

Sexual risk behaviors among young migrants and key populations in Sweden



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SEXUAL RISK BEHAVIORS

AMONG YOUNG MIGRANTS

AND KEY POPULATIONS IN SWEDEN

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Sexual risk behaviors among young migrants
and key populations in Sweden
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By

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Abstract

Background: The approximate number of young migrants (aged 15 to 24 years) is almost 32 million globally. In Sweden, in 2022, nearly 2.5% of all citizens were foreign-born aged 15-24. Previous research has shown that young migrants are at increased risk of engaging in sexual risk behaviors, including sexual minorities, such as men who have sex with men (MSM). In addition, migrants can suffer from poor health due to their migration journey and postmigration living circumstances. The aim of this thesis is to assess the prevalence of sexual risk behaviors and the socio-demographic factors that can influence the sexual risk behaviors among young foreign-born key populations who are at risk for HIV in Sweden. Additionally, to assess the prevalence of sexual risk behavior transactional sex among MSM and foreign-born MSM living in Sweden.

Methods: Four papers were completed using data from two cross-sectional surveys: one from a migrant SRHR study conducted in Sweden during 2017-2018 (Papers I and II) and another from the European Men who have sex with men Internet Survey (EMIS) conducted in 2017 (Papers III and IV). In Paper I, 1563 participants aged between 15 and 25 years (56% male, 44% female) were eligible to participate in the assessment of sexual risk behavior prevalence, and in paper II, 976 (54% male, 46% female) participants to assess the prevalence of poor mental health. Descriptive, bivariate and multivariable logistic regression analyses were performed to estimate the relationship between sexual risk behavior and demographic and migration-related variables (Paper I). In paper II, we assess the association between mental health, sexual risk behavior, willingness to take risks, and demographic and migration-related variables. In the EMIS–2017 papers, 4443 MSM participants reporting to live in Sweden are included to assess the prevalence of engaging in transactional sex. Descriptive, bivariate and multivariable logistic regression analyses were performed to estimate the prevalence of transactional sex and the relationship between transactional sex and demographic and migration-related variables (paper III) and HIV status (paper IV).

Results: In paper I, the overall prevalence of sexual risk behaviors in the past year was 33% (n=536). Condomless sex was the most prevalent sexual risk behavior, with increased odds among those coming from the Americas and Europe (compared to Syria) and coming to Sweden to live with a family (compared to those arriving as asylum seekers/refugees), including younger age and living longer in Sweden. Belonging to Islam decreased the odds. Increased odds for engaging in sex under drug influence were among young migrants born in Europe or a MENA country and those who came to Sweden to work or study, while age decreased the odds. Young migrants who came to work or study and lived longer in Sweden had increased odds of engaging in exchanging sex for money or goods.

In paper II, 59% of participants reported poor mental health. Participants who reported living 4 and 5 years in Sweden had increased odds of poor mental health outcomes compared to those who lived in Sweden for less than one year. Living alone or with friends they had known earlier (compared to those living with family), being female, coming from Syria, engaging in sexual risk behaviors, and the willingness to take risks increased the odds of reporting poor mental health. Being highly educated, born in Asia, Europe, or Africa, and coming to live with family (compared to coming as an asylum seeker/refugee) decreased the odds of poor mental health.

In paper III, we observe that the overall prevalence of engaging in selling sex ever was 13.2% (16% in foreign-born and 12.7% in Swedish-born) and 5.9% in the previous five years (8.4% foreign-born and 5.4% Swedish-born) among participants. Increased odds of selling sex were observed among those who were younger, reporting to struggle on their current income, being foreign-born, not defining their sexual orientation, and reporting to had sex with a woman in the previous 12 months. Low levels of outness decreased the odds of selling sex among Swedish-born MSM, contrary to foreign-born MSM, where higher levels of outness increased the odds of selling sex. Prevalence of buying sex ever was 10.8% (11.6% in foreign-born and 10.7% in Swedish-born) and 6.7% in the previous five years (6.9% foreign-born and 6.6% in Swedish-born). Factors increasing the odds of buying sex were

higher education and not having a current partner, while younger age, low level of outness and defining as bisexual (compared to gay/homosexual) decreased the odds, including years of living in Sweden among foreign-born MSM.

