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Access to the Local AIDS Service Organization among African, Caribbean and Other Black Residents of Middlesex-London, Ontario, Canada

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A thesis submitted in partial fulfillment of the requirements for the Master of Science degree in Epidemiology and Biostatistics

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Access to the Local AIDS Service Organization among African, Caribbean and Other Black Residents of Middlesex-London, Ontario, Canada

(Monograph)

by

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Graduate Program in Epidemiology and Biostatistics

A thesis submitted in partial fulfillment
of the requirements for the degree of
Masters of Science

The School of Graduate and Postdoctoral Studies
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Abstract

The migration of people from HIV-endemic countries has altered the demographics of the HIV epidemic in high-income countries. In Canada, most people from HIV-endemic countries are of African descent. While they are an established priority group for HIV-related services, they can face access difficulties. This study uses quantitative data from the Black, African and Caribbean Canadian Health Study to evaluate AIDS service organization access in Middlesex-London, Ontario, using the Andersen Gelberg model for vulnerable population sand an overarching intersectionality framework. In bivariate analysis, older age, having a primary care provider, less inappropriate fear of contagion and less time in Canada were associated with greater access to the organization. After adjusting for other factors, older age and shorter time in Canada were found to be associated with greater access to care. These findings have implications for reaching community sub-groups and for linkage with health care services.

Keywords

African Caribbean and other Black communities, HIV/AIDS, AIDS Service Organizations

"We cannot change the past, but we can change our attitude toward it. Uproot guilt and plant forgiveness. Tear out arrogance and seed humility. Exchange love for hate --- thereby, making the present comfortable and the future promising."

Maya Angelou (1928-2014)

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List of Abbreviations

ACB- African, Caribbean and other Black [communities]

ASO- AIDS Service Organization

RHAC- Regional HIV/AIDS Connection

VCT- Voluntary Counselling and Testing

Chapter 1

1 BACKGROUND

1.1 The HIV/AIDS global HIV/AIDS epidemic

At the end of the year 2012, UNAIDS reported that globally 35.3 million [32.2 million–38.8 million] individuals were living with an HIV infection, with an estimated 2.3 million [1.9 million -2.7 million] newly infected individuals [1]. It was also reported that 1.6 million [1.4 million–1.9 million] people had died of AIDS in 2012[1]. This represents a tremendous decrease in the number of incident cases and AIDS-related deaths compared to previous years [1]. However, challenges in addressing the epidemic remain in areas affected the most [1]. These include low and middle income countries situated in Sub-Saharan Africa, Asia and the Caribbean where only 34% of the population eligible had access to therapy [1].

In high-income countries located in Western and Central Europe and in North America, the HIV/AIDS epidemic has been concentrated within specific groups [2]. These include men who have sex with men, injection drug users and sex workers [2]. However, the migration of women and men originating from low and middle-income countries where the HIV epidemic is generalized, which is where HIV has spread to the broader population, has begun to change the pattern of infection in these countries [2]. For instance, in 2009, 49% of the infections transmitted heterosexually in Europe were found among people originating from countries where the epidemic is widespread [2]. These communities are thus becoming priority groups in some of the countries in Western Europe and in North America [2]

1.2 HIV/AIDS interventions

Most of the decline in the impact of the HIV/AIDS epidemic has been credited to advances in interventions [3]. The most successful intervention model used worldwide is known as combination prevention. It includes the implementation of a mix of behavioural programs, biomedical interventions and structural changes in areas affected by the epidemic [4]. Behavioural programs include interventions that aim at postponing the first sexual encounter, reducing the number of sexual partners while attempting to achieve a higher number of protected sexual contacts, and, reducing both the sharing of injection equipment and drug use. In addition, behavioural programs make counselling and testing for HIV/AIDS possible while facilitating access and adherence to treatment [5]. Effective behavioural programs tend to be radical, multileveled, and participatory interventions that target the local epidemic's main mode of transmission [4], [5].

Biomedical interventions include the ensemble of tools that have been used to reduce the transmission of HIV/AIDS [6]. These include physical barriers such as male and female condoms, surgical interventions such as male circumcision and chemical interventions such as antiretroviral therapies. Male condoms have been determined to be the most efficient tool to reduce the transmission of HIV/AIDS sexually with 95% of effectiveness when used properly [6]. Male circumcision has been estimated to reduce the likelihood of transmission from a HIV-infected female to an unaffected male by about 20% [6]. Although still not universal, access to treatment is increasingly available to people living with HIV/AIDS [3]. Indeed, more people have been started on live-saving treatment in 2011 than in any previous year[3]. This increase in access to treatment has positive implications for individuals living with HIV/AIDS as it enhances their life expectancy and quality of life with the virus [3], [6]. Furthermore, antiretroviral therapy has been proven to be effective in reducing mother-to-child transmission of HIV/AIDS [6] as well as transmission between sero-discordant couples [6]–[8]. Other promising recent chemical interventions include pre-exposure prophylaxis [9] and post-exposure prophylaxis [10] which have been found to reduce the number of infections in individuals exposed to the virus [9], [10].

Finally, structural changes include addressing the societal factors that influence HIV infection rates, screening for HIV and access to treatment [4]. These include addressing issues such as poverty, gender inequality, and stigma. In the third decade of HIV/AIDS, it has become evident that only when these systemic issues will be taken into account will the HIV/AIDS epidemic be effectively addressed [4].

1.3 The Black, African Caribbean Canadian Health Study

The Black, African Caribbean Canadian Health (BLACCH) Study is a community-based research project that originated from Middlesex County, Ontario [11]. The aim of this project is to assess the social determinants of health of African, Caribbean and Black communities living in Middlesex County[12]. This project is a mixed-methods study undertaken by researchers at Western University in collaboration with two community organizations, the Regional HIV/AIDS Connection (formerly the AIDS Committee of London) and the Cross-Cultural Learner Centre, and community members of African descent [11]. The BLACCH Study was carried out in two phases [11]. The first phase was comprised of qualitative interviews using purposive sampling for recruiting participants. The interviews were conducted with 22 African, Caribbean or Black individuals and 8 service providers working with this population [11]. The themes explored included general health and access to health services, social determinants of health, health behaviours, migration, HIV/AIDS, social network, gendered experiences and research methods [11]. The results of these interviews were used to design a survey and launch the second, quantitative phase of the project [11]. A total of 188 surveys were completed by African Caribbean and Black community members residing in Middlesex County [11].

This thesis is a continuation of the BLACCH Study and will be carried out in collaboration with one of the main partners on the project, the Regional HIV/AIDS Connection.

1.4 The Regional HIV/AIDS Connection

The Regional HIV/AIDS Connection (RHAC), is an AIDS service organization (ASO) based in London, Ontario since 1985 [13]. RHAC was founded by members of the LGBT community to address the HIV/AIDS epidemic that was affecting their community [13]. This organization has been working with communities living with, at risk for and affected by HIV/AIDS [14]. The services of the RHAC have recently been expanded to the counties of Perth, Huron, Lambton, Elgin, Middlesex and Oxford [13].

The main mandate of this ASO is to improve the quality of life of individuals living with HIV/AIDS, reduce the incidence of HIV/AIDS and increase awareness about HIV/AIDS in the communities they serve [14]. This mandate is mainly fulfilled through the following departments: Education Services and Client Services and Community Relations [15].

The Education Services department works to inform the community about HIV/AIDS through multiple strategies [16]. These include informational presentations delivered to schools, detention centres, residential facilities, social service organizations, elder care facilities and other relevant settings [16]. Staff from the Education Services department also run informational booths at community events such as Sunfest and Pride [16]. Furthermore, outreach workers engage with the communities affected by HIV/AIDS and distribute safer-sex and harm reduction materials in relevant setting such as bathhouses and bars [16]. Outreach workers also engage with the service providers who care for communities affected by HIV/AIDS to ensure optimal care [16]. In addition, they facilitate and collaborate in community based research projects such as the BLACCH Study [16]. Finally, workers from the Education Services department often partake in community events such as Black History Month and facilitate support groups for marginalized communities such as the Homophobia, Biphobia, Transphobia (HBT) working group [16]. Importantly, the Education Services department includes a Multicultural Prevention Worker whose main responsibility is to work with ethno-cultural communities affected by HIV/AIDS such as African, Caribbean and Black communities [16].

The Client Services department includes programs targeted at people living with HIV/AIDS [15]. These include counselling for people living with HIV/AIDS and their close ones and practical support programs such as providing food and referrals to HIV-related health care services, covering costs to attend medical appointments, and supporting clients with applications for assistance programs such as Ontario Works, Ontario Disability Program and Rent Geared to Income housing [15]. Case managers and peer support workers from this department also organize the "PHA cafes", which are social events aiming at education and capacity building for people living with HIV/AIDS; the "winners' circle", a social support group for long-time survivors of HIV/AIDS; and the "women's group", a support group for women living with HIV/AIDS [15]. The Client Services department also administers the Counterpoint Needle and Syringe program. This program provides education materials to injection drug users on blood borne illnesses [17]. In addition, they distribute harm reduction and safer sex materials to injection drug users to prevent the transmission of blood borne and sexually transmitted illnesses [17][13]. Finally, this programs refers clients to relevant health and social services [17]. The Counterpoint Needle and Syringe Exchange Program also includes a street/mobile component through which the outreach worker provides services across London [17].

RHAC also engages with the community by providing volunteering opportunities to those interested through their Community Relations Services. This enables the formation of educated peer support and outreach volunteers that assist the agency in fulfilling its mandate. In 2013, there were 165 volunteers involved with the organization.

1.5 People from HIV-endemic countries and African Caribbean and Black people in Canada

In Canada, the Public Health Agency of Canada uses a hierarchy of risk to classify diagnosed HIV/AIDS cases [18]. This hierarchy of risk represents the most probable way one contracted HIV/AIDS [18]. The most recent exposure classification is comprised of (from higher risk to lower): Perinatal transmission (confirmed), men who have sex with men and inject drugs, men who have sex with men, people who inject drugs, people who received blood and products derived from blood, and heterosexual contact [18]. Within the risk category of heterosexual contact, the following sub-categories are defined: people born in a HIV-endemic country, people who have had a heterosexual contact with a person at risk and people with no identifiable risk with heterosexual contact [18]. An individual is classified in the highest risk category of transmission possible [18]. For instance, a woman who has had a heterosexual relationship with an injection drug user and injected drugs herself would be categorized within the IDU category as opposed to the heterosexual contact with a person at risk category.

The term "HIV-endemic Country" refers to countries in which the HIV/AIDS epidemic is generalized [18]. For a country to be designated as an HIV-endemic country by the Public Health Agency of Canada, the prevalence of HIV/AIDS in people between 15 to 49 years of age has to be 1% or more. In addition, one of the following criteria has to be met: 50% or more of HIV cases are transmitted through heterosexual contact, the presence of a male to female ratio of 2:1 and a prevalence of 2% or more among women accessing prenatal care [18]. According to the 2006 census, people from HIV-endemic countries represented about 2.2% of the Canadian population (2.7% if individuals born in Canada with a parent from a HIV-endemic countries are included) [18]. However, people from HIV-endemic countries are overrepresented in new HIV/AIDS diagnoses in Canada. For instance, it is estimated that there were between 2300 and 4300 new cases of HIV/AIDS diagnoses in Canada in 2008, of these, 14% were among people from HIV-endemic countries [18].

From 1998 until 2009, 986 cases in Canada were reported among the HIV-endemic country category, of the cases that included information on race and ethnicity, 95.5% of new diagnoses were among people whose race was Black [18]. People who self-identified as Black also represented 90% of AIDS cases in the HIV-endemic country category [18]. Similarly, data from Ontario from 2012 indicates that 97.1% of diagnoses from the HIV-endemic country category came from Blacks with Black men comprising 96.7% of new infected cases and Black women 97.3%[19]. In addition, Blacks comprised 31.1% of the total incident cases in Ontario with Black men constituting 20.6% of cases in men and Black women 71.4% of cases[19]. Preliminary reports tracing diagnosis of HIV from 1985-2011 have identified Middlesex-London, Ontario as having a high-intermediate of cumulative incidence of HIV/AIDS (309.5 diagnoses per 100 000 people), following Toronto (779.2 diagnoses per 100 000 people) and Ottawa (441.0 diagnoses per 100 000 people) during that period [21]. Middlesex-London also ranged as having an intermediate rate of AIDS incidence with 71.3 AIDS cases diagnosed per 100 000 people, after Toronto with 214.3AIDS diagnoses per 100 000 people and Ottawa with 92.2 AIDS diagnoses per 100 000 people during that period [20]-[21]. In Central-West, the local health integration network which comprises Middlesex-London, 132 individuals from HIV-endemic countries were diagnosed with HIV/AIDS from 1985 to 2011 and 42 cases of AIDS were recorder for the 1981 to 2011 period [21]. In Middlesex-London, for the 1985-2008 period, 126 individuals from HIV-endemic countries were diagnosed with HIV/AIDS with an estimated 109 (53%) of HIV/AIDS infections undiagnosed [22]. This represents 18.7% of the total number of undiagnosed cases [22].

1.6 Brief history and Profile of African, Caribbean and Black People in Canada

During the period in which slavery was legal in the Canada (1600s-1833), some Blacks lived in Canadian territories as slaves; this was especially seen in Eastern Canada due to the migration of loyalists from the United States [23]. During the American revolution, many Black loyalists who aided the British troops during the war, or simply took refuge with them, were resettled in Nova Scotia and Ontario by England[23]. However, due to the discriminatory attitudes and harsh living conditions they encountered, some later accepted the offer from the Sierra Leone Company to immigrate to West Africa [24]. Following the War of 1812, some Blacks slaves who had aided the British Empire were also installed in Nova Scotia [24], [25]. Similar to Black Loyalists, these slaves encountered harsh living conditions and hostilities from their host communities, with some even encouraged to emigrate to the West Indies [24]. Following this period, a small but steady stream of Black people immigrated into the country through the underground railroad [23], notably due to the enactment of restrictive Black codes in the United

States [26]. On September 10th 1850, the Fugitive Slave Bill was passed by the American Congress to counter the escape of slaves to the Northern areas of the United States. This Act allowed slave "masters" to capture fugitive slaves who had taken refuge in the Northern States [26], [27]. Following this, escapes towards Canada increased tremendously [27]. As many as 20, 000 slaves and free men are thought to have fled into the Canadian territories, which became a safe haven [26].

It is estimated that Black settlements started in London in the 1830s [27]. The local Black community is thought to have been smaller than the neighboring areas due to the lack of proximity between London and the borders of the United States [27]. Although, there is some evidence of racial prejudice [26], the Black community seemed to have been faring well in this area, with many owning property and employed in trades [25, 26]. The community seemed to have peaked in number around the 1860s to about 400 individuals [27]. However, it plummeted following the end of the civil war in 1865, as many escaped slaves and free men decided to return to the United States after the declaration of Emancipation [27]. London is thought to have had a Black population of about 135 people around the 1880s [27]. After the First World War, London's Black population increased to about 250 people [27].

During the first half of the 20th century, the Black population did not increase at the same pace as other ethnic groups in Canada [23]. However, after 1960, the Canadian immigration system shifted from a framework focused on European immigration to a point-based immigration system. This shifts in policy had implications for economic success [23]. It also increased opportunities for Blacks from Africa and the Caribbean to immigrate into Canada resulting in a higher population density of Blacks in Canada [23].

This brief account of history perhaps explains the great diversity in ancestry and country of origin seen in Black communities in Canada. The main countries of ancestry of this population are Jamaica (22.8%), Haiti (13.9%), Somalia (4.4%) and Trinidad and Tobago (3.7%) [28]. Other Blacks reported their origins from the British Isles (10.9%), Canada (10.8%) and France (4.3%) [28]. People of Black descent are on average younger than both the broader Canadian population and other visible minorities [28]. Indeed, Blacks have a median age of 29.5 years compared with 33.4 years for the visible minority population and 40.1 years for the broader Canadian population [28]. In addition, 27% of Black people were 14 years of age or younger as opposed to 21.5% of the visible minority population and 17% of the broader Canadian population [28].

The most recent accessible information on demographic data for people of African descent in Ontario is found in the 2006 census. It is estimated that Black people represent the third largest visible minority following South Asians and Chinese in Ontario [29]. They represent 3.94% of the Ontarian population and 17.26% of all visible minorities in the province [29]. People of Black ethnicity comprise a lower proportion of the total population of Middlesex County and its visible minority population (1.91% and 16.3% respectively) when compared to the provincial statistics [29]. However, this group remains the third most populous visible minority in Middlesex County, after South Asians and Chinese [29].

These census data illustrate how diverse Black people are in Canada both in terms of their ethnicity and countries of origin. The term "African Caribbean and Black” (ACB) has recently been used by services organizations [30] and by the BLACCH Study team [12] to denote this group and highlight its diversity. This same term will be used throughout this thesis when referring to people of African descent.

1.7 Literature review on African Caribbean and Black people living in High-income countries and HIV/AIDS

A review of the literature exploring the themes of HIV/AIDS, social determinants of health, and access to health services and African, Caribbean and Black (ACB) communities in Canada identified very few studies, in addition to the BLACCH Study. Two main studies, conducted in Ontario, will be repeatedly referred to in this literature review. The “East African Study in Toronto” or EAST Study was a community participatory project conducted through the administration of a cross-sectional survey [31]. This study collected information on HIV/AIDS and other health issues in East African communities in Toronto [32]. The “HIV/AIDS Stigma, Denial, Fear and Discrimination: Experiences and Responses of People from African and Caribbean Communities in Toronto” or STIGMA study conducted qualitative interviews with ACB HIV-positive community members and organized focus groups with other ACB community members to gather information on experiences of HIV-positive individuals and perception from their communities [31]. Our literature search was also expanded to include studies with broader HIV/AIDS themes and other high-income countries to paint a more complete picture of the subject matter. When results from these queries were scarce, the search was expanded to countries of origin of ACB communities. The main themes from these studies are presented in using a social determinant of health framework.

In 1974, “A new perspective on the health of Canadians” was published by then Health and Welfare Minister Marc LaLonde [33]. This report acknowledged that the biomedical understanding of health was only one facet of what truly determines health status [33]. This document was one of the first of its kind pointing to health as a multidimensional concept influenced by “lifestyle, environment, human biology and health services” [33]. These factors were later named the “social determinants of health”. In Canada, the main social determinants of health have been identified as: “social status and income, social support networks, education, employment/ working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetic endowment, health services, gender and culture” [33].

The social determinants of health also shed light on the principle of health inequities. Health equity can be defined as the lack of systematic, avoidable health disparities between social groups positioned differently on the social ladder or with different ethnic, religious or cultural characteristics [34]. Health inequities are thought to put marginalized groups at a further disadvantage with regard to health [34]. The difference in HIV incidence between ACB individuals and the rest of the Canadian population represents a health inequity as there is no biological or genetic basis for this disparity and because contracting the HIV/AIDS virus is preventable [35]. Nevertheless, HIV/AIDS is not necessarily the only issue ACB people have to address in their communities, nor is it necessarily the most important one from the communities' perspective [31], [36]. Indeed, as determined by Burns et al. (2007), social determinants of health such as employment, housing, childcare and migration issues often take precedence over HIV/AIDS [36]. In addition, the STIGMA study reported that HIV/AIDS was only one of the many issues faced by these communities but not the most salient to community members. This is illustrated by the following quote from a Trinidadian woman: *“I think the Black community feels it’s under siege so that HIV is like one more thing on top of, you know? And if you don’t have to deal with it, why?”* [31]. PHAC has also identified sexual violence, racism and immigration experience as other risk factors that might impact the health of African, Caribbean and other Black people in the context of HIV/AIDS [23]. The main social determinants of health addressed in this review are gender, socio-economic status, migration, cultural norms and health services through the lens of access to care. However, these do not constitute an exhaustive list of factors that impact health in ACB communities. In addition, many of these factors do not act in isolation but interact with other key determinants of health or influence them.

1.7.1 Sex/Gender

As illustrated by the epidemiology of HIV/AIDS in Canada, ACB women are more at risk for HIV/AIDS than their male counterparts. This increased risk for infection might be partly due to biological factors such as the larger vaginal and cervical surface areas susceptible to entry from the HIV virus in comparison to surface areas in male genitals during heterosexual sexual encounters [37]. However, a review of the literature reveals that ACB women are also at increased risk of HIV infection due to the interaction of other socio-cultural factors such as power differentials and double standards in relationships.

Perception of women's power over sexual negotiation often varies with some perceiving women as gatekeepers in their relationships while others perceive them as powerless over sexual encounters [38]. This can have consequences during sexual intercourse with regard to cultural norms and condom use. For instance, in a study conducted with Eritrean and Ethiopian immigrants in the United Kingdom, women worried about being labeled "promiscuous" or "prostitutes" if they asked their partners to wear a condom [39]. Similarly, in a study with African immigrants in Calgary, a participant said that "*an African girl would not ever summon the courage to make that request [for condom use]*" [38]. In cases where there are power differential within sexual encounters, women might be at higher risk for HIV/AIDS. This is especially true when their partners are of unknown HIV status or where double standards enable men to be unfaithful or entertain multiple relationships [38].

Married women seem to be especially at a disadvantage with regard to condom use negotiation. For instance, a study with Jamaican-born women who recently immigrated in the United States found that some of the married women identified male infidelity as unavoidable [40]. In addition, they mentioned fear of retaliation as a factor for not asking their partners to use condoms [40]. In another study with African immigrants in Philadelphia, women mentioned that although they could not be sure of their husbands' faithfulness, it was hard to negotiate HIV-testing and condom use within their relationships [41]. Finally, a study conducted with

Quebecers of Haitian origin, found that female regular partners of male Quebecers of Haitian Origin were at increased risk for HIV/AIDS because men entertaining multiple types of relationships who did not use condoms consistently with their regular partners also did not use protection with their casual partners [42].

1.7.2 Socio-economic Status

The most recent published data on income and employment of ACB people can be found in the Canadian 2001 census. Analyses from the study demonstrated that Blacks had a higher unemployment rate than all other adults of working age [43]. This phenomenon cannot be explained solely by the loss of status, which occurs during immigration. Indeed, although Canadian-born Blacks have similar levels of education [43] than the rest of the Canadian population, they have a lower average income than other Canadians [43]. These trends occur in spite of the fact that both Canadian and foreign-born Blacks were found to have similar levels of education to the rest of the Canadian population [43]. Therefore, the Black population has been found to be at an economic disadvantage compared to the rest of the Canadian population.

In the EAST Study, the annual median household salary of the participants was estimated to be $38 000 and 42% of respondents indicated that their household income was below the Low Income Cut off despite 73% of the sample having been to university or college [31].

Lower income and unemployment have been associated with higher morbidity and mortality [23]. PHAC states that income and social status are the most important determinants of health [23]. In many of the studies reviewed, these factors were often identified as sources of worry for many participants. In the qualitative phase of the BLACCH Study, participants stated that income affected their health by influencing the power to buy products, such as medications [11]. In the STIGMA study, participants identified unemployment and low income as factors increasing vulnerability to HIV/AIDS [44]. For instance, a male participant explained that economic hardship might force people to enter unstable relationships that might put them at risk for HIV/AIDS [44]. However, quantitative results from the BLACCH Study have shown that people living at or below the low income cut off had lower risk profiles for HIV/AIDS [12]. Indeed, they were less likely to have a history of forced or unwanted sex and more likely to use condoms with their cohabiting and non-cohabiting partners [12].

These results, from the BLACCH Study, have been paralleled in other studies conducted in Sub-Saharan Africa. For instance, a study exploring the vulnerability of women in Kenya and Uganda, using representative national demographic surveys, found that women of higher economic status were more at risk for HIV/AIDS than other women [45]. Similar results were observed in a study conducted with a national representative survey of sexual active adults in Tanzania [46]. The authors used household standard of living, educational attainment, and occupational status as measures of socio-economic status, in addition to area of residence, as potential exposures for HIV/AIDS infection in their analyses [46]. In adjusted models, there was a positive association between professional status and HIV/AIDS infection [46]. In addition, individuals placed the highest in the economic ladder where more at risk for HIV infection [46]. However, no association was found between educational attainment and area of residence and HIV/AIDS in adjusted models [46]. Wealth and education are thought to come with increased sexual opportunities, higher numbers in partners and greater likelihood of premarital sexual relationship[46]–[48]. For instance, a study exploring the relationship between sexual risk behaviours and wealth in Kenya and Ghana using demographic health surveys, found no association in females, but a general increasing trend in sexual risk behaviours with increasing wealth in Ghanaian males[48]. Similarly, this study found an increasing trend in HIV-risk behaviours among the most educated males in both countries [48].

These mixed results in differential in HIV risk and prevalence within socio-demographic groups across Sub-Saharan Africa also illustrate the importance of contextual factors in the HIV/AIDS epidemic contributing to the uniqueness the epidemic within countries. This also highlights the danger of stereotypes, with regard to poverty and gender dynamics, and, the need for validated measures of concepts such as wealth. For instance, in a study exploring the relationship between socio-economic status, using the demographic health surveys of Burkina Faso, Cameroon, Ghana, Kenya and Tanzania multiple measures of wealth were accounted for in addition to education. The authors found a positive association between education and HIV prevalence not explained by non-response bias, differential survival, age and residence. However, this study found a more heterogeneous relationship between wealth, depending on its definition, and HIV prevalence [47].

1.7.3 Migration or loss of social status

As illustrated by the census data, many ACB community members living in high-income countries are immigrants. The migration process can affect ACB individuals by introducing issues such as breakages of social networks and loss of social status, two factors identified as social determinants of health [33]. For instance, Worthington et al. (2013) found that African women felt isolated after immigrating to Canada [38]. The interaction of these migration experiences and the social inequities resulting from them are thought to influence HIV-risk in ACB individuals. For instance, in the same study, male participants were said to become 'desperate' and be more likely to engage in high-risk behaviours such having sexual intercourse while inebriated. Dissatisfaction with the lack of employment opportunities was cited as a factor perhaps contributing to these risk behaviours [38].

Another effect of immigration, due to the marginalization, seems to be the formation of small sexual networks from individuals from the same communities, isolated from the larger society [38]. In the study conducted by Worthington et al., participants implied that the small sizes of the sexual networks might contribute to increasing the likelihood of HIV/AIDS transmission for those involved [38]. Other authors have found that formation of sexual networks and partner concurrency played a role in the transmission of STIs within some communities [49], [50]. In addition, the presence of these sexual networks within the context of precarious social conditions resulted in the overburdening of certain communities with sexually transmitted infections [49]. For instance, Adimora and Schoenbach (2005) showed that poverty, discrimination, racism and sexual segregation put American Blacks at higher risk for HIV/AIDS in the United States. Indeed, the authors explained that high mortality and incarceration rates contribute to a lower ration of men to women in American Blacks communities[49]. These in turn increased the formation of concurrent partnerships while having a negative effect on women’s ability to negotiate relationships. Thus, these formed sexual networks make it easier for the transmission of the virus throughout this ethnic group.

Finally, factors caused by the immigration process can sometimes interact with gender norms and introduce vulnerabilities within couples. Indeed, participants in the study by Worthington et al (2013) explained simultaneous under-employment of men and emancipation of women due to the immigration process resulted in family breakdowns, physical violence, divorce and high-risk behaviours for HIV [38].

1.7.4 Cultural Norms

Cultural norms are pervasive dominant values that influence conditions such as marginalization and stigmatization within communities [33]. Societal norms are also known to influence personal health practices. Therefore, cultural norms have implications for health and health care access. Some cultural norms might be putting ACB individuals at higher risk for HIV/AIDS. These include refusal to use condoms and cultural taboos around discussing sexuality and HIV/AIDS. As previously discussed, the use of condoms during sexual intercourse is the most efficient route to limit the transmission of HIV/AIDS [6]. Yet, many of the reviewed studies identify a low use of condoms in ACB communities [39], [42]. Some of the reasons offered by community members included not liking the way condoms feel and the use of condoms ruining the mood [39]. However, there might be greater issues around the use of condoms in some communities. For instance, in a study with Ethiopians and Eritreans in the United Kingdom, the use of condoms was seen as eroding trust between partners and a possible sign of unfaithfulness [39].

Another omnipresent theme in many studies was the cultural taboo surrounding discussing sexuality and HIV/AIDS. For instance, in the STIGMA study, a participant explained: "*I guess there's the whole culture if you're West Indian you don't talk your business. And so, I mean, never talked really about sex. Even with your girlfriend. I mean, I just didn't. You know, we didn't talk about those things*" [31]. These cultural norms have implications for prevention efforts. For instance, some HIV-service providers have difficulties approaching and educating ACB youth about sexual health when their parents are in close proximity [51]. Finally these cultural norms might also translate into a lack of communication regarding safe-sex between partners [38].

Cultural norms regarding health might also be influencing access to prevention and care by ACB people. Indeed, in a qualitative study with key informants from ASOs in Britain, participants identified the norm of accessing care only when ill as a barrier for timely diagnosis of HIV/AIDS [36]. Men can also sometimes be accessing HIV/AIDS services less due to intersections between gender and cultural norms. This might be due to the cultural norms through which individuals do not access health care service as long as they perceived themselves to be healthy [36] . In addition, service agencies might be more frequented by women of reproductive age and their children, which somewhat reinforces those spaces as "women's spaces" that men might not feel comfortable accessing [39]. "iSpeak", a study conducted with ACB men living in Toronto and Middlesex-London further illustrates this. Indeed, in this study heterosexual Black men shared that they felt in competition with ACB women and white gay men with regard to access to services[53].

Religion and Faith

The importance of religion and faith in ACB communities was touched upon by many studies. The majority of participants in the BLACCH Study thought of themselves as being religious (46.3%) or very religious (19.7%), with the most common religion practiced being Christianity [12]. Similarly, in the EAST study, 37% of participants indicated that they were Christians and 37% Muslim while only 2% indicated that they did not pertain to any faith. Importantly, 69% of participants revealed that religious beliefs were "the foundation of their whole approach to life" [31]. In a study with Haitians living in Boston, 53% of participants indicated that they would pray for healing in addition to seeking medical help and 63% reported that religion was a crucial factor in making decisions for their health [54]. A study with youth in Windsor, Ontario showed that faith also impacted sexual behaviours in this population [55].

Faith was identified by HIV–positive ACB individuals as one of the main mechanisms for coping with their infection [56]. However, faith communities themselves were not always perceived as a source of support and could become stigmatizing spaces [56]. It is not surprising then that there were differentials in disclosure to faith leaders with some HIV-positive participants revealing their status whereas others withheld this information. In case of disclosure, there were also different reactions, with some participants receiving support from their faith leaders while others were asked to leave their congregation [59].

Religious institutions, due to their powerful influence within ACB communities, have been identified as important space for prevention efforts [59]. A qualitative interview with African faith leaders in the United Kingdom showed that they were not as involved with HIV prevention as their counterparts in their home countries [59]. Although they expressed interest in supporting HIV-positive individuals and facilitating access to sexual health information to their congregants, these faith leaders also identified significant barriers in doing so [59]. For instance, lack of recognition of faith leaders by providers of "official" services impeded the creation of partnerships that could increase prevention efforts in the community [59]. On the other hand, some faith leaders expressed reluctance about discussing sexuality and HIV/AIDS in religious settings because “they were not social workers” and that these topics did not correspond to the principles of holiness that they promoted [59]. Indeed, because many churches have stigmatized extra-marital activities as "ill behaviours" or "sexual promiscuity” associated with the spread of HIV; the topic has become a taboo in some religious settings [59].Williams et al. (2009) also identified religious teachings on topics such as vaginal drying; the insertion of substances into the vagina to induce dryness and tightness [60], and the use of contraception as impediments to proper HIV prevention [51]. Finally, religious norms emphasizing reverence of women towards their husbands might be precluding conversation around safer sex between couples [51].

1.7.5 Access to health services

In spite of their vulnerability to HIV/AIDS, ACB people face barriers to access relevant social and medical services. For instance, HIV-positive Africans living in the United Kingdom accessed HIV testing and other services at later stages of disease than their British-born counterparts [61]. The same phenomenon was observed with migrants living in Belgium [39]. In France, in a study comparing access to care for pregnant women during the 1984-2004 period, Sub-Saharan African women were found to access testing for HIV later than native-born French women, and were more likely to discover their seropositivity during later stages in their pregnancy [62]. A study on non-planned HIV/AIDS-related admission in a general hospital in the United Kingdom found that Black Africans accounted for the highest proportion of individuals not aware of their HIV-infection, compared to Whites and Black Caribbeans [63]. This group also presented with lower CD4 counts [63]. Our literature review identified four main themes around access to care for HIV/AIDS: stigma and discrimination fear of a positive diagnosis, low perception of risk and structural issues.

Stigma and discrimination towards people living with HIV/AIDS

Stigma towards people living with HIV/AIDS seems a concern shared by all ACB communities. Indeed, this theme was brought up in virtually every study reviewed on the topic.

Many ACB communities perceive people living with HIV/AIDS in a negative way. The participants from the STIGMA study explained that HIV was seen as being a “gay disease”, and with the high level homophobia present in some communities, individuals living with HIV/AIDS were thought of as people that "were doing what they are not supposed to do" [32], [44]. HIV was also perceived as an illness affecting promiscuous individuals and drug users [32], [44]. These perceptions were echoed in many of the studies reviewed. In a telephone survey with Haitians residing in Boston; 77% of participants thought that HIV was transmitted because of irresponsible behaviours [54]. In Switzerland, in a qualitative study with African migrants, participants related that shame was omnipresent in HIV positive individuals [52]. In particular, women were perceived as “whores” for being HIV-positive [52]. In a study with HIV-positive African women living in the United Kingdom, many women expressed shock and disbelief at their diagnosis because they were “proper” women who had not had numerous sexual partners [57]. In addition, couples dealing with HIV who decided not to conceive were thought to bring shame upon their families because of the importance of childbearing within their cultures [52]. These negative perceptions contributed to increasing stigma towards those infected with HIV. Indeed, their infection was seen as a proof of their interaction with society’s outcasts or outsiders or their engaging in forbidden activities [32]. This stigma in turn affected their access to both testing and treatment. This is because associating with ASO and specialized treatment facilities was perceived as a potential risk of disclosing a positive HIV status [32], [41], [44], [64]. For this reason, many community members would not access ASOs where they could encounter members of their community [60].

In a qualitative study on stigma in the Netherlands, Afro-Caribbeans identified the different ways in which HIV-positive individuals experienced stigma. Social distance was experienced from family members, friends and romantic partners [65]. This was felt mostly through exclusion from events, rejection and breakups in romantic relationships [65]. HIV-positive participants also discussed physical distance such as absence of touching (hugging, handshakes) or the refusal of their friends and family members to let them handle food and glassware [65].

Gossiping was also identified as an issue in some studies [44], [51]. In the STIGMA study, some HIV-positive individuals explained that their serostatus was divulged throughout the community even by some they considered to be their close friends [44]. Stigmatization seems to not only occur in the form of community gossip and blaming but also in the absence of talking about HIV/AIDS in conversations in the community [38], [44].

Throughout the literature, it appears that stigma is sometimes propagated by the host societies themselves [36], [44]. For instance, in Toronto, participants of the STIGMA Study felt stigmatized by the portrayal of HIV/AIDS as an illness affecting only people of Black descent or only Africans [44]. This stigma was also in some cases propagated by health care professionals [44]. For instance, one participant in the STIGMA study, recounted that her nurse told her she taught her children to consider all Africans to be HIV-positive [44]. In Britain, the perception propagated by the media that Africans were vectors of diseases on which money should not be spent was also identified as a barrier to access [36].

There does seem to be an attempt at decreasing the stigma within the communities with some participants insisting that there were other ways to contract HIV/AIDs than the stigmatized routes [38], [44]. For instance, participants in the STIGMA study stressed that the transmission of HIV/AIDS was also possible through cuts and blood transfusion and that people infected through these routes did not deserve to be stigmatized [44]. The same sentiment was echoed by African migrants interviewed in Calgary [38].

Fear of a positive diagnosis

In Belgium, in a study exploring the attitude of Sub-Saharan migrants with regard to voluntary counseling and testing (VCT), participants acknowledged the advantages of VCT but were worried about the consequences of a positive test [66]. This is because an HIV/AIDS diagnosis was often equated to death [66]. This might be due to the migrant's experiences of HIV/AIDS in their countries of origin. For instance, in a qualitative study in Switzerland, African migrants referred to HIV/AIDS as an invisible illness. This is because back home, it was perceived to be obvious when one was HIV-positive due to physical signs such as wasting. However, the HIV-positive immigrants they met in their host country had no obvious symptoms of the infection [51]. Necessary accommodations and lifestyle changes that would need to be effected upon the discovery of one's seropositivity were also identified as barriers to testing. These included treatment regimen, condom use during sex and employment issues [51].

ACB communities are often comprised of migrants, such as refugees and asylum seekers. Many participants expressed worry about the impact of a positive status on their immigration status. For instance, Manirankunda et al. (2012) found that some participants thought that a seropositive status might result into a rejection of asylum claims [53]. This is not accurate as an

HIV-positive status would not negatively impact an asylum application in Belgium [66]. In Britain, key informants from ASOs believed that migrants worried about the possibility for their results to be shared between government institutions and to impact their permanent residency applications [36]. Similarly, in the United States, African immigrants distrusted the health care system due to their perception of its linkage to Homeland Security, the department in which immigration services are delivered [41].

Stigma and social exclusion were also mentioned as potential consequences of obtaining a positive test [32], [44]. This was again compounded by the perception that “bad” individuals of dubious morals got infected with HIV/AIDS.

Low perception of risk

Some ACB people feel that HIV/AIDS is not a concern in the countries to where they have immigrated and thus they do not feel at risk of contracting the infection [31], [39], [44]. For instance, in a study with Ethiopian and Eritrean immigrants living in the United Kingdom, participants revealed that most of their knowledge with regard to HIV/AIDS came from their country of origin [29]. In addition, they were more alert to the risk of HIV/AIDS when living in their home country[39]. They also had little knowledge of the epidemic or the HIV/AIDS-related services in the United Kingdom [39]. The informants cited the lack of accessible information and education as the reason for their low awareness of HIV/AIDS as being an issue in the United Kingdom [39]. Some participants even mentioned their perception of the United Kingdom as being a low-risk environment for contracting HIV/AIDS as a factor in not using condoms during sexual intercourse [39].

In the STIGMA study, participants also felt that HIV/AIDS was not addressed consistently in their communities in Canada, particularly in comparison to their home countries [44]. This issue was compounded by the fact that HIV-positive individuals did not disclose their status and went “underground”, resulting in HIV being considered a myth in the community [44]. The same was observed with African immigrants in Philadelphia, where absence of disclosure resulted in community members’ lack of awareness of HIV/AIDS as an issue [41]. In the EAST study, participants who knew one person with HIV were more likely to perceive themselves to be at risk for the infection [31]. A qualitative study with key informants from ASOs in Britain identified intrinsic community factors such as the perception of HIV as an issue for the community and the mobilization in the country of origin or lack thereof, as influencing awareness of HIV/AIDS as an issue for their communities in Britain [61].

The stereotyping of people living with HIV/AIDS as individuals engaged in immoral behaviours seems to also have resulted in a low risk perception by some ACB community members [44]. For instance, in a study with Black African women in Canada, there was a strong "othering" of people living with HIV/AIDS, with the perception that HIV infection happened to other women and that by being "good", they were at low risk for the infection [51].

Stutterheim et al. (2012) found that although many participants had a low perceived risk of HIV/AIDS, they did acknowledge that it was hard to be confident in their risk level [65]. This is because most people were not honest about their relationships and the number of sexual partners they have had [65]. Bischofberger et al. (2008) identified the decrease of HIV-related information in the media and the normalization of the condition in Western Europe as reasons for the perceived low-risk of infection [52].

In a study with Ethiopians living in the United States, the vast majority of participants (more than 80%) thought that they were not at risk for HIV/AIDS [67]. This is in spite of 40% reporting irregular condom use, 18% acknowledging at least two concurrent sexual partners, and 46% having at least five lifetime partners [67]. Similarly, in a study with the Haitian community residing in Boston, in spite of an adequate knowledge of HIV transmission, the risk profile of the community was quite high [54]. This lack of translation of knowledge into protective behaviours with regard to HIV/AIDS was attributed to a low risk perception by individuals in the community [54]. In the EAST Study, although 66% of the participants thought that HIV/AIDS was an issue in their communities, 56% of participants felt that they were at no risk for HIV/AIDS [31]. Reassuringly, participants who engaged in concurrent relationships or who felt that their partners had engaged in these relationships were more likely to feel at higher risk for infection [31].

Structural Issues

In some instances, structural issues within the health care system of the host country act as impediments to HIV-related services and care for ACB people. For instance, in the United States, lack of health insurance was identified as a key impediment to care for African people at risk for or living with HIV/AIDS [41]. This was especially an issue for undocumented immigrants who might not be eligible for social programs that can cover their treatment costs [41]. In addition, there was often a lack of information about the prevention and treatment services that were covered for immigrants and asylum seekers [36], [41]. For instance, a study reviewing the literature on structural barriers to care in the United State with regard to HIV/AIDS identified immigrant and undocumented status and the reluctance they induce towards accessing health services, lower insurance coverage, lack of familiarity with the health care system, marginalization, anxiety around deportation and fatalistic views with regard to HIV/AIDS as some of the most salient issues.

A lack of cultural competence and sensitivity of service providers were also identified as impediments to care [41], [53], [64]. For instance, in a study with African immigrants, participants identified hostility in prenatal care and HIV services as barriers to access [41]. This was also mentioned as an issue in a study with Jamaican-born women having recently immigrated to the United States. In a study assessing the perception of Black women in Canada towards a potential vaccine against HIV, participants explained that women of colour could be mistreated by health care providers with no accountability or repercussions for their behaviour [51]. In addition, the women expressed a fear of losing one's general practitioner upon discovery of one's seropositivity [51]. In the United Kingdom, Burns et al (2007) identified difficulty navigating the system for those not familiar with it and the lack of family facilities as institutional barriers [36]. In addition, uneasiness of some general practitioners to recommend HIV/AIDS testing as well as lack of professionalism towards HIV-positive individuals were also mentioned as issues [36].

Confidentiality within health care settings seemed to be a major issue with some individuals' serostatus being outed by their health care provider or by other community members attending the ASOs or other organizations in question [36], [44], [65]. There also seems to be a certain level of mistrust within certain communities with regard to HIV services and medications. For instance, in the study with Black women in Canada and their view towards a potential vaccine against HIV, participants expressed suspicion towards the health care system [51]. They thought that while HIV infection was not only an issue in ACB communities, attention was unjustly focused on these groups while the true prevalence in the White communities were hidden[51]. Due to these issues, the women worried that overtly targeting the Black population with a potential vaccine might harm the community and deter them from accessing this intervention [51]. Furthermore, they expressed concern with regard to the potential side effects of a vaccine on them and doubted the motivation of the institutions that would be providing it [51]. These sentiments of mistrust were thought to stem from the historical abuses committed by the West such as the Tuskegee study [51], an unethical study on the effects of syphilis conducted on African American males in the United States for over 50 years [68].

Finally, lack of resource allocation to relevant services was identified as an important impediment to proper care [36], [64].

1.7.6 HIV Risk, access to care and heterogeneity in ACB communities

Although ACB people face similar challenges, it is important to realize that they do constitute different communities with diverse histories and thus different risk profiles for HIV/AIDS. For instance, in the United States, African-born residents Blacks were found to have higher rates of HIV diagnoses when compared to the broader American population [69]. In addition, this group presented with a higher proportion of new incident cases due to heterosexual transmission and a lower percentage due to intravenous drug use when compared African Americans. A review of the literature on HIV/AIDS and African-born Blacks showed that these communities had earlier treatment initiation and better linkage to care than the general American population [69]. However, these groups also had later diagnoses than their US-born counterparts [69].

A study of West Indians or Caribbean-born Blacks compared to African-Americans showed differences in their risk behaviours [70]. For instance, West Indians men were less likely to use drugs other than marijuana and alcohol than African American men [70]. African American were more likely to report using condoms than West Indians and African American women were more likely to be highly confident that they could convince their partners to use condoms [70]. However, these women were less likely to use condoms with their casual partners than West Indian women [70]. In addition, African Americans were more likely to report being extremely likely to inform their partners of a sexually transmitted infection and discuss STI screening than West Indians [70]. African American women were also more likely to convince their partner to undergo STI screening than West Indian women [70]. However, this finding did not hold for one time partners where West Indian women were more likely to convince their partner to undergo STI screening [70]. Similarly, a study with English-speaking Caribbeans, African-Americans, English-speaking Haitians and Creole-speaking Haitians found different risk profiles and perception of risk between the groups, with Creole-speaking Haitians exhibiting the highest level of risk and English-speaking Haitians the lowest one [71].

It is also important to note that various ACB groups experience barriers to treatment differently and avoid generalizations. For instance, in a study assessing barriers to HIV/AIDS services in Philadelphia, French-speaking Africans were found to differ from English speaking Africans in their perception of access to HIV/AIDS services [72]. Although language barriers have been documented as an impediment to care, the perception of barriers also differed between the groups [72]. Indeed, in addition to language difficulties, French-speaking Africans identified lack of sensitivity from immigrants with regard to the host culture and lack of documents as the main barriers to access whereas English-speaking Africans identified a lack of sensitivity from the host culture to immigrants, transport, and inadequate knowledge about how the system functions as the main barriers [72]. Finally, social support seemed to be more available for English-speaking Africans as opposed to French-speaking ones [72].

1.8 The Andersen-Gelberg model for vulnerable populations

The Andersen-Gelberg model for vulnerable populations is a modification of the Andersen's Behavioural model of health, created by the health services researcher Ronald M. Andersen in 1968 [73]. The original model took a systems approach to access to health care considering: "environmental factors, population characteristics, health behaviours and health outcomes" [73].

The environmental component of the model contains the macro-system factors such as societal wealth and economic status, politics and societal norms and their influence on the health care system [73] . The population characteristics consist of three main components: predisposing factors, enabling factors and need factors [73]. These factors are thought to affect health behaviours of the population at risk which consist of personal health practices and their access to health services [73]. Predisposing factors consist of demographic and social factors as well as health beliefs that might affect health care access [73]. The demographic and social factors include biological factors such as age, sex as well as markers of social position such as education, profession and ethnicity [73]. Other markers of social structure such as social networks and interaction as well as culture can be considered [73]. Health beliefs consist of the overall “attitudes, values and knowledge” that a population has of health services that can impact its perceived needs and access to care [73]. Enabling factors consist of community and personal resources (or barriers) affecting access to care [74]. Personal enabling factors include an individual’s income and access to health insurance, as well as access to transportation, travel and waiting times [73], [74]. Organizational factors include health personnel and their availability as well as the coordination of community resources [73]. Need factors can be subdivided into perceived and evaluated needs [73]. Perceived needs refer to individuals’ own discernment with regard to their health status as well as illness signs they might be experiencing [73]. Andersen and Davidson make it clear that perceived needs are a social phenomenon that should be accounted for by health beliefs and social variables [73]. Evaluated needs refer to an “objective and professional” appraisal of a patient’s need for medical care [73]. The evaluated needs are not thought to be objective as they also vary by the advancement of science and the level of expertise of the personnel [73]. Health behaviours include personal health practices such as alimentation, level of physical activity, use of alcohol and tobacco and actual use of health services [73]. Finally, outcomes consist of perceived and evaluated health status as well as consumer satisfaction [73]. Similar to needs, perceived health status is dependent on the individual’s or his/her caregiver’s perception whereas evaluated health status is reliant on the health care professional’s assessment [73]. The consumer’s satisfaction refers to the individual’s level of contentment with his or her received care [73].

In 2000, the Behavioural model was amended by Gelberg and Andersen to better encompass the health and health seeking behaviour of vulnerable populations [75]. This model was tested and validated for a population of homeless individuals [75]. The rationale of the authors for altering the model was that homeless individuals and other vulnerable populations experience particular problems that might affect their use of health services and their health status [75]. The new Behavioural Model for Vulnerable Populations subdivides the components of the Andersen’s Behavioural model of health into traditional and vulnerable domains with the vulnerable components focusing on factors of social structure and enabling resources [75].

The predisposing *traditional* domain contains demographic characteristics such as gender, age, and marital status as well as beliefs about health and social structure [75]. The predisposing *vulnerable* domain includes other social structure characteristics such as acculturation, immigration status, and literacy as well as childhood characteristics, residential history and current conditions of living, criminal behaviour and prison history, mental illness psychological resources and substance abuse [75].

The enabling *traditional* domain consists of assets available to the individual and his/her family (salary, source of care, coverage) as well as some of the community infrastructures (area of residence, health care structure and resources) [75]. The enabling *vulnerable* domain include, whether the individual is a recipient of assistance, has access to useful information and presents with other necessities [75]. At the community level, factors such as level of crime and the presence of social services constitute the *vulnerable* domain [75].

The need *traditional* domain is composed of the previously described perceived and objective needs [75]. The need *vulnerable* domain include the perceived and evaluated health needs of specific health issues that are prevalent in the populations of interest [75]. The personal health practices *traditional* domain contains of the individual's behaviours with regard to alimentation, physical activity, personal care, smoking, and treatment adherence [75]. The personal health practices *vulnerable* domain refers to sources of alimentation of the individual, as well as their pattern of behaviours with regard to personal hygiene and sexual behaviours [75]. Finally, the outcomes portion of the domain is not subdivided into domains and is similar to the original model [75].

1.9 Intersectionality

The word "Intersectionality" was first used in 1989 by Black feminists, to describe the systematic exclusion experienced by African American women from the civil rights movement and the women's right movement, two movements of high relevance to their social advancement [76].

The main principles of intersectionality can be summarized as follows: social characteristics are not one-dimensional and independent but multiple and interacting identities [76]. These multiple identities at the micro-level interact with macro-level structures in order to produce observed outcomes (such as health status) [76]. Intersectionality, as a framework of study, aims at understanding how social position interact with structural forces to result in the human experiences observed [76]. This is done in a manner where the effects of multiple categories are examined on outcomes without blindly assuming the predominance of the effects of one factor over another [77]. Furthermore, intersectionality theory advocates for groups from oppressed and marginalized communities to be the starting point of research as opposed to the post-hoc comparisons to dominant normalized groups. Indeed, racial and sexual minorities experience different levels of intersecting types of stigma. They are also more likely to be in social and physical environments conducive to risk and with higher HIV prevalence [78]. In addition, due to experienced discrimination and stigma, minority groups show a high level of mistrust towards the health care system [78]. This also translates into a differential impact of STIs and HIV on sexual and racial minorities [78].

Although this framework has been originally used in women studies, it has started to be considered of utility in other fields such as psychology and public health [76], [79]. Indeed, it has been argued that intersectionality, by its virtue of providing the power to study intersection of identities, as well as the interaction between individuals and structural factors can increase the effectiveness of interventions [76], [77].

The literature review identified two main studies, which explored the theme of HIV/AIDS in African Caribbean and other Black populations in high-income countries using an intersectionality framework. Doyal et al. (2009) explored the differential experiences of African migrants living with HIV/AIDS residing in London [58]. Although women described being infected with HIV/AIDS as affecting their potential as mothers, moral guardians and partners in relationships, heterosexual males spoke about the powerlessness they felt because of their illness and the loss of status that they experienced through their migration and the shift of gender norms in British Society [58]. Gay and bisexual African men living with HIV/AIDS gave yet another perspective into living with HIV/AIDS as a migrant [58]. Indeed, gay and bisexual African men had to negotiate their identity and often hid their sexual orientation and/or their seropositivity to their communities of origin [58] . This resulted in them socializing and getting social support either from White gay men or from heterosexual Black Africans but not both [58]. Finally, Bowleg et al. 2013 used intersectionality as a framework to study the challenges faced by Black men residing in the United States [80]. Specifically, through interviews with Black men, systemic racism, lack of meaningful employment, incarceration and police harassment were identified as the structural forces that might interact to produce particular forms of oppression affecting Black men [80]. The authors suggest that these determinants might be worthwhile for studying the differential of HIV incidence in African Americans instead of more proximal factors such as lack of condom use and STI infections [80].

1.10 Current gaps in the literature addressed in this thesis

As shown in this review of the literature, social determinants of health do not act in isolation but rather interact to produce particular forms of vulnerabilities in terms of HIV/AIDS risks and access to care for ACB communities. In conducting studies, it becomes important then to account for the interlocking of these determinants and not to make blanket, and perhaps erroneous, statements about risk factors [76]. Using intersectionality as a theoretical framework for conducting analyses enables us to explore these particular vulnerabilities [76]. However, to our knowledge, very few studies have used this framework for HIV/AIDS prevention work [58], [76] and none of them were quantitative studies.

In addition, there is a paucity of quantitative studies addressing the needs of ACB communities in terms of HIV/AIDS-related prevention services. Although some of the quantitative studies explore the risks incurred by one specific ACB community, such as Haitians living in Quebec [42] or Ethiopians and Eritreans living in the UK [39], their results are not directly applicable to ASOs.

Furthermore, in Canada, most studies on this topic have primarily taken place in large urban centers such as Montreal [42], and Toronto [31], [44]. The present study is unique in that the data were collected in a middle-sized city and thus the results and implications might be of relevance to areas with similar health and demographic profiles in Canada [72].

The main objective of the current research project is to use quantitative data collected by the BLACCH Study and work in collaboration with the RHAC in order to define ACB people's needs in terms of access to HIV-related services. Specifically, socio-demographics factors and demonstrated needs with regard to HIV will be used to determine the following:

1) What are the factors influencing familiarity with, willingness to access, and actual access to the Regional HIV/AIDS Connection by ACB communities?
2) Are there socio-demographic differences and dissimilarities between the diverse ACB communities?

By using an integrated conceptual model adapting the Andersen-Gelberg model for vulnerable populations with an overarching intersectionality framework to guide the analysis, this study aims to address some of these gaps.

1.10.1 Integrated Andersen-Gelberg model for vulnerable populations

The following model has been designed after a careful review of the literature, consultation with workers at the RHAC and considerations of the survey data. This integrated model follows the Andersen-Gelberg Model for Vulnerable populations very closely with added terms for intersectionality analyses (See Figure 1.0).

Similar to the Andersen-Gelberg model for vulnerable populations, socio-demographic factors and variables indicative of social position are included in the predisposing factors. In keeping with the review of the literature, ethnicity and time in Canada, which encompasses an immigration component, were included in the vulnerable domain due to the differentials observed within ACB communities and the challenges faced by immigrants in host countries. Intersections between gender and marital status, gender and education have been highlighted in our literature review and were identified as potentially useful for RHAC. The intersection between age and religiosity was also identified as potentially interesting for the agency's purposes and will also be explored. The intersection between gender and ethnicity has been included as potentially relevant as previous findings from BLACCH Study analysis had identified differences in risk between African men, Caribbean men, African women and Caribbean women respectively [82].

The enabling factors were constituted of a range of variables that could impede or facilitate access to an ASO such as RHAC. These include an individual’s knowledge of HIV/AIDS and his/her access to a primary care provider, the awareness of HIV/AIDS as being an issue in ACB communities and his/her level of inappropriate fear of contagion and finally whether or not the individuals considers their care provider as knowledgeable of Black health issues. The latter three variables were included in the vulnerable domain as low perception of risk of HIV/AIDS contraction and distrust of health care professionals were echoed in the review of the literature as issues affecting access to care.

The needs factors are only represented by objective needs in this case. The needs variables were defined using the Canadian AIDS Society guidelines for assessing risk. As there is no biological or genetic basis for some ACB people to be at higher risk when compared to the general population, no vulnerable domain was included in this case.

Finally, health services utilization will be measured using three main indicators: familiarity with (whether the respondent has heard about RHAC), willingness to access (whether the respondent would go to RHAC if they felt the need to) and demonstrated access (whether the respondent has been to RHAC). Each indicator used measures access differently. For instance, as established in the literature review, not all ACB people are at risk for HIV/AIDS in Canada, however being familiar with an AIDS service organization, which might have important implications for one's health, is of relevance to ACB communities. It is therefore important for RHAC to be able to quantify the communities' familiarity with the agency.

In addition, assessing the sample's willingness to access RHAC and the socio-demographic variables underlying this construct is important to the organization, as this might highlight targets for interventions and outreach. Finally, the last indicator used in this analysis will enable the agency to know the socio-demographical characteristics of those who have been to the site of their agency.

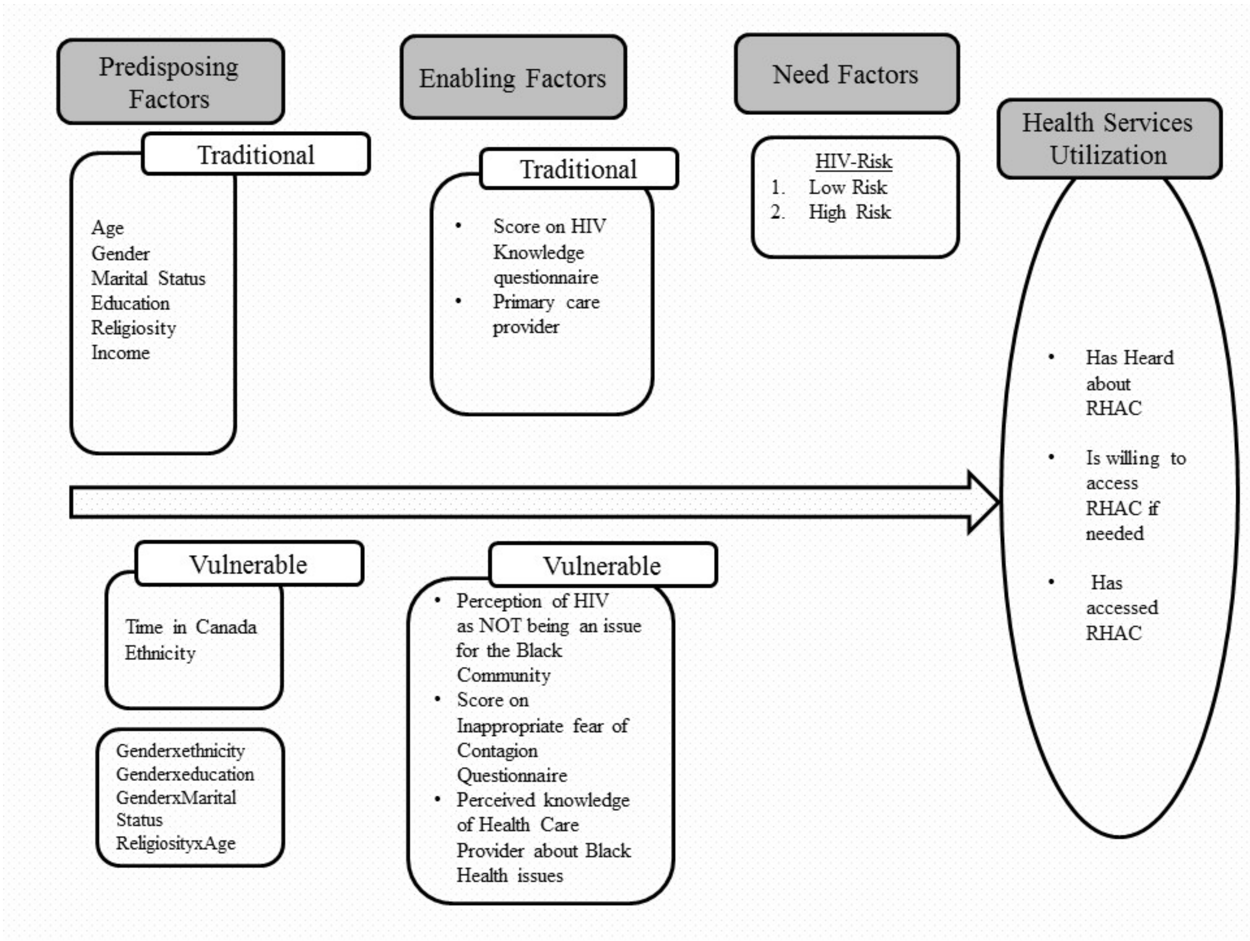

Figure 1. Integrated Andersen-Gelberg Model for Vulnerable Populations

Chapter 2

2 METHODS

2.1 Data Source: The BLACCH Study Quantitative Survey

During the quantitative phase of the BLACCH Study, 400 paper surveys were distributed to ACB community members and agencies working with this population. Eligibility criteria included being at least 18 years of age, self-identifying as "Black" and residing in Middlesex-London. The survey distribution was effected through three main routes: snowball sampling, venue-based sampling and advertising. A total of 188 surveys were returned yielding a response rate of 32% [12]. Data from the surveys were entered by members of the BLACCH Study team and were checked for accuracy by the principal investigator [12].

The development of the survey was informed by the previous qualitative phase of the BLACCH Study and collected information on socio-demographics, general health, health care use, health behaviours, sexual and reproductive health [11]. As part of the survey, participants were given information about the AIDS committee of London and asked questions regarding their access to the organization and HIV/AIDS information material. In addition, participants' knowledge, perceptions and attitudes with regard to HIV/AIDS were measured. The current project relies heavily on this portion of the survey for the analysis conducted.

2.2 The BLACCH Study and Community-based Research

Community-based research is defined as research conducted in an egalitarian manner between researchers and community members to address a problem faced by the community. The core tenets of community-based research include conducting research relevant to community members, using that research to effect change, addressing frontline problems, shared learning on the part of community members and the researchers, and, addressing power differentials between the community and the research team [83]. Finally, the research conducted must be scientifically rigorous and meet ethical guidelines [83].

The BLACCH Study team strived to meet these tenets throughout the project. The team incorporated input from other ACB community members in the conceptualization of the study. For instance, although the initial intent was to focus on HIV/AIDS and ACB communities in

London, Ontario, the scope of the study was expanded after community members expressed interest in other social determinants of health [11]. Additionally, the survey questions for the quantitative portion of the study were designed taking into account participants' responses to the qualitative portion of the study [11]. Finally, the BLACCH Study team included community members and workers from agencies working with ACB communities who had input in all aspects of the research conducted [11].

The current project is conducted in collaboration with RHAC, a service organization that serves ACB community members. In addition to her academic advisory committee, the author of this thesis, (SB), also had a community advisory committee composed of her academic supervisor, the director of education services at RHAC and the multicultural prevention worker at RHAC. The input of this committee was sought to validate relevant factors identified from the literature review, such as the demographic intersections of interest, and conceptualize the model for analysis.

2.3 Data quality

2.3.1 Assessing and handling missingness

The data were assessed for missing values. Ten covariates: age, marital status, religiosity, income, "perception of HIV/AIDS as NOT being an issue in Canada", "having a primary care provider", "perception of one's primary care provider, score on inappropriate fear of contagion scale", "score on knowledge of HIV/AIDS scale and sexual risk had missing values". The variables "score on inappropriate fear of contagion scale" and "perception of HIV/AIDS as NOT being an issue in Canada" had more than 5% missing. Two other variables, "score on knowledge of HIV/AIDS scale" and income, had more than 10% of their values missing. All three outcomes of interest had missing values, with two approaching 6%.

All observations missing one or more outcome variables were removed from the analysis. This resulted in the deletion of 10 observations. It is noteworthy that these observations were also missing data across covariates and that their removal resulted in lowering the overall percentage of missing values. Following Harrell's guidelines [84], the data were multiple imputed, as one variable, income, had 20 % of its values missing. Multiple imputation was effected for all variables with missing values to reduce bias.

2.3.2 Multiple imputation of Data

Multiple imputation was effected using the proc MI function of SAS 9.3. Five datasets were created through this process, as recommended by Rubin and Schaffer [85]. The missing data were assumed to be missing at random. The multiple imputation was carried out in two steps. The Markov chain Monte Carlo (MCMC) method was used to carry out the imputation until the created datasets were exhibiting a monotone missing pattern. The data was then imputed to completeness using monotone regression. These methods were used because of the greater flexibility afforded by the use of the MCMC method in the choice of covariates influencing the imputations [86]. Although fully conditional specification methods, which are recommended when imputing data with discrete values, are available is SAS 9.3, they were not used in this analysis. This is because these methods are experimental in SAS 9.3. In addition, the option of including discrete variables in the imputation equation of other categorical variables using fully conditional specification methods was not available in the 9.3 release of this software [87].

MCMC methods assume multivariate normality and impute datasets as if all variables were continuous. All categorical and binary values were thus corrected to reflect their discrete nature before carrying the second step of the imputation. All discrete and binary variables were imputed within the first step of the imputation. Continuous variables were imputed to completion in the second step using monotone regression. In order to render the imputation model as similar to the analysis as possible, all interaction terms were included in the second imputation step [88]. There were no missing variables at the end of the imputation.

2.4 Variables of Interest

The integrated model of Andersen for vulnerable populations will be used as a framework to guide this analysis in order to identify the main factors associated with access to care at RHAC.

2.4.1 Predisposing factors

Age

This variable was categorized in three main groups that were identified as potentially of interest by (SB) and her committee advisory committee. These include participants less than 30 years of age, participants between 31 and 50 years of age and participants over 50 years of age.

Gender

This variable was categorized in two groups: male and female. One participant had indicated other as an option. This participant was reclassified as female as they had also indicated that they identified as that gender.

Marital Status

This variable was categorized in three groups: never married, married or common law and no longer married. This final group included participants who were previously married, in other words those who were separated, divorced, widowed or had had their marriage annulled.

Education

This variable was categorized into four groups: participants who had never gone to school composed the first group. The first group was comprised of participants who had secondary education or less. Those who had finished community college or university at the Bachelor's level comprised the second group. Finally, participants who had a university certificate, a diploma or had gone to professional school or graduate school were included in the fourth group.

Religiosity

Participants classified themselves as: very religious, religious and not very religious or not religious at all. The last two categories were collapsed for the analysis.

Income

Income was measured in terms of household income per person supported. Participants had been asked to choose the range in which their household income fell. The options were less than $5,000; $5,000 to $9,999; $10,000 to $19,999; $20,000 to $29,999; $30,000 to $39,999; $40,000 to $49,999; $50,000 to $59,999; $60,000 to $69,999; $70,000 to $79,999; $80,000 or more. The midpoint was calculated for every range with $85 000 used for the last category to avoid skewing this variable. These midpoints were then divided by the total number of individuals supported on this income, including those living outside of Canada. This variable was used as a continuous variable in the analysis.

Ethnicity

Ethnicity was categorized in three main groups: African; Caribbean; and Black, Canadian and other.

Time in Canada

This variable was categorized into four different groups: participants who were born in Canada, participants who had been in Canada for less than five years, those who had been in Canada between five and ten years and those who had been in Canada for over ten years.

2.4.2 Enabling factors

Score on HIV-Knowledge Scale

Participants were asked multiple questions using an adapted version of the “Brief HIV Knowledge Questionnaire” or “HIV-KQ-18” by Carey and Schroder [89]. This questionnaire was developed as a reliable alternative to the 45 item-long HIV knowledge questionnaire developed by Carey, Morrison-Beedey and Johnson. This questionnaire was developed using data from two samples of 210 and 357 low income women from two different previous HIV/AIDS risk reduction research projects and 464 individuals who received psychiatric treatment in outpatient clinics from a third HIV/AIDS risk reduction project. The authors’ intent was for this scale to cover HIV risks and protective behaviours misconceptions while offering the capacity to assess changes in knowledge. This original scale was found to have a Spearman-Brown alpha of 0.79. The original knowledge scale is composed of 18 statements:

1. Coughing and sneezing DO NOT spread HIV
2. A person can get HIV by sharing a glass of water with someone who has HIV

3. Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex
4. A woman can get HIV if she has anal sex with a man
5. Showering, or washing one’s genitals/private parts, after sex keeps a person from getting HIV
6. All pregnant women infected with HIV will have babies born with AIDS
7. People who have been infected with HIV quickly show serious signs of being infected
8. There is a vaccine that can stop adults from getting HIV
9. People are likely to get HIV by deep kissing, putting their tongue in their partner’s mouth, if their partner has HIV
10. A woman cannot get HIV if she has sex during her period
11. There is a female condom that can help decrease a woman’s chance of getting HIV
12. A natural skin condom works better against HIV than does a latex condom
13. A person will NOT get HIV if she or he is taking antibiotics
14. Having sex with more than one partner can increase a person’s chance of being infected with HIV
15. Taking a test for HIV one week after having sex will tell a person if she or he has HIV
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV
17. A person can get HIV from oral sex
18. Using Vaseline or baby oil with condoms lowers the chance of getting HIV

Participants were asked about the veracity of each statement and had the choice between “True” and “False”. Two additional questions were added by the BLACCH Study team: “HIV can be spread through sharing injection needles” and “A person can get HIV by sharing food with someone who has it”. Correct answers were given a value of 1 and incorrect ones a value of 0. Items were then summed to obtain a total score. Participants had to answer 16 items or more for their scores to be rescaled and considered in analyses. Most participants answered all questions, 20 participants were excluded and coded as missing because they had answered less than 16 questions. No rescaling was needed for participants included in the analysis. The range of possible values for the score is (0-20).

Primary Care Provider

Participants were asked whether or not they had a primary care provider. The answers for this variable were “yes” and “no”.

Perception of HIV as NOT being an issue for the Black Community

Participants were asked whether they believed that “HIV/AIDS is NOT an important issue in the Black community”. Participants had to choose between five possible items on a Likert Scale. Options ranged between “strongly agree” and “strongly disagree”.

Score on Inappropriate fear of Contagion Questionnaire

Participants were asked to fill out 5 questions to measure their level of inappropriate fear of HIV-related contagion. This scale was adapted from the “Evidence-based Generic Tools for Operational Research on HIV” [90]. This scale was designed as a measure of stigma in the general population and to determine the fear of contracting HIV from casual contact. Unfortunately, there is a paucity of information on this scale and its indices in the literature. Participants were asked to indicate whether they had no fear, a little fear or a lot of fear in carrying out certain activities. These included:

1. Hugging a person with HIV
2. Sharing a drinking glass with a person with HIV
3. Working next to a person with HIV
4. Caring for a person with HIV

Two items, “would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the AIDS virus” and “would you rather not touch someone with HIV because you are scared of infection” were removed from the questionnaire by the BLACCH Study team. In addition, the BLACCH Study team added two items to this questionnaire: “having sex without a condom with a person with HIV” and “sharing needles with a person with HIV”. Participants also had the options to indicate that they “did not know”, however this was collapsed with the option “a little fear”. There was no indication on how to score this scale;

therefore, the participants who indicated some fear of casual contact were given a greater score on the item in question. Notwithstanding, items with activities carrying a reasonable risk of contracting HIV/AIDS such as having sex without a condom with a person with HIV, i.e. that would constitute "inappropriate non-fear" were reverse-coded. The total score was obtained by summing all items. Participants had to answer five out of the six items for their score to be included in the analysis. Seventeen participants were coded as missing as they had answered less than five items. Six individuals answered five out of the six items on the scale, their scores were rescaled. The range of possible values for the score is (0-12).

Perceived knowledge of Health Care Provider about Black Health issues

Participants were asked to indicate their opinion about health care providers' knowledge about Black people's health issues. The following categories were used as followed:

1. "They don't know anything about the health care needs of Black persons, they know a few things about the health care needs of Black persons, and I would rather not say."
2. "They know about the health care needs of Black persons, they know a lot about the health care needs of Black persons."
3. "I have not seen a doctor in London or Middlesex County."

2.4.3 Need Factor

HIV-related Sexual Risk

This HIV –related sexual risk variable was dichotomized as high risk or low risk using the Canadian AIDS Society's guidelines [91] . If an individual indicated that they had been sexually active within the past year or that they had casual partners, regular partners or partners with whom they were not cohabiting within the past year but did not indicate that they always used condoms for activities for which condom use is warranted, then they were categorized as being at high risk for HIV. Conversely, if a participant indicated sexual activity or acknowledged having any type of sexual partner within the past year but indicated constant use of condoms, they were categorized as being at low risk for HIV. Participants were not asked about oral sex which carries a small risk of transmission of the virus [91] and thus it was impossible to differentiate between participants at no risk and at low risk of contracting the virus in this analysis.

2.4.4 Outcomes

Access to care

The variables measuring access to care comprised the outcome variables in this analysis. Access was captured using three different questions:

1. "Have you ever heard of the AIDS Committee of London?"
2. "If you felt you needed to, would you ever go to the AIDS Committee of London?"
3. "Have you ever been to the AIDS Committee of London?"

The participants had the options "yes" and "no" for the first and the last question. The second question had three possible options "yes", "no" and "I don't know". The options "no" and "I don't know" were collapsed for the purpose of the analysis.

2.5 Modified Poisson Regression

The measure of association between predisposing, enabling, need and access variables was obtained using Poisson regression with a sandwich error term, a method also labeled "modified Poisson regression" [92]. This method was used because of its increase in precision over other methods and its ability to render prevalence estimates [92], [93]. Logistic regression is often used to estimate associations when the outcome variable is binary. However, the assumption of low event rate is often violated and this has implications for estimates [92], [94]. In addition, odds ratios rarely equal relative risk, and, contrary to prevalent use, should not be interpreted as such [92]. Furthermore, modified Poisson regression has been found to perform better than other procedures used to estimate risk ratios such as binomial regression and (unmodified) Poisson regression [94]. Moreover, estimates produced with modified Poisson regression were found to be reliable with small sample sizes [92]. Additionally, modified Poisson regression has previously been used as a tool to estimate prevalence ratios, the measure of association of interest here [93]. Prevalence ratios were chosen because using this as a measure of association renders the estimation of additive interaction more accurate. Additionally, because this study is cross-sectional in nature, it is difficult to establish temporality between the predisposing, enabling and need factors and the outcomes of interest, and thus prevalence ratios are more appropriate estimates.

2.6 Model Building

2.6.1 Variable Selection

Backward elimination was used to reduce the number of variables included at each step and obtain a more parsimonious model. This was done using logistic regression as the automated variable selection is not readily available using proc genmod, the SAS command used for modified Poisson regression [95]. As recommended by Vittinghoff [96], we used more liberal criteria to allow variables to stay in the models. Variables were entered sequentially with three different cut-offs: 0.30 for predisposing variables, 0.20 for enabling variables and 0.15 for the need variable. Predisposing variables which met the 0.30 cut-off were forced into the second block during the procedure. Similarly, enabling factors which met the 0.20 cut-off were forced with the previously significant predisposing factors into the last block (See Figure 2). This was done to see the effects of these factors on other the other blocks. Additionally, backward elimination procedures were carried out adding interaction terms one at a time. If kept in the first model, the interaction terms were to be carried on throughout the analysis. Modified Poisson regressions were effected after each block to establish associations between the factors kept in the respective models and the outcomes of interest.

In order to conduct variable selection using the multiple imputed datasets, we followed methods explored by Wood et al., by selecting variables that were kept in three out of five imputed datasets [97]. This was found to be comparable to using the results of the backward elimination in one of the datasets [97]. This procedure was also found to give similar results to stacked datasets where individuals are assigned weights that scale the log likelihood of the resulting dataset to the original dataset while not taking into account the degree of missingness [97].

In order to assess for possible intersectional differences within the sample, tests for additive interaction were conducted. This was done as additive interaction has more relevance for public health implications [98] and therefore takes precedence over multiplicative interaction [99]. However, there were unsolvable issues in conducting the tests for additive interactions. Please refer to Appendix A for detailed information.

2.6.2 Quasi-complete separation

When effecting the backward eliminations, quasi-complete separation of the data was encountered. This phenomenon occurs in small datasets, with a rare outcome predicted perfectly by the factors in the equation [100].Continuous variables, such as time in Canada were categorized and other discrete variables such as religiosity and education had some levels collapsed into other meaningful groupings, as recommended to address this issue [100].

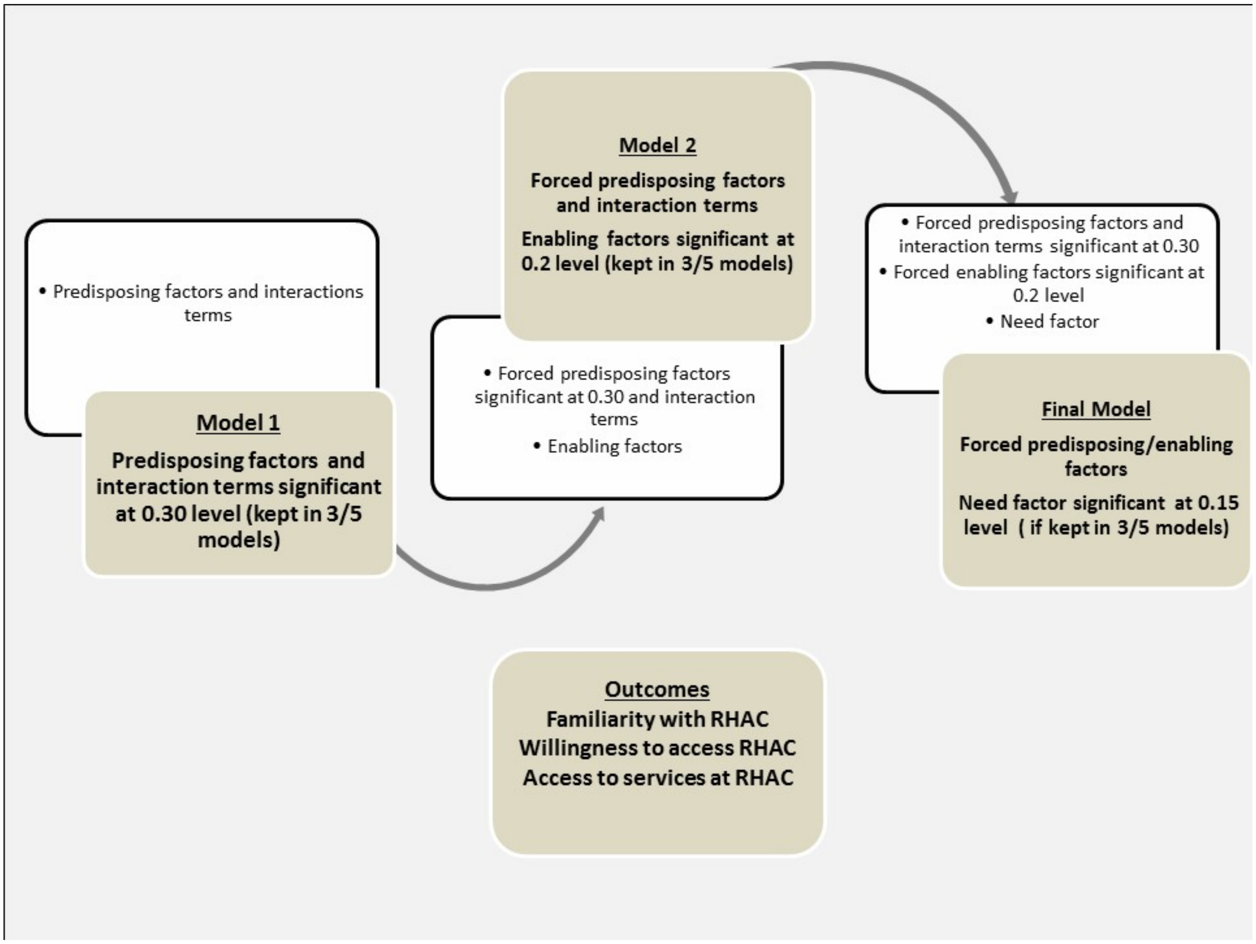

Figure 2. Conceptualization of Analysis using Backward Elimination

Chapter 3

3 RESULTS

3.1 Characteristics of the sample

The results of this project will be presented using the Andersen Model for Vulnerable Populations' framework, grouping factors of interest in predisposing, enabling and need factors.

3.1.1 Predisposing factors

Most survey respondents were female (60.1%) and 41.9% were between 31 and 50 years of age. Half of the participants had never been married, while about a third were married or living in a common law relationship. Most had attended a postsecondary institution and 22.9% had some postgraduate education. Only 31.5% of participants identified as not religious at all, or not very religious. The majority of respondents were of African ethnicity (56.9%) and immigrants to Canada (84.5%). The median income to needs ratio was $ 11,250 per person per year (Table 1).

With regard to gender and marital status, 17.0% of participants were ACB men who had never been married, 17.4 % were married men while 4.7% were previously married men. As for the remainder of the sample, 29.2% of participants were women who had never married, 14.6% were married women, and 12.3% previously married women. With regard to gender and education, 14.6% of participants were ACB men with secondary education or less, 13.5% were men who had an undergraduate or college degree whereas 11.2% were men with postgraduate education. Additionally, 29.2% of participants were ACB women who had secondary education or less, 20.2% were women with an undergraduate or college degree whereas 11.2% were women with postgraduate education. With regard gender and ethnicity, 26.5% of the sample were men of African ethnicity, 10.1% were men of Canadian ethnicity, while 2.8% of the sample were men of Canadian or other ethnicities. In addition, 29.2% of participants were women of Canadian ethnicity, 28.6% were women of Caribbean ethnicity and2.85% of the sample were women of Canadian or other ethnicities. Finally, with regard to age and religiosity, 15.2% of participants were 30 years of age or less and not very religious or not religious at all, 15.8% were 30 years of age or less and religious and 9.1% were 30 years of age or less and very religious. Additionally, 14.6% of participants were between 31 and 50 years of age and not very religious or not religious at all, 19.5% were between 31 and 50 years of age and religious and 7.9% were between 31 and 50 years of age and very religious. Additionally, 4.3% of participants were 50 years of age or older and not very religious or not religious at all, 11.6% were 50 years of age or older age and religious and 1.8% were 50 years of age or older and very religious.

3.1.2 Enabling factors

The majority of participants had a primary care provider (70.1%). Half of the participants had a score of 17 of 20 or higher on the HIV knowledge scale with the 25th percentile scoring 16. Participants scored low on the inappropriate fear of contagion, with 2 of 12being the median score. This means that ACB participants did not show misplaced fear of contracting HIV/AIDS through casual contact. About half of participants (54.0%) disagreed with the statement that HIV/AIDS was NOT an issue affecting the ACB community in Canada. However, most participants (64.2%) thought that their health care provider did not know a lot about the health issues affecting ACB people or would rather not express an opinion on the matter (Table 2).

3.1.3 Need factors

The majority of participants (63.2%) indicated having sexual activity, but an inconsistent use of condoms. They were thus were classified as being at high risk for HIV/AIDS (Table 3).

3.1.4 Outcomes

Most participants had heard of RHAC (58.4%) and a high proportion of participants indicated that they would be willing to access the AIDS service organization (69.3%), if they felt the need to. Notwithstanding, only 21.3% of participants had ever been to RHAC (Table 4). Further breakdown of the outcomes by socio-demographic intersections can be found in Table 5.

Table 1. Frequencies and Medians for Predisposing Factors and Socio-demographic Intersections

Predisposing Factors	**N**	**%**
Gender		
Male	75	39.9
Female	113	60.1
Age		
≤ 30 years old	70	39.1
31-50 years old	75	41.9
>50 years old	34	19.0
Marital status		
Never Married	90	50.0
Married/Common law	58	32.2
Previously married	32	17.8
Education		
Secondary education or less	81	43.1
Undergraduate/College education	64	34.0
Postgraduate education	43	22.9
Religiosity		
Not religious at all/Not very religious	57	31.5
Religious	87	48.1
Very religious	37	20.4
Income to needs ratio	**Median**	**Range**
$/year/person	11,250	(50-85,000)
Ethnic background	**N**	**%**
African	107	56.9
Caribbean	71	37.8
Canadian and other ethnicities	10	5.3

Time in Canada		
Born in Canada	29	15.4
Fewer than 5 years in Canada	44	23.4
5 to10 years in Canada	23	12.2
Ten years or more in Canada	92	48.9
Gender and marital status		
Men who never married	29	17.0
Men married or living common law	30	17.4
Men previously married	8	4.7
Women who never married	58	33.9
Women married or living common law	25	14.6
Women previously married	21	12.3
Gender and education		
Men with secondary school or less	26	14.6
Men with undergraduate or college degree	24	13.5
Men with postgraduate education	20	11.2
Women with secondary school or less	52	29.2
Women with undergraduate or college degree	36	20.2
Women with postgraduate education	20	11.2
Gender and ethnicity		
African men	47	26.4
Caribbean men	18	10.1
Men of Canadian and other ethnicities	5	2.8
African women	52	29.2
Caribbean women	51	28.6
Women of Canadian and other ethnicities	5	2.8

Age and religiosity		
≤ 30 years of age and not/not very religious	25	15.2
≤ 30 years of age and religious	26	15.8
≤ 30 years of age and very religious	15	9.1
31-50 years old and not/not very religious	24	14.6
31-50 years old and religious	32	19.5
31-50 years old and very religious	13	7.9
>50 years of age and not/not very religious	7	4.3
>50 years old and religious	19	11.6
>50 years old and very religious	3	1.8

Table 2. Frequencies and Medians for Enabling Factors

Enabling Factors	N	%
Having a health care provider		
No	55	28.9
Yes	129	70.1
Score on HIV-knowledge scale	**Median**	**Range**
	17.0	(6-20)
Score on Inappropriate Fear of Contagion Scale	**Median**	**Range**
	2.00	(0-10)
Perception of HIV/AIDS not being an issue in Canada	**N**	**%**
Strongly disagree	95	54.0
Disagree	53	30.1
Neutral	14	7.9
Agree	6	3.4
Strongly agree	8	4.5
Perception of health care provider		
Know nothing/ a few things/ rather not say	115	64.2
They know /They know a lot	54	30.2
I have not seen a health care provider	10	5.6

Table 3. Frequency of HIV-related Sexual Risk

Need Factors	N	%
HIV-sexual risk, past year		
High	115	63.2
No, negligible or low risk	67	36.8

Table 4. Outcome Frequencies

Outcomes	N	%
Has heard of RHAC		
Yes	104	58.4
No	74	41.6
Would be willing to go to RHAC, if need be		
Yes	124	69.3
No/Don't know	55	30.7
Has been to RHAC		
Yes	38	21.3
No	140	78.6

Table 5. Percentage of ACB Community Members who Accessed RHAC, by Demographic Intersections

Factor	Has heard of RHAC N (%)	Willing to go to RHAC, if need be N (%)	Has been to RHAC N (%)
Gender and marital status			
Men who never married	13 (44.8%)	16 (55.2%)	5 (17.2%)
Men married or living common law	17 (56.7%)	25 (83.3%)	8 (26.7%)
Men previously married	5 (62.5%)	5 (62.5%)	2 (25.0%)
Women who never married	34 (58.6%)	41 (70.7%)	13 (22.4%)
Women married or living common law	17 (68.0%)	15 (60.0%)	4 (16.0%)
Women previously married	13 (61.9%)	17 (80.9%)	3 (14.3%)
Gender and education			
Men with secondary school or less	13 (50.0%)	18 (69.2%)	5 (19.2%)
Women with undergraduate or college degree	12 (50.0%)	16 (66.7%)	6 (25.0%)
Women with postgraduate education	12 (60.0%)	14 (70.0%)	5 (25.0%)
Women with secondary school or less	28 (53.8%)	35 (67.3%)	9 (17.3%)
Women with undergraduate or college degree	27 (75.0%)	28 (77.8%)	8 (22.2%)
Women with postgraduate education	12 (60.0%)	13 (65.0%)	5 (25%)
Gender and ethnicity			
African men	23 (48.9%)	30 (63.8%)	13 (27.7%)
Caribbean men	11 (61.1%)	14 (77.8%)	3 (16.7%)
Men of Canadian and other ethnicities	3 (60.0%)	4 (80.0%)	0
African women	33 (63.5%	37 (71.1%)	12 (23.1%)
Caribbean women	30(58.8%)	36 (70.5%)	37 (71.1%)
Women of Canadian and other ethnicities	4 (80.0%)	3 (60.0%)	0

Age and religiosity			
≤ 30 years of age and not/not very religious	12 (48.0%)	15 (60.0%)	4 (16.0%)
≤ 30 years of age and religious	12 (46.1%)	14 (53.8%)	3 (11.5%)
≤ 30 years of age and very religious	7 (46.7%)	11 (73.3%)	1 (6.7%)
31-50 years old and not/not very religious	13 (54.2%)	17 (70.8%)	7 (21.9%)
31-50 years old and religious	24 (75.0%)	24 (75.0%)	7 (21.9%)
31-50 years old and very religious	7 (53.8%)	9 (69.2%)	3 (23.1%)
> 50 years of age and not/not very religious	3 (42.9%)	6 (85.71%)	2 (28.6%)
> 50 years old and religious	16 (84.2%)	16 (84.2%)	5 (26.3%)
> 50 years old and very religious	2 (66.7%)	2 (66.7%)	1 (33.3%)

3.2 Bivariate Analysis

3.2.1 Outcome 1: Familiarity with RHAC

Age was found to be associated with familiarity with RHAC. Indeed, participants in the older age bracket (>50 years of age) were 1.54 (1.12, 2.13) times as likely to have heard of RHAC when compared to the youngest age group (Table 6). With regard to enabling factors, ACB community members who had a primary care provider were 1.51 (1.08, 2.12) times as likely to have heard about the ASO compared to those without a primary care provider (Table 7). No other potential predisposing, enabling, or need factors were associated with familiarity with RHAC in unadjusted analysis.

3.2.2 Outcome 2: Willingness to go to RHAC, if need be

Age was found to be associated with willingness to go to RHAC, if need be. ACB community members in the older age bracket (>50 years of age) were 1.37 (1.07, 1.34) times as likely to be willing to access RHAC, if need be when compared to the youngest age group (Table 6). Finally, men who are married are living common law were 1.46 (1.01, 2.10) time as likely to be willing to go to RHAC compared to men who were never married. No other factor was found to be significantly associated with the outcome in this bivariate analysis.

3.2.3 Outcome 3: Realized access to RHAC

Age was also associated with having been to RHAC. Individuals in the older age bracket (>50 years) were found to be 2.46 (1.12, 5.34) times as likely to have been to RHAC when compared to the youngest age group (Table 6). In addition, Canadian-born ACB people were 77% less likely (RR=0.23 (0.05, 0.93)) to have been to RHAC when compared to recent immigrants (Table 6). With regard to enabling factors, ACB community members with a higher score on the inappropriate fear of contagion scale were 19% less likely (RR=0.81 (0.67, 0.97)) to have been to RHAC (Table 7). The last category “Canadian and other ethnicities” was dropped for the variable “ethnicity” in conducting the analysis for the third outcome. This is because all participants in that category had indicated the same outcome, leaving no variation for the analysis.

Table 6. Unadjusted Prevalence ratios and 95% Confidence intervals for predisposing factors and socio-demographic intersections

Predisposing Factors	**Familiarity with (N=178)**	**Willingness to access (N=178)**	**Realized Access (N=178)**
Age			
≤ 30 years old	1.00	1.00	1.00
31-50 years old	1.26 (0.93, 1.71)	1.16 (0.91, 1.48)	1.76 (0.85, 3.68)
>50 years old	**1.54 (1.12, 2.13)***	**1.37 (1.07, 1.74)***	**2.46 (1.13, 5.34)***
Gender			
Male	1.00	1.00	1.00
Female	1.17 (0.90,1.53)	1.03 (0.84, 1.25)	0.89 (0.50, 1.57)
Marital Status			
Never Married	1.00	1.00	1.00
Married/Common Law	1.13 (0.86, 1.50)	1.09 (0.88, 1.37)	1.11 (0.59, 2.09)
Previously married	1.16 (0.84, 1.62)	1.16 (0.91, 1.49)	0.97 (0.41, 2.31)
Education			
Secondary education or less	1.00	1.00	1.00
Undergraduate/College education	1.24 (0.93, 1.64)	1.07 (0.87, 1.34)	1.30 (0.67, 2.51)
Postgraduate education	1.14 (0.82, 1.59)	0.99 (0.76, 1.29)	1.39 (0.68, 2.85)
Religiosity			
Not religious at all/Not very religious	1.00	1.00	1.00
Religious	1.30 (0.96, 1.74)	1.03 (0.82, 1.30)	0.81 (0.44, 1.51)
Very religious	0.93 (0.61, 1.43)	0.99 (0.74, 1.32)	0.68 (0.29, 1.61)
Income to needs ratio			
Per $1000 increase in $/person/year	1.00 (0.99, 1.01)	1.00 (0.99, 1.00)	1.00 (0.99, 1.02)
Time in Canada			
Born in Canada	1.21 (0.81, 1.82)	1.02 (0.74, 1.41)	**0.23 (0.05, 0.93)***

Less than 5 years in Canada	1.00	1.00	1.00
Between 5 and 10 years in Canada	0.88 (0.50, 1.55)	0.96 (0.66, 1.41)	0.66 (0.25, 1.77)
Ten years or more in Canada	1.25 (0.89, 1.74)	1.07 (0.84, 1.37)	0.73 (0.40,1.33)
Ethnicity			
African	1.00	1.00	1.00
Caribbean	1.05 (0.81,1.36)	1.07 (0.88, 1.31)	0.75 (0.41,1.35)
Canadian and Other ethnicities	1.24 (0.80, 1.92)	1.03 (0.67, 1.59)	+++
Gender and marital Status			
Men who never married	1.00	1.00	1.00
Men Married or living common law	1.22 (0.73, 2.04)	**1.46 (1.01, 2.10)***	1.53 (0.57, 4.14)
Previously married Men	1.39 (0.73, 2.04)	1.14 (0.62, 2.10)	1.62 (0.39, 6.77)
Women who never married	1.28 (0.81, 2.01)	1.26 (0.88, 1.82)	1.29 (0.51, 3.27)
Women Married or living common law	1.09 (0.32, 3.73)	1.09 (0.32, 3.73)	1.08 (0.04, 29.22)
Previously married Women	1.45 (0.28, 741)	1.45 (0.28, 7.41)	0.97 (0.01, 63.95)
Gender and education			
Men with secondary school or less	1.00	1.00	1.00
Men with undergraduate or college degree	1.00 (0.57, 1.74)	0.96 (0.66, 1.41)	1.30 (0.45, 3.71)
Men with postgraduate education	1.20 (0.71, 2.03)	1.01 (0.69, 1.48)	1.30 (0.43, 3.88)
Women with secondary school or less	1.08 (0.68, 1.70)	0.97 (0.71, 1.34)	0.90 (0.33, 2.41)
Women with undergraduate or college degree	1.50 (0.28, 7.82)	1.12 (0.35, 3.59)	1.15 (0.04, 34.20)
Women with postgraduate education	1.20 (0.23, 6.36)	0.94 (0.27, 3.24)	1.30 (0.04, 44.74)
Gender and ethnicity			
African Men	1.00	1.00	1.00
Caribbean Men	1.25 (0.78, 2.00)	1.22 (0.88, 1.69)	0.60 (0.19, 1.87)
Men of Canadian and other ethnicities	1.23 (0.57, 2.65)	1.25 (0.77, 2.04)	+++

African Women	1.30 (0.91, 1.85)	1.11 (0.84, 1.47)	0.83 (0.42, 1.64)
Caribbean Women	1.20 (0.30, 4.83)	1.10 (0.40, 3.05)	0.71 (0.03, 16.79)
Women of Canadian and other ethnicities	1.63 (0.21, 12.61)	0.94 (0.18, 4.88)	+++
Age and religiosity			
≤ 30 years of age and not/not very religious	1.00	1.00	1.00
≤ 30 years of age and religious	0.99 (0.56, 1.72)	0.92 (0.58, 1.45)	0.89 (0.23, 3.38)
≤ 30 years of age and very religious	0.93 (0.47, 1.83)	1.16, 0.73, 1.83)	0.52 (0.07, 4.00)
31-50 years old and not/not very religious	1.07 (0.62, 1.85)	1.04 (0.60, 1.79)	1.82 (0.61, 5.47)
31-50 years old and religious	1.46 (0.24, 8.90)	1.22 (0.29,5.16)	1.32 (0.02, 78.81)
31-50 years old and very religious	0.98 (0.11, 8.80)	1.09 (0.23, 5.12)	1.40 (0.005, 363.20)
>50 years of age and not/not very religious	1.15 (0.56, 2.38)	0.62 (0.24, 1.58)	2.70 (0.82, 8.89)
>50 years old and religious	1.73 (0.20, 14.55)	1.40 (0.35, 5.61)	1.83 (0.03, 128.08)
>50 years old and very religious	1.24 (0.09, 16.78)	1.05 (0.18, 6.20)	1.91 (0.005, 715.24)

*: Bolded values indicate significant factors at $p<0.05$
+++: This symbol indicates that the comparison was not conducted.
The reference group is indicated by the number 1.00
95% Confidence intervals are included with the prevalence ratio estimate

Table 7. Unadjusted Prevalence Ratios and 95% confidence interval for enabling factors

Enabling Factors or Barriers	Familiarity with (N=178)	Willingness to access (N=178)	Realized Access (N=178)
Score on HIV-knowledge questionnaire			
Per one digit increase in score	1.03 (0.97, 1.10)	1.02 (0.98, 1.06)	1.11 (0.97, 1.26)
Having a regular primary care provider			
No	1.00	1.00	1.00
Yes	**1.51 (1.08, 2.12)***	1.27 (0.99, 1.64)	0.85 (0.47, 1.56)
Perception of HIV/AIDS as NOT being an issue for the Black Community			
Strongly disagree	1.00	1.00	1.00
Disagree	0.82 (0.61, 1.11)	0.85 (0.67, 1.08)	1.00 (0.53, 1.88)
Neutral	0.96 (0.61, 1.51)	0.70 (0.42, 1.15)	0.30 (0.04, 2.09)
Agree	0.56 (0.18, 1.71)	0.86 (0.47, 1.58)	0.74 (0.12, 4.64)
Strongly agree	1.07 (0.60, 1.91)	1.07 (0.70, 1.65)	2.21 (0.89, 5.48)
Inappropriate fear of contagion			
Per one digit increase in score	0.96 (0.89, 1.04)	0.92 (0.83, 1.00)	**0.81 (0.67, 0.97)***
Perception of health care providers' knowledge of health needs of Black persons			
They don't know anything/They know a few things/I would rather not say	1.00 (0.75, 1.32)	0.94 (0.76, 1.17)	0.72 (0.37, 1.38)
The know /They know a lot	0.66 (0.30, 1.44)	0.54 (0.25, 1.17)	0.40 (0.06, 2.66)
I have not seen a health care provider	1.00	1.00	1.00

*: Bolded values indicate significant factors at $p<0.05$
The reference group is indicated by the number 1.00
95% Confidence intervals are included with the prevalence ratio estimate

Table 8. Prevalence Ratios and 95% Confidence intervals for the Need factor

Need Factor	**Familiarity with (N=178)**	**Willingness to access (N=178)**	**Realized Access (N=178)**
HIV-related Sexual Risk Profile			
High risk	1.27 (0.96, 1.70)	1.08 (0.88, 1.34)	1.46 (0.77, 2.76)
No, negligible or low risk	1.00	1.00	1.00

The reference group is indicated by the number 1.00
95% Confidence intervals are included with the prevalence ratio estimate

3.3 Multivariable Analysis

3.3.1 Outcome 1: Familiarity with RHAC

Predisposing factors

Due to problems with analysis of large number of additive-scale interactions using polytomous variables and a multiplicative-scale model (see Appendix A), additive-scale interactions were not included in any of the models for this outcome. The variables age, gender, income-to-needs ratio and religiosity were kept as influential variables after effecting the backward elimination. The variable “time in Canada”, education, ethnicity and marital status were not kept in the model.

Compared to ACB community members who were less than 30 years of age, participants age 50 years or older were 1.47 (1.06, 2.03) as likely to have heard of RHAC. There was no statistically significant effect observed for the other predisposing factors (Table 9).

Predisposing factors and enabling factors:

The variables “score on the HIV-knowledge scale” and “having a primary care provider” were kept in the model after conducting the backward elimination. The enabling factors “perception of HIV as NOT being an issue for the Black Community”, “score on the inappropriate fear of contagion questionnaire” and “perceived knowledge of health care provider about Black health issues” were not kept in the model.

Compared to ACB community members who were less than 30 years of age, participants age 50 years or older were 1.39 (1.00, 1.93) times as likely to have heard of RHAC. There was no association seen between enabling factors and the outcome, or between other predisposing factors adjusted for enabling variables and the outcome (Table 10).

Of note, the variable “HIV-related sexual risk” was not retained in the backward elimination model.

Table 9. Adjusted Prevalence ratios of familiarity with RHAC and 95% confidence intervals for predisposing factors

Factors	Prevalence Ratios
Age	
≤ 30 years old	1.00
31-50 years old	1.25 (0.92, 1.70)
>50 years old	**1.47 (1.06, 2.03)**
Gender	
Male	1.00
Female	1.19 (0.92, 1.55)
Income-to-needs ratio	
Per $1000 increase	1.00 (0.99, 1.00)
Religiosity	
Not religious at all/ Not very religious	1.00
Religious	1.23 (0.91, 1.66)
Very religious	0.95 (0.62, 1.44)

*: Bolded values indicate significant factors at $p<0.05$
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

Table 10. Adjusted Prevalence ratios of familiarity with RHAC and 95% confidence intervals for predisposing and enabling factors

Factors	Prevalence Ratios
Age	
≤ 30 years old	1.00
31-50 years old	1.23 (0.91, 1.67)
>50 years old	**1.39 (1.00, 1.93)**
Gender	
Male	1.00
Female	1.13 (0.87, 1.47)
Income-to-needs ratio	
Per $1000 increase	1.00 (0.99, 1.01)
Religiosity	
Not religious at all/ Not very religious	1.00
Religious	1.22 (0.91, 1.65)
Very religious	0.99 (0.65, 1.52)
Score on HIV-knowledge scale	
Per one digit increase in score	1.04 (0.97, 1.10)
Have a primary care provider	
No	1.00
Yes	1.33 (0.93, 1.90)

*: Bolded values indicate significant factors at $p<0.05$
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

3.3.2 Outcome 2: Willingness to access RHAC, if need be

Predisposing Factors:

Similar to the first outcome, additive-scale interactions were not included in any of the models for this outcome. The predisposing factors age and income-to-needs ratio were kept in the model. The variables marital status, gender, education, ethnicity, religiosity, "time in Canada" were removed from the model.

ACB community members who were 50 years of age or older were 1.41 (1.10, 1.81) as likely to be willing to go to RHAC. There was no association found between the income-to-needs ratio variable and the outcome (Table 11).

Predisposing and enabling factors:

With regard to enabling factors, "having a primary care provider" and the "score on the HIV-knowledge scale" were kept as influential factors in the model after backward elimination. The variables "perception of HIV as NOT being an issue for the Black Community" "score on the inappropriate fear of contagion questionnaire" and "perceived knowledge of health care provider about Black health issues" were removed from the model.

ACB community members who were 50 years of age or older were 1.31 (1.03, 1.68) as likely to be willing to go to RHAC. No association was found between enabling factors and the outcome, or between the variable income-to-needs ratios adjusted for enabling variables and the outcome (Table 12).

Of note, the variable HIV-related sexual risk was not kept in the backward elimination mode

Table 11. Adjusted Prevalence ratios of willingness to RHAC and 95% confidence intervals

Factors	**Prevalence Ratios**
Age	
≤ 30 years old	1.00
31-50 years old	1.18 (0.93, 1.51)
>50 years old	**1.41 (1.10, 1.81)**
Income-to-needs ratio	
Per $1000 increase	1.00 (0.99, 1.00)

for predisposing factors

*: Bolded values indicate significant factors at p<0.05
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

Table 12. Adjusted Prevalence ratios of willingness to access RHAC and 95% confidence intervals for predisposing and enabling factors

Factors	Prevalence Ratios
≤ 30 years old	1.00
31-50 years old	1.15 (0.91, 1.44)
>50 years old	**1.31 (1.03, 1.68)***
Income-to-needs ratio	
Per $1000 increase	1.00 (0.99, 1.00)
Have a primary care provider	
No	1.00
Yes	1.26 (0.98, 1.61)
Score on the inappropriate fear of contagion scale	
Per 1 increase in score	0.91 (0.83, 1.00)

*: Bolded values indicate significant factors at $p<0.05$
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

3.3.3 Outcome 3: Has been to RHAC

Predisposing factors:

Similar to the first two outcomes, additive-scale interactions were not included in any of the models for this outcome. The variables age, income-to-needs ratio, religiosity, “time in Canada” and ethnicity were kept in the model after effecting the backward elimination. The variables gender, marital status and education were removed from the model.

ACB community members who were 50 years of age or older were 2.97(1.16, 7.60) as likely to have been to the location of RHAC compared to the youngest age group. ACB community members who were born in Canada were 75% less likely (RR=0.25 (0.06, 0.99)) to have been to RHAC compared to immigrants that had been in the country for five years or less (Table 16). Similarly, those who had been in the country for more than ten years were 50% less likely (RR=0.50 (0.25, 0.98)) to have been to the RHAC compared to immigrants who had been in the country for five years or less (Table 13). No significant association was found between income-to-needs ratio, religiosity nor ethnicity and the outcome.

Predisposing and enabling factors:

The variables “score on the HIV knowledge scale” and “Perception of HIV/AIDS as NOT being an issue for the Black Community” were kept in model after conducting the backward elimination. The variables “having a primary care provider”, “score on the inappropriate fear of contagion questionnaire”, and “perceived knowledge of health care Provider about Black Health issues” were removed from the model.

With regard to predisposing factors, compared to ACB community members who were less than 30 years of age, participants age 50 years or older were 3.25 (1.27, 8.33) times as likely to have heard of RHAC. In addition, those that were born in Canada were 76% less likely (RR=0.24 (0.07, 0.84)) to have been to RHAC compared to immigrants who had been in the country for five years or less (Table 14). No enabling factors were found to be significantly associated with the outcome.

Of note, the variable HIV-related sexual risk was not kept in the backward elimination model.

Table 13. Adjusted prevalence ratios of physical access to RHAC and 95% confidence intervals for predisposing factors

Factors	Prevalence Ratios
Age	
≤ 30 years old	1.00
31-50 years old	1.87 (0.87, 3.98)
>50 years old	**2.97(1.16, 7.60)***
Income to need ratio	
Per $1000 increase	1.01 (0.99, 1.03)
Religiosity	
Not religious at all/ Not very religious	1.00
Religious	0.58 (0.31, 1.06)
Very religious	0.47 (0.18, 1.25)
Time in Canada	
Born in Canada	**0.25 (0.06, 0.99)***
Less than 5 years in Canada	1.00
Between 5 and 10 years in Canada	0.50 (0.16, 1.61)
Ten years or more in Canada	**0.50 (0.25, 0.98)***
Ethnicity	
African	1.00
Caribbean	0.59 (0.28, 1.28)

*: Bolded values indicate significant factors at p<0.05
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

Table 14. Adjusted Prevalence ratios of physical access to RHAC and 95% confidence intervals for predisposing and enabling factors

Factors	Prevalence Ratios
Age	
≤ 30 years old	1.00
31-50 years old	1.75 (0.78,3.91)
>50 years old	**3.25 (1.27, 8.33)***
Income to needs ratio	
Per $1000 increase	1.01 (0.99, 1.04)
Religiosity	
Not religious at all/ Not very religious	1.00
Religious	0.66 (0.34, 1.28)
Very religious	0.57 (0.21, 1.56)
Time in Canada	
Born in Canada	**0.24 (0.07, 0.84)***
Less than 5 years in Canada	1.00
Between 5 and 10 years in Canada	0.59 (0.20, 1.73)
Ten years or more in Canada	0.57 (0.29, 1.11)
Ethnicity	
African	1.00
Caribbean	0.58 (0.28, 1.24)
Score on HIV-knowledge scale	
Per one digit increase in score	1.11 (0.97, 1.28)
Perception of HIV/AIDS as NOT being an issue for the Black Community	
Strongly disagree	1.00
Disagree	1.17 (0.63, 2.17)
Neutral	0.33 (0.05, 2.07)
Agree	0.67 (0.11, 3.90)
Strongly agree	2.66 (0.70, 10.17)

*: Bolded values indicate significant factors at $p<0.05$
95% Confidence intervals are included with the prevalence ratio estimate
The reference group is indicated by the number 1.00

Chapter 4

4 DISCUSSION

This thesis set out to explore the factors associated with access to RHAC by ACB community members and test for socio-demographic differences within ACB communities. This was done using an integrated model of Andersen-Gelberg for vulnerable populations with an overarching intersectionality framework. Descriptive statistics show that this sample is predominantly female, younger and fairly educated. In addition, most ACB community members in the sample are of African ethnicity, identify as religious or very religious and are immigrants to Canada. Furthermore, this sample scored quite high on the HIV-knowledge score while showing low levels of inappropriate fear of contagion of HIV/AIDS. This analysis highlights two main factors of influence with regard to access to care in this sample, older age and length of time in Canada. Additional factors seen to influence access to the ASO include having a primary care provider and the inappropriate fear of contagion of HIV/AIDS. The results of this project are discussed by order of importance. First, the findings that were significant in bivariate analysis are addressed. Then, important factors, found to be related to access to RHAC in multivariable analysis, that is when other important factors are controlled for, are discussed.

4.1 Bivariate analysis

4.1.1 Primary health care and familiarity with RHAC

Access to a primary care provider was considered to be an enabling factor with regard to facilitating contact with the ASO in this analysis. Primary health care is defined by Health Canada as “an approach to health” and the array of services that influences health beyond the regular health care system [104]. Primary care providers, who can be family doctors, nurse practitioners or pharmacists are considered the first point of contact with the health care system in Canada and often provide referrals to further health and social services [104]. This variable was therefore included within the *traditional* domain of the model.

ACB community members with a primary care provider were more likely to have heard of RHAC compared to those who did not have one. This finding might be indicating a proper connection between the ASO's outreach workers and the medical community. Indeed, these primary care providers might be more likely to be informed about the services offered at RHAC and notify their patients about the presence of the organization in Middlesex-London. This is reassuringly different from what the literature suggests on ACB community members' interactions with primary care providers. Indeed, Burns et al. found that physicians' uneasiness with HIV/AIDS referrals contributed to the barriers affecting access to care in ACB communities in Britain [36]. Additionally, ACB women in Canada expressed the fear of losing one's family physician as one of the additional difficulties faced by people living with HIV/AIDS, suggesting the perception of prejudice from their care provider [51]. No association was found between having a primary care provider and the willingness to access the organization or the access to the ASO's location. This indicates that primary care providers do not influence their patients' access to the organization in further ways.

Alternatively, it might be that ACB community members who advocate more for their health and take upon themselves to have a primary care provider were also more likely to have knowledge of another organization that might be of relevance to them. This might explain why having a primary care provider no longer has an association when other socio-demographic factors were controlled for.

4.1.2 Inappropriate fear of contagion and access to the location of RHAC

The score on the Inappropriate fear of contagion scale was included in the *vulnerable* domain as this scale measure one facet of stigma, a factor identified as a great deterrent to HIV/AIDS care in the literature. ACB community members as a whole had a low score on the inappropriate fear of contagion scale as the median was a 2.0 and with a range from 0 to 10. In this sample, participants with higher scores on the inappropriate fear of contagion scale were less likely to have accessed the physical space of the organization. The effect of stigma on access has implications for education services and testing for people at risk of HIV/AIDS. A study reviewing the literature on HIV stigma showed that higher levels of stigma were associated with a decrease in willingness to attend voluntary counselling and testing, decreases in disclosure of test results and erroneous knowledge about the transmission of HIV/AIDS [105]. Importantly, the effect was no longer seen in multivariable analysis, which means that other socio-demographic and enabling variables might explain the variation observed.

Stigma and discrimination were also identified as some of the primary barriers in accessing HIV services by ACB people and service providers from ASOs in the literature [44], [64]. ACB community members might delay accessing needed care and avoid associating with ASOs due to stigma. This is primarily caused by the fear of inadvertent disclosure of HIV-status to other community members by being seen accessing HIV-related services [44], [64]. This is especially true within smaller ethnic groups where there are more chances of being recognized [44]. This anxiety around access to care is due to the social consequences associated with the disclosure of one's seropositivity, especially when HIV/AIDS is linked with negative connotations such as promiscuity [44]. The consequences include social isolation, rejection and gossiping within the communities of origin [42]. These factors might explain why stigma was only found to be associated with physical access to RHAC, but not with familiarity with, nor willingness to access to the AIDS service organization. Indeed, the social consequences would only be felt if one were to be seen at the location of RHAC. Stigma and discrimination were also identified to have negative consequences for ACB people living with HIV/AIDS [65]. Indeed, stigma is associated with fear of disclosure to family members and intimate partners, avoidance of social situations, difficulties engaging in romantic relationships and hindrance to treatment adherence for ACB people living with HIV/AIDS [65].

It is important to note that the scale used in this analysis measures fear of inappropriate contagion through casual contact. This is only one -limited- facet of the concept of stigma. Stigma is multileveled, affects more than individuals and communities and often permeates the very institutions that legislate and deliver care to marginalized communities [105]. Other dimensions of stigma include negative judgments about people living with HIV, enacted stigma or discrimination, and compounded stigma, defined as HIV-stigma exacerbating the marginalization of groups [105]. Addressing stigma as a multifaceted construct has been proven more useful in addressing this issue through interventions [105]. However, other dimensions were not reflected in this analysis and it is therefore hard to determine their effect on access to care in this sample. Of note, enacted stigma or discrimination was measured in the BLACCH Study survey, but was not included in this specific analysis as it was identified as being potentially correlated with access to the ASO. That is, ACB community members who were more linked with ASOs in general would probably be more likely to personally know or have heard stories about people discriminated against due to their seropositivity.

4.2 Multivariable Analysis

Andersen defined predisposing factors as the socio-demographic factors and health beliefs that might impact access to care. The integrated model used in this thesis included typical demographics often used such as age and gender as well as those identified as influential by the literature on access to HIV/AIDS services, such as marital status, religiosity and education. Two variables, length time in Canada and ethnicity were included in the vulnerable domain as they constituted domains of heterogeneity within ACB communities and were identified by the literature and the advisory committee as particular vulnerabilities in this group with regard to access to care. Two socio-demographic factors included in the predisposing domain were found to be significant in this project. Specifically, in both crude and adjusted analysis, age was found to be significantly associated with every indicator used and length of time in Canada was associated with accessing the physical location of RHAC.

4.2.1 Age as a determinant of access to care: knowledge, willingness, and physical access

Age is one of the demographic variables included in the *traditional* domain of predisposing factors affecting access to health care in the Andersen-Gelberg model for vulnerable populations [74]. In the first version of the behavioural model of health services use, Andersen and Davidson present age and gender as "biological imperatives" that influence the need for health services [73]. A systematic review of the Andersen Model for health care utilization found that age was among the demographic variables the most researched when using this model. Additionally, the majority of studies found a significant association between age and health care utilization [74]. However, the directions of the effects varied between studies with no clear pattern emerging [74].

In this sample, ACB community members in the older age bracket (>50 years of age) were more likely to be familiar with RHAC, be willing to access the organization or to have been there. These effects were seen in adjusted multivariable analysis for all three outcomes, which suggests that they are not explained by other socio-demographic and enabling factors. Although the biological explanation for age influencing access to care is sensible, it is quite likely that age serves as a proxy for other constructs not controlled for in this analysis. Indeed, RHAC does not deliver medical but social services. For instance, these results might be due to higher perceived needs within this age group. Additionally, the older an individual is, the longer they have to access an organization when compared to their younger peers.

A systematic review assessing access to HIV/AIDS care in high and low income countries is one of the few studies that can be used as comparison. The authors found that participants who were between 25 and 34 years of age were less likely to access testing, start treatment and show optimal adherence in high income countries[101]. Similarly, being between 35 to over 45 years of age was associated with lower uptakes of HIV-testing and adherence in low income countries [101]. However, being 50 years of age or older had a protective effect in high income countries, with people living with HIV/AIDS showing better adherence to treatment in these settings [101]. Pooled estimates showed that, in general, being younger than 30 years of age was associated with lower adherence with the opposite effect seen for participants over the age of 50 [101]. Unfortunately, the authors do not offer additional insight into what upstream factors might be producing these findings.

In Canada, AIDS service organizations were created as a way of supporting people living with HIV/AIDS, consisting primarily of gay men, expected to die within years, perhaps months of a positive diagnosis [102]. However, with the advent of highly active anti-retroviral therapy, individuals living with HIV/AIDS now have a life expectancy close to those not affected by the infection [102]. Notwithstanding these facts, ASOs have stayed on as social hubs for many older gay men living with or affected by the HIV/AIDS epidemic [102]. With the event of the digital age however, younger gay men are seen to be accessing health information and forming community bonds online[103]. Although this generation shift is not directly related to ACB people's access to ASOs, the expansion of the mandate of this organization might partly explain these findings. With the changing demographics of those at risk for HIV/AIDS, due to the increased immigration from countries where HIV/AIDS is endemic, and the shift in mode of access of HIV-related services, ASOs such as RHAC have had to broaden the scope of their practice [2]. They are now working with very diverse ethno-racial communities, often facing needs different from the groups RHAC originally served [102]. This expansion of services provided by the organization now includes community development projects and engagement in ethno-cultural activities in Middlesex-London. These programs might be more likely to attract older ACB community members. This group might be then more likely to get involved or associate with the agency, as compared to their younger peers.

4.2.2 Time in Canada as a determinant of access to the location of RHAC

The variable length of time in Canada was included in the model as one of the predisposing factors, in the *vulnerable* domain. This factor was used to capture ACB community members who were born in Canada, as well as recent and longer-term immigrants. Heterogeneity within ACB communities was found as access to the locale of the organization depended on the length of time in Canada. Canadian-born ACB people were less likely to have been to the location of RHAC when compared to recent immigrants. This effect was seen even when predisposing and enabling variables were added to the model. This might indicate that ACB people emigrating from countries where HIV is endemic are more comfortable accessing HIV-related care than Canadian-born ACB people. Alternatively, ACB participants born in Canada might be at lower risk for HIV/AIDS and thus might not need to access RHAC. As shown in the literature, ACB groups can have very different risk profiles [69]–[71] and thus they do not necessarily present with the same needs nor do they face the same barriers to access to care [72].

When considering only predisposing factors, recent immigrants from ACB communities are also more likely to access RHAC when compared to those who have been in Canada for 10 years or more. Multiple factors might explain this finding. Newer

ACB community members might be less likely to know many other individuals in the Middlesex London area. Therefore, accessing services at RHAC would not necessarily impact their social perception by other ACB community members with regard to being seen at an ASO. Alternatively, this finding might also be evidence of proper liaison between RHAC and settlement and immigration agencies. The multicultural prevention worker at RHAC has an outreach program at Limberlost, a community center working around housing issues situated in Middlesex-London that also serves newcomers. This outreach program might partly explain the differential access between recent immigrants and Canadian-Born ACB community members as well as immigrants who have been in Canada for longer.

4.3 STRENGHTS AND LIMITATIONS

This study adds to the limited literature of access to care in ACB communities in high-income countries. Moreover, this is one of the few quantitative research projects looking at access to an ASO. Additionally, this study was conducted in partnership with the ASO in question and thus its findings will have direct implications for the organization. Furthermore, this project was undertaken in a middle-sized city as opposed to greater urban centers where such projects are usually undertaken.

The primary limitation of this study is its sample size. With 188 participants, further breakdown of important factors such as ethnicity was not possible. In addition, the small sample size limits the inferences that can be made from the results. Moreover, this study might have been underpowered to detect the effects of some of the factors in multivariable analysis. For instance, Canadian-born ACB community members and ACB community members who have immigrated to Canada ten years ago or more were found to be less likely to access RHAC. However, when additional variables were added to the model, the effect faded for ACB community members who had been in Canada for ten years or more. This might be due to a lack of power to detect an effect. Finally, due to the sample size, it was not possible to evaluate access to specific services and programs within RHAC such as the winner's circle or the women's group. In addition, it was not possible to do an omnibus chi-square test for discrete variables. This is because this function is not offered by the SAS software with multiple imputed datasets [106].

Therefore, although Canadian-born ACB community members are less likely to access to ASO compared to recent immigrants, it was not possible to test whether time in Canada, as a variable, was associated with access.

Another limitation of this study has to do with the design of some the questions. Indeed, it is not possible to establish temporality between some the factors of interest and the outcomes. For instance, although HIV-related sexual risk was measured within the past year, there was no temporality attached to the questions measuring access to RHAC. Thus, it is not possible to differentiate whether a participant accessed the organization within the past year or ten years ago. Therefore, it becomes difficult to make causal inferences with regard to pathways to care. Additionally, some of the measures used might have been subject to recall bias. These include the question regarding sexual behaviour of participants as well as questions addressing access to the agency. Also, due to the sensitive nature of some of the questions, there might have been some desirability bias in participants' responses.

The Andersen-Gelberg model might not be an appropriate framework for evaluating access to ASOs by ACB communities. Indeed, of all the socio-demographic factors used in this model, only age and the participant's length of time in Canada were found to be associated with the outcomes. The enabling factors used in this analysis were the score on knowledge of HIV/AIDS scale, access to a primary care provider, awareness of HIV/AIDS as being an issue in ACB communities, score on the inappropriate fear of contagion, and perception of one's care provider's knowledge of Black health issues. In multivariable analysis, no enabling factor was found to be associated with the outcomes. It is possible that the socio-demographic characteristics explain all the variation seen in the enabling factors. However, it might also be that, although suggested as influential in the literature, the factors used are poor constructs in terms of enablers of access to care. Furthermore, as illustrated in the previous section, there might be construct validity issues with some of the measures used in this analysis, reinforcing the need for validation of these measures in ACB communities. Finally, no association was found between the variable HIV-sexual risk, which was conservatively defined around the consistent use of condoms, and any of the outcomes. It might have been more useful and more in line with community-based research to quantify participants perceived needs with regard to

HIV/AIDS however, this information was not available. Additionally, this variable was not retained in any of the final analytical models. It is therefore possible that this theoretical model is not fit for this population, or, that other variables need to considered and validated within these communities.

This thesis was started after the decision of the Supreme Court of Canada on the issue of non-disclosure of HIV status in Canada [107]. Advocates for people at risk for or living with HIV/AIDS have warned that this decision and the judicial pursuits that ensue from it will negatively impact access to HIV/AIDS care [108]. However, because this data was collected before the Supreme Court decision, it was not possible to assess its impact on the health seeking behaviour of ACB communities in Middlesex- London [82].

4.4 IMPLICATIONS FOR FUTURE RESEARCH

Additional research is needed to test whether the Andersen-Gelberg model is adequate to evaluate access to ASOs by ACB participants. Additionally, some components of this model need to be expanded and validated. This is especially the case for the stigma measure which only assesses one facet of stigma, fear of contagion through casual contact [105]. Other measures of interest with regard to stigma might include scales assessing negative judgments about people living with HIV, enacted stigma and compounded stigma [105].

Our findings suggest evidence of good linkage between services at RHAC and other social and health agencies. Mainly, ACB community members with primary care providers were more likely to have heard of RHAC when compared to their peers. Additionally, more recent immigrants were more likely to have accessed the location of the organization when compared to other groups. It would be useful to confirm these findings with clients of the organization.

In addition, the effects of age and generational differences with regard to access to RHAC might be of importance to the agency. There seems to be a gap in the literature with regard to the psychological and sociological factors influencing access to care in seronegative, middle aged individuals with regard to HIV/AIDS. Moreover, the prevalence of risks with regard to age groups should be assessed to determine whether groups with higher needs are indeed accessing the organization. It would also be useful for RHAC to evaluate access to specific services from the different age groups.

These findings point to potentially useful target groups for prevention. For instance, it might relevant to investigate the factors influencing access for Canadian-born ACB community members. This could contribute to explain the differential access seen in this group when compared to recent immigrants. Additionally, our study highlights the impact of stigma on access to HIV-care, illustrating the need to continually address this factor within ACB communities. Finally, the ruling of the Supreme Court of Canada might be affecting access to ASOs and investigating this effect might be of relevance to the agency.

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Appendix A. Statistical issues with assessing additive interactions in multiplicative models with chunkwise regression.

As part of the analysis planned for this thesis, and in keeping with intersectionality theory, additive interactions were screened for in each of the models. There are multiple indices that can be used to test for additive interactions in a multiplicative model. However, some of the underlying statistical assumptions for these indices occasionally make it impossible to estimate these indicators and/or interpret them. This appendix present the three indices used to test for additive interaction in multiplicative models. In addition, the issues that rendered this part of the analysis impossible to conduct are discussed. Finally, tables with estimates for the three models are presented to illustrate the matter.

There are three main indices that can be used to test for additive interactions. The relative excess risk due to interaction (RERI) measures the relative risk of disease occurring when there is joint exposure of two factors, compared to the absence of exposure[109]. RERI estimates can vary from negative infinity to positive infinity. A negative RERI is indicative of antagonistic interaction while a positive RERI is indicative of a synergistic interaction[86]. If the RERI is found to be null (i.e. RERI=0), there is no evidence of additive interaction[109].Significant additive interaction is deduced when the confidence interval of this measure does not include the number0. The attributable proportion (AP) measures the proportion observed that is due to combined exposure[109]. Similar to the RERI, a negative AP estimate is indicative of antagonistic interaction while a positive AP is indicative of a synergistic interaction[109]. If the estimate for the AP is null (i.e. AP=0), then there is no evidence of additive interaction[109]. Significant additive interaction is deduced when the confidence interval of this measure does not include the number 0.

The synergy index can be defined as the excess risk from the presence of interaction relative to the excess risk in the absence of interaction[110]. If the synergy index is smaller than 1 than there is evidence of antagonism, conversely, if the synergy index is greater than 1 then there is evidence of synergism[110]. The synergy index was used as the main estimate to test for the presence of a significant additive interaction in this thesis. This is because the synergy index was found to be the most robust when there are additional covariates added in the model [111].Significant additive interaction is deduced when the confidence interval of this measure does not include the number 1[110].

In conducting this analysis, the synergy index was sometimes found to be negative and its confidence interval not estimable. This might be due to an opposite directionality of effects between the two main effects. For instance, although those who identify as very religious were less likely to have heard or be willing to go to the ASO when compared to the reference group, individuals in the older age bracket were more likely to access the ASO. Knol et al. argue that if one of the main effects is preventative then the estimates of the RERI and synergy index are no longer interpretable [109]. The authors advise recoding variables so that the group at the lowest risk where both factors are considered together serves at the reference group [109]. Of note, when directionality differs, Knol et al. also found that the indices from the RERI and AP might render opposite findings i.e. one parameter might show evidence of synergism while the other show evidence of antagonism [109]. Therefore, even if estimates are found for those two indices, it is possible that one, or both of them are erroneous.

In keeping with Knol et al.'s recommendation, it would be possible to change the reference group for factors with preventive effects. For instance, the reference group for religiosity could be changed from not religious at all/not very religious to religious or very religious. However, when handling a variable used in multiple cross-terms, additional issues arise. For instance, the variable, gender was included into three out of four intersections. If the reference group were to be changed from male to female for one intersection, it would not be possible to use the male category as a reference group for any another intersection in the model, even if men constitute the group at the lowest risk when interacting with another factor. Therefore, this complicates the use of the groups at lowest risk as the reference category in this analysis. Additionally, as this analysis was constructed in a stepwise fashion, adding or removing one variable might affect the directionality of the effects and would potentially require changing the reference group at each step. Furthermore, changing the reference group to use the one at the lowest risk might require using group with the smallest sample size as the reference group, which has implications for power, or lack thereof. Finally, changing the reference group could have violated one of the tenets of intersectionality which advocates for using the most marginalized group as a point of reference [76]. The tables presented below are the products of screening for additive interaction in the three multiplicative models built.

Table 15. Estimates of indices for additive interaction: Familiarity with RHAC[1]

	RERI (CI)	AP (CI)	S (CI)
Gender and marital Status			
Men who never married	1.00	1.00	1.00
Women Married or living common law	-0.08 (-1.01, 0.46)	-0.07 (-0.7, 0.46)	0.65 (0.04, 11.38)
Previously married Women	-0.35 (-1.59, 0.26)	-0.34 (-1.35, 0.34)	0.05 ($1.75*10^{-12}$, 1.71)
Gender and education			
Men with secondary school or less	1.00	1.00	1.00
Women with undergraduate or college degree	0.43 (-0.32, 1.92)	0.31 (-0.61, 0.83)	-10.83***
Women with postgraduate education	0.0006 (-0.82, 1.05)	0.0006 (-1.37, 0.72)	1.03 ($1.8*10^{-13}$, 5.87)
Gender and ethnicity			
African Men	1.00	1.00	1.00
Caribbean Women	-0.35 (-1.24, 0.17)	-0.31 (-1.01, 0.19)	0.26 (0.03, 2.57)
Women of Canadian and other ethnicities	-0.35 (-2.08, 0.92)	-0.25 (-1.99, 0.35)	0.54 (0.05, 5.47)
Age and religiosity			
≤ 30 years of age and not/not very religious	1.00	1.00	1.00
31-50 years old and religious	0.36 (-0.68, 0.95)	0.24 (-0.35, 0.71)	4.01 (0.002, 7558.28)
31-50 years old and very religious	-0.10 (-1.42, 0.82)	-0.10 (-1.78, 0.65)	-0.26***
>50 years old and religious	0.53 (-0.87, 1.30)	0.31 (-0.42, 0.77)	3.82 (0.01, 1147. 39)
>50 years old and very religious	0.15 (-1.57, 1.87)	0.12 (-2.03, 0.77)	2.03 (0.0005, 7067.41)

*** Confidence interval not estimable

[1] Not all the estimates are interpretable due to differences in directionality

Table 16. Estimates of indices for additive interaction for outcome 2: Willingness to access RHAC[1]

	RERI (CI)	AP (CI)	S (CI)
Gender and marital Status			
Men who never married	1.00	1.00	1.00
Women Married or living common law	-0.10 (-1.04, 0.43)	-0.08 (-0.74, 0.42)	0.67 (0.08, 5.53)
Previously married Women	-0.35 (-1.56, 0.32)	-0.32 (-1.33, 0.31)	0.23 (0.004, 12.68)
Gender and education			
Men with secondary school or less	1.00	1.00	1.00
Women with undergraduate or college degree	0.15 (-0.38, 0.51)	0.13 (-0.28, 0.50)	-14.84***
Women with postgraduate education	0.004 (-0.63, 0.511)	0.004 (-0.72, 0.46)	0.86 ($2.93*10^{-9}$, 254665851)
Gender and ethnicity			
African Men	1.00	1.00	1.00
Caribbean Women	-0.25 (-0.85, 0.13)	-0.22 (-0.66, 0.14)	0.35 (0.11, 1.07)
Women of Canadian and other ethnicities	-0.52 (-1.55, 0.55)	-0.58 (-3.07, -0.02)	-0.10***
Age and religiosity			
≤ 30 years of age and not/not very religious	1.00	1.00	1.00
31-50 years old and religious	0.15 (-0.59,0.52)	0.12 (-0.36, 0.55)	2.47 (0.003, 2074.36)
31-50 years old and very religious	-0.20 (-1.15,0.53)	-0.17 (-1.18, 0.36)	0.41 (0.01,14.02)
>50 years old and religious	-0.08 (-0.96, 0.37)	-0.05 (-0.5, 0.36)	0.85 (0.28, 2.62)
>50 years old and very religious	-0.71 (-1.94, 0.63)	-0.68 (-3.46, -0.04)	0.07 ($8.55*10^{-9}$, 523668.9)

*** Confidence interval not estimable

[1] Not all the estimates were interpretable due to differences in directionality

Table 17. Estimates of indices for additive interaction for outcome 3: Access to RHAC[1]

	RERI (CI)	AP (CI)	S (CI)
Gender and marital Status			
Men who never married	1.00	1.00	1.00
Women Married or living common law	-0.08 (-1.01, 0.46)	-0.07 (-0.75, 0.46)	0.65 (0.04, 11.38)
Previously married Women	-0.35 (-1.59, 0.26)	-0.34 (-1.36, 0.34)	0.05 ($1.75*10^{-12}$, 1.71)
Gender and education			
Men with secondary school or less	1.00	1.00	1.00
Women with undergraduate or college degree	-0.21 (-3.31, 1.17)	-0.16 (-2.04, 0.95)	0.58 (0.02, 15.59)
Women with postgraduate education	0.57	0.36 (-1.42, 1.34)	-8.87***
Gender and ethnicity			
African Men	1.00	1.00	1.00
Caribbean Women	-0.30 (-1.87, 063)	-0.78 (-8.61, 3.78)	1.96 (0.07, 51.15)
Women of Canadian and other ethnicities	+++	+++	+++
Age and religiosity			
≤ 30 years of age not/not very religious	1.00	1.00	1.00
31-50 years old and religious	-0.30 (-4.32, 0.84)	-0.35 (-3.66, 1.73)	-1.11 ***
31-50 years old and very religious	-0.07 (-4.42, 2.54)	-0.09 (-7.12, 3.24)	1.78 ($9.57*10^{-9}$, 331121103)
>50 years old and religious	-0.08 (-5.20,2.17)	-0.05 (-2.25, 1.25)	0.87 (0.04, 20.48)
>50 years old and very religious	0.11 (-5.56, 8.30)	0.07 (-7.73, 2.94)	1.26 (0.002, 948.88)

*** Confidence interval not estimable

[1] Not all the estimates were interpretable due to differences in directionality

Curiculum Vitae

Soraya Blot

RESEARCH INTERESTS

- Social Determinants of Health
- Immigrant communities
- Health Services Access
- HIV/AIDS

EDUCATION

Master of Science
September 2012-August 2014
Population Epidemiology
Master's Thesis: Heterogeneity in access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London
Academic Advisor: Greta R. Bauer PhD, MPH
Bachelor of Health Sciences
September 2008-April 2012
Honors Specialization in Health Sciences with Biology
Minor in Rehabilitation Sciences
Western University

RESEARCH EXPERIENCE

Field Mentoring Placement, University Without Walls
September 2013-Present
The Ontario HIV treatment Network

- Using data from the OHTN Cohort study to develop a profile of African Caribbean and other Black communities living with HIV/AIDS and linked to care in Ontario

Student Researcher
September 2012 — August 2014
Black African and Caribbean Canadian Health (BLACCH) Study
Department of Epidemiology and Biostatistics, Western University

- Working collaboratively with community organization staff and Western University researchers, designed an analysis of access to the Regional HIV/AIDS Connection among Black, African and Caribbean residents of London-Middlesex, using data collected as part of a community-based research project.
- Independently conducted statistical analysis using the following methods: multiple imputation, cross-tabulation, multiple regression, modified Poisson regression (robust variance), chunkwise regressions, and additive-scale interaction.

- Currently producing research results in three formats for different purposes or audiences: MSc thesis (complete), community report (in draft form), and academic article for submission to peer-reviewed journal (in draft form).

Research Assistant, Health in Middlesex Men Matters (HiMMM) Project
September 2012-August 2014
Department of Epidemiology and Biostatistics, Western University

- Performed a literature review to identify factors affecting HIV testing for Men who have Sex with Men (MSM)
- Reviewed the survey codebook to verify the accuracy and consistency of codes and labels for variables
- Reviewed the scientific literature to identify methods for handling variables missing from survey scales, recoded variables of interest and calculated relevant scores
- Prepared reports on descriptive statistics for the sample and their perception of acceptance of the LGBT community and the broader London community for the research team
- Performed statistical tests to determine whether there were differences in perception of acceptance of different groups in the LGBT community and in the broader London community
- Participated in the conceptualization of the model for qualitative analysis on HIV sexual risk in the sample

Summer Research Student, Neurofibromatosis Type 1 research project
May 2011 -August 2011
Clinical and Metabolic Genetics, The Hospital for Sick Children

- Performed a literature review on Neurofibromatosis Type 1 diagnosis and compiled the relevant bibliography
- Reviewed and classified approximately 200 charts of patients tested for Neurofibromatosis Type 1
- Designed and entered data on a Microsoft Excel spreadsheet and undertook primary data analysis for descriptive statistics
- Designed and presented a poster outlining the research project undertaken and the early findings of the analyses conducted at the Sickkids Summer Research Program (Ssure)

PRESENTATIONS

- Heterogeneity in familiarity with, willingness to attend and access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. Poster Presentation. Canadian Society for Epidemiology and Biostatistics (CSEB) National Student Conference. May 2014. Hamilton ON.
- Heterogeneity in familiarity with, willingness to attend and access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. Poster Presentation. Canadian Association for HIV Research: CAHR. May 2014. St John’s NL.

- Heterogeneity in familiarity with, willingness to attend and access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. Oral Presentation. Intersectionality Research, Policy and Practice: Influences, Interrogations and Innovations. April 2014. Vancouver BC.
- Heterogeneity in familiarity with, willingness to attend and access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. Poster Presentation. London Health Research Day. March 2014. London ON.
- Heterogeneity in familiarity with, willingness to attend and access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. Poster Presentation. Ontario HIV Treatment Network Conference. November 2013.Toronto ON.
- HIV/AIDS and stigma in Ontario's African Caribbean and other Black communities. Muslim Community Forum. October 2013. Oral Presentation. Windsor ON.
- Establishing Genetic Testing Guidelines for NF1 in Patients Who Do Not Meet Clinical Diagnostic Criteria. Poster Presentation: The Sickkids Summer Research Program (Ssure) Conference day. July 2011. Toronto ON.

PUBLICATIONS

- Lewis NM, Bauer GR, Coleman TA, Blot S, Pugh D, Fraser M, Powell L. Community cleavages in the post-AIDS post-rights era: Effects of age, race, sexual identity, and place on gay and bisexual men's perceptions of gay and mainstream community acceptance. Under review, *Journal of Homosexuality*.
- Blot S, Bauer GR, Fraser M, Nleya M. Access to the local AIDS service organization among African, Caribbean and other Black residents of Middlesex-London. In preparation for submission.

SCHOLARSHIPS AND AWARDS

2013-2014

- University Without Walls Training Fellowship ($17 000)
- CIHR - Master's Award - HIV/AIDS Community-Based Research ($17 500)

2012-2014

- Western Graduate Research Scholarship (WGRS) ($4 500)

Summer 2011

- Starbucks Clinical Genetics Research Studentship Award ($4 800)

2010-2011

- UWO In-Course Scholarships Year III ($700)

2008-2012

- Dean's Honor list

COMPUTER SKILLS

- Proficient in using SAS software 9.3
- Proficient in using Microsoft Office

LANGUAGE SKILLS

- Completely fluent in French and English
- Introductory knowledge of Spanish