated in our study as it was not collected as part of the primary study. The sample size for this secondary analysis was also small, and this meant we had to use much stricter criteria to select variables for inclusion in the multivariate data analysis. These limitations would need to be accounted for if future research on this topic is planned.

5.6 Conclusion and recommendations

The study has contributed toward our understanding of factors that are associated with HCT uptake amongst adolescents in an urban SA setting.

Despite the fact that the levels of HCT uptake in this study were within the range of estimates reported for similar studies involving adolescents in SSA, the HCT uptake of 85% requires improvement if the UNAIDS 90-90-90 goal for the elimination of HIV/AIDS as public health burden by 2030 is to be attained in this key population group. This could be achieved by continued implementation of community-based outreach HCT, as well as the introduction of HCT in the school's health programme (following the consideration of ethical and implementation implications). This would also ensure that HCT services are accessible to those adolescents who might experience barriers to community-based outreach HCT.

Furthermore, this study confirms the negative effect that lack of support can have on an adolescent's decision to undergo HCT. HCT campaigns should attempt to engage with potential support persons for adolescents who wish to undergo HCT, raise HIV awareness in these support persons, and encourage their inclusion in the process by highlighting the important role they play before, during, and after HIV testing.

Adolescents in this study with a high perceived risk of HIV infection were more likely to consent to HCT. Urban SA adolescents should be given correct information about HIV and made aware of HCT services through well-designed awareness campaigns. This is crucial if these adolescents are to correctly perceive their risk of HIV infection, which might then influence their decision to undergo subsequent HCT.

This study serves as a building block for the future research on new approaches that seek to improve HCT uptake in urban SA adolescents. It does this by demonstrating the importance of social and personal factors in urban SA adolescents' decision-making processes and highlights the necessity of addressing these factors in planned HCT interventions targeting this population group.

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APPENDIX 1: CARe QUESTIONNAIRE

CARe
community aids response

OFFICE USE ONLY	
Questionnaire #	
District	

HIV testing among adolescents Questionnaire

Section 1: Demographic Measures

1	Gender	Male	Female				2	Type of dwelling	Formal	Informal
3	Employment status	Unemployed	Employed	Student			4	Nationality	South African	Non South African
5	Average **monthly** income	R0-R4999	R5000-R9999	R10000-14999	R15000-R19999	R20000-R24999	R25000-R29999	R30000 or more	6 Age	
7	Marital Status	Single	Married	Divorced	Cohabitating		Widowed			
8	Ethnicity	African/Black	White	Coloured	Indian/Asian	Other				
9	Highest Education	Below matric	Matric	Certificate 3	Diploma 4	Degree 5				
10	Number of people in household	Live alone	1-3	4-7	8-11	12 or more				
11	Religious affiliation	Christian	Muslim	Traditional	Buddhist	Atheist	Other			

Section 2: Behavioural factors

12	Are you sexually active? If no skip to question 15	Yes	No	13	How many sexual partners did you have during your lifetime?			1-3.	4-7.	8 or more
14	Did you use a condom during your last sexual intercourse?			Yes	No					
15	At what age were you first sexually active?	Under 10 years	11-14 years	15-19 years	20 years or older		16	Ever had a sexual transmitted disease (STD) before?	Yes	No
17	Have you ever tested for HIV? If no skip to question 22	Yes	No	18	Thinking of the last time you were tested, where was the place you got tested?			At a hospital	A clinic	At an HIV campaign	Other (where):
19	When was the last time you went for an HIV test?	A week ago	2 weeks ago	A month ago	Past 6months	Past year		More than 1 year	More than 2 years	
20	Why did you go for an HIV test?	I was concerned about my health	I have had many sexual partners	I had sex with someone HIV positive	I had sex without a condom	I have shared drug-use equipment		I wanted to find out my status with my partner	I wanted to get a STI test as well	Other
21	Rate how satisfied you were with the last HIV testing services on a scale of 1 to 5 (where 1=Poor, 5 = Very Good)									
22	Would you encourage your friends and family members to test for HIV?			Yes	No					