In paper IV, 5.4% of participants reported living with HIV (8.8% foreign-born and 4.8% Swedish-born). In the overall sample, the factors for increasing odds of reporting living with HIV were buying and selling sex in the past five years, being foreign-born, and really struggling with current income. Factors decreasing the odds for reporting living with HIV were younger age (up to 34 years compared to 65 and above), low levels of outness, always using a condom, including with a non-steady partner, and one to five sexual partners in the previous 12 months. Factor decreasing the odds among foreign-born MSM were 20-39 years old, higher education, living comfortably, always using a condom in the past 12 months and years lived in Sweden. Among Swedish-born MSM, low levels of outness, having one partner, and using a condom always and with a non-steady partner in the past 12 months (compared to never using a condom) were decreasing the odds.

Conclusions: One in three young migrants aged 15-25 years living in Sweden reported engaging in sexual risk behavior, predominantly in condomless sex. Those who engage in sexual risk behavior also have increased odds of poor mental health. We observe that foreign-born MSM participants living in Sweden had a higher prevalence of transactional sex engagement than their Swedish-born MSM peers. Transactional sex remains a risk factor for living with HIV among MSM, particularly among foreign-born. Socio-demographic characteristics and migration influence young migrants' sexual risk behavior. These findings can inform the design of social, economic, and political programs that aim promote safer sexual behaviors among young migrants. These findings can also benefit future targeting and tailoring of HIV prevention and testing programs reaching MSM and meeting the various needs of different MSM subpopulations.

List of scientific papers

This thesis is based on the following four papers, which will be referred to in the text by their Roman numerals.

- I. Causevic S, Salazar M, Orsini N, Kågesten A, Ekström AM. Sexual risk-taking behaviors among young migrant population in Sweden. *BMC Public Health*. 2022;22(1):625.
- II. Causevic S, Ekström AM, Orsini N, Kågesten A, Strömdahl S, Salazar M. Prevalence and associated factors for mental ill-health among young migrants in Sweden; a cross-sectional study. Submitted manuscript.
- III. Causevic S, Salazar M, Ekström AM, Berglund T, Ingemarsdotter Persson K, Jonsson M, Jonsson J, Strömdahl S. Prevalence and risk factors for transactional sex among Swedish-born and foreign-born MSM in Sweden. *BMC Public Health*. 2022;22(1):2412.
- IV. Causevic S, Strömdahl S, Ekström AM, Berglund T, Ingemarsdotter Persson K, Jonsson M, Jonsson J, Salazar M. HIV risks and transactional sex among Swedish-born and foreign-born MSM in Sweden. Manuscript.

Contents

1	Introduction	5
1.1	Sexual risk behavior	5
1.2	Risk preferences and risk perception	8
1.3	Key and vulnerable populations at increased risk of HIV	9
1.4	Migration	9
1.5	Migration and sexual risk behavior	10
1.6	Mental health among migrants	14
1.7	Mental health and sexual risk behavior among migrants.....	15
1.8	MSM and sexual risk behaviors	16
1.9	Migration and SRH in Sweden	17
1.10	The rationale for the studies.....	19
2	Research aims	21
2.1	Main aim.....	21
2.1.1	Specific aims.....	21
3	Materials and methods	22
3.1	Methods.....	23
3.1.1	Migrant SRHR study.....	23
3.1.2	EMIS–2017	25
3.2	Measures	28
3.2.1	Paper I.....	28
3.2.2	Paper II	29
3.2.3	Paper III.....	30
3.2.4	Paper IV.....	32
3.3	Analysis.....	33
3.4	Ethical considerations	34
3.4.1	Papers I and II	34
3.4.2	Papers III and IV	35
3.5	My role as a PhD student	36
4	Results	38
4.1	Papers I and II.....	38
4.2	Papers III and IV	40
5	Discussion	49
5.1	Prevalence and associated factors for sexual risk behavior among young migrants in Sweden.....	49

