Health Service Utilization among Men who Have Sex with Men (MSM) who Live in Toronto: Secondary Analysis of a Cross-sectional Study

Health Service Utilization among Men who Have Sex with Men (MSM) who Live in Toronto: Secondary Analysis of a Cross-sectional Study

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A Thesis submitted to the School of Graduate Studies in Partial Fulfilment of the Requirements for the Degree of Master of Science

McMaster University

McMaster University MASTER OF SCIENCE (2014) Hamilton, ONTARIO

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NUMBER OF PAGES: viii, 78

ABSTRACT

There is a paucity of research describing patterns of access to health services, specifically HIV services among men who have sex with men (MSM) living in Toronto. To understand whether and how MSM access health services, a secondary analysis of a large survey (implemented in 2006-2008) about HIV vulnerability among MSM was undertaken. Through logistic regression methods, an investigation of factors potentially associated with differential access to health services by MSM and subsequent impact on safer sex practices among MSM was conducted.

Most participants reported to have seen a family doctor (65.7%) and a dentist (62.5%). Some reported to have accessed walk-in clinics (34.5%), seen a medical specialist (25.4%), and fewer reported accessing emergency rooms (15.7%). The main factors associated with seeing a family physician were income (Adjusted Odds Ratio (AOR): 1.08, 95% Confidence Interval (CI): 1.02-1.14), age (AOR: 1.03, 95% CI: 1.01-1.05), and HIV status (AOR: 3.46, 95% CI: 1.95-6.14). Having been diagnosed with HIV and with STIs were also associated with seeing medical specialist (AOR: 1.89, 95% CI: 1.07-1.93), and using walk-in clinics (AOR: 2.69, 95% CI: 1.75-4.14) respectively; whereas substance use was associated with access to emergency rooms (AOR: 2.21, 95% CI: 1.27-3.87). Ethno-racial identity was not associated with differential access to any of the health services investigated. In addition, access to health services was not found to be associated with safer sex practices. The small sample size did not allow for in-depth comparison of service use by specific ethnicity.

In conclusion, health promotion interventions that target young MSM in lower income bracket should be tested to increase access to family physicians. More research with sufficient, diverse and representative data on ethnicity is needed to better understand factors associated with health service utilization by MSM living in Toronto.

ACKNOWLEGMENTS

I am happy to thank everyone who has supported me during my learning in the Health Research Methodology program, including professors and instructors who have taught me so much. I am sincerely grateful to my M.Sc. supervisor, Dr. Joseph Beyene, who has encouraged and guided me during my academic journey. I am thankful for my thesis committee: Dr. Brian Haynes, Dr. Winston Husbands and Dr. Lehana Thabane who have challenged me, and provided me with valuable feedback. I also thank Dr. Robert Remis and Dr. Ted Myers who provided access to the data used to complete this thesis work. I truly appreciate Lorraine Carroll and Kristina Vukelic for their administrative help and encouragement. I also thank my parents, siblings, and friends for their love and support. Last but not least, thank you V for your unconditional love. You have been by my side throughout this journey, and I dedicate this work to you.

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CHAPTER 1 INTRODUCTION

1. Problem Statement

In Canada, Human Immunodeficiency Virus (HIV) disproportionately affects men who have sex with men (MSM), who accounted for 46% of new HIV infections reported in Canada in 2011.[1] Although HIV is a preventable disease, the rate of new infections among MSM living in Toronto has been steady over the last five years.[2] This is in spite of the development and dissemination of multiple, comprehensive and targeted HIV prevention campaigns, which promote condom use and safer use of drug injection equipment, HIV testing, HIV stigma reduction strategies, access to HIV treatment, and efforts to optimize adherence to HIV treatment. The effectiveness of these HIV prevention strategies has been attributed to various socio-demographic, structural, and cultural factors[3,4] which is the reason why health promotion and social determinants of health frameworks have been adopted to improve and contextualize targeted HIV prevention strategies.

There are also numerous positive HIV prevention interventions (with an emphasis on the health and well-being of HIV positive people), which may include the following activities: (1) ensuring HIV viral suppression to minimize HIV transmission from a HIV positive individual to a HIV negative individual [5, 6] while at the same time achieving optimal health for the HIV positive individual; or (2) utilizing HIV post-exposure prophylaxis (PEP) or pre-exposure prophylaxis (PrEP) to prevent HIV transmission in a situation of known risk.[7, 8, 9, 10] Furthermore, advances in research suggest that in the future, HIV prevention options for MSM and other populations at risk will include microbicides, and possibly even vaccines.[11, 12]

A holistic approach to HIV prevention may help limit the negative impact of HIV stigma and discrimination which often prevents MSM from talking about HIV, from recognizing potential routes of HIV transmission, or from accessing health services.[13,14] Several HIV prevention strategies such as condom use, and safer injection can be accessed and disseminated outside of the healthcare system, whereas other HIV prevention measures, such as accessing HIV highly active anti-retroviral treatment (HAART), PrEP and PEP require the intervention of a healthcare professional. With current advances in HIV treatment, and ongoing development of HIV prevention messages targeting MSM, it becomes important to determine whether MSM take advantage of available health services and whether the utilization of such services is linked to similar access to HIV prevention services. These questions are key because increased use of health services by MSM may lead to earlier HIV diagnosis, treatment and care. The utilization of health services, including HIV specific services that are integrated within the healthcare system, also contributes to the existing discourse on the interaction of MSM with healthcare in Canada.

This work will offer further insights into the pattern of health care utilization among a marginalized group (i.e. MSM) and is a preliminary investigation of various factors that may contribute or hinder the utilization of health services by MSM living in Toronto.

2. Setting the Tone: Why MSM and not Simply Gay Men?

MSM is a term that has emerged over the course of the HIV epidemic to facilitate a targeted response to HIV. It is increasingly used by various epidemiologists and healthcare professionals who seek to describe and understand HIV risk according to one's sexual behaviour as opposed to one's sexual identity or sexual orientation. The phrase MSM also recognizes that

some of the men who engage in same-sex sexual behaviour or have sex with another man might not always identify as homosexual, gay or bisexual.[15] Indeed, a person's sexual identity does not dictate one's sexual behaviour. People with identical sexual orientation may abstain from sex, may have multiple sexual partners, or may be in a monogamous sexual relationship. Some may refuse to use condoms, or use them inconsistently; others may engage in sexual activities under the influence of alcohol or drugs, or in the presence of one or multiple (known or unknown) sexually transmitted infections.

Some researchers have argued that MSM are difficult to recruit into research studies, because unlike gay men, they do not tend to share common culture or to live in aggregated areas.[16] It is also believed that MSM remain invisible in the HIV epidemic because existing HIV prevention efforts do not always reach them.[17] Some racialised[a],[18] men who live in North America do not always identify as gay but rather might use other labels to identify their sexual orientation and sexual behaviour or conceal their sexual orientation.[19,20] Several studies conducted in North America targeting men with diverse sexual orientation, have found that men most frequently reported being gay, bisexual, and MSM, and non-gay identified men are often omitted.[21] Although, some researchers agree that MSM behave differently than gay men,[22] the challenge is to identify a significant number of MSM who do not identify as gay, in order to compare their behaviour against those of other gay men.[16] Indeed, when gay men are asked whether they have sex with men, they will respond affirmatively. On the other hand, MSM will agree that they have sex with men but will not identify as gay or bisexual.

[a]Racialised refers to "persons other than Aboriginal peoples, who are non-Caucasian in race or not-white in colour- Includes: Chinese, South Asian, Black, Arab/West Asian, South East Asian, Filipino, Latin American, Japanese, Korean, and Pacific Islanders (based on the Federal Employment Equity Act definition of visible minorities)" (Galabuzi G., 2001, pg10).

For the reasons above mentioned, and because gay and MSM are the two terms predominantly used in the literature, these two words will be used interchangeably for the purpose of this work.

3. Purpose of the Study

The purpose of this thesis is to understand the factors associated with utilization of health services and other HIV services by racialised MSM living in Toronto. I conducted a secondary data analysis of the Lambda study [23] that looked at the vulnerability to HIV among MSM living in Toronto. The Lambda study, a large cross-sectional study, was originally conducted to determine the prevalence of HIV among a sample of MSM living in Toronto and Ottawa, to understand their sexual behaviour and risk for HIV infection, and to determine their knowledge of HIV and STI transmission. The Lambda study also collected some data about access to health services which constitute the focus of this secondary data analysis.

The primary objective of this investigation was to determine what socio-demographic and health characteristics were associated with differential utilization of health services among the sample of MSM, recruited for the Lambda study on vulnerability to HIV. The secondary objective was to determine whether regular access to health services was associated with lower sexual risk taking, among this same sample of MSM.

Prior to conducting the secondary analysis, I reviewed the current literature on MSM, and their access to health services including HIV services. This first step enabled me to identify potential factors known to affect ways in which MSM navigate the healthcare system, or what

type of health services they seek regularly. Once those factors were identified, I determined which statistical techniques were appropriate for secondary data analysis of a cross-sectional survey.

From those results, I offer recommendations for future investigation on health service utilization among MSM.

CHAPTER 2 LITERATURE REVIEW

1. Introduction

This chapter offers an overview of current knowledge related to the utilization of health services in Canada. I begin by describing the structure of the Canadian healthcare system. I then review the literature on (a) access to health services among MSM, gay, bisexual, transsexual and queer (GBTQ) men; (b) utilization of health services by white, racialised, and immigrant men because these socio-demographic characteristics often intersect and constitute the premise of my inquiry. I also review the literature on access to HIV related services by MSM and other men who live in Canada. I identify various factors known to facilitate or hinder access to health services by MSM, analyze and critique the methodology, and describe existing strengths and limitations. Finally, I outline gaps in the literature on this topic, and describe how my work will address them.

The following databases Medline, Pubmed, Embase, and Cochrane were searched for studies that were published from January 2000 to December 2013. Specific search terms such as "healthcare utilization", "health access", "HIV", "Men who have sex with men", "immigrants" (see Appendix 1) were used to identify relevant articles. I also reviewed the abstracts of Canadian conferences on HIV, and manually reviewed the references of a select number of articles. The search included articles published in North America (United States of America (USA) and Canada), excluding studies conducted in Mexico. The decision to include the USA was based on the recognition that although the USA healthcare system is different from the Canadian one, there are several health related issues that are commonly shared by people living in those two countries. For instance, Canada and the USA impose restrictions on getting health insurance for newcomers and non-status immigrants, the high prevalence of HIV infection among MSM is a shared

concern, and the type of HIV medication and treatment available to people living with HIV is also similar in both nations.[24,25]

Two main strategies were adopted to maximize the retrieval of relevant literature on the utilization of health services in Canada. The first one consisted of casting a wide net to include literature on the utilization of any and all health services (e.g., diabetes) by MSM and ethno-racial men, newcomers to Canada, and other marginalized populations (e.g., women, children). The second strategy involved the review of studies on HIV and access to HIV related health services by MSM, ethno-racial men, and newcomers to Canada. These two approaches recognize that access to health services is largely determined by a health need (i.e., a disease which may require a diagnosis, treatment and care); the behaviour of the individual or community exposed to the disease; and by other external/environmental/structural factors such infrastructure, geography.

2. Framework Related to the Utilization of Health Services in North America

The identification of factors associated with access to and utilization of health services by any given population is not simple. In order to understand this complex process, an examination of patient (service user), and physician (service provider) insight can offer valuable information and is methodologically sound.[26] This thesis work focuses on the perspective of the service users. The assumption is that the first contact with the healthcare system is often initiated by the patient (potential or actual). For instance, seeking an HIV test implies the patient's willingness and readiness to find out their actual HIV status. A look at the service user's motivation demonstrates how one effectively responds to his/her healthcare needs.[27]

Studies on the utilization or access to health services tend to adopt various frameworks to inform their inquiry. For instance, Andersen and Newman's framework [28] is often associated with research studies on the utilization of health services. It acknowledges the interaction of three main factors to explain a pattern or process of health service utilization: (a) predisposing, (b) enabling, and (c) need. Predisposing factors include a set of characteristics that may exist before the onset of an illness, and which may lead someone to seek healthcare (they include social, structural and demographic characteristics). The enabling factors include any characteristics that will facilitate the obtainment of healthcare (such as income, health insurance, availability of healthcare personnel, ability to wait for the desired healthcare service, and genetic and psychological factors). And finally, the need factors refer to the existence of health conditions which will ultimately lead someone to seek health services. These are either perceived needs (which will lead someone to seek care), or actual evaluated needs (which may be confirmed by a third party, or lead to referral for further healthcare). Two of the three components of the Anderson and Newman framework (predisposing and enabling factors) are of particular interest for this work.