Section 3: Measurement of immediate outcome

Indicate the extent to which you agree or disagree to the following statements where

1= Strongly Disagree, 2= Disagree, 3= Neutral/ Don't know, 4= Agree, 5= Strongly Agree

	Personal factors					
	3.1 Treatment literacy					
23	I am afraid of getting infected during getting tested for HIV	1	2	3	4	5
24	People who are HIV positive are more likely to become sick with Tuberculosis (TB)	1	2	3	4	5
25	I believe that the HIV tests are not accurate or unreliable	1	2	3	4	5
26	I believe healthy looking persons who are HIV positive can transmit the disease to others	1	2	3	4	5
27	Most of the HIV infections are as a result of unprotected sexual intercourse	1	2	3	4	5
28	I will only get tested for HIV if I have any symptoms	1	2	3	4	5
29	I believe that the practice of Voluntary Counselling and Testing (VCT) for HIV is necessary in the workplace	1	2	3	4	5
	3.2 Perceived susceptibility					
30	I believe I'm at risk of getting HIV	1	2	3	4	5
31	I worry about getting infected with HIV	1	2	3	4	5
	3.3 Beliefs and expectations					
32	Getting an HIV test make me believe that I can live a healthy lifestyle	1	2	3	4	5
33	Getting an HIV test make me feel positive about the future	1	2	3	4	5
34	Getting an HIV test and knowing my status makes me feel confident about myself	1	2	3	4	5
	Socio-environmental factors					
	3.4 Healthcare services					
35	Clinics are too far	1	2	3	4	5
36	Testing kits were not available at the campaigns or clinics	1	2	3	4	5
37	The queues at clinics, hospitals or campaigns were too long	1	2	3	4	5
38	Getting tested for HIV is quick and on time	1	2	3	4	5
39	The HIV testing are done in a safe area	1	2	3	4	5
40	The HIV testing are done in tidy and clean areas	1	2	3	4	5
	3.5 Stigma, discrimination and fear					
41	I feel ashamed of my health status	1	2	3	4	5
42	I feel my family and community members are judging me when I go for a HIV test	1	2	3	4	5
43	I think the healthworker is judgmental when I get tested	1	2	3	4	5
44	I am afraid I will die if I am tested positive for HIV	1	2	3	4	5
45	I am afraid I will get depressed if I know my status	1	2	3	4	5
46	I am afraid of my partner's reaction if I tested positive for HIV	1	2	3	4	5
	3.6 Social support					
47	My family willl give me support if they knew about my status	1	2	3	4	5
48	My community will accept and support me if they knew my status	1	2	3	4	5
49	My colleagues or company encourages HIV testing	1	2	3	4	5
	3.7 Financial and time constraints					
50	HIV testing is too expensive	1	2	3	4	5
51	I do not have the time to go for an HIV test	1	2	3	4	5
52	I cannot afford to go to the clinic or hospital for an HIV test	1	2	3	4	5

Thank you for paticipating

APPENDIX 2: HREC ETHICS APPROVAL LETTER

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R14/49 Dr Raymond Longolongo and Dr Ndumiso Tshuma

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M180478

NAME: (Principal Investigator)	Dr Raymond Longolongo and Dr Ndumiso Tshuma
DEPARTMENT:	School of Public Health Division of Epidemiology and Biostatistics
PROJECT TITLE:	Factors associated with acceptance of HIV testing among adolescents in the City of Johannesburg, South Africa
DATE CONSIDERED:	04/05/2018
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Prof Peter Nyasulu
APPROVED BY:	Professor CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	13/08/2018

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 on the 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 April and will therefore be due in the month of April each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date 20/12/2019

APPENDIX 3: TURNITIN REPORT

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