5.2	Prevalence and associated factors for poor mental health, including sexual risk behaviors, among young migrants living in Sweden.....	52
5.3	Prevalence and associated factors for transactional sex and living with HIV	55
5.4	Methodological considerations.....	67
6	Conclusions	72
7	Points of perspective	73
8	Acknowledgements	75
9	References	78

List of abbreviations

AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
ART	Antiretroviral Treatment
CI	Confidence Interval
EATG	European AIDS Treatment Group
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
ECOM	Eurasian Coalition on Male Health
EMCCDA	European Monitoring Centre for Drugs & Drug Addiction
EMIS	European Men who have Sex with men Internet Survey
HIV	Human Immunodeficiency Virus
IOM	International Organization for Migration
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer and more
MENA	Middle East and North Africa
MICE	Multiple Imputation by Chained Equations
MSM	Men who have Sex with Men
NGO	Non-Governmental Organization
PTSD	Post-Traumatic Stress Disorder
RHS	Refugee Health Screener
SDG	Sustainable Development Goal
SFI	Svenska För Invandrare
SRH	Sexual and Reproductive Health
SRHR	Sexual and Reproductive Health and Rights
STI	Sexually Transmitted Infection
WHO	World Health Organization
UCL	University College London
UN	United Nations

1 Introduction

This thesis is nested in the Swedish context to explore sexual risk behaviors, such as sex without a condom, transactional sex, and sex under the influence of drugs among young migrant populations in Sweden. The thesis converges around the problem of being a migrant, young and a sexual minority, and engaging in sexual risk behavior.

1.1 Sexual risk behavior

Sexual behavior has been described as all activities related to sexual health and the fulfillment of sexual health needs [1]. Sexual behaviors, as part of sexual and reproductive health and rights (SRHR), are shaped by complex social, political, and economic determinants [1]. Understanding and researching sexual behavior in a context thus requires a socioecological approach, where individual behaviors are observed within a network, community, and policy and legal dimensions and their interaction beyond the health sector [2]. By applying this approach lens, we can focus on the advantages and benefits a system can convey to individuals to achieve positive health outcomes [1].

Sexual behavior has been addressed in research primarily on the negative connotation known as sexual risk behavior [1]. Sexual risk behavior lacks a uniform and agreed to definition; however, it encompasses many different unsafe activities that have a harmful effect on health [3]. Under the umbrella of the term sexual risk behaviors, authors have included condomless sex (anal, vaginal, oral), sex under the influence of alcohol or drugs or both, early sexual debut, transactional sex (sex in exchange for gifts or money), multiple concurrent or sequential partners, having sex with a person who injects drugs, forced sex, and other behaviors [3–7]. Sexual risk behavior can lead to sexually transmitted infections (STIs), including HIV [6,8–16].

According to the Guttmacher–Lancet Commission report, SRHR has been defined as “...a state of physical, emotional, mental, and social wellbeing concerning all aspects of sexuality and reproduction, not merely the absence of disease,

dysfunction, or infirmity” [17]. The report emphasized that communication, trust, and pleasure in a sexual relationship are precursors to a positive approach to sexuality and reproduction [17]. They all promote individual self-esteem, overall well-being, the right to decision-making, bodily integrity, and services [17].

Sexual and reproductive health (SRH) encompasses different aspects and attitudes related to health. These are further described in the Guttmacher–Lancet Commission report, such as a “positive approach to sexuality and sexual relationships, enjoying safe sexual experiences” [17]. Following, individuals should be “able to access various services related to their SRH, such as counseling on sexuality, identity, and relationships, psychosocial counseling, as well as services to prevent and manage STIs, including HIV, cancers of the reproductive system, gender-based and partner violence, abortion and post-abortion care, family planning, maternal and childcare, and infertility, etc.”[17].