Two other frameworks have also informed the development of research on the utilization of health services as it relates to HIV. The social determinants of health[29] stipulate that a set of biological, social, physical, and environmental factors are essential to health. This framework emphasizes the full promotion of each factor independently or collectively in order to achieve optimal health. For instance, housing is a social determinant of health that has been associated with optimal medication adherence, improved physical and mental health among people living with HIV.4 In addition, income (another social determinant) is connected to what type of housing a person living with HIV can afford, and will also determine what type of food and

health treatment they will likely access.[30, 31] Therefore, both housing and income are important elements responsible for the optimal health of a person living with HIV.[32] In research, the social determinants of health framework recognizes that biological, genetic, social, physical and environmental factors act together to influence the health of an individual and the ways in which this individual will potentially access various health services available. The health promotion framework[33] is slightly different in that it reflects a process that motivates individuals or groups of people to take control over their own health, and to try to maintain optimal physical health, mental health, and social well being. The adaptation of the health promotion framework is evident in HIV prevention work, treatment and care, where the emphasis is on the dissemination of HIV prevention messages, development of targeted HIV prevention interventions, or in the promotion of a healthy diet, relaxation, and exercises to optimize self-care.[34, 35]

Finally, the network episode model of health care utilization[36] suggests that access to healthcare is influenced by the context within which social relationships are organized. It implies that friends, coworkers, and family members can influence someone to seek care especially when the existence of medical symptoms is denied.[37] In the case of HIV this model would conclude that based on their social network, some MSM might have more access to HIV prevention messages, or carry out discussions about HIV prevention messages within their networks, which in turn will influence how and when they utilize HIV prevention services. However, the reverse is also true in that, when MSM are part of a network that does not value regular HIV testing, consistent condom use, and tend to engage in high risk sexual activities, their desire to seek HIV prevention services might be lessened.[38]

The frameworks identified will inform the secondary analysis, the purpose of which is to determine whether ethnicity is associated with differential utilization of different health services available to MSM living in Toronto.

3. Access to Health Services in Canada

The Canada Health Act [39] is legislation which stipulates that any legal resident of Canada will have access to publicly funded healthcare services. Every province has adopted this legislation (although some variance exists provincially) in order to guarantee certain types of healthcare services offered, while at the same time limiting any financial or other barriers to these services. In Ontario, the public administration of the healthcare system falls under the responsibility of the ministry of health and long-term care, which offers comprehensive access to essential medical services and is based on the principles of universality (access is assured to all eligible residents of the province), portability (all eligible residents of the province retain the right to access health service for three months, as they relocate to another province), and accessibility (any eligible resident who is insured has automatic access to any of the insured health services offered in the province). Equitable, prompt and adequate access to health services are key indicators of successful healthcare policies. Public health authorities and other healthcare professionals invest in opportunities that improve accessibility of health services for every eligible person living in the province.

Access to health services is usually self motivated, stems from individual needs (for diagnosis, treatment and care of a given disease), or desire to remain healthy (avoid infections/diseases), or is a response to prevention messages designed by public health

authorities. The utilization of health services is a phenomenon difficult to investigate because it depends on intrinsic (actual sickness) and extrinsic (desire to remain healthy, peer pressure, history of disease in family, etc) factors.

Multiple study designs have been implemented to investigate the factors which may facilitate or prevent access to health services. The many facilitators and barriers to health services reflect the population diversity existing in Canada, and likewise the diverse needs in regard to health services. These variations extend along age, gender, ethnicity, race, geographical location, income, social status, language, sexual orientation, marital status, and health status.[40, 41, 42, 43, 44] The characteristics mentioned above not only shape the healthcare needs of the individuals who utilize health services but also determine the way in which these individuals may choose to access these services. For instance, language influences whether there is adequate access to healthcare. People who understand and speak English fluently are able to communicate their needs to health care professionals, and are able to follow medical instructions or follow up on other referral services. For people for whom English is not the first language (or those who have difficulty communicating in English), expressing their healthcare needs, or understanding health related instructions and information would be challenging.[45] They might also be intimidated by their medical provider, and not disclose pertinent information that could result in a prompt and accurate diagnosis.[46]

Similarly, geographical location shapes the type of health services readily available in a region (e.g.: specialized hospitals are found in large urban centres versus only general hospitals in rural areas), which in turn may limit the access to certain services due to factors such as proximity, time, and transportation.[47] In regard to the distribution of HIV services in the Greater Toronto

Area (GTA), most AIDS service organizations (ASOs), HIV specialized clinics, and hospitals with known HIV physicians tend to be located in downtown Toronto.[48]

A number of residents of Ontario, who are eligible for healthcare, report limited access to these services. Often those reporting poor or inadequate access to healthcare are part of one or more marginalized groups (such as homeless people, immigrants, low income, injection drug users, people living with HIV, and gay, lesbian, bisexual, transsexual and queer (GLBTQ) people).[43, 49, 50] The factors contributing to disparities in the utilization of health services can also be disease specific. For instance with HIV, Aboriginal people, injection drug users, gay youth and black people have reported experiences of stigma and discrimination when accessing health services.[43, 51, 52, 13] Other factors reported to influence the utilization of health services include socio-economic status, availability of physicians, existing health policy, health status and risky behaviour that may compromise health.[53]

The literature shows that some factors associated with access to health services may receive more attention than others. In general, studies tend to focus on one disease and assess factors that might prevent people from accessing health services specific to that disease. Indeed, factors such as gender, immigrant status, age and income are known predictors of access to health services, and are often controlled for during any analysis of data related to the investigation of access to health services. However, factors such as sexual orientation and ethnicity have been rarely investigated jointly either as facilitators or barriers to access to health services. Yet, relationship status and sexual orientation might play a role in terms of interpretation and perceptions of risk to HIV infection.

Overall there is a paucity of studies investigating utilization of health services in Canada. Most of the time, studies have been conducted in the US, a country (until recently) without specific policies on universal access to healthcare, and consequently a predominantly private healthcare system. In addition, those with a geographical focus on North America tend to combine or report on both healthcare systems (USA and Canada), thus making it difficult to decipher which results are attributable to the Canadian healthcare system alone.

4. Immigrants and Access to Health Services in Canada

Between 2006 and 2011, about 1.2 million people immigrated to Canada from other countries.[54] Most of the newcomers to Canada would fall under three broad immigration categories: economic migrants, refugees, and those who come under the family reunification category.[55] On the whole, newcomers to Canada report good health upon arrival.[56]

The "healthy immigrant effect" is a phenomenon widely discussed in the Canadian health literature. Several studies have indicated that immigrants to Canada are generally in better health upon arrival, although their health inevitably deteriorates within 10 years of their arrival.[57] Some studies have indicated that although the decline in health of immigrants to Canada tends to correlate with the length of stay in Canada, it does not become worse than that of individuals born in Canada; rather the health of new immigrants deteriorates to a similar state to those people born in Canada.[58, 59, 60] Although the outcome described above is somewhat reassuring, it also suggests that a number of factors may prevent new immigrants from maintaining the good health reported upon their arrival to Canada. It is also possible that a number of immigrants might hide

some of their health concerns in order to gain entry into Canada, although this is unlikely since entry into Canada is only granted based on confirmed health status of the immigrant.[61]

The factors that contribute to the decline in health among immigrants to Canada include poor access to health services, poor awareness of existing healthcare services, language and structural barriers, and low socio-economic status which prevent access to needed health services.[62] Several qualitative and quantitative studies have investigated the pattern of health service utilization among immigrant populations and newcomers to Canada. Some qualitative studies tend to focus on one large immigrant group (such as Chinese, Taiwanese, Pakistani, or Iranian)[63, 64]; whereas others may investigate factors associated with utilization of health services among immigrants as single group (whereby "immigrant" is defined as "someone who recently immigrated to Canada (varies between 0 and 10 years), and with a place of birth outside of Canada").[65] Although Canadian immigrants share commonalities, there are notable differences across subgroups, with certain issues being more typical within one sub-group than within the other. For example, a study among older Chinese immigrants indicates that language, waiting time, poor knowledge of existing health services, and lack of Chinese specific health services, prevented them from accessing health services.[64] A number of cross-sectional and longitudinal studies have also investigated barriers and facilitators to health services among immigrants. These studies often explore the association between different socio-economic, structural and environmental factors and healthcare utilization among various immigrant groups. For example, many newcomers experience a number of challenges such as lengthy waiting lists or long waiting times, inability to afford the health service offered, language difficulties, inability to find a doctor, and lack of health insurance.[56] Lai & Chau[66] found that older Chinese immigrants, with shorter residence in Canada, and stronger beliefs about Chinese medicine, have poorer access to health

services in Canada compared to others in the same group. Among another cohort of immigrants, higher socio-economic status and an active lifestyle were associated with lower rates of hospitalizations, indicating that immigrant status alone was not enough to justify poor access to health services.[59] However, immigrant women seem to report that most of their health needs had been attended to, compared to immigrant men.[67] Experiences of discrimination were also connected to a decline in health among recent immigrants to Canada.[68]

However, studies on access to health services by immigrant populations rarely investigate the role of ethnicity as a determinant of health service utilization. When they do, they invariably examine one ethnic group alone, and rarely is this group being compared to another ethnic group. Another approach would be to isolate ethnicity as a single factor associated with the utilization of health services, which is important since some immigrants may be more prone to using certain services than others. In addition, sexual orientation is often omitted as a variable that influences health service utilization among immigrants, thereby assuming that most immigrants are heterosexual or negating any possibility of determining whether it is a factor. Taking into consideration sexual orientation is relevant because discrimination is known to decrease access to health services. In addition, HIV and access to HIV-related services among these populations do not appear to be an issue widely investigated in Canada. In fact, most studies on HIV and immigrant populations have focused on the healthcare needs of people living with HIV who have recently immigrated to Canada, those of newcomers and people without status in Canada.[69]

5. LGBTQ and Access to Healthcare Services in Canada

Homosexuality was classified as a mental health disorder until 1973, [70,71] and had been criminalized in Canada and many USA states before 1967 and 2003 respectively, which may explain the limited number of studies on access to services among LGBTQ people living in both countries. Most health studies published about homosexual men, gay men and MSM tend to focus on HIV. Others show that LGBTQ people have been subjected to discrimination based on their sexual orientation, which in turn has had a negative impact on their overall health and well being.[72, 73] A USA literature review of barriers to healthcare indicated that many LGBTQ people faced homophobia/transphobia when seeking healthcare, were mistreated by their physicians who often made assumptions about their sexual practices, and/or had misunderstandings about the healthcare needs of LGBTQ people.[74]

Given the progressive laws enacted in Canada, one might expect that LGBTQ human rights are upheld and protected in this country. However, many LGBTQ people still report being discriminated against in school, public life, or while seeking health or social services, because of their sexual orientation and gender identity.[75] Same-sex couples also continue to report that it is challenging to find a specialist, and to receive medical care when they need it.[76]

In the USA, gay and bisexual men tend to experience more mental health issues compared to heterosexual men, and they face barriers when accessing health care services.[77] LGBT youth experience similar barriers to accessing health services. Indeed, most of them were more likely to abandon medical care, even though they were more likely to present with more sexually transmitted infections (STIs) than heterosexual youth, and these same youth were also more likely to suffer from anxiety, depression, suicidality and to not receive adequate support for their mental health needs.[78] LGBT people are also reported to be more likely to access health care when

compared to the general population, and that most of them were comfortable discussing their health concerns with their physician,[79] although this appears to be truer for men than women. Women in same-sex relationships were less likely to have seen a healthcare provider, and were more likely to report unmet medical needs in comparison to other women in opposite sex relationships.[74] Interest in providing adequate healthcare to LGBTQ people may be gaining momentum in North America, UK, Australia and New Zealand. In fact, a recent systematic review, seeking to identify guidelines for the primary care of LGBT people, appraised the quality of 11 guidelines, two of which were specific to primary health care provision for LGBT people.[80]

The number of Canadian studies that have investigated health service use among LGBT people is limited. One qualitative study has described the experiences of LGB and two-spirited people who sought health care, and revealed that coming-out was beneficial for the health and wellbeing of LGBT people, who were able to access and receive healthcare when they needed it.[81] Another study which recruited a large sample of Canadian men and women, indicated that gay and bisexual men were more likely to report a health need, and more likely to use health services compared to heterosexual men. And, bisexual men were more likely to report that their health needs had not been attended to.[82] The prevalence of complex health needs was echoed by another study that found that GBT Canadian men are six times more likely to be diagnosed with a STI compared to heterosexual men, and are more likely to report mood/anxiety disorders and past suicidal attempts than their straight counterparts.[83]

The studies that managed to recruit MSM in related research only count a small number of racialised men, despite the existing ethnic diversity in Canada. In addition, these studies do not address the question of how ethnicity or race may determine whether gay and bisexual men are likely to access health services and whether they all experience the same kind of health concerns.

This is of particular importance because racialised MSM is a growing group, and some studies have shown that they feel discriminated against based on their ethno-racial background.[84, 85, 86]

6. The State of HIV in North America: Focus on Racialised MSM Living in North America

MSM continue to be predominantly affected by HIV in Canada and the USA.[2, 87] They present with the highest number of new HIV infections, and engage in sexual activities that increase risks of HIV infection.[88] Among MSM, Black and Latino MSM are reported to be disproportionately infected with HIV and to be at risk for HIV infection.[89, 90] Monitoring patterns of health service utilization among MSM is an important component of HIV prevention because it helps to identify gaps in HIV testing, treatment and care, specific to the needs of MSM. However, such information is scarce in Canada because a lot of the research on health service utilization does not include MSM.

During the early stages of the HIV epidemic, the utilization of health services among HIV positive MSM was determined by various factors such as having AIDS, extensive pain, and negative mood, which were related to the progressive stages of the disease.[91] Currently, the evidence is mixed. On the one hand, MSM seem more likely to access health services than heterosexual men, and they tend to report having more STIs and mental health issues.[82, 83] On the other hand, MSM are not a homogenous group, and some racialised MSM report experiences of discrimination (based on their ethnicity and skin color) when seeking health services and as a result they may not access the help they need.[81] Their limited utilization of available health services is also attributable to a number of factors, such as denial about their sexual orientations; and substance use.[92]

Another possible reason racialised MSM fail to access HIV/AIDS services is because they do not trust the institutions which provide these services. Racialised MSM who experience discrimination have lower incidence of HIV testing.[93] Specifically, Black MSM who experience racism and sexual discrimination may be dissuaded from utilizing the health services available and getting tested for HIV.[94] Some Black MSM are less likely to have a healthcare professional, and among those who do, very few disclose their sexual orientation/behaviour, which can result in inaccurate or incomplete healthcare provision.[95] In addition, having a minority status is often associated with poor HIV medication adherence and lack of trust towards healthcare providers.[96,97]

In the USA, among Black MSM who report going to HIV health clinics, the majority tend to be older, HIV positive, and connected to a large social network.[98] Young racialised MSM have also been reported to be as likely to access HIV prevention services as white MSM.[99] The differences between white versus racialised MSM arise under closer examination of the quality of care received. Among the Black MSM who reported having seen a healthcare provider, only two fifths had been screened for STIs in the previous two years, even though they were sexually active.[100] In contrast, newly diagnosed MSM of colour referred by a provider who initially offered an HIV test were more likely to remain a patient.[101] This finding demonstrates that when given the appropriate information, MSM of colour are able to access the health services they need.

Unfortunately, two of the Canadian studies[83, 82] that included racialised MSM, failed to include any analysis based on ethnicity, so the question remains, "Would the same pattern of access to health services hold if ethnicity had been controlled for?" Although this information is well documented among Black MSM living in the USA, such evidence is lacking within the

Canadian context, leaving us to draw conclusions based on information collected in a country where the legacy of slavery and racism remains distinctly prevalent today.

7. Summary of the Literature Review

The literature suggests that socio-demographic characteristics and perceived or actual need for health services will influence whether and how people choose to utilize health services. Certain factors might be associated with the utilization of one health service over the other. For instance, older age is associated with increased access to anal screening; whereas stable employment and having access to healthcare benefit at work is associated with access to extensive dental services, or alternative health services (i.e. chiropractor). The access to specific health services is also compounded by health care need and health care referral from family or social networks. Environmental factors (such as geography) have an impact on the way in which people access various health services. All these factors are relevant and will inform the analysis to be conducted for this thesis work.

Moreover, this literature review reveals that healthcare utilization among MSM is a topic understudied in Canada. The limited number of studies identified was specific to HIV and access to HIV prevention services or HIV related services by MSM. However, very few of those did investigate whether ethno-racial background was associated with differential access to health services.

CHAPTER 3 MATERIALS AND METHODS

This chapter introduces the thesis research questions and the Lambda study, which was a cross sectional study that was implemented in Toronto and Ottawa between 2006 and 2008. The focus of this thesis work is to undertake a secondary analysis of the Lambda dataset in order to identify which factors contribute to the utilization of health services among a diverse sample of MSM living in Toronto. It also offers a description of the different measurements used, the hypothesis outlined and sample size calculation done, as well as the statistical challenges encountered and how they were addressed.

1. Overview of the Lambda Study

The Lambda survey (Ontario component of the M-Track surveillance study conducted by the Public Health Agency of Canada and provincial partners) was designed to gather "information on sexual behaviour associated with HIV/AIDS infection and general issues relevant to sexual health and sexual behaviour among MSM".[23] The study also investigated the utilization of health services among MSM living in Toronto and Ottawa.

Data collection occurred from 2006-2007 in Toronto and Ottawa. A survey questionnaire was distributed in English and French to a convenience sample of gay, bisexual and other MSM. In addition, serological samples were collected for HIV, Hepatitis C and Syphilis testing. The participants (MSM) were recruited at public venues and at events frequented by gay and bisexual men (i.e. bars, dance clubs, restaurants in gay communities, bathhouses, parks, cruising areas, business establishments, social organizations, health care clinics, and special events such as gay,

bisexual and queer Pride parties), at AIDS service organizations, at universities and at two high schools. Participants were enrolled into the study if they indicated to be a biological man, to be above the age of 16, to live in Toronto or Ottawa, and had not completed the survey before.

Men enrolled into the Lambda study were asked to provide the following information: 1) socio demographic characteristics (place of birth, ethnicity, age, level of education, income, employment status, etc); 2) access to health services (walk-in clinics, emergency rooms, family doctor, medical specialists, psychiatrist, HIV treatment if HIV positive, etc) and social services in the previous six months; 3) health measures (HIV testing and status, smoking, drug and alcohol use, sexually transmitted infections, Hepatitis A & B vaccination); 4) sexual behaviour (sexual activities with regular or casual male partners, condom use); and 5) opinions and knowledge about HIV and sexually transmitted infections. The objectives of the study, data collection strategies, and sampling techniques have been described elsewhere.[23]

The Toronto sample of the Lambda study (with the exclusion of Aboriginal men) constitutes the focus of the secondary analysis. This sample was selected because of its size (1,932 men as opposed to 511 men recruited in Ottawa), ethnic diversity, and because access was granted by the principal investigators.

2. Research Questions

Two main questions constitute our point of inquiry. The primary research question is to determine whether ethno-racial background accounts for differential utilization of health services.

Racialised MSM refers to men who self identified as gay, bisexual or MSM and who indicated that their ethno-racial background was African, Caribbean, Latino, South East-Asian, or East Asian.

The primary research question is formulated as follows: "Among MSM living in Toronto, are racialised men less likely to access health services than white men?" The primary hypothesis is that there is an absolute difference of 10 percent in the prevalence of health care service use between white MSM and racialised MSM, with racialised MSM using less health services. This is in line with the literature on health disparities among MSM, which shows that racialised MSM tend to have poor access to health services.[102]

The secondary research question explores whether MSM who utilize various health services available to them have different sexual behaviour than those who do not utilize these health services. We seek to answer the following question: "Among MSM who report accessing health services in the last six months, are racialised men less likely to engage in risky sexual behaviour[b] when compared to white men?"

3. Hypothesis and Sample Size Calculation

The purpose of the secondary analysis was to determine whether ethno-racial characteristics were associated with differential utilization of health services by MSM living in Toronto. Previous studies which investigated the pattern of health care utilization among gay men living in Canada have found that about 80% of gay men had reported seeing a family doctor

[b] For the purpose of this work, risky sexual behaviour has been defined as "having more than two sexual partners in the previous six months, and engaging in unprotected anal sex with another man who is HIV positive or whose HIV status is unknown".

in the previous twelve months.[82] Another study suggests that MSM were less likely to access health services compared to heterosexual men.[103]

To my knowledge, there isn't any study that has established the prevalence of utilization of health services among MSM. Instead, what has been reported is that in Canada, the utilization of health care services was different between immigrants and Canadian born people. Often, immigrant groups report lower access to family doctor, and lower utilization of emergency rooms.[62,104] Therefore, a hypothesis was made that the Lambda participants will mimic the pattern of healthcare utilization known to exist among the national sample recruited for large studies such as the population national health survey, the community health survey and the immigrant health survey. The anticipation is that racialised MSM will report lower prevalence of utilization of health services in comparison to white MSM.

The process used to determine the appropriate sample size was three fold. First, I determined (based on the literature review and information collected in the survey), that fifteen explanatory variables will be included in the logistic regression model for the primary outcome, and that each explanatory variable should account for a minimum of 10-15 events,[105, 106] leading to an estimated sample size 225 participants. Second, I calculated a sample size of 1000 gay men (200 non-white gay men, and 800 white gay men) in order to detect an absolute difference of 10 percent in the degree of access to health services between white versus racialised MSM. This difference will be detected with a type I error probability of 0.05 and a power of 0.80. This calculation accounts for the uncertainty and wide range of access to health services among white gay men (considered control group), the 4 to 1 ratio between the number of white MSM and racialised MSM, and uncorrected Chi-square statistics. Third, since ten explanatory variables will

be included in the logistic regression model for the secondary outcome (determine the factors associated with risky sexual behaviour), and each explanatory variable will account for a minimum of 10-15 events, the minimum number of participants needed is 150. The Lambda survey recruited 1,932 MSM, 1,292 of which identified as white and 359 as other ethno-racial identities. Therefore the sample size available was deemed adequate to answer the primary and secondary questions of interest.

4. Ethical Considerations

The study participants were recruited as part of a large cross-sectional study implemented between 2006- 2008. Participants provided informed consent by signing a consent form which stipulated that the information collected would be maintained in a secure place and accessible if further analysis was needed. This secondary analysis is retrospective in nature, and is in line with questions posed by the research team and information collected during the implementation of the study. The data file provided by the principal investigator was password protected and all identifiable information had been removed. The Lambda data file was only accessible to the author of this work, and was stored on a password protected computer, in a locked office. Once the analysis was completed, the results were reported in general terms to avoid potential identification of participants belonging to one specific ethno-racial group. Moreover, the study protocol was reviewed by the Hamilton Integrated Review Ethic Board office and approval granted to proceed with the secondary analysis.

5. Measurements

All the information pertaining to the participants was collected using a survey questionnaire. The survey questionnaire was pilot tested prior to the implementation of the data collection.[23] The socio-demographic characteristics, potential confounders and moderators associated with consumption of health services are described below.

5.1 Outcome Variables

a. Primary Outcome Defined as Access to Health Services

The survey questionnaire asked the participants to indicate whether, in the previous six months, they had accessed a walk-in clinic, emergency room, whether they had seen a family doctor, eye specialist/ophthalmologist, medical specialist, HIV specialist, psychiatrist, nurse/nurse practitioner, dentist/other dental specialist, chiropractor, physiotherapist, psychologist, social worker/ counselor, dietician/nutritionist, and/or other. Each variable was analyzed individually.

b. Secondary Outcome Defined as Risky Sexual Behaviour

The survey questionnaire asked the participant to indicate whether he had anal sex with another man in the previous six months, whether he knew the HIV status of the person he had anal sex with, and whether he used a condom during that anal sexual encounter.

The secondary outcome of interest "risky sexual behaviour" refers to situations that may lead to HIV transmission. Previous researchers have shown that unprotected anal sex constitutes a sexual activity with elevated risk because it is likely to lead to HIV infection if one of the sexual

partners is HIV positive.[107, 108] In addition, sexual positioning, whereby during unprotected anal intercourse the HIV negative participant is the receptive partner and the HIV positive man is the insertive partner, may increase the risk of HIV transmission.[109, 110, 111] The number of sexual episodes and the presence of a sexually transmitted infection are also likely to increase the risk of HIV transmission.[112] For these reasons, a new variable for "risky sexual behaviour" was computed as "having more than two sexual partners in the last six months, and engaging in unprotected sex with a sexual partner who is HIV positive or whose HIV status is unknown". This definition provides an approximate measure of risky sex, and does not make a distinction between two HIV positive partners who might engage in condomless sex (nor sero-discordant partners) because the number of HIV positive people enrolled into the study was small. This secondary outcome is dichotomous.

5.2 Primary Explanatory Variable: Ethnicity

The Lambda survey questionnaire asked participants to disclose their ethnic identity and the ethnic identity of their ancestors. These two variables were then utilized to assign the most suitable ethnic identity. This selection process was based on census data from statistics Canada and was conducted by the Public Health Agency of Canada (PHAC). PHAC compared the ethnic origin classification index to create a new ethnic origin variable. Moreover, participants were able to record more than one ethnicity on the questionnaire. In those situations the first ethnicity recorded by the participants was the one selected.[23]

Ethnic identity is therefore a categorical variable that includes the following ethnic groups: Canadian-European, Black, Latino, South Asian, South East Asian, and East Asian. For the

purpose of the thesis work a dichotomous variable was created with only two options: white and racialised. The white category includes Canadian-European, and the racialised category[c] includes African, Caribbean, Latino, South Asian, South East Asian, and East Asian.

5.3 Confounding Variables

The Lambda survey questionnaire included numerous questions related to socio-demographic characteristics of the participants. Previous research suggests that variables such as age, education, income, place of birth, immigration status, and language spoken at home, could be potential confounders of utilization of health services by racialised MSM.[59] In the Lambda questionnaire, the characteristics above mentioned were defined through binary, continuous or categorical variables.

In addition, a set of variables act as moderator to health services use because they either represent a need or they may influence a person's decision to seek healthcare. Those include (a) knowledge about HIV and STI transmission, (b) and presence of a STI.

6. Statistical Analysis

The statistical analysis undertaken was two-fold. First, a multivariate logistic regression was initiated to determine what factors were associated with access to specific health services by MSM, and what factors contributed to risky sexual behaviour among those who had utilized a health service in the previous six months. Second, an assessment of analytical approaches best

[c] Although each ethnic group included in the racialised category is different from one another, the common experience of racialisation is known to affect access to health services and justifies placing them into one category.

suited to deal with missing values was undertaken. The statistical analysis was conducted with SPSS 21.

6.2. Data Management

The Lambda dataset included numerous variables some of which were not relevant to the research questions stated a priori. Data cleaning was therefore initiated by deleting irrelevant data points and variables (e.g.: Aboriginal men were excluded from all the analysis). Some variables were re-coded or merged in order to facilitate subsequent analysis (e.g.: risky sex[d] was redefined by taking into consideration the type of sexual activities, condom use, and number of sexual partners). Some preliminary analysis, such as determining whether the recruitment sites were associated with one particular ethno-racial group, age group, education, or income, was undertaken in order to identify any potential response bias. Similar scrutiny was applied to missing values by assessing whether some socio-demographic variables were associated with a lower or higher number of missing values (e.g.: the proportion of missing values across one of the outcomes of interest was compared according to ethnicity, age, income, etc)

6.2. Preliminary Analysis

A descriptive statistical analysis was performed to determine the profile of the participants recruited into the Lambda study. Frequency tables were created to determine the age and income distribution of the participants enrolled in the study, to identify the percentage of MSM who

[d] Risky sex is defined as followed: "having more than two sexual partners in the previous six months, and engaging in unprotected anal sex with another man who is HIV positive or whose HIV status is unknown"

belong to a particular ethnic group, who speak one particular language, who were born in a particular place, and to determine the overall percentage of MSM who utilize one type of health services in comparison to another. The frequency tables enabled us to determine (a) whether there were any answers with a large proportion of missing values, or (b) whether the missing values were based on a correct skip pattern. Bar graphs, histograms and box blots were drawn to gain a visual representation of the data and identify potential outliers.

Bivariate analysis, chi-square statistics, Pearson's coefficients and Fisher exact tests were applied to determine whether there was any significant difference in the percentage of participants who belong to one ethnic group versus the other (white MSM vs racialised MSM) in relation to other variables of interest, both independent and dependent variables. The level of significance was set at 0.05 in line with the a priori hypothesis.

6.3. Logistic Regression

The logistic regression is a modelling technique widely used in observational studies, and most specifically in scenarios where the probability of an event occurring lies between zero and one. In cross-sectional studies, logistic regression is commonly applied in order to determine whether there is an association between a number of explanatory variables (independent variables) and a dichotomous outcome (dependent variable).[113] In this case, causality cannot be established because the data (in cross-sectional studies) is collected at one point in time; however association between a set of variables can be determined.[114] In order to apply logistic regression, the main assumption made is that the outcome variable is binary, which implies that the probability of its occurrence varies between zero and one.[113] Consequently, the odds of having one particular

outcome are determined by the existence of one or more explanatory variables. The multivariate logistic regression enables one to establish the association between one dependent variable and an independent variable, while at the same time accounting for the influence of other independent variables (these may act as confounders or moderators).

In theory, because the possible value of the outcome lies between zero and one, its association to the explanatory variables is not visually represented by a linear equation, but instead by a graph revealing an S shape. To interpret the meaning of such a non-linear curve, mathematical transformation techniques are applied to obtain a linear relationship with coefficients, the value of which can be extrapolated in meaningful ways. This type of statistical technique allows us to build a regression model that is based on one or more coefficients. The value of each coefficient is then extrapolated to determine the odds that one event will occur or not. The logistic regression model is based on the following equations:

$$\text{Probability of an event} = \Pr(Y = 1/X) = \frac{e^{(B0+B1X1)}}{1+e^{(B0+B1X1)}}$$

Or

$$\text{Probability of no event} = \Pr(Y = 0/X) = 1 - \frac{e^{(B0+B1X1)}}{1+e^{(B0+B1X1)}} = \frac{1}{1+e^{(B0+B1X1)}}$$

In both equations above, Y represents the dependent variable (if Y= 1 the event has occurred, and if Y=0 the event did not occur), X represents the independent variable (which can be binary, continuous, or categorical), *e* constitutes the base of the natural logarithms, $B_0 + B_1X_1$ is

a linear sum. The coefficients of this linear expression (B_0 and B_1) represent the unknown parameters that are to be estimated according to the values of the dependent and independent variables.

In order to interpret the significance of the coefficient B_0 and B_1, one needs to transform these two equations into a linear function by taking advantage of the odds (defined as the ratio of the probability of an event over the probability of a non-event). Through the logit transformation, one is able to determine the value of the odds ratio, and therefore quantify the association between two variables. The value of B_1 represents the value of the slope of the linear equation obtained through the logit transformation. As in linear regression, a negative value of the slope indicates that the independent and dependent variables are negatively associated (i.e.: when the value of the independent variable increases, the outcome tends to be worse, with a value less than one and closer to zero) and vice versa. The magnitude of this association can only be interpreted by determining the value of e^{B1}.[106]

When the logistic regression model includes more than one independent variable, the logistic model takes on the following expressions:

$$\Pr(Y=1 \mid X_1, X_2, X_3, \ldots X_j) = \frac{e^{B0+B1X1+B2X2+B3X3+\cdots+BjXj}}{1+e^{B0+B1X1+B2X2+B3X3+\cdots+BjXj}}$$

Therefore, $\ln[\text{odds}] = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \ldots + B_jX_j$

In the scenario, here above, the coefficient B_1 represents the ln(odds) for X_1 when the other variables are adjusted.

Each of the coefficients of the linear expression is estimated through a method known as the maximum likelihood method (MLM). This method, through numerous repetitions, tries to

assign different values to the unknown coefficient in a way that maximizes the probability of obtaining similar values to the observed data.[106] The statistical significance of the results obtained is determined by comparing the log likelihood statistics of two different models (one with the parameter of interest and the other without it) which have a chi-square distribution with a degree of freedom of value 1 (usually the difference between the number of parameters included in each of the two models)[106]

Two issues, collinearity and the presence of interaction terms, often arise when using logistic regression analysis. First, it is important to determine whether the independent variables included in the model satisfy the condition of non-collinearity. When two independent variables display collinearity, they tend to behave similarly in relation to the outcome (independent variable). For instance, if two independent variables have the same information in relation to the outcome, then they may have an impact on the estimation of the coefficient of the parameter and the standard errors. This often occurs when the independent variables are highly correlated. An examination of the correlation matrix may help select one of the variables that is more probable to be associated with the outcome of interest, based on previous literature and information contained (or expressed by) in the variable of interest. Second, it is equally important to establish whether there are any interaction terms to be included in the regression model. The interaction term is indicative of the presence of a confounding effect. The confounding effect occurs when one independent variable is associated with the outcome variables and at the same time associated with another independent variable or can act as a proxy of the independent variable.[114] An examination of the plot of the outcome against two independent variables is often indicative of an interaction effect (or term), in which case, such a term (the product of the two independent variables of interest) is to be included in the regression model.[113]

For each logistic regression model created it is important to assess how well the outcome can be truly predicted by the newly created model and its related coefficients. A statistical test known as the Hosmer-Lemeshow Goodness of Fit (HL- GOF) is a chi-square test, which enables one to determine whether the model created represents the best estimation of the true relationship between the variables under investigation.[106] In this statistical test, the null hypothesis is that the model is poor at predicting the data; therefore a rejection of the null hypothesis or a non-significant p value is indicative that the model is a good fit. The following steps take place: (a) The regression model built helps to predict the outcome for each participant and the predicted values are recorded in ascending order; (b) these predicted values are grouped into ten approximately equal groups; (c) within each group the number of observed outcomes are compared to the number of expected/predicted outcomes and the chi-square test statistics is determined. However, the statistical test is not exhaustive and can be limited by a small sample size. For this reason a visual plot of the predicted values against the actual values of the outcome is often analyzed. A straight line with a slope value of one is a good indication that the model is a good fit. [106]

For the purpose of this thesis work, the logistic regression techniques were applied to determine the association between ethnicity and access to specific health services, while at the same time controlling for other confounding or moderator variables such as age, income, education, language, sexual orientation, substance use, health status, and health knowledge. The main outcome of interest relates to access to health services in the previous six months. This outcome is binary (access=1 and no access=0). The main explanatory variable of interest is ethnicity (white=1 and non-white=0). The other explanatory variables included in the logistic regression models were either continuous (i.e.: age), ordinal (i.e.: income and education),

categorical (i.e.: sexual orientation), or dichotomous (i.e.: health status, place of birth). Two main steps were undertaken to answer the primary and secondary research question.

First, a univariate logistic regression to establish the association between each predicator and the primary and secondary outcomes (access to health services and risky sexual behaviour) was conducted. The threshold level of significance was set at p= 0.1 for each univariate analysis performed. A goodness of fit test was also carried out for each regression model built. A maximum likelihood test, based on k-1 degrees of freedom (k representing the number of variables included in the model) was done to ascertain the level of significance. Each variable with a statistically significant p value became a potential candidate for multivariate logistic regression. Babyak[115] argues that this first step may decrease the number of degrees of freedom available, is likely to introduce error and therefore not recommended. However, in the present situation, the univariate analysis is not used to screen for variables, as all potential explanatory variables were selected a priori based on the literature.

Second, a multivariate logistic regression model was built, by including eligible explanatory variables and using a stepwise process. The threshold was set at 0.05 for inclusion and 0.1 for exclusion. The stepwise logistic regression model consists of inclusion and exclusion of explanatory variables based on the threshold value mentioned above, and which allows for the construction of the best regression model.[106] Once the final regression model has been determined, the coefficient associated with each relevant variable is then verified to establish stability. The coefficients represent an odds ratio and its 95% confidence interval is examined to determine statistical significance. Moreover, collinearity between the explanatory variables of interest were determined, interaction terms were created, and each were included in the model only when appropriate.

All the results were expressed as unadjusted and adjusted odds ratio, which took into account the impact of other variables included in the model.

6.4. Handling Missing Values

Missing values may constitute a hindrance to the logistic regression analysis. Missing values tend to decrease the sample size and reduce the number of pre-recorded events. This pattern can occur whether the information is missing at random or non-randomly. Missing data at random implies that there was no particular pattern to the way in which the information was not collected. It may be due to the fact that a potential participant with a particular characteristic was not recruited, it could also be due to the fact that a participant inadvertently omitted to respond to one or two questions. The other possibility is that the information can be missing at non random, in which case participants were consistently omitting to answer a particular question because the skip pattern was not clearly indicated on the questionnaire, or because the participants were uncomfortable with a given answer. Each scenario, once identified, calls for a specific technique, such as pairwise elimination of data, casewise deletion, or imputation.[116]

A preliminary analysis of the missing values was undertaken. First, through a visual representation of the data, we were able to determine where most of the missing values were concentrated. We also used bivariate analysis to determine whether the missing values for each variable of interest varied across ethnicity and the reported health service utilized by participants. The main logistic regression analysis was carried out without the missing data, as those data points were automatically excluded from the model, which reduced the overall sample size. However, in

each case the number of events and non-events per variable included in the model were not less than ten, a value recommended. We then compared the cases that were included in the logistic regression with those that were excluded in order to determine whether there were any differences across variables.

CHAPTER 4 RESULTS

This chapter describes the results of the multivariate logistic regression analysis performed. First, the socio-demographic characteristics and health profile of the men who participated in the Lambda study are depicted. Second, descriptions of the different health services accessed by MSM and factors that contribute to their utilization are outlined. Third, the elements that contribute to risky sexual behaviour among MSM who have utilized at least one health service in the previous six months are reported. And last but not least, an assessment of the analysis performed and an investigation into the impact of missing values are summarized.

Overall, 1,932 MSM completed the Lambda survey questionnaire. This included 101 MSM who self-identified as Aboriginal[e], 70 MSM who reported a postal code outside of the Greater Toronto Area (GTA)[f], and about 179 MSM who did not provide any information about their ethnicity, all of whom were excluded from further analysis[g]. (Figure 1)

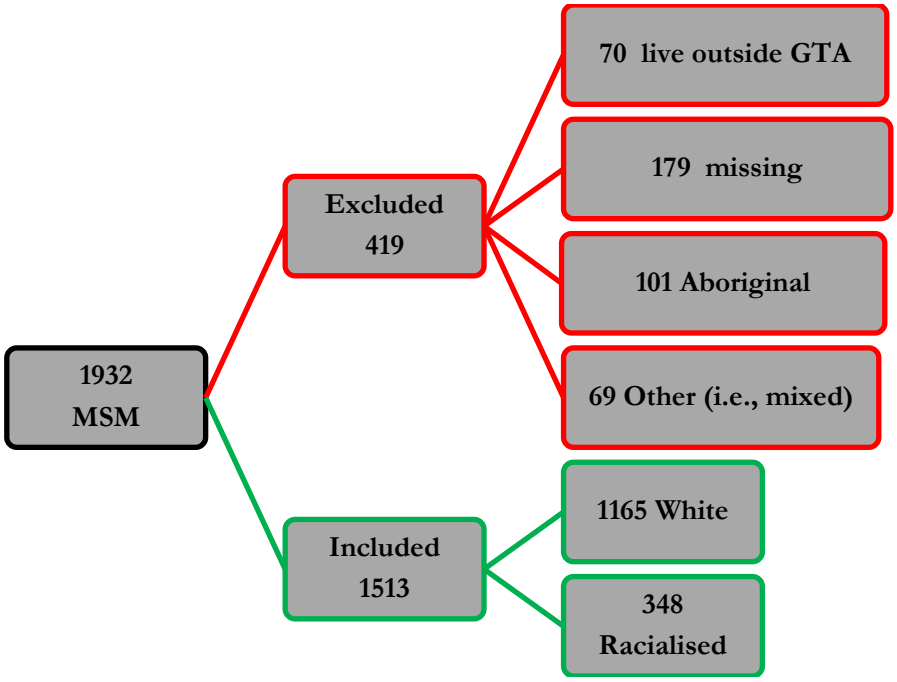
Following data cleaning, 1,513 MSM was the sample size available to answer the primary and secondary research questions which relate to (a) utilization of health services according to ethnicity and (b) risky sexual behaviour of MSM who accessed health services in the previous six months compared with MSM who did not.

[e] Aboriginal men have unique challenges that cannot be addressed within the scope of this thesis work.

[f] A decision was made a priori to focus on MSM who live in the GTA.

[g] Ethnicity is the main explanatory variable. Participants with missing information on this variable were excluded. Further sub-analysis of this group of people shows that they do not report differential access to health services, compared to other MSM who reported about their ethno-racial background.

Figure 1: Illustration of the Participants Selection Process



1. Socio-demographic and Health Profile of MSM Living in Toronto

Among the 1,513 MSM who completed the Lambda survey questionnaire, the majority (77%) reported to have a white/European ethnic background whereas the rest (23%) self-identified as being part of another ethno-racial background (South Asian, Asian, Latino, African and Caribbean) (TABLE 1).

TABLE 1 Breakdown by Ethnicity of MSM Included into the Study

White	*Percent (n)*
European	73.3 (854)
North American	26.7 (311)
Total	*77.0 (1165)*
Racialised	***Percent (n)***
African	11.8 (41)
Caribbean	15.2 (53)
Latin	15.1 (55)
South Asian	16.4 (57)
Southeast Asian	40.8 (142)
Total	*23.0 (348)*

N=1513

The mean age of all the participants was 40.2 years, with a median age of 40 years, and an age range between 16 and 86 years. Most participants (67.3%) were born in Canada, where as the participants born outside of Canada (32.7%) reported a mean age of 22 years at arrival in Canada, a median age of 24 years and a range between 0 and 67 years. English was the language spoken by most participants (76.8%) at home, although about 15.3% reported speaking another language including French (only 7.9% of the sample spoke French at home). The Lambda participants reported to be well educated; indeed most (62.5%) had completed a post secondary education, and about 22.5% reported to have some college or university education. Of the 1,467 MSM who shared information about their personal annual income, the majority (97.6%) reported to have earned an income during the previous year, and the median income was around $49,999. When asked about their sexual orientation, most participants identified as gay (86.4%), followed by bisexual (10.4%), and only a few (3.3%) reported another sexual orientation (e.g.: straight, queer).

Participants were also asked some questions about existing sexually transmitted infections, including HIV. Among the participants who reported to have taken a HIV test in the previous twelve months, 16.9% had received a positive HIV diagnosis. And of those, the majority (75.8%) reported to have taken anti-HIV medication at least once in their lifetime, with 94.5% of them indicating that they were still taking anti-HIV medication at the time of survey. Moreover, about 80.8% reported to have been screened for STIs at least once in their lifetime. Among those who sought a STI test in the previous year, 15% had received a positive diagnosis. In addition, when asked about their vaccination history, most reported to have received a vaccine against Hepatitis B (69%) or against Hepatitis A (55.1%). Participants were also asked about their use of substances and very few (9.4%) reported to have ever used recreational drugs.

A stratification of the socio-demographic and health profile by ethnicity reveals noticeable differences (TABLE 2a & 2b). For example, racialised MSM were more likely to be young (30.2% were under the age of 30 years vs 14.7% for white MSM), and more likely to report an income below $20,000 (15.8% of the racialised MSM versus 5.7% of the white MSM) despite having reported similar levels of education to white MSM. In addition, most racialised MSM reported that they were born outside of Canada (75.9%) compared to white MSM (17.1%).

TABLE 2a Socio-demographic Characteristics Stratified by Participants' Ethnicity

Income	**Racialised (%)**	**White (%)**
None	7.2	1.0
$1- $19,999	9.6	4.7
$20,000 - $29,999	9.3	10.9
$30,000 -$ 39,999	13.0	10.7
$40,000- $ 49,999	13.6	14.1
$50,000- $ 59,999	14.8	12.9
$60,000- $69,999	9.9	10.7
$70,000- $79,999	6.9	9.8
$80,000 and more	15.6	25.3
	n=332	*n=1135*

Age	**Racialised (%)**	**White (%)**
Less than 19	1.4	0.8
20-24	14.1	5.1
25-29	14.7	8.8
30-34	19.0	9.6
35-39	15.2	12.3
40-44	14.9	17.4
45-49	8.3	15.5
50-59	2.6	14.8
More than 60	0	8.4
	n=348	*n=1165*

Education	**Racialised (%)**	**White (%)**
Elementary	0.6	0.35
Some high school	1.8	6.1
High school	8.2	8.8
Some college	27.1	21.2
College - University	40.6	41.7
Some graduate	6.8	6.3
Post graduate	15.0	15.5
	n=340	*n=1155*

Place of birth	**Racialised (%)**	**White (%)**
Canada	24.1	82.9
Outside of Canada	75.9	17.1
	n=324	*n=1102*

Language	**Racialised (%)**	**White (%)**
English	61.7	82.4
French	4.0	9.1
Other	34.3	8.5
	n=324	*n=1104*

Percentages are reported for each column and N=1513

In regard to the health profile, racialised MSM were less likely to report having ever tested for HIV and having tested for a STI in the previous six months (TABLE 2b)

TABLE 2b: Additional Socio-demographic and Health Characteristics Stratified by Participants' Ethnicity

Sexual Orientation	**Gay (%)**	**Other (%)**	**OR (95%CI)**
White	89.3	10.7	
Racialised	82.5	17.5	**1.77 (1.27-2.49)***
	n=1294	*n=180*	
Substance Use	**Used Substance (%)**	**Did not use substance (%)**	**OR (95%CI)**
White	9.4	90.6	
Racialised	6.0	94	0.61 (0.36-1.05)
	n=109	*n=1353*	
Tested for STI	**Yes (%)**	**No (%)**	**OR (95%CI)**
White	83.9	16.1	
Racialised	67.9	32.1	**0.41 (0.30 - 0.55)***
	n=909	*n=225*	
Tested for HIV	**Yes (%)**	**No (%)**	**OR (95%CI)**
White	90.4	9.6	
Racialised	80.7	19.3	**0.45 (0.32-0.63)***
	n=1244	*n=167*	
HIV Status	**Positive (%)**	**Negative (%)**	**OR (95%CI)**
White	18.5	81.5	
Racialised	11.8	88.2	**0.59 (0.39-0.90)***
	n=204	*n=988*	
HIV Meds ever**	**Yes (%)**	**No (%)**	**OR (95%CI)**
White	76.0	24.0	
Racialised	79.3	20.7	1.21 (0.46-3.17)
	n=153	*n=47*	
HIV meds now**	**Yes (%)**	**No (%)**	**OR (95%CI)**
White	96.0	4.0	
Racialised	87.0	13.0	0.28 (0.06-1.27)
	n=139	*n=8*	

*Indicates that difference is statistically significant ($p<0.05$).
** Includes those who reported to be HIV positive only (n= 204) and difference is not statistically significant ($p>0.05$)
N=1513

2. Patterns in the Utilization of Health Services by MSM living in Toronto

The survey questionnaire included a series of questions specific to fourteen different health and social services accessed by the participants in the previous six months. Overall, most participants reported utilizing the following health services: seeing a family physician (65.7%), a dentist (62.5%), and an optometrist (24%). Fewer participants reported accessing health services located within a clinic or a hospital. Indeed, only 34.5% had sought health care at a walk-in clinic, 15.7% had utilized the emergency room, and about 13% had seen a nurse during the previous six months. Numerous specialized medical services require the onset of a medical issue and previous referral from a family physician or a general practitioner; therefore it was not surprising to note that fewer participants had reported seeing a medical specialist (25.4%), a HIV specialist (16.1%), a psychiatrist (10.9%), and a chiropractor (12.8%). The percentage of participants who reported to have utilized different alternative health services was often lower than 12%. About 7.6%, 6.6% and 11.3% had seen a dietician, psychologist, and counsellor respectively.

A stratification of access to these health services according to ethnicity revealed that some of them were differentially accessed by one group compared to the other (TABLE 3). Indeed, more white MSM reported to have utilized the emergency room, seen a medical specialist, and to have seen a dentist in comparison to racialised MSM (16.2% versus 11.6% {p=0.04}; 27.8% versus 20.1% {p=0.004}); and 64.9% versus 58.1% {p=0.025} respectively). On the other hand, racialised MSM seemed more prone to attend walk-in clinics (38.7% versus 32.5% {p=0.04}).

TABLE 3 Utilization of Health Services and Social Services Stratified by Participants' Ethnicity

	Walk-in Clinic					**Emergency Room**				
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	32.5	67.5			*White*	16.2	83.8		
Racialised	38.7	61.3	**1.31***	**1.02-1.68**	*Racialised*	11.6	88.4	**0.68***	**0.47-0.98**
	Family Physician					**Eye specialist**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	68.0	32.0			*White*	24.1	75.9		
Racialised	63.7	36.3	0.82	0.64-1.06	*Racialised*	24.1	75.9	1.00	0.76-1.33
	Medical specialist					**HIV specialist**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	27.8	72.2			*White*	16.7	83.3		
Racialised	20.1	79.9	**0.65***	**0.49-0.87**	*Racialised*	16.6	83.4	0.99	0.72-1.37
	Psychiatrist					**Psychologist**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	11.0	89.0			*White*	6.0	94.0		
Racialised	8.7	91.3	0.77	0.51-1.18	*Racialised*	6.7	93.3	1.12	0.69-1.82
	Nurse					**Dietician**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	14	86			*White*	7.2	92.8		
Racialised	10.5	89.5	0.86	0.49-1.05	*Racialised*	8.4	91.6	1.18	0.76-1.83
	Chiropractor					**Physical therapist**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	13.8	86.2			*White*	8.5	91.5		
Racialised	10.5	89.5	0.73	0.50-1.07	*Racialised*	7.3	92.7	0.85	0.54-1.34
	Dentist					**Counsellor**			
	Yes (%)	*No (%)*	*OR*	*95%CI*		*Yes (%)*	*No (%)*	*OR*	*95%CI*
White	64.9	58.1			*White*	10.6	89.4		
Racialised	35.1	41.9	**0.75***	**0.59-0.96**	*Racialised*	11.0	89.0	1.04	0.71-1.53

N= 1513, n= 1490 for each health service, and the number of missing value across each health service is 23

*Indicates the difference is statistically significant ($p<0.05$)

In addition, further exploration (through multivariate logistic regression) shows that the independent variables identified earlier have a unique association with each health service utilized (TABLE 4). For instance in multivariate analysis, the factors strongly associated with access to a walk-in clinic were age, reporting a sexual orientation other than gay, and having received a positive STI diagnosis in the previous six months. Older MSM were less likely to utilize the walk-in clinic than younger MSM and those who had been diagnosed with a STI in the previous six months were 2.69 times (95% CI: 1.75-4.14) more likely to access the walk-in clinic than those who had not been diagnosed. The survey questionnaire did not specify whether the diagnosis of a STI had occurred prior to accessing the walk-in clinic. In other words, a positive STI diagnosis may have occurred during or prior to this visit at the walk-in clinic. In either case, this would suggest that irrespective of their ethnicity, MSM tend to seek healthcare when their health status warrants it. On the other hand, seeking the help of a family physician seemed to be slightly associated with higher income, with older age, and strongly associated with a previous positive HIV test result. MSM who were HIV positive were 3.5 times (95% CI: 1.95-6.14) more likely to have seen a family physician in the previous six months. Similarly seeing a medical specialist was mainly associated with having received a positive HIV diagnosis. Indeed HIV positive MSM were 1.89 times (95% CI: 1.26-2.84) more likely to see a medical specialist than HIV negative MSM. However, when we isolated those MSM who were HIV positive and sought to determine factors associated with seeing a HIV specialist, all variables including ethnicity were non-significant. Interestingly, the usage of the emergency room was less likely to occur among those who did not identify as being gay (AOR= 0.49; 95% CI: 0.26-0.89), and more likely to occur among those who had reported to have used a substance (AOR=2.21; 95% CI: 1.27-3.87). It is possible that substance use might lead to a health crisis requiring immediate attention.[117]

TABLE 4 Characteristics Associated with Access to Selective Health Services

Walk- in Clinic				
Characteristics	*Included analysis*	*Unadjusted OR (95% CI)*	*Included analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		825 (47%)	
White		1.00		1.00
Racialised ↓		0.77(0.60-0.98) ↓*		0.67 (0.45-1.00)
Age ↓	1473 (83.9%)	0.95(0.93- 0.96) ↓*	825 (47%)	**0.94 (0.92- 0.95)***
Sexual Orientation	1660 (94.6%)		825 (47%)	
Gay		1.00		1.00
Other ↓		1.64 (1.24 - 2.18)*		**0.54 (0.31- 0.92)***
Diagnosed with STI	1560 (88.9%)		825 (47%)	
Yes		2.40 (1.79- 3.22)*		**2.69 (1.75- 4.14)***
No		1.00		1.00
Emergency Room				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		825 (47%)	
White		1.00		1.00
Racialised ↓		0.68 (0.47- 0.98) ↓		0.64 (0.36-1.13)
Sexual Orientation	1660 (94.6%)		825 (47%)	
Gay		1.00		1.00
Other		1.43(1.11-1.84)*		**2.04 (1.12 -3.85)***
Substance Use	1398 (79.7%)		825(47%)	
Never used Substance		1.00		1.00
Used substance		2.69(1.78-4.07)*		**2.21 (1.27-3.87)***
Family Physician				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		825 (47%)	
White		1.00		1.00
Racialised ↓		0.83 (0.64 - 1.06) ↓		0.92 (0.61-1.38)
Income	1560 (88.9%)	1.08(1.04 – 1.12)*	825 (47%)	**1.08 (1.02-1.14)***
Age	1473 (83.9%)	1.04 (1.03- 1.05)*	825 (47%)	**1.03 (1.01 - 1.05)***
HIV test results	1318 (75.1%)		825 (47%)	
Negative		1.00		1.00
Positive		2.69(1.85-3.93)*		**3.46 (1.95-6.14)***
Eye specialist				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		1096 (62.5%)	
White		1.00		1.00
Racialised		1.00 (0.76 - 1.33)		1.15 (0.79-1.66)
Age	1473 (83.9%)	1.02 (1.01- 1.03)*	1096 (62.5%)	**1.03 (1.01- 1.04) ***

*Indicates that the association is statistically significant with $p<0.05$; ↓ indicates that it is a negative association; N=1513

TABLE 4: Characteristics Associated with Access to Selective Health Services (Continued)

Dentist				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		1096 (62.5%)	
White		1.00		1.00
Racialised ↓		0.75 (0.59 – 0.96)↓		0.96 (0.69 - 1.33)
Income	1560 (88.9%)	1.18 (1.14 – 1.23)*	1096 (62.5%)	**1.18 (1.13 - 1.24)***
Age	1473 (83.9%)	1.02 (1.02 - 1.03)*	1096 (62.5%)	1.01 (1.00 - 1.03)
Medical Specialist				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included analysis*	*Adjusted OR (95% CI)*
Ethnicity	1490 (84.9%)		825 (47%)	
White		1.00		1.00
Racialised ↓		0.65 (0.49 - 0.87)*		0.72 (0.46 -1.13)
Age	1473 (83.9%)	1.02(1.01-1.03)*	825 (47%)	1.02 (1.00- 1.04)
HIV test results	1318 (75.1%)		825 (47%)	
Negative		1.00		1.00
Positive		2.26(1.68 – 3.04)*		**1.89 (1.26 – 2.84)***
HIV specialist				
Characteristics	*Included in analysis*	*Unadjusted OR (95% CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	201 (86.6%)		168 (72.4%)	
White		1.00		1.00
Racialised ↓		0.85 (0.35 – 2.06)↓		0.59 (0.19 – 1.81)
Knowledge STI↓	201 (86.6%)	0.30 (0.91-1.37) ↓	168 (72.4%)	**1.44 (1.07 – 1.93)***

*Indicates that the association is statistically significant with $p<0.05$; ↓ indicates that it is a negative association; N=1513

In regard to seeking the help of an eye specialist and a dentist, age and income seemed to be associated with the utilization of each of these health services.

Overall ethnicity was not a factor associated with utilization of any of the health services investigated. Instead, age, income, previous substance use, and pre-existing medical concerns (such as having a STI or being HIV positive) were strongly associated with utilization of health services in the previous six months. The reported utilization of alternative health services such as accessing a dietician, psychologist, and chiropractor was sporadic and further analysis could not be completed due to a small sample size.

3. Sexual Risk of MSM who Utilize Health Services Available in their Community

The Lambda participants were asked to describe any sexual encounter they had engaged in with another man. Risky sexual behaviour was defined by a set of activities that had occurred in the previous six months, and which included all of the following: have had (a) anal sex with another man, (b) more than two sexual partners with whom they have had anal sex, and (c) unprotected sex with at least one man who is HIV positive or whom HIV status is unknown. Any participant who did not fulfill these three criteria was categorized as someone who had not engaged in risky sexual behaviour over the previous six months. The next step, was to determine whether accessing at least one health service (defined as any one of the following: family doctor, walk-in clinic, emergency room, medical specialist including HIV specialist, and nurse) was associated with differential risky sexual activities and whether a set of factors such as ethnicity, age, income, education, sexual orientation, STI diagnosis, and HIV knowledge had a confounding or moderating effect on this association.

Among the 1,362 participants who provided information about their sexual activities during the previous six months, the majority (77.4%) reported to have had anal sex with another man, and most of them (63.3%) indicated that they had two or more sexual partners. About 1,029 MSM shared information about a recent episode of unprotected sex with another man, with more than half (56.5%) indicating that they had unprotected anal sex with another man within the previous six months. About 45.0% of these men reported to have had unprotected anal sex with a man whose HIV status they did not know, and fewer (27.8%) reported to have had unprotected anal sex with a man who they knew to be HIV positive. In addition, over a quarter (28.3%) reported that they had engaged in risky sexual behaviour (had more than two anal sexual partners in the previous six months and did not use a condom during anal sex with another man).

A univariate analysis of independent factors that may be associated with reported instances of risky sexual behaviour shows that MSM who identified as gay (29.3% gay vs. 13.9% other {p=0.003}), those who had previously tested for a STI (31.0% tested for STI vs. 16.5% who did not {p=0.004}), those who had received an HIV positive diagnosis (52.7% tested HIV positive vs. 23.7% HIV negative {p<0.001}), and those who had utilized at least one health service in the previous six months (41.0% accessed one health service vs. 19.7% who did not {p=0.001}) were more likely to report a risky sexual activity. (TABLE 5) Other factors such as age, education, ethnicity, place of birth and being on HIV antiretroviral treatment were not associated with risky sexual behaviour.

TABLE 5 Description of Risky Sexual Activities in Relation to Various Socio-demographic and Health Characteristics

	Risky sex**				**Risky sex**		
	Yes (%)	*No (%)*	*OR (95%CI)*		*Yes (%)*	*No (%)*	*OR(95%CI)*
White	28.1	71.9		*Canada born*	29.7	70.3	
Racialised	27.1	72.9	0.95 (0.66-1.38)	*Born outside of Canada*	27.1	72.9	0.88 (0.64-1.21)
	Risky sex				**Risky sex**		
	Yes (%)	*No (%)*	*OR (95%CI)*		*Yes (%)*	*No (%)*	*OR(95%CI)*
English	28.0	72.0		*No substance use*	26.1	73.9	
Other language	31.1	68.9	0.86 (0.61-1.21)	*Substance use*	41.0	59.0	**1.97* (1.21-3.19)**
	Risky sex				**Risky sex**		
	Yes (%)	*No (%)*	*OR(95%CI)*		*Yes (%)*	*No (%)*	*OR(95%CI)*
Gay	29.3	70.7		*No health service use*	19.7	80.3	
Other	14.0	86.0	**0.39* (0.21-0.73)**	*Used at least one health service*	41.0	59.0	**1.46* (1.26-1.69)**
	Risky sex				**Risky sex**		
	Yes (%)	*No (%)*	*OR(95%CI)*		*Yes (%)*	*No (%)*	*OR(95%CI)*
HIV negative	23.7	76.3		*Never tested for STI*	16.5	83.5	
HIV positive	52.7	47.3	**3.58* (2.48-5.19)**	*Tested for STI*	31.0	69.0	**2.28* (1.30-4.00)**
	Risky sex				**Risky sex**		
	Yes (%)	*No (%)*	*OR(95%CI)*		*Yes (%)*	*No (%)*	*OR(95%CI)*
STI negative	24.2	75.8		*Never on HIV treatment*	26.0	74.0	
STI positive	50.0	50.0	**3.13* (2.17-4.51)**	*On HIV treatment****	53.1	46.9	**3.22* (2.17-4.76)**
	Risky sex						
	Yes (%)	*No (%)*	*OR(95%CI)*				
No HIV treatment now	45.5	54.5					
*On HIV treatment now****	55.9	44.1	2.083 (0.47-9.20)				

***Indicates that the difference is statistically significant with $p<0.05$

**Risky sex refers to unprotected anal sex in the previous six months, with two men (or more) who are HIV positive or whose HIV status is unknown.

***Only applies to HIV positive men

The multivariate analysis indicates that a couple of factors had a statistically significant association with having engaged in risky sexual activities (TABLE 6). MSM who had been diagnosed with HIV seemed to be 3.89 times (95% CI: 2.28-6.64) more likely to engage in risky sexual behaviour than those who were HIV negative, and those who had been diagnosed with a STI were 2.88 times (95% CI: 1.72- 4.83) more likely to engage in risky sexual behaviour than those who never had a STI. This finding is surprising because most research conducted among HIV positive MSM shows that people diagnosed with HIV avoid behaviours that may lead to new HIV infection. For instance, HIV positive MSM may engage in unprotected sex only with other HIV positive MSM, or ensure that their viral load is suppressed before engaging in unprotected sex. [118, 119, 120] However, my operational definition of risky sex could not account for these possible scenarios. In addition, others have found that MSM who are unaware of their HIV status, or think they are HIV negative, are more likely to engage in risky sexual behaviour.[121]

The primary explanatory variable of interest, utilization of health services in the last six months, did not seem to have a moderating effect on risky sexual activities. However, another indicator of access to healthcare, "having ever been on HIV medication", was strongly associated with risky sexual activities (5.0 times (95% CI: 2.92- 8.61) more likely than for those who were not on an antiretroviral). Upon analysis of the correlation matrix, "having ever been on HIV medication", was strongly correlated with being "HIV positive" (r= - 0.72, 95% CI: -0.76; -0.67), hence the multivariate model only included "HIV positive" as a factor.

TABLE 6: Characteristics associated with risky sexual behaviour among MSM

Characteristics	*Included in analysis*	*Unadjusted OR (95%CI)*	*Included in analysis*	*Adjusted OR (95% CI)*
Ethnicity	822 (88.7%)		513 (55.5%)	
White		1.00		1.00
Racialised		0.95 (0.66 -1.38)		1.29 (0.75-2.20)
Income↓	865 (93.3%)	0.93 (0.88 -0.98)*	513 (55.5%)	0.96 (0.89-1.03)
Access to health service	910 (98.2%)		513 (55.5%)	
Did not use		1.00		1.00
Used at least one		1.72 (1.12 -2.66)*		1.66 (0.83-3.31)
Age	819 (88.3%)	1.01 0.99 -1.02)	513 (55.5%)	1.00 (0.98-1.02)
Sexual orientation	898 (96.9%)		513 (55.5%)	
Gay		1.00		1.00
Bisexual↓		0.36 (0.17-0.73)*		8.85 (1.98-39.53)
STI Diagnosis	706 (40.2%)		513 (55.5%)	
No		1.00		1.00
Yes		3.13 (2.17-4.51)*		**2.88(1.72 - 4.83) ***
HIV test results	779 (84.0%)		513 (55.5%)	
Negative		1.00		1.00
Positive		3.58 (2.48 -5.19)*		**3.89(2.28 - 6.64) ***
Substance Use	881 (95.0%)		513 (55.5%)	
Did not use		1.00		1.00
Used		0.61 (0.36-1.05)		1.25 (0.66 - 2.37)

*indicates that the result is statistically significant $p<0.05$; ↓ indicates a negative association; N=1513

Overall, access to health services was not associated with reporting less risky sexual activities. Instead, sexual health status of MSM enrolled in the study seemed to be the biggest factors associated with engaging in risky sexual activities. Other socio-demographic characteristics (such as age, education, income, and language) which have been previously identified as conditions that may explain risky sexual behaviour, were not significantly associated with risky sexual behaviour.

4. Goodness-of- Fit Test

The Hosmer and Lemeshow Goodness-of-Fit statistic calculated for the different logistic regression models suggested that each model retained was closer to the true model. Indeed, the null hypothesis associated with this test is that "the model is a poor fit", therefore a non significant result (i.e.: p> 0.05) indicates that the null hypothesis had been rejected, and that the model is indeed a good fit. (TABLE 7) In addition, a model which satisfies the Hosmer and Lemeshow Goodness- of- Fit statistic also implies that the values of the observed and expected cases are relatively similar, which was a requirement satisfied by each model built.

TABLE 7 Hosmer-Lemeshow Goodness-of-Fit test for final logistic regression model built per outcome

Walk-in clinic		
Chi-Square	*Degree of freedom*	*p value*
5.66	8	0.69
Family doctor		
Chi-Square	*Degree of freedom*	*p value*
7.15	8	0.52
Eye specialist		
Chi-Square	*Degree of freedom*	*p value*
4.90	8	0.77
Dentist		
Chi-Square	*Degree of freedom*	*p value*
12.79	8	0.12
Medical specialist		
Chi-Square	*Degree of freedom*	*p value*
7.23	8	0.51
HIV specialist		
Chi-Square	*Degree of freedom*	*p value*
11.62	8	0.63
Risky sex		
Chi-Square	*Degree of freedom*	*p value*
8.85	8	0.36

5. Missing Values

Overall most variables included in the Lambda dataset had a relatively low percentage of missing values (range between 0% and 67.6%, and a mean of 16.6%) with the variable regarding the number of HIV tests taken, displaying the largest number of missing values. In multivariate logistic regression the least case deletion method was applied and any cases with missing values were excluded from the analysis, which led to a reduced sample size. The main analysis and subsequent results reflect the exclusion of this missing data. In order to determine whether there was any difference between the cases that were included in the logistic regression model and those that were excluded from it, we examined and compared the frequencies in each group (TABLE 8). This comparison reveals that more young men (20-24 years), racialised men, men born outside of Canada, and men who reported a sexual orientation other than gay were excluded from the multivariate logistic regression analysis. The deletion of these cases might have had an impact on the results displayed (TABLE 4 & 6) because of error and bias, which were likely produced by the small sample size and change in the socio-demographic profile of the participants. Also, this phenomenon might have resulted in a lack of association between ethnicity and the various health services utilized by the participant, the premise of the primary hypothesis.

TABLE 8 Characteristics of Participants Included (percentage) in Multivariate Logistic Regression versus those Excluded (percentage) from the Model

Income	**Included (%)**	**Excluded (%)**
None	1.7	4.6
$1- $19,999	5.4	6.5
$20,000 - $29,999	10.1	11.9
$30,000 -$ 39,999	9.9	12.8
$40,000- $ 49,999	14.8	13.1
$50,000- $ 59,999	13.1	13.2
$60,000- $69,999	11.4	8.9
$70,000- $79,999	9.0	8.8
$80,000 and more	24.5	20.3
	n=865	**n=720**

Age	**Included (%)**	**Excluded (%)**
Less than 19	0.7	1.1
20-24	3.6	10.8
25-29	10.9	8.0
30-34	14.5	7.8
35-39	15.1	8.5
40-44	20.0	11.4
45-49	16.4	8.9
50-59	13.3	7.6
More than 60	5.5	5.9
	n=883	**n=872**

Education	**Included (%)**	**Excluded (%)**
Elementary	0.3	0.7
Some high school	3.9	7.1
High school	7.1	11.7
Some college	21.6	23.5
College - University	43.1	38.6
Some graduate	5.7	7.1
Post graduate	18.2	11.3
	n=883	**n=733**

Place of birth	**Included (%)**	**Excluded (%)**
Canada	70.2	63.3
Outside of Canada	29.8	36.7
	n=877	**n=660**

Language	**Included (%)**	**Excluded (%)**
English	76.0	77.9
Other	24.0	22.1
	n=883	**n=657**

Sexual Orientation	**Included (%)**	**Excluded (%)**
Gay	90.7	81.5
Bisexual	9.3	18.5
	n=883	**n=788**

HIV status	**Included (%)**	**Excluded (%)**
HIV negative	83.2	81.6
HIV positive	16.8	18.4
	n=883	**n=456**

STI diagnosis	**Included (%)**	**Excluded (%)**
Did not have a STI	85.6	88.1
Had a STI	14.4	11.9
	n=883	**n=699**

Substance Use	**Included (%)**	**Excluded (%)**
Never	89.7	92.7
Used substance	10.3	7.3
	n=883	**n=534**

Ethnicity	**Included (%)**	**Excluded (%)**
White	79.7	73.7
Racialised	20.3	26.3
	n=837	**n=676**

Risky sex	**Included (%)**	**Excluded (%)**
No risky sex	70.9	72.8
Risky sex	29.1	27.2
	n=519	**n=408**

CHAPTER 5 DISCUSSION AND CONCLUSION

This chapter contextualizes the results obtained, discusses methodological limitations, and offers implications for future research on the utilization of health services by MSM.

There were noticeable socio-demographic differences between the white and racialised MSM recruited into the Lambda study. Indeed, compared to racialised MSM, white MSM tended to be older, they reported a higher income, and the majority were born in Canada. These socio-demographic differences can be attributed to changes in immigration legislation that have resulted in an increase of non-white populations immigrating to Canada. Statistics Canada has reported a steady increase in the number of people who emigrated from non-European countries and an increase in the number of visible minorities[h] since 1960,[55, 54] which might also explain the younger age of racialised people who are born in Canada (their parents are more likely first generation immigrants). In addition, recent immigrants tend to be well educated (the majority have a university degree), another factor that reflects Canadian immigration policies which favour and encourage the entry of skilled immigrants.[122] However, similar to the Lambda participants, newcomers to Canada tend to earn less than Canadian born people, despite having the same or higher levels of education.[123]

[h] Statistics Canada designates anyone who is neither Caucasian nor white as a member of visible minority. (Statistics Canada. Definitions of Concepts and Variables: Concept Visible Minority. Ottawa, Canada: Statistics Canada, 2006)

1. Understanding the Utilization of Health Services by MSM Living in Toronto

According to the social determinants of health framework, factors such as age, lower income and education can have a negative impact on people's health and their access to health services. Income has been identified as one of the three factors currently contributing to health inequity in Canada[124], and both age and income have been known to affect access to cancer health services in Canada.[40] My results also suggest that age and income were two social determinants of health associated with utilization of health services by MSM who live in Toronto.

When compared to white MSM, racialised MSM were less likely to be tested for STIs and HIV, and they were less likely to report a HIV positive status. Millett et al.[125] have reported similar trends among Black MSM who live in the US. Indeed, Black MSM are less likely to test for HIV and STI, are often diagnosed with HIV once it has reached an advanced stage, and tend to present with STIs more often than white MSM, all of which may exacerbate the risk of HIV transmission and hinder disease management. Studies that have investigated utilization of STI services by MSM, have found that compared to heterosexual men, MSM were more likely to access both HIV and STI testing, and to be diagnosed with an STI.[126, 83] Unfortunately, we were unable to find Canadian-based studies that had investigated the rate of HIV and STI testing among racialised MSM communities (such as Latino, East Asian), with the exception of Black Men. Indeed, George et al.[127] found that the rate of recent HIV testing (within the previous six months) was about 50%, whereas the lifetime rate was about 85%. However, younger Black MSM were less likely to seek a HIV or STI test, a pattern that might be extrapolated to my findings since my analysis revealed that racialised *MSM* were younger (30.2% racialised MSM were under the age of 30 versus 14.7% for white MSM) than white MSM.

There were noticeable differences in the type of services accessed by the Lambda participants. Overall, most participants reported to have accessed the services of a family doctor or a dentist (over 60%), and the access was similar between white and racialised MSM. Access to primary care has been reported to be the same between recent immigrants to Canada and Canadian-born participants.[128] In addition, lower income and education have been associated with a higher utilization of emergency services, even when the participants had access to a family physician.[129] In my study, older age and higher income were associated with visits to the family doctor and the dentist. Higher income is often equated to job security, housing stability, and access to a number of social benefits, such as the ability to take sick days, access to additional health insurance, all of which are known to facilitate the access to a family physician or a dentist. Older age has also been associated with the emergence of various health concerns, which in turn explain the need to seek medical attention, either through a family physician or dentist. However, findings about the impact of income on the utilization of health services seem inconclusive. Low income has been reported to limit access to a family physician but not necessarily for older people.[130, 131] It is also possible that the current shortage of family physicians reported across the province might have led to younger people's inability to find their own family physician. Following this theory, older people may have had the same family physician for some time, and thus may not need to find another, whereas younger adults and people who have recently emigrated to Canada, Ontario or Toronto, would likely need to locate new health services.

The walk-in clinic environment is different from a family physician's private practice and is often used for its convenience (i.e.: seeing a doctor on the same day, flexible office hours, etc). It offers a unique anonymity as people have access to more than one physician and do not always see the same provider. It is also an option for those who do not have access to a regular family

physician. Walk-in clinics usually operate on a same day appointment policy, which might be convenient if someone is ill or experiencing symptoms that require immediate attention, such as a cough, or a STI. The Lambda participants seemed more likely to utilize a walk-in clinic if they were bisexual, had an STI and were younger. Others have shown that MSM, including youth, were more likely to utilize walk-in clinics to attend to their sexual health needs, rather than seeing a family physician.[99]

Access to a medical specialist usually occurs through a process of referral either from a family physician or other health care professional. It is also a marker of being connected to the health care system for those who have a chronic illness, as specialized and ongoing care is often required for disease management or disease prevention. The Lambda participants were more likely to see a medical specialist if they had been diagnosed with HIV, and among those living with HIV, MSM who knew a lot about HIV prevention, transmission and treatment were more likely to see an HIV specialist. However, since causality could not be established, this association could also be an indication that HIV positive MSM are more likely to obtain information about HIV prevention and treatment from their HIV specialist. In contrast, others have shown that ethnicity is a barrier to accessing specialized medical care.[132] For instance, Black MSM living in the UK and USA are less likely to be on HIV anti-retroviral medications compared to other HIV positive MSM.[97] Nonetheless, my findings do not support the results cited above.

As previously mentioned, ethnicity was not associated with differential utilization of health services, despite the variability in age and income in both groups. Existing literature is inconclusive, with some studies reporting no difference in the utilization of HIV prevention services between white and racialised MSM,[133] and others suggesting that racialised MSM are less likely to utilize health services.[102, 38]

In addition, the results indicate that the prevalence of risky sexual activities was high among the Lambda participants. And, although most of them reported to have seen a family doctor in the previous six months, an equally high number reported having engaged in unprotected sex over the last twelve months, with close to half of this group reporting to have had unprotected sex with someone whose HIV status was unknown to them. In a multivariate analysis, MSM who had received a STI test and those who had received a positive HIV diagnosis, were more likely to report having had unprotected sex. This would seem to suggest that the incidence of unprotected sex may be associated with higher access to medical services, which is also corroborated by the number of people who screen for STIs. This could also suggest that gay men tend to test as a mode of prevention, to ensure that they do not have an STI, before engaging in unprotected sex. However, given this study design, I was not able to establish causality and so these results could also be interpreted as: unprotected sex leading to greater need to test for STIs and subsequently, the need to seek medical care. Previous studies indicate that different reasons may lead to instances of unprotected sex among HIV positive MSM. For example, sero-sorting is a common practice among MSM who choose when not to use condoms and engage in unprotected sex.[134, 135,136] Also, the prevalence of psychological factors such as social anxiety,[137] or trust in a regular sexual partner,[138] and substance use (crystal methamphetamine) have all been associated with unprotected sex among HIV positive MSM.[139] Furthermore, Black MSM have been identified to be at greater risk of HIV infection because of untreated STI and sex within a close network of other black MSM.[140] The scope of this study was limited and did not allow me to investigate these multiple possibilities. However, these results suggest that it is worth exploring the different modes of safer sex practices developed by MSM, beyond the use of condoms, and to determine whether some of these practices are more common among one ethnic group, one culture, and/or age group.

In the end, the study results did not support the hypothesis stated a priori, which was that ethnicity was a determining factor of the ways in which MSM choose to access health services available in their community. Instead, it seems that health concerns are the main factors explaining access to health services. In addition, since certain health services may be under-utilized by MSM, the association based on ethnicity could not be adequately analyzed. Finally, a connection between engagement in risky sex and seeking an HIV test was revealed, although the direction of this association could not be determined.

2. Other Factors not Explored

I was unable to explore whether there were any reported differences in the utilization of health services within the racialised MSM group. This was due to the small sample size of Latino, East Asian and Black MSM recruited into the study. I also could not determine whether access to other health services such as chiropractors, physical therapists, dietitians and counselors were similar or different across the two groups.

3. Study Limitations

It should be noted that there are a number of limitations to this study. First, the Lambda study recruited a non-probability sample of MSM living in Toronto, thereby introducing potential selection bias. In other words, those who volunteered to participate in the Lambda study could have been quite different from those who refused to participate, either in regard to their socio-demographic profile, or their access to health services. Furthermore, since the recruitment was venue-based, a number of eligible and interested participants might have been

excluded, despite every effort made to recruit at multiple venues, on a rotational basis, and the application of a screening mechanism that prevented anyone from participating more than once. It is also possible that a non-probability sample might have led to overestimation of the results, particularly with regard to rate of STI testing.[141] With advances in technology and the ever changing social networking tools, it would certainly be worth using other recruitment methods (e.g.: web based, respondent driven) that would generate a probability sample. [142, 143]

The study design itself (cross sectional survey) presents a second limitation. Naturally, the information that was collected at one point in time may not be representative of another group of MSM living in Toronto, studied at another time. Therefore, it is difficult to establish any temporal association between variables and causality cannot be determined either. In the future, it would be worthwhile exploring a longitudinal design which would help understand the impact of non-static factors (such as onset of disease, or change in insurance plan, change in marital status, etc) on the utilization of health services by MSM. In addition, because the survey questionnaire was self-administered, I was unable to determine whether missing answers were due to discomfort with a question, not knowing the answer, being rushed for time or simply an oversight on the part of the participant. The other concern with self- administered questionnaires is that it can lead to reporter bias, with participants over-reporting or under-reporting certain issues. For the outcome of interest (access to health services), participants were asked to recall their access in the previous six months. In the future, I would ask for a monthly recall as opposed to six months and review medical records, to increase accuracy.

Since this was a secondary analysis, I was limited by the type of variables collected. The Lambda survey did not inquire about satisfaction of health services sought, nor did it inquire about the reason for seeking service. It was therefore impossible to know whether and how the

actual needs for a particular health service were addressed if at all. For example, did MSM go to the walk-in clinic because their family physician was too far from them or not available soon enough? Information about the reason (s) for accessing health service would shed light on factors that motivated MSM to use (or prevented them from using) one type of health service over another. Moreover, the scope of health services was limited therefore I could not gain any insights about healthcare utilization outside of HIV and STI services. This study was mainly exploratory, and sought to determine whether MSM access health services in the first place, as this has been identified as a subject not extensively investigated in the literature.

The number of racialised MSM enrolled in the Lambda study was small (348 in total) and included various ethnicities from visible minority populations. The first goal was to conduct a comparison based on individual ethnicities; however the small sample size and presence of missing values became a problem, which did not allow for detailed examination. Indeed, some researchers have argued that grouping visible minority groups together might hide existing health disparities and they recommend a disaggregation of data based on race and ethnicity.[144,145] However, since this work is primarily exploratory, the goal was to establish whether there was any differential access to health services between two large groups (white MSM versus racialised MSM). Moving forward, I would definitely increase the sample size to allow for indepth comparison to be made between different groups of racialised MSM, including comparison with white MSM.

Finally, as this secondary analysis was based on MSM who live in Toronto, we cannot generalize our findings to other MSM who live outside of Toronto, or in the rest of Canada. Certainly, geographic location can be a significant factor preventing people from accessing services and in rural communities, some health services may not even exist. It is important to

note that since this analysis did not include Aboriginal MSM, the findings cannot be applied to this population, either.

4. Conclusions and Implications

This thesis work showed that access to health services among MSM living in Toronto varied based on type of health service used. It also revealed that age and income were the main factors associated with access to a family physician, and/or dentist, whereas HIV or STI diagnoses were associated with access to a walk-in clinic, family physician, and medical specialist. The hypothesis that ethnicity might be associated with differential health service utilization was not proven. There were a number of limitations to this study, and future research should include strategies to recruit a larger representative sample of ethno-racial MSM to allow for comparisons based on ethnicity. Also, a longitudinal study would allow for a broader understanding of needs, barriers and facilitators to accessing to health services over time.

In regard to service delivery, this work suggests that MSM generally attend to their sexual health needs and access HIV and STI prevention services. In addition, health promotion initiatives, which focus their attention on the engagement and support of younger MSM and those with lower incomes, should be tested to ensure optimal access to health services.

APPENDIX

Appendix 1: List of Search Terms Used for the Literature Review

- Healthcare utilization/ health utilization
- Health access / access to health / health services accessibility / delivery of health
- Health service/ health services misuse/ health disparity / minority health
- Health service research/ health services needs and demand
- HIV / HIV infection
- Men who have sex with men/ gay men/homosexuality male/ bisexual / bisexuality
- Immigrants/ emigrants / newcomers
- North America/ Canada/ USA

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