HIV TESTING AND ASSOCIATED FACTORS AMONG MALE LONG-DISTANCE TRUCK DRIVERS IN ZAMBIA

BY

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DECLARATION

I, LWITO SALIFYA MUTALE this 4th day of October 2018, declare that this dissertation represents my own work. This work has not been done in Zambia before and neither has it been published for any qualification at the University of Zambia or any other University. Various sources to which I am indebted are clearly indicated in the text and in the references.

Date: …… Signature……..

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APPROVAL

This dissertation of MUTALE LWITO SALIFYA has been approved as partial fulfilment of the requirements for the award of the Master of Science degree in Epidemiology at the University of Zambia.

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Chairperson Board

of Examiners…….……...Signature…… Date……

Supervisor…….Signature…… Date……

DEDICATION

This dissertation is dedicated to my beautiful mother Bridget Lwito Simumba and my lovely sister Mulenga Mutale, they were my motivation and source of inspiration.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CDC	Centre for Disease Control and Prevention
CSO	Central Statistical Office
HIV	Human Immuno-deficiency Virus
MoH	Ministry of Health
TDRC	Tropical Diseases Research Centre
UNZABREC	University of Zambia Biomedical Research Ethics Committee
USAID	United States Agency for International Development
UNAIDS	Joint United Nations Pregramme on HIV/AIDS
WHO	World Health Organisation
ZDHS	Zambia Demographic and Health Survey
BSS	Behavioral Surveillance Survey
LDTD	Long-distance Truck Driver

ABSTRACT

Globally, truckers have been reported to have an important role in the spread of sexually transmitted infections (STIs) and Human Immunodeficiency Virus (HIV). Evidence on uptake of HIV testing among this key population is not well established. We examined factors associated with HIV testing among male long-distance truck drivers (LDTDs) since HIV testing has been found to be an integral part of the preventive strategies.

A cross sectional study was conducted among male LDTDs using secondary data from the 2015 Behavioral Surveillance Survey (BSS). The BSS was carried out in 5 of the 10 Corridors of Hope (COH) III project sites (Livingstone/Kazungula, Solwezi, Kapiri Mposhi, Chipata and Chirundu). The study recruited LDTDs from truck depots, border sites, Zambia Revenue Authority offices and those parked along the road. Face-to-face structured interviews were used to collect data on socio-demographic characteristics, HIV testing, HIV risk behaviors and knowledge towards HIV/AIDS. Multivariable logistic regression was done to improve predictive power and control for confounders.

A total of 1,406 male LDTDs were included in the study, with age range 18-70 and mean age of 21 (± 0.2). Over 80% reported being currently married and living with spouse while 94% reported having only one wife. Uptake for ever having tested for HIV among LDTDs was 83%, while 39% were circumcised. Positive predictors for HIV testing included circumcision for health and hygiene (AOR 2.30, 95%CI 1.23-4.28), having prevention of genital infections (AOR 3.29, 95%CI 1.34-8.10) reasons. Other positive predictors were never having drank alcohol (AOR 1.75, 95%CI 1.16-2.65) and not having a relative or friend who was infected or died of HIV (AOR 1.63, 95%CI 1.07-2.47), while having more than three wives (AOR 0.41, 95%CI 0.25-0.67) was a negative risk factor for HIV testing uptake.

Personal reasons for circumcision such as hygiene and infection prevention were strong drivers for HIV testing. These findings suggest the need to implement more focused interventions and messages on health and hygiene and prevention of genital infections to increase circumcision and uptake of HIV testing among LDTDs. Additionally, there is need to improve services targeting LDTDs, especially those who are less health-conscious.

CHAPTER ONE: BACKGROUND

1.1 Introduction

Acquired Immuno-Deficiency Syndrome (AIDS) is one of the most serious modern diseases (United Nations, 2010) (Leeper and Reddi, 2010) and the Human Immuno-deficiency Virus (HIV) is the causative agent. According to the Joint United Nations Pregramme on HIV/AIDS (UNAIDS), 36.9 million people (31.1 million – 43.9 million) were living with HIV worldwide as of 2017. There was an increase of 1.8 million people newly infected, while 940 000 million of the infected people died (UNAIDS, 2018). The African continent is disproportionately affected by the HIV pandemic, although it only represents 12% of the world's population. Sub-Sahara Africa alone bears an estimated total of 25.6 million people living with HIV in 2015 and reporting about 66% of all the new HIV infections (UNAIDS, 2016a).

The prevalence of HIV in Zambia have been reported to be reducing according to the Zambia HIV and AIDS Epidemiological projections 1995-2010 (2005) and Zambia Demographic Health Survey (ZDHS) 2001-2002, at 16 percent of the Zambian adult population in 2015 (15-49 years for females and 15-59 years for males) to 12 percent among adults aged 15-59 years old in 2016 (Ministry of Health, Zambia., 2017).

However, even though there seems to be a decline, the problem of HIV is still very significant in Zambia and new cases continue to be reported. Distinct epidemics have emerged in different geographical areas of Zambia. These epidemics differ in their severity depending on the population groups they affect, their associated risk behaviors, and the viral strains that drive them (Shao and Williamson, 2012).

Population mobility is commonly identified as one of the key drivers of the HIV epidemic (Deane, Parkhurst and Johnston, 2010). Decosas and colleagues (1995) argues that "the fact that population movements distribute HIV is secondary to the fact that certain types of migration cause HIV epidemics" (Decosas *et al.*, 1995; Brummer, 2002; Crush *et al.*, 2005). He further explained that individual migrants separated from their partners and social support networks, are more likely to adopt additional sex partners to those at home (Lurie *et al.*, 1997). Numerous, but not all studies have shown that individual migrants that are separated from their partners are more likely to adopt additional sex partners resulting into higher prevalence of HIV in migrants and their partners compared to non-migrants (Pison *et al.*, 1993; Lurie *et al.*, 1997; Mundandi *et al.*, 2006; Yang, Derlega and Luo, 2007). Therefore, there is need to look at the

considerable variation in the timing and intensity of the HIV epidemic in different regions of the world (Watts and May, 1992).

Long-distance Truck Drivers (LDTDs) because of being involved in a mobile kind of occupation are recognized as a population of interest in the spread of HIV/AIDS. Their long driving hours and exhausting working environment causing lethargy and mental fatigue which incline them towards being sexually active (Essuon *et al.*, 2009). This behavior and attitude puts them at high risk of acquiring Sexually Transmitted Infection (STIs) /HIV. Studies done have found that the prevalence of HIV among LDTDs is by location estimated at more than ten times that of the general population (Ramjee and Gouws, 2002). It has therefore been established that LDTDs have an important role in the spread of STIs and HIV in several countries in the worldwide (Gibney, Saquib and Metzger, 2003; Atilola, Akpa and Komolafe, 2010).

With the aim of improving Anti-Retroviral Therapy (ART) client outcome and prevention of HIV transmission, Zambia has adopted the UNAIDS Fast Track Strategy of 90-90-90 targets. Which is calling for 90% of all people with HIV to be diagnosed, 90% of people with HIV diagnosed to receive ART and 90% of those on ART to have suppressed viral load by 2020. The diagnosis of HIV (first 90%) is essential to both second 90% and third 90% (initiation of ART) (UNAIDS, 2014). Experts have explained and further attribute irreversible immunologic damage and complications as well as transmission of HIV through risky behavior, to delays in a patient's treatment due to lack of knowledge of HIV status (UNAIDS, 2010; Aniebue and Aniebue, 2011; DiNenno *et al.*, 2017).

There is need for the expansion of HIV testing, which is an integral part of the preventive strategies that have been advocated for (Maman *et al.*, 2000; Sweat *et al.*, 2000; WHO, 2009; UNAIDS, 2016b). Expanding HIV screening among LDTDs is a relatively cost effective way of decreasing HIV transmission. The central concept in the basis for understanding the factors influencing the testing dynamics of STIs and HIV relates to the importance of undertaking a study on a subset of the population (critical community), who have higher rates of sexual partner change, concurrent sexual relationships with lack of awareness, little knowledge, need to travel long-distances and overnight stay (Ishtiaq *et al.*, 2017).

Therefore, we selected truck drivers as they can be a source of transmission of STIs acting as national carriers. The aim of this study was to collect and access data gathered from LDTDs

about symptoms of STIs, their attitude towards hazards of multiple sexual partners, and their perception about preventing STIs using condoms and other barrier methods.

1.2 Statement of the Problem

Though the Zambian government has put in place interventions to combat the HIV/AIDS epidemic, new cases have continued to be record (46,000 annually among adults aged 15 to 59 years) (Ministry of Health, Zambia., 2017). Zambia mostly has a generalized kind of HIV/AIDS epidemic, with one major characteristic of the epidemic being that it is largely concentrated along the line of rail and major highways. This makes the line of rail and major highways (in the border areas) to have the most at risk populations (ReliefWeb Blog, 2014). This identifies the LDTDs to be an important population in the spread of HIV, because of their mobile type of occupation.

The Centre for Disease Control and prevention (CDC) in the USA estimates that up to 40% (162,500) of the new infections annually, can be attributed to people who are unaware of their HIV- positive results (CDC, 2018). Therefore, there is need for the expansion of HIV testing among the male long-distance truck drivers, since HIV testing has been found to be an integral part of the preventive strategies (Maman *et al.*, 2000; Sweat *et al.*, 2000). Furthermore, a deeper understanding of the factors associated with HIV testing among male LDTDs is essential for reducing HIV new infections and transmission.

1.3 Justification

With the aim of improving ART client outcomes and prevention of HIV transmission, Zambia adopted the UNAIDS Fast Track Strategy of 90-90-90 targets calling for 90% of all people with HIV to be diagnosed, 90% of people with HIV diagnosed to receive ART and 90% of those on ART to have suppressed viral load by 2020 (UNAIDS and UNFPA, 2017).

Having identified long-distance truck drivers as having an important role in the spread of STIs and HIV (Gibney, Saquib and Metzger, 2003; Atilola, Akpa and Komolafe, 2010), emphasis must be put on HIV testing of LDTDs as it is the most important entry point to achieving the fast track strategy targets. The factors associated with HIV testing uptake among male long-distance truck drivers in Zambia are not well known. Evidence on the factors associated with HIV testing among male LDTDs is limited because there seem to be not much study done to show whether this may reduce the transmission of HIV.

Therefore, it was important that this study be carried out to enable creation of better prevention programs that can target this particular group in providing HIV/AIDS awareness programs. This study has added to the body of knowledge on the sexual behaviors of LDTDs in Zambia. Based on the results, new areas for intervention might be recognised to ensure improved access to health care services for LDTDs.

1.4 Research Questions and Objectives

1.4.1 Research Questions

What are the factors associated with HIV testing among male long-distance truck drivers?

1.4.2 General Objective

To investigate factors associated with HIV testing among male long-distance truck drivers.

1.4.3 Specific Research Objectives

1. To establish the prevalence of HIV testing among male long-distance truck drivers.
2. To examine factors associated with HIV testing among male long-distance truck drivers.

CHAPTER TWO: LITERATURE REVIEW

2.1 Conceptual Framework

The conceptual framework used in this study illustrates factors that may contribute to accessing HIV testing services by male LDTDs.

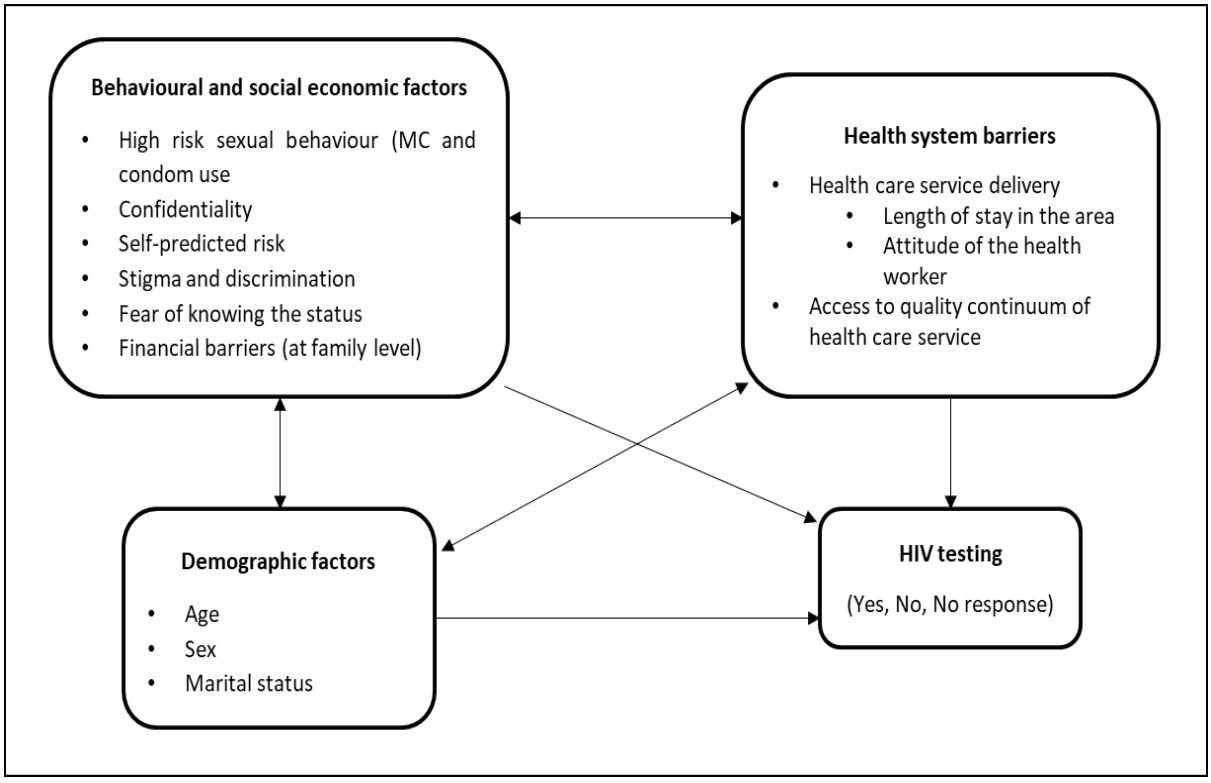
As shown in Figure 1.1, the major factors that may contribute to accessing HIV testing services by male LDTDs are categorized into three categories. The study is designed with background knowledge that may determine access to quality continuum of care services such as demographic factors, behavioral and social economic factors and health care service delivery.

The first category of factors affecting seeking HIV testing service is behavioral and social economic factors. Behavior is mostly formed by the amount of information or knowledge one has, in the case of information. Poor/bad behavior in this case can be explained as lack of knowledge in recognizing the risk of not accessing a health care service and need to access the health care services on time. High levels of illiteracy, lack of information, no education and poor communication may cause failure to perceive how grave or sever a condition really is (Bastable *et al.*, 2010; Cornett, 2018). A person's social economic position in society will strongly influence ones risk of dying. In most circumstances and for most diseases including HIV, the poor and disadvantaged are more likely to die than the more affluent people (Dzimnenani, 2007; Pellowski *et al.*, 2013). Among the behavioral and social economic risk factors are high risk sexual behaviors such as the concurrent/simultaneous sexual partnerships (which simply affects the overlap of partners over time) (Nunn *et al.*, 2012; Gandhi *et al.*, 2015), shunning of health care services ("which have led to low service delivery figures being recorded, despite the proven efficacy of greater than 60% reduction in HIV transmission among those that have accessed HIV services based on the results of three randomized controlled trials conducted in the region") (Auvert *et al.*, 2005), low condom usage and low self-predicated risk.

The second category of factors affecting seeking HIV testing service is health system barriers. The availability of service will aid in the access to the health service. Thus despite the length of stay in an area, without services being provided accessing the services is impossible. However, it's important to note that it's not only about services availability but also the quality of services being provided (Mosadeghrad, 2014). Saving lives depends highly on the coverage and the quality of the integrated services packages being provided. Thus to ensure that the care provided at each time and place contributes to the effectiveness of all services delivered

(American College of Physicians, 2009; Cummings, 2013; Robertson, Gregory and Jabbal, 2014). HIV testing is directly linked to poor technical quality of reproductive health services. The difficulty of access to quality health care can be attributed to various barriers namely; health infrastructure, human resource, equipment, drugs, financial barriers and information barriers (WHO, 2012, 2018; Eide *et al.*, 2015).

Lastly, the category of factors affecting seeking HIV testing service are demographic factors. Demographic characteristics such as age, gender, marital status have an influence a person's propensity to use services before the need for those services is present. A multiplicity of studies have demonstrated that variations of utilization behaviour can be related to these demographic characteristic (Andersen and Newman, 1973; Gilford, 1988; Koukouli, Vlachonikolis and Philalithis, 2002; French, 2014; WHO, 2015).



Adapted from (Thaddeus & Maine 1994:1091)

Figure 1.1: Conceptual framework for factors associated with HIV testing uptake

2.2 Literature Review Introduction

With the prevalence of HIV infection being particularly high in the vicinity of the main roads, LDTDs who are involved in the mobility kind of profession have been identified as the major group at risk and involved with the high transmission of the disease (United Nations and ILO, 2001). Studies conducted have demonstrated increased levels of HIV prevalence among LDTDs as compared with non-mobile male populations (Rakwar *et al.*, 1999; Pandey *et al.*, 2008; Dude *et al.*, 2009).

HIV testing has been identified as one of the key policy responses to the HIV/AIDS epidemic, principally as a primary prevention strategy and as an entry point to other HIV/AIDS related services (Denison *et al.*, 2008). This is because, while undergoing HIV testing services, individuals learn about their sero-status and gain knowledge on avoiding risky behaviors to protect themselves and others (World Health Organization, 2003). Increasing preventive interventions such as testing would increase the number of LDTDs put on treatment which would lead to reduced onward transmission (Fox *et al.*, 2009) and increasing response to antiretroviral treatment (ART) (Egger *et al.*, 2002).

Studies have shown that LDTDs have an unmet need for most HIV prevention services (ILO, 2005; IRIN News Report, 2013). To curb the unmet need among LDTDs, health clinics have been put up alone the major trucking routes (NBCRFLI, 2008; Lafort *et al.*, 2010; North Star Alliance, 2014). However, available studies that have been done among LDTDs show that HIV testing is still very low, ranging from 21% to 47% (Lafort *et al.*, 2010; Chidley, 2012; Trucking Wellness, 2012; Delany-Moretlwe *et al.*, 2014; Yaya *et al.*, 2016). Thus, despite putting up convenient roadside health clinic, HIV testing services among LDTDs is still facing persistent barriers (Kelvin *et al.*, 2018).

2.2.1 Factors associated with HIV testing among male long-distance truck drivers:

2.2.1.1 Knowledge

In general, literature has highlighted a positive association between the likelihood of LDTDs having an HIV test with those who have the knowledge about HIV (Atilola, Akpa and Komolafe, 2010; Hassan, 2014). LDTDs and their commercial sex contacts have been implicated in the spread of HIV and other STIs along major transportation routes in developing countries (Morris and Ferguson, 2007; McCree *et al.*, 2010; Thakur, Toppo and Lodha, 2015). Results from studies of LDTDs suggest that, those that have low HIV/STI knowledge (Meda *et al.*, 1998)

have higher reported rates of STIs, (Meda *et al.*, 1998; Morris and Ferguson, 2007; Sorensen *et al.*, 2007), engage in sex with multiple regular and commercial partners while on the road, (Gibney, Saquib and Metzger, 2003; Morris and Ferguson, 2007), report low condom use (Bwayo *et al.*, 1994; Meda *et al.*, 1998; Gibney, Saquib and Metzger, 2003) and engage in illicit drug use.

2.2.1.2 Behavioural Factors

Among the factors affecting HIV testing in LDTDs are some behavioural factors. They are a number of behavioural factors but only stigma has been considered in this study. LDTDs are being perceived as a bridge population and have been among the most targeted population groups by AIDS control programs for many years. Stigmatization may pose as challenges for these programs (Sahu *et al.*, 2015). HIV related stigma and discrimination have been shown to impede progress in the interventions of HIV programs (Kinsler *et al.*, 2007). A study from southern Brazil, indicated that stigma is an important barrier to HIV testing among LDTDs (Pulerwitz *et al.*, 2008).

Additionally, a study in Paraguay stated that LDTDs like most highly-mobile workers worldwide tend to be more vulnerable to HIV infection. However, the ILO stated that it was important to emphasise that LDTDs were not the problem (ILO, 2012). As the ILO has stated clearly, "The recognition of these risk factors means that transport workers are sometimes blamed for rising rates of HIV infection and for spreading the virus (ILO, 2012). This has proved to be very dangerous, because stigmatizing transport workers helps drive the problem underground and makes the disease spread faster (Smith *et al.*, 2008).

2.2.1.3 Social Economic Factors

Financial barriers

A study done in Morocco showed that LDTDs who were self-employed were more likely to take HIV test and received counselling than those who were not self-employed (Himmich *et al.*, 2015). Self-employment is a proxy of high socio-economic status. In most circumstances the poor and disadvantaged are more likely to die than those the more affluent people (Knapton, 2015). Fanatical barriers in this case are considered because of people being unable to access good and quality health care services. In most poor African countries because of poverty being very severe, access to good and quality health services is a very huge problem (O'Donnell, 2007; Peters *et al.*, 2008; Roberts, 2018).

2.2.1.4 Services Health System Barriers

Quality continuum of care (services health system barriers)

A study done in the United States reported that even though LDTDs find themselves in high endemically risk-laden work environment, their access to healthcare services is scanty (Solomon *et al.*, 2004). In addition, over 30% of truckers in the Michigan study described their health as "not excellent" due to poor access to healthcare on the road. The drivers described problems of access to healthcare and unanimously expressed need for health care clinics near truck stops (Stasko and Neale, 2007).

Therefore, because of poor access to health care services by LDTDs at clinic level, there is delay from the initial call to the initial medical visit, which has been associated with HIV-infected patients failure to engage in HIV care (Mugavero *et al.*, 2009). Furthermore, lack of flexibility of clinic hours to accommodate LDTDs work schedules and dependent care activities, also serves as barriers to consistence in accessing HIV health care services (Horstmann *et al.*, 2010). Within the clinic, culturally appropriate services coupled with a prevailing climate of acceptance of all individuals are an essential components for encouraging patients to both seeking and remaining in care.

2.2.2 Factors associated to HIV testing among the general population

2.2.2.1 Demographic

Among the factors affecting HIV testing are some demographic factors, which in this case are Age and Sex.

Age

It is normally assumed that older adults with more experience and better reasoning would easily take up HIV testing than their counterparts the young adults. However, results from researches done have shown that young adults are more likely to take up HIV testing services (Mack and Bland, 1999; Akers *et al.*, 2008) because the older adults have been reported to opt out from taking an HIV test (Lekas, Schrimshaw and Siegel, 2005; Ford *et al.*, 2015). Studies done have also show that reasons for not taking an HIV test among older adults could be because of ageist assumptions, stating that only young adults are involved in bad sexual habits such as unprotected sex, multiple sex partners and selling sex for money (Gott, Hinchliff and Galena, 2004; Bokhour *et al.*, 2015).

Sex

As established in most studies, men have been found to be very reluctant at accessing health services in most cultures in Africa. Because of this HIV prevalence among men may be highly underestimated. In one study done using data from the 2008 South African National HIV prevalence, incidence, behaviour and communication Survey, shows that more women (30%) were tested for HIV (and know their results) in the past 12 months compared with men (20%) (Shisana *et al.*, 2010). Furthermore, results from the household survey conducted among 3,416 adults in Soweto, South Africa show that 65% of women were tested but only 29% of men reported ever having been tested for HIV (Venkatesh *et al.*, 2011).

2.2.2.2 Knowledge

In general, studies have highlighted a positive association between the likelihood of one having tested for HIV with those who have the knowledge about importance of HIV testing (Scott-Sheldon *et al.*, 2013; Gumede and Sibiya, 2018).

Literature has also highlighted that the knowledge to be considered should not only be that of the individual clients, but also knowledge of the clinicians. It was emphasized that training of clinicians would make them more proactive in offering HIV testing services (Kellock and Rogstad, 1998; Burns *et al.*, 2008), and also help clinicians treat HIV/AIDS like other infectious diseases for which early diagnosis is essential for appropriate treatment and prevention, without forgetting emphasis of informed consent and confidentiality (Cock and Johnson, 1998).

2.2.2.3 Behavioral Factors

In the general population, like among the long-distance truck drivers, factors known to affect HIV testing are some behavioural factors such as stigma. HIV-related stigma is one of the most serious obstacles in the fight against HIV/AIDS in the world (Leclerc-Madlala, Simbayi and Cloete, 2009).This could be due to the fact that HIV infection, as with other STIs, is widely perceived as an outcome of sexual excess and low moral character. According to studies done from different parts of the world, results show that stigma influenced peoples testing decisions (Van Dyk A, 2001; Shinsasa O and Simbayi L, 2002; Herek, Capitanio and Widaman, 2003). Consequently, there is a strong culture of silence and non-disclosure of positive status by people in the societies because of the fear of rejection and isolation from both close relatives and the community at large (Johnston, 2001). Results from some studies done also show that

stigma is more severe for women than for men (Petros *et al.*, 2006; Leclerc-Madlala, Simbayi and Cloete, 2009).

A study in South Africa found HIV-related stigma is one of the most serious obstacles in the fight against HIV/AIDS (Leclerc-Madlala, Simbayi and Cloete, 2009). At the time when those infected really need social support the most, for those whose status is revealed are often subjected to victimization and discrimination. This happens in all social realms, in the home, in the workplace and in the broader community (Leclerc-Madlala, Simbayi and Cloete, 2009).

2.2.2.4 Social Economic Factors

Financial barriers

It is a well-known fact that the risk of dying is strongly influenced by ones position in society. This is so because, in most circumstances the poor are unable at access health care services and are highly disadvantaged, making them more likely to die than the more affluent people (Maine *et al.*, 1992). In most poor African countries because of the poverty being very severe, the access to health care services is only though the government institutions. Without such a service being offered at a government institution, services would have to be sourced and paid for by individuals which would be very difficult.

2.2.2.5 Services Health System Barriers

Quality Continuum of Care (Services Health system barriers)

At the clinic level, delays from initial call to initial medical visit have been associated with HIV-infected patients' failure to engage in HIV care (Mugavero *et al.*, 2009). Lack of flexibility of clinic hours to accommodate work schedules and dependent care activities also serves as a barrier to consistent HIV care (Horstmann *et al.*, 2010). Within the clinic, culturally appropriate services, coupled with a prevailing climate of acceptance of all individuals, are essential components for encouraging patients to both seek and remain in care.

CHAPTER THREE: METHODOLOGY

3.1 Study Design

The study was a cross sectional study using secondary data from the 2015 Behavioral Surveillance Survey (BSS). Cross sectional design was selected because, firstly, it is the best design when estimate prevalence and secondly, data used was collected on each of the participants at a single point in time (2015).

3.2 Behavioral Surveillance Surveys

Since 2000, FHI360 has implemented the Corridors of Hope (COH) and BSS Projects in Zambia targeting female sex workers and their main LDTDs male clients with behavior change information and biomedical interventions; for example, HIV testing and counselling and treatment of sexually transmitted infections. The goal is to prevent sexual transmission of HIV. The COH project mainly operates in 10 sites namely; Nakonde, Kapiri Mponshi, Chililabombwe, Solwezi, Chipata, Katete, Chirundu, Livingstone, Kazungula and Sesheke.

FHI360 has conducted five rounds of BSS (between 2000 and 2015) (CSO, MOH, 2009). The BSS have been carried out in five of the 10 COH III project sites (Livingstone/Kazungula, Solwezi, Kapiri Mposhi, Chipata and Chirundu). Although the behavioral component of the study targeted both female sex workers and truck drivers, the HIV testing component of the study was restricted to FSWs. Though both FSWs and truck drivers are mobile, truck drivers were not included in the HIV testing component because most of them were unlikely to wait for a post-test counseling and management of HIV and other STIs.

The main objective of the 2015 BSS was to provide information on changes in HIV-risk behaviors. In addition, the BSS provided indications of the combined effects of various behavior change and other HIV and AIDS programs in the country.

3.2.1 BSS Sampling Procedures

To get a representative sample of LDTDs, the places where truck drivers' park where mapped and grouped in clusters as primary sampling units (PSUs). These sites are usually along and or near the border sites, truck hubs, Revenue Authority collection points, weigh bridges and rest houses. The total numbers and average number of trucks passing through a point over a day and over a week where assessed prior to study to develop a sampling frame. Assessments of

how and where trucks are parked where carried out to avoid producing a biased sample; e.g., sampling or interviewing only truckers from the same company. The study recruited LDTDs from truck depot, border sites, Zambia Revenue Authority offices and those packed along the road. The sample selection strategy followed a two-stage time-location cluster sampling. Two-stage sampling approach was followed for LDTD.

First stage was time-location cluster sampling. Here the sampling frame was prepared based on the results of the mapping exercise at each selected survey site. Truck drivers were associated with fixed parking places, typically each trucking companies had specific parking place and share characteristics shaped by the organizations code of conduct. The first stage involved identification of congregation points i.e. truck depots, packing sites for LDTDs and selection proportionate to size (PPS). Location-day-time clusters representing the total number of potential locations, days and times.

The second stage of 'time-location sampling' involved selection of respondents for the interview. A "take-all" approach was used to select sample respondents if the initial contact/enumeration establishes that there are not enough LDTDs that can be recruited at the study sites. This approach specified that on the time and day the site was visited, all LDTDs who were present, or who entered the site while the interviewer was working, were to be contacted for an interview. This resulted in self-weighted sample. A key aspect of this sampling approach was that all "time-location" clusters visited the same number of times (i.e., once) and for the same amount of time (i.e. for two hours). Otherwise, if it was established through formative assessment that there are large number of LDTDs at each target group in the study sites (significantly more than the required number), then from each of the selected cluster) a fixed number of them will be recruited for the survey.

3.3 HIV Testing & Associated Factors study

The study was based on HIV risk behaviors data collected in the BSS whose data focused on the male long-distance truck drivers. The study included 1400 drivers who answered the questions in the questionnaire. Questions which were be considered in answering the objectives of the study were be those that focused on the associated factors under study. These included background characteristics (age education, marital status, etc.), length of stay this site/border, knowledge and condoms, number of female sexual partners, HIV testing, sexually transmitted diseases, and male circumcision. Therefore, in understanding HIV testing among male long-

distance truck drivers in Zambia, these were the main associated factors that were examined in order to determine the prevalence and knowledge on HIV testing uptake.

Variables that were investigated in this study are shown in Table 1.

Table 1: List of variables

Type of Variable	Variable	Indicator	Measurement Scale
Dependent	HIV testing	Ever had an HIV test	Nominal
Independent (underlying)	Age	In years at last birthday	
	Educational attainment	Highest level of education	Nominal
	Marital status	Marital status	Nominal
	Length of stay	Length of stay this site/border (in days)	Ratio
		Number of times been to site/border in past 3 months	Interval
	Female sexual partners	Female sexual partners you've had in the last 12 months.	Ratio
	Condom used	Condom used during sexual intercourse	Nominal
	Had an STI	Had an STI in last 12 months	Nominal
	Circumcision status	Being circumcised or not	Nominal
	Knowledge on HIV	Number of current response	Nominal
	Alcohol intake	Frequency of alcohol intake	Ratio

3.3.1 Target Population

The study population for the proposed study was LDTDs who participated in the 2015 BSS. The 2015 BSS eligibility and exclusion criteria for LDTDs in the study are highlighted in Table 2.

Table 2: Summary of the eligibility criteria for study participants

TARGET GROUP	Inclusion CRITERIA	Exclusion criteria
Long-distance Truck Drivers (LDTDs)	1. Male aged 18 years and over 2. Driver or Co-driver with a driving license crossing at least once a year one or more country borders	1. Less than 18 years of age 2. does not have license as truck driver 3. previous participated in this survey

3.3.2 Sampling

Considering that this study was nested in the BSS, the sampling method was based on that of the BSS. The BSS sampling method has been described in previous sections (4.3). The data collected from these respondents was analyzed in line with the description in the following section.

3.3.3 Sample Size

The sample size was determined using the formula below:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Were n = sample size, Z = Z statistic for a level of confidence, P = expected prevalence or proportion (in proportion of one; if 20%, P = 0.2), and d = precision (in proportion of one; if 5%, d = 0.05).

Using a proportion of LDTDs who had been tested for HIV was 47.4% in Togo (Yaya *et al.*, 2016). And since the prevalence of the disease is between 10% and 90% it is appropriate to have a precision of 5% (Naing et al, 2006).

Where Z=1.96, P= 0.474, d=0.05

Sample size (n) = 383

3.3.4 Data Extraction

In this study data was extracted using a check list. The variables of interest were as follows: age, level of education, marital status, Length of stay at site/border, knowledge about HIV,

condoms, number of female sexual partners, HIV testing, sexually transmitted diseases and male circumcision.

3.3.5 Data Analysis

Preliminary data analysis involved description of predictor variables to understand their distribution in relation to the dependent variable (Drivers who tested for HIV and Drivers who never tested). Description of categorical variables was done using frequencies and percentages; means and standard deviations was used for continuous variables. Tests for normality for age distribution among LDTDs were done using QQ plots and a normal distribution curve is shown in Figure 1.1. Descriptive statistics of HIV testing uptake were calculated with respect to measures of independent variables. In addition, chi-square (x2) and Fisher's exact test were used to explore the factors associated with having taken an HIV test and the socio-demographic characteristics. To assess the relative contribution of each of these predictor variables, a logistic regression analysis was carried out. Univariate logistic regression analysis examined the association between these variables and the history of HIV testing. This allowed for understanding the effect of each independent variable without controlling for confounding variables. Variables that were significant at univariate analysis (p-value <=0.1) were entered into a model for multiple logistic regression analysis to control for confounding using the investigator led stepwise regression method, were variables with the largest p-values were then removed one at a time until only significant variables were left in the model. Associations between the outcome and independent variables were assessed using odds ratios, and p-values ≤ 0.05 was deemed statistically significant. All analyses were performed using STATA software, version 13.0 SE (Stata Corporation, College Station, TX, USA).

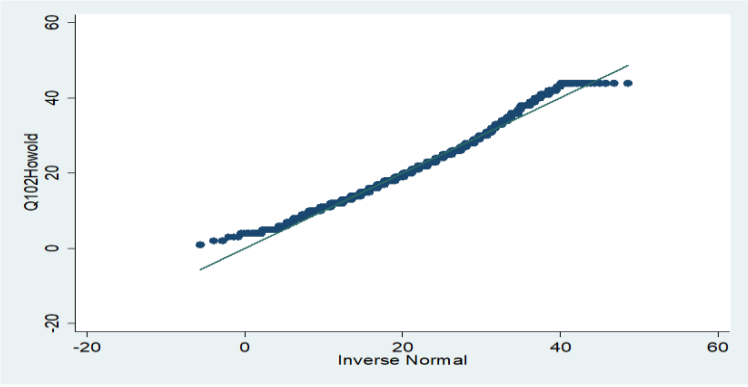


Figure 1.2: QQ Plot- Showing normality test for age distribution

3.4 Ethical Review

Ethical clearance for the BSS study obtained from Tropical Diseases Research Centre (TDRC) (for mother study). Ethical clearance, in terms of waiver for the HIV testing uptake and associated factors among male LDTD in Zambia study, was sought and granted from TDRC. And authority to use the BSS data was also obtained from TDRC. All data was de-identified to ensure confidentiality and the database will be stored on a password- protected computer.

3.5 Limitations

Two limitations of the study were noted; firstly, this study was based on secondary data, some variables mentioned in literature such as stigma, income, confidentiality and health system barriers were not accounted for. Secondly, our outcome variables relied on self-reported HIV testing. Self-reported information in most cases leads to over reporting or under-reporting of socially desirable and unacceptable behaviours, respectively, affecting the accuracy of the findings in the study. Despite these limitations, the results presented in this analysis provide an acceptably representative picture of the status of HIV testing in among LDTDs in Zambia.

CHAPTER FOUR: FINDINGS

We set out to investigate HIV testing uptake among long-distance truck drivers in Zambia. In this section, we will describe socio-demographic characteristics of respondents in the first part, followed by identifying determinants for HIV testing uptake using chi-squared test and univariate and multivariate logistic regression analysis. Then we will end with presenting predictor/determinant variables for HIV testing uptake among the long-distance truck drivers.

4.1 Socio-Demographic Characteristics

A total of 1,386 male long-distance truck drivers were enrolled for the study. The age ranged from 18 to 60 years, with a mean age of 21 (± 0.2). Generally, majority of the drivers interviewed (28%) were in the age range 20-24 years, followed by age range 15-19 years (27%), with the age range 45-60 years having the lowest number of truck drivers interviewed at less than one percent.

Overall, 84% of truck drivers had an HIV test. Most (98%) of the respondents reported having some education up to primary level. Seventy-five percent of the respondents reported having at least secondary education, 15% reported having at least primary education, 8% of the respondents reported having at least tertiary education and very few (n = 117) reported not having any education at all (1%).

Over 80% of the respondents reported to have been currently married and living with spouse, 6% reported being currently married but also living with other sexual partner, 1% reported to have been currently married but not living with spouse or any other sexual partner, 3% reported not being married but living with sexual partner and lastly 7% reported not being married and not living with sexual partner.

In terms of number of wives, 94% of the respondents reported having only one wife, while 6% of the respondent reported having more than one wife.

The distribution of respondents by length of stay at the border reveals that a larger proportion (26%) stayed at the border for less than a day, while the least proportion (7%) stayed five days and more at the border. With the majority passing through the border between 21 to 30 times in the last three months.

Table 3: Socio-demographic characteristics and prevalence of HIV testing (ever) uptake among 1,386 long-distance truck drivers, in Zambia

	Ever had an HIV test		
Characteristic	**Drivers who got tested n (%)**	**Drivers who never tested n (%)**	**P-value**
Age	1171 (84.1)	221 (15.9)	0.987∫
Age at first marriage			0.876†
8-14	580 (84.6)	106 (15.4)	
15-24	106 (83.5)	21 (16.5)	
25-34	199 (83.3)	40 (16.7)	
35-44	17 (85.0)	3 (15.0)	
45+	79 (89.8)	9 (10.2)	
Current Marital Status (Grouped)			0.430 †
Currently married, living with spouse	937 (84.5)	172 (15.5)	
Currently married, living with other sexual partner	65 (85.5)	11 (14.5)	
Currently married, not living with spouse or any other sexual partner	16 (94.1)	1 (5.9)	
Not married, living with sexual partner	31 (73.8)	11 (26.2)	
Not married, not living with sexual partner	76 (83.5)	15 (16.5)	
Country of Origin			0.225 †
Zambia	580 (82.2)	126 (17.8)	
Zimbabwe	374 (86.2)	60 (13.8)	
Tanzania	61 (82.4)	13 (17.6)	
South Africa	58 (89.2)	7 (10.8)	
Malawi	35 (87.5)	5 (12.5)	
Congo DR	17 (85.0)	3 (15.0)	
Others	31 (96.9)	1 (3.1)	
Length of stay at Border (Days)			0.799†
Less than a day	306 (86.0)	50 (14.0)	
One day	216 (85.4)	37 (14.6)	
Two days	289 (82.1)	63 (17.9)	
Three days	167 (83.5)	33 (16.5)	
Four days	93 (86.1)	15 (13.9)	
Five days and more	84 (82.4)	18 (17.6)	
Number of times through Border past 3 Months			0.955†
1-10	277 (84.2)	52 (15.8)	
11-20	424 (84.6)	77 (15.4)	
21-30	455 (84.0)	87 (16.0)	

Chi square test † Mann –Whitney U test ∫

4.2 Association between Socio-Demographic Factors and HIV Testing Uptake

Socio-demographic data including; age, marital status, number of wives, country of origin, length of stay at the border and number of times pass through border was collected and results are presented in Table 3 above.

Overall, 84% of truck drivers had an HIV test. Majority (80%) of the respondents were currently married and living with a spouse, of which 84% had an HIV test. With the least number being recorded among those who were currently married but not living with spouse or any other sexual partner. But this difference was not significant ($\chi2$=4.880, df =4, p-value = 0.346). Majority (40%) of the truck drivers in the last three months passed through the border between 21 and 30 times. And 84% of all the truck drivers had an HIV test. But this difference was not significant ($\chi2$=0.0927, df =2, p-value = 0.955).

4.3 Univariate Analysis

Univariate logistic regression analysis was done comparing between HIV testing and number of wives, reason for interested in circumcision, relative or friend infected or died of HIV, marital status, sex with live-in partner condom use, ever heard of an HIV infected or dead person, protect HIV by abstinence and alcohol consumption (Table 4).

Results for both adjusted and unadjusted logistic regression analysis of factors affecting testing uptake among long-distance truck drivers are shown in the table below. Truckers who had two or more wives had a decreased (OR 0.41 95%CI 0.25-0.67, p-value = 0.001) chance of testing for HIV both at adjusted and unadjusted estimates compared to their counterparts who had one wife. Truckers whose reason for circumcision was health and hygiene had increased (OR 2.28, 95%CI 1.22-4.27, p-value = 0.009) chance of testing for HIV both at adjusted and unadjusted estimates compared to their counterparts whose reason was tradition or religion. Truckers whose reason for circumcision was to prevent genital infections had increased (OR 3.30, 95%CI 1.34-8.11, p-value = 0.009) chance of being tested for HIV both at adjusted and unadjusted estimates compared to their counterparts whose reason was tradition or religion. Truckers who had no relative or friend who was infected or died of HIV had increased (OR 1.63, 95%CI 1.07-2.48, p-value = 0.022) chance of testing for HIV both at adjusted and unadjusted estimates compared to their counterparts who had close a relative was infected or died of HIV. Truckers who were not married and truckers who had not heard of an HIV Infected or a person who died from HIV showed to be significant at unadjusted analysis but showed to be insignificant after adjusting for other variables. Truckers who never drank alcohol had an increased (OR 1.75, 95%CI 1.16-2.64, p-value = 0.008) chance of being tested for HIV both at adjusted and unadjusted estimates compared to their counterparts who had drank alcohol every day.

Table 4: Factors associated with HIV testing among truck drivers-results from the Univariate analysis

Variables	Univariate	
	OR (95%)	**P-value**
Number of wives		
One wife	1	
No wife	0.65 (0.41, 1.02)	0.060
Two to five wives	0.37 (0.23, 0.59)	<0.001
No response	0.65 (0.18, 2.32)	0.504
Reason for circumcision		
Tradition/ religion	1	
Health/ Hygiene	2.46 (1.34, 4.53)	0.004
Sexual satisfaction	2.02 (0.25, 16.58)	0.512
Prevent genital infections	2.88 (1.30, 6.35)	0.009
Known relative/friend infected or died of HIV		
Yes, a close relative	1	
Yes, a close friend	1.26 (0.81, 1.97)	0.302
No	1.6 (1.07, 2.40)	0.023
Marital status		
Yes	1	
No	0.64 (0.42, 0.98)	0.042
Live-in partner condom use		
Yes	1	
No	0.39(0.15, 1.04)	0.059
Ever heard of infected or died from HIV		
Yes	1	
No	0.72 (0.52, 1.00)	0.049
Protect HIV by abstain		
Yes	1	
No	1.82 (0.99, 3.37)	0.055
Alcohol intake		
Every day	1	
At least once a week	1.52 (0.98, 2.36)	0.061
Less than once a week	1.43 (0.82, 2.49)	0.203
Never	1.62 (1.10, 2.40)	0.015
Current marital status (Grouped)		
Currently married, living with spouse	1	
Currently married, living with other sexual partner	1.08 (0.56, 2.10)	0.809
Currently married, not living with spouse or any other sexual partner	2.94 (0.39, 22.29)	0.297
Not married, living with sexual partner	0.52 (0.26, 1.05)	0.068
Not married, not living with sexual partner	0.95 (0.52, 1.66)	0.806
circumcision status		
Yes	1	
No	0.81 (0.60, 1.09)	0.158
Had Any leakage in past 12 months		
Yes	1	
No	0.76 (0.48, 1.22)	0.258

AOR=Adjusted Odds Ratio, OR=Odds Ratio, CI=Confidence interval, 1=Reference group

4.4 Variables Associated with HIV Testing

Table five shows results of the multiple logistic regression. We considered significance from ≤ 0.1 percent and all variables that were significant at this level were included in the multivariable analysis. At multivariable analysis, level of significance was set at ≤ 0.05. From this analysis, having two or more wives, reason for circumcision being health and hygiene, reason for circumcision being to prevent genital infections, never drank alcohol and not having a relative or friend who was infected or died of HIV (p-value < 0.001, p-value = 0.009, p-value = 0.009, p-value = 0.007 and p-value =0.023, respectively) were statistically significant.

Table 5: Factors associated with HIV testing among male long-distance truck drivers- Multivariable analysis

Variables	**Multivariable**	
	AOR (95% CI)	**P-value**
Number of wives		
One wife	1	
No wife	0.57 (0.16, 2.08)	0.394
Two or more wives	0.41 (0.25, 0.67)	<0.001
Reason for circumcision		
Tradition/ religion	1	
Health/ Hygiene	2.30 (1.23, 4.28)	0.009
Sexual satisfaction	2.78 (0.33, 23.55)	0.349
Prevent genital infections	3.29 (1.34, 8.10)	0.009
Known relative/friend infected or died of HIV		
Yes, a close relative	1	
Yes, a close friend	1.25 (0.79, 1.98)	0.333
No	1.63 (1.07, 2.47)	0.023
Alcohol intake		
Every day		
At least once a week	1.47 (0.93, 2.32)	0.098
Less than once a week	1.40 (0.78, 2.52)	0.259
Never	1.75 (1.16, 2.65)	0.007

AOR=Adjusted Odds Ratio, CI=Confidence interval, 1=Reference group

CHAPTER FIVE: DISCUSSION

The study was carried out in order to establish the prevalence of HIV testing among male long-distance truck drivers and investigate factors associated with HIV testing uptake among male long-distance truck drivers. The prevalence of HIV testing uptake (ever) among long-distance truck drivers in Zambia was found to be 84%. Although the prevalence of HIV testing uptake was found to be high, the aim of achieving 90% of all people with HIV to be diagnosed was not yet reached. These finding are different from what was found in a study in South Africa which found that only 38.2% had ever been tested for HIV (Delany-Moretlwe *et al.*, 2014). Another study done in Togo in 2012, shows that only 47.4% had ever tested for HIV (Yaya *et al.*, 2016). The difference in the findings of the studies could be attributed to the many interventions that the government of Zambia has put in place, of which the Corridors of Hope HIV/AIDS Prevention Initiative (COH III) could be one of them, which is aimed to reduce the spread of HIV in high prevalence border and transportation corridor to provide comprehensive HIV and AIDS prevention services.

We found that truck drivers with two or more wives were at reduced chance of having an HIV test done compared with truckers who had only one wife. This could be because having multiples sexual partners has shown to make one to be unsure of their health situation since faithfulness in the relationships is not guaranteed, hence unwillingness to go for an HIV test for fear of a positive result. This finding is supported by other studies who had similar results (Steinberg, 2008; Salazar-Austin *et al.*, 2018). In a study conducted by De Wit at el, 2008, results showed that one of the most prevalent barriers to testing for HIV was reported by men who reported having more than 10 sexual partners in the last six months (De Wit and Adam, 2008). If the need for more frequent testing is linked to high-risk behaviours, caution is needed as men who do not perceive their having multiple partners as risky behaviour may not present for testing. This provides a reason for continued and normalised routine schedules for testing of all sexually active high risk populations (Conway *et al.*, 2015). Discouraging truck drivers from having multiple sex partners would lead to increased likely hood of HIV testing uptake. Polygamy causes one to be unsure about the faithfulness in the relationships they have and hence may end up not willing to go for an HIV test for fear of a positive result.

Our study found that knowledge about benefits of circumcision such as enhancing health and hygiene and also prevention of genital infections increased the chance of having an HIV test among LDTDs. Creating awareness and highlighting the important benefits of circumcision

services in the communities would lead to further increase in the uptake of the HIV service in general. Our findings are consistent with what was reported previously in other studies (Eaton and Kalichman, 2007, 2009; Grund and Hennink, 2012; L'Engle *et al.*, 2014). The results highlighted the importance of counselling occurring alongside medical circumcision which capitalises on the significant educational opportunity provided. The education given caused participants' to use sound understanding of partial protection and HIV risk behaviours leading them to stable or even increased use of HIV protective measures following circumcision service rather than riskier sexual behaviour. However, this finding was not significant at multivariable analysis.

We also found that truck drivers who never drank alcohol had increased likelihood of taking an HIV test compared to those truck drivers that took alcohol. This findings is consistent with previous studies that have similarly reported a relationship between alcohol and access to HIV health care services (Fiellin *et al.*, 2006; Clark *et al.*, 2009; Korthuis *et al.*, 2012). The findings from this study suggests that drivers who reported consuming alcohol received fewer HIV care services (HIV testing) than those drivers who reported having never consumed alcohol. These findings suggested the need to implement more focused interventions to promote testing at establishments that sell alcohol. However, this finding was also not significant at multivariable analysis.

Finally, the results from this study show that LDTDs who reported having a relative or having known any friend who was infected or had died of HIV had reduced chance of taking an HIV test. This shows that having knowledge of someone being sick or dying of HIV reduced the chance of one taking an HIV test. This could be attributed to one having fear of testing because of having prior knowledge of the seriousness of the disease. These results are contrary to what was found in others studies that show that the knowledge of someone being sick or died of HIV increased the chance of one taking an HIV test (Rosenstock, 1974; Leventhal, 1980; Evangeli, Pady and Wroe, 2016).

5.1 Conclusion

This study has identified some important factors associated with self-reported HIV testing among LDTDs which include having knowledge on relative or friend who was infected or died of HIV, number of female sexual partners (wives) and personal reasons for accessing male

circumcision services. Personal reasons for circumcision such as hygiene and infection prevention were strong drivers for ever being tested for HIV.

5.2 Recommendations

This data provides information that shows that there is still need to increase efforts to reach LDTDs. The following are some of the recommendations that may be needed in order to increase testing uptake among LDTDs.

Findings from the study have shown that the prevalence of HIV testing uptake (ever) among long-distance truck drivers in Zambia was found to be high. However, they were not meeting the national target of 90% of all LDTDs with HIV to be diagnosed. Therefore, we also recommend that the national HIV Testing Servicers (HTS) program enhance HIV testing modalities in all facilities and ensure more locations of appropriate testing centres are made available for this mobile population. Providing more accessible and available facilities have improved service uptake in others studies (Jenness *et al.*, 2009; Mumtaz *et al.*, 2014; Ng'ang'a *et al.*, 2014; Gwadz and M. Cleland, 2016).

We found that Knowledge about benefits of circumcision such as enhancing health and hygiene and also prevention of genital infections increased the chance of having an HIV test among LDTDs. These findings suggest the need to implement more focused interventions and messages on knowledge about the importance of circumcision in order to increase uptake of HIV testing among LDTDs. As argued by Mall et al, increasing knowledge on services in the communities leads to an increase in the uptake of health care services (Mall *et al.*, 2013).

Lastly because of the new testing strategies that have become available after the BSS study of 2015, we recommend that emphasis be made on usage and education about new testing options (such as use of self-testing kits). This maybe essential as new strategies for HIV testing being implemented may improve the testing rates and bring the country closer to achieving its target of achieving the 90% testing (Choko *et al.*, 2011; Pai *et al.*, 2013).

5.3 Potential Physical, Psychological and Social Risks

Since there was no direct contact with participants, as the study involved secondary data, no obvious physical or psychological injuries to participants were observed. And confidentiality and privacy were ensured, as the data given did not have identification details of persons involved.

5.4 Potential Benefits

There may be no direct benefits to the respondent. However, the information that will be obtained from the study will provide a basis for informed decision making and programing by the Ministry of Health and cooperating partners for increased access to accessing HIV testing services by LDTDs

5.5 Dissemination

A report will be provided to the Tropical Diseases Research Center (TDRC), and to the University of Zambia library (UNZA). The findings will also be published in a credible peer reviewed paper and presented at local and international conferences.

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APPENDIX 1: Ethical approval letters

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RESEARCH CENTRE
P O Box 71769
NDOLA, ZAMBIA

OFFICE OF DIRECTOR

TRC/DD/ADMIN/05/18

28th May 2018

School of Public Health
P. O. Box 32379
LUSAKA

Dear Sir/Madam

RE: PERMISSION FOR MS. LWITO SALIFYA MUTALE TO USE BSS DATA

Reference is made to the above subject. Ms. Lwito Mutale is a Master of Science (MSc) student in "Field Epidemiology" at The University of Zambia (UNZA) and would like to use data from the study entitled, **"Behavioral Surveillance Survey (BSS) among Male Long Distance Truck Drivers (LDTD's) in Five Corridors of Hope Project District Sites in Zambia"** for her thesis. As a student of the MSc in Field Epidemiology at UNZA in collaboration with TDRC.

Ms. Mutale is required to write a thesis examining a research topic of her choice as a requirement for completion of her studies. She has a strong interest in HIV related issues among LDTD's and therefore recognizes the importance and utility of the BSS data. She intends to utilize components of the BSS data to examine patterns of HIV test uptake among the LDTD's.

Mr. David Mwakazanga will be working with Ms. Mutale throughout the thesis process. All data is de-identified and the database will be stored on a password- protected computer. The results of the analyses will be shared with the BSS team for feedback and input; the final thesis will also be shared. If possible, Ms. Mutale will also take the lead in completing a manuscript for submission to a peer-reviewed journal, which will also be shared and credit any relevant contributors to the works.

Please let us know if you need further clarification.

Yours faithfully
TROPICAL DISEASES RESEARCH CENTRE

Dr. Ray Handema
For/DIRECTOR

TROPICAL DISEASES
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TDRC ETHICS REVIEW COMMITTEE
IRB REGISTRATION NUMBER : 00002911
FWA NUMBER : 00003729

TRC/C4/0/2018

29th May 2018
Lwito Salifya Mutale
Student number 2016145021
University of Zambia
Ndola

Dear Ms. Mutale,

RE: ETHICAL REVIEW EXEMPTION OF STUDY PROTOCOL

Reference is made to the protocol entitled **""HIV testing uptake and associated factors among male long distance truck drivers in Zambia, 2015".**

On behalf of the Chairman of the TDRC Ethics Review Committee, I am pleased to inform you that your protocol was granted ethical review exemption based on conditions below.

The Committee has noted that your study will utilize secondary data from a protocol entitled "**Behavioral Surveillance Survey (BSS) among male long distance truck drivers (LDTD's) in five corridors of Hope Project District Sites in Zambia**" which it had already granted ethical review approval. The Committee therefore wishes to advise you to work closely with the Investigators of the aforementioned study and ensure confidentiality by storing the data on a password protected computer.

You are required to submit a final report to the Ethics Review Committee at the end of the study.

Yours faithfully
TROPICAL DISEASES RESEARCH CENTRE

Edna Mwale. Simbayi
SECRETARY – TDRC Ethics Review Committee
cc: Chairperson – TDRC Ethics Review Committee

TROPICAL DISEASE RESEARCH CENTRE
ETHICS REVIEW COMMITTEE
2018
P.O.BOX 71769
NDOLA, ZAMBIA

Dear Lwito Salifya Mutale,

Your manuscript has been submitted to the Journal of Interventional Epidemiology and Public Health.

This manuscript will need clearance from the relevant authorities before it is published.

Summary

Title: Uptake of HIV testing and associated factors among long-distance truck drivers in Zambia, 2015
Manuscript ID: JIEPH_2018_018
Date of submission: 22 October 2018
Authors: Lwito Salifya Mutale, Mumbi Chola, Gershom Chongwe, Webster Kasongo, David Kasanga Mwakazanga, Maurice Owiny, Olufemi Olamide Ajumobi, Choolwe Nkwemu Jacobs
Submitted as: Research

We will send you an update on the status of your submission as soon as possible by email.

Thank you for submitting your manuscript to the Journal of Interventional Epidemiology and Public Health.

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