There are different underlying factors for sexual risk behavior in the general population and among young people [4–6,9,18–26]. For individuals to exercise their SRHR and achieve optimal health outcomes, they must have ownership over their bodies and the ability to make informed decisions about their SRH. This can include decisions related to their “own sexual orientation and gender identity, a decision on sexual activity and sexual partners, having access to information related to their SRH and decide whether and whom to marry, in addition to when, whether, with whom and how many children to have” [17].

Traditionally described determinants for engaging in sexual risk behaviors are “individual factors related to psychosocial issues, history and culture, evolutionary and individual developmental and physiological factors, the influence of alcohol and drugs, context and education and awareness of the partners’ infection status” [26–28].

Adolescents and young people face challenges that can harm their SRH, such as partner violence, peer pressure, or lack of access to education, information, and commodities for safe SRH [29]. They may not be able to make deliberate choices on

SRH due to physical and emotional development that happens at that age that limits knowledge processing capability [5]. When faced with a decision, they engage in various cognitive processes, but their cognitive system is not entirely developed. This is insufficient to make a safe decision. Underweighting the likelihood of rare and adverse events, underestimating the risk behavior consequences, sensation-seeking, and impulsive decision-making can further encourage risk engagement in risk behaviors, such as condomless sex or having sex under drug or alcohol influence [7,30,31]. Risk behavior consequences can be challenging for both boys and girls, such as young girls could face early pregnancies that affect their future reproductive health, staying in school, and future economic prospects, whereas boys can be at risk for STI, among other risks.

Other factors can influence young person's ability to exercise their SRHR, including cultural norms and traditions, political climate, and economic circumstances. In some cases, individuals may feel disempowered or face barriers to accessing information and services related to their SRH. Certain cultures and religions can be more conservative regarding sexual behavior and emphasize collective thinking. In contrast, other contexts and cultures can be more liberal about sexual behaviors and value individual agency [28,32]. Discriminatory laws and norms can scrutinize sexual activity in different populations, such as young people, women and girls, unmarried couples, sex workers, and indigenous groups [1]. The impact of the gendered perspective on sexual activity coupled with socioeconomic circumstances can lead women and young girls into transactional sex. Prejudice and stigma towards people with other sexual orientations and gender identities and the lack of ability to exercise their sexual agency can lead to sexual risk behaviors [33,34].

Safe behaviors can be crucial for future decision-making and health [29]. It is essential to take a comprehensive and intersectional approach to promote SRHR, one that recognizes the broader social, economic, and political context in which individuals live [35].

1.2 Risk preferences and risk perception

Risk preferences have varied definitions under different frameworks related to decision-making theories. According to Weber and Milliman (1997), “risk preference is operationalized as risk attitude that describes the shape of the utility function thought to be behind people’s choices” [36]. In addition, risk preferences are defined as the “willingness to engage in harmful behavior or behavior that could cause loss” [31,36].

Using theories and tools that utilize self-reported measures can be valuable for predicting risk preference and possible health outcomes. Some authors have extensively studied the prediction of individuals engaging in risk behavior, creating different theories behind the concept. For example, one of the most noted theories by Kahneman and Tversky is the Prospect Theory [37]. This theory acknowledges two opposites, namely, “risk-averse” individuals whose choices are in the gain domain, and they are less willing to engage in risk, and “risk-loving” individuals on the other end of the spectrum, who are willing to engage in risk and suffer losses [36,37]. Blais and Weber have also supported this concept with Expected Utility Theory [36,38]. The Rational Choice Theory further explains the Risk–Return model, where there is a downplay of the first occurrence of a risky moment and a decrease of the risk of occurring with a second moment [39]. This theory is visible in examples where the first sexual encounter without a condom can lead to a second condomless encounter because of the perceived predictability of the outcome [39].

Risk perception is a cognitive process that evaluates the risk at a given time [36]. Risk perception is a utility of context where the situation occurs, and this perception can determine the choice. Health promotion initiatives have often taken risk perception as a point of departure because an informed individual able to evaluate the situation should be able to make an informed choice about their SRH.

Authors argue whether risk preference is a character trait that can be shaped and changed [36]. However, the authors agree that people’s choices are not always entirely rational, even with informed decisions, which explains the role of risk

perception in decision-making among young people [36]. Further, decisions sometimes cannot be compared between individuals, even if they belong to the same social group and have many similar or identical traits. Individual behavior can differ by point of time and place, and the prior outcomes of one behavior can structure future decisions [36,37].

In conclusion, behavior is a function of weighing different outcomes, the possibility for these events to occur in general and happen to the individual in question, the value of each outcome as a function of gain and loss, and the value of each outcome choice.

1.3 Key and vulnerable populations at increased risk of HIV

According to WHO, the definition of key populations encompasses widespread population groups that, because of specific risk behaviors, have an increased risk of HIV, regardless of the epidemic type or local setting [40,41]. This group includes “men who have sex with men (MSM), prisoners and individuals living in other closed settings, people who inject drugs, sex workers and transgender people” [40,41].

In vulnerable populations, including adolescents, orphans, people with disabilities, migrants, mobile workers, and street children, situations and context contribute to their vulnerability [40].

1.4 Migration

About 281 million people migrate daily worldwide, and these numbers vary in different regions [42]. There is a lack of a uniform definition of migrants. The term migrant encompasses a heterogeneous group of asylum seekers, refugees, seasonal workers, students, undocumented migrants, unaccompanied children, and family migrants [43]. Here we use the International Organisation for Migration (IOM) definition, where the migrant is any person moving from their residence to another place, in-country or across the border, for different reasons and times [44].

The context determines the type of migration – such as *forced migration* as part of a migration process due to a conflict and *voluntary migration* – changing the residence by freedom of choice [44,45]. Legal pathways construct the concept of migration, whether the possibility of leaving the country of origin or settling in another country as a migrant [45]. Migration is an individual aspiration further enabled by the prospect of moving [45]. Those unable to move usually suffer from increased mortality and morbidity due to poor living conditions and the proximity of violent conflict [46]. This is especially important when we look at the demographic structure of migrants in a destination country – because of the legal pathways to leave the country of origin, the aspiration and the possibility to migrate, and the acceptance of the destination country of migrants (of different subcategories), can determine the structure of migrants [45]. As suggested by Social Construct Theory, the negative perception of migrants as a burden to society can also affect migration pathways and policies [47].

The approximate number of young migrants (aged 15 to 24 years) is almost 32 million globally [42]. Young people migrate for different reasons as they evolve – to experience freedom, develop, explore, and mature. In addition, young people migrate because of political and economic circumstances, including escaping exploitative working conditions, early marriages, harmful practices (e.g., female genital mutilation), and protection from conflict [48]. Migration among young people can be both an opportunity and a challenge. The opportunity is new possibilities to learn, explore, and grow away from the place of origin, which can sometimes be a liberating experience. The challenge is the transition involving physical maturation but limited knowledge processing capability while faced with new contexts and often being away from family and home.

1.5 Migration and sexual risk behavior

Migrants are usually a healthy group of individuals with better health than the native population; however, their health can deteriorate after some time in the host country, known as the “healthy migrant effect” [49].

The health outcomes among migrants are affected by premigration factors, migration journey, and host country factors, which affect different migrant subgroups differently [50]. As mentioned in the UCL–Lancet Commission on Migration and Health report, discrimination, exclusion, and inequalities appear to influence poor health among migrants [50].

The overall burden of disease varies between countries, and it is a consequence of different factors, including culture, norms, and values. In these contexts, some groups can be more vulnerable than others, suffering from health risks, especially related to their SRH [51]. Women and girls may suffer from abuse and violence and not being offered support. Rape or sexual abuse of young boys and girls can also happen where there is a taboo to discuss these practices, and the victims are silenced [52]. Sexual minorities have been victims of hate crimes in countries where same-sex relationships or being a sexual or gender minority has not been accepted [53]. Different sexual minorities have been forced to seek protection in countries where they will not be persecuted or suffer physical and psychological abuse for being a sexual minority [53]. In countries with armed conflict, women and children have been adversely affected by increased mortality, but they are also subject to malnutrition, injuries, poor mental health, and poor SRH [46]. The prolonged exposure to trauma in the home country and during their migration journey can cause traumatic stress [53].

The migration route can be a traumatizing experience for different migrants, especially refugees and asylum seekers. They can be subjects of continued victimization and at high risk of abuse and violence. In addition, fleeing from the protracted humanitarian emergencies in their home countries, they may end up in detention centers of transit countries, living in poor conditions, overcrowded spaces, and lacking health services [54]. Sexual minorities can be a subject of humiliation, exploitation, or bullying during migration [55].

By arriving to host countries, migrants enter a new context [50]. They may be faced with challenges and constraints, such as unmet social and economic needs

(e.g., unstable housing, unemployment, poverty), psychological consequences of migration (e.g., distress, anxiety, social isolation, separation from spouse, family, and different sociocultural norms), or discrimination related to racial, ethnic, gender, and/or sexual orientation [56–61]. Migrants can be exposed to practical challenges to exercise their SRH, such as lack of awareness, availability, and accessibility of health services, and may not understand how the health system functions [62–67]. This can also be a major concern for those with poor mental health [64,67,68]. Unaccompanied young migrants can be more at risk of sexual abuse and exploitation due to a lack of parental support, fear for parental well-being who are left back in the home country and financial insecurity, causing stress [69].

Migration and sexual risk behavior can also be gendered. Young girls can be more vulnerable and be forced into sexual risk behaviors, resulting in pregnancies and early marriages, and some may migrate while pregnant or with small children [70]. Some may be victims of violence, have an STI, including HIV, or have been a subject of harmful practice [71–73]. Migrant women are disproportionately affected by sexual or partner violence compared to men during travel and in the host country [74–77]. In addition, sexual gender-based violence has been recognized as means of war and used against women and men [78]. In the host country, migrant women could be at higher risk of experiencing sexual or intimate partner violence due to social isolation, poverty, and lack of support networks. Women migrants may face poor living conditions, such as a lack of housing tenure, making them more vulnerable to violence, especially when younger [75–77,79,80]. Young women struggling to meet their basic requirements in the host nation, such as a shortage of food and shelter, financial struggles and limited economic opportunities, may turn to exchanging sex for gaining income [50]. Women who migrate with their partners may depend on their visa status, making them vulnerable. Fear of being deported can deter them from reporting intimate partner violence to the authorities [75,76]. Women may be exposed to new gendered expectations in the host country that may differ from what they are used to in their home country. This can cause them difficulties adjusting to their new environment [75–77,79,80]. It is important to address these issues and

provide support and resources to migrant women to ensure their safety and well-being.

The migration process has been linked to an increased risk of engaging in transactional sex, defined in different ways, but it refers to an exchange of sex for money, gifts, or favors [2,16]. The definition of transactional sex can take on different meanings and contexts, but also age and gender, and the motivations for engaging in it can vary from financial need to social status and prestigious material goods [81,82]. It is also worth noting that transactional sex is not always synonymous with commercial sex work. It can also occur within consensual romantic or sexual relationships where the exchange of gifts or money may be seen as a part of courtship [83]. Therefore, it is essential to consider the sociodemographic background, living context, and cultural values and norms that may influence an individual's decision to engage in transactional sex [82,84].

A systematic review found that transactional sex in high-income countries occurred more frequently among boys than girls, whereas the opposite was observed in low and middle-income countries [85]. Furthermore, the reported prevalence of transactional sex among young people varied between high-income countries (10%) and sub-Saharan Africa (5-85%) [85]. Data also reveals a power aspect of transactional sex in that socioeconomic class affects the nature of transactional sex relationships and puts sellers at a higher risk of violence [84,86]. Persons with better financial standing may buy sex more frequently, especially from those that are financially struggling [82,84,87]. Regardless of the context in which it occurs, transactional sex can have potential risks and consequences for individual and public health, such as increased vulnerability to STIs and other health issues, as well as social stigma and legal repercussions [81,88].

Transactional sex can occur pre-migration, especially in humanitarian settings where individuals may suffer from material and non-material scarcity [89]. During Ebola and COVID-19 pandemics, researchers have reported an increase in transactional sex, mostly due to food insecurity or lack of protection and assistance

[89]. During migration, transactional sex can occur as a measure of protection or escaping sexual violence from perpetrators or smugglers [89]. The risk of transactional sex increases for newly arrived migrants because they frequently lack a protective social network, are more likely to be financially disadvantaged, suffer from violence, and may not be aware of their legal rights [90]. This can be especially challenging for persons with multiple marginalized identities, based on ethnicity or sexual identity, among others [55].

1.6 Mental health among migrants

The WHO has defined mental health as “a state of well-being, making it possible for individuals to realize their ability, cope with daily stress, be productive and be valuable community members” [91]. Poor mental health outcomes encompass depression, anxiety, bipolar disorder, schizophrenia and other psychoses, dementia, and developmental mental disorders, including autism [91].

Social, economic, and political factors can negatively affect young migrants’ mental health throughout the migration process, from pre-migration to post-migration [59,92–96]. These factors include exposure to trauma and violence, unmet socioeconomic needs, language barriers, racism, and social pressure to succeed [97–102]. Post-traumatic stress disorder (PTSD) may be more common among refugees, which, together with lower medicine adherence, can further exacerbate mental health problems [103,104]. As mentioned, the fear of deportation, especially among young women who have been victims of intimate partner violence or undocumented migrants, can cause poor mental health [75,76,94]. Poor mental health among refugees, asylum seekers, and irregular migrants can be caused or exacerbated by poor socioeconomic conditions and lack of access to healthcare [105]. Studies have shown that both first- and second-generation young migrants in Sweden may have a higher risk for poor mental health than their Swedish-born peers [96,103,106]. In addition, sexual minorities may have substantial barriers to accessing health services that might be very specific if they come from a country where they were physically or psychologically abused because of their sexual or gender orientation [107]. These

populations can be overlooked or excluded for different reasons, increasing their mental stress and social isolation [107]. Lastly, sexual minorities suffering from a traumatic experience in their home countries may require a long time before they are psychologically stable and feel safe [53,55]. Seeking asylum in this condition may be difficult, especially since one needs to claim they are a sexual minority, and elaborating on the reasons for asylum-seeking can increase their psychological burden [53,55].

This does not curtail the value of understanding poor mental health among migrant subgroups such as students, seasonal workers, family members, etc. While displaced people, such as asylum-seekers and refugees, may experience higher rates of PTSD and anxiety due to the trauma and stress associated with their migration journey and resettlement experiences, it is important to recognize that voluntary migrants can also face poor mental health outcomes [108]. Voluntary migrants, such as students, workers, and family members, may feel lonely and isolated as they adjust to a new environment [45,56,109,110]. They may also face discrimination, racism, and other forms of prejudice, which can negatively impact their mental health [45,56,109,110]. The acculturation process, where a migrant arrives from another culture trying to immerse into the mainstream culture, especially in a lack of support system such as family, can lead to stress and depression [32,102].

Understanding the challenges young migrants confront during the entire migration process, including their social position and living environment, is crucial since these challenges can significantly impact the control of their agency, decision-making, and health [111].

1.7 Mental health and sexual risk behavior among migrants

Sexual risk behavior has been associated with mental health in different ways [21,27,112,113]. Poor mental health can further exacerbate sexual risk behavior, leading to condomless sex, multiple and concurrent sexual partners, alcohol and drug intake before sex, or transactional sex [113]. In addition, sexual activities leading to unwanted events, such as unwanted pregnancy or STI, can lead to poor mental

health outcomes [27,114–117]. However, sexual activity can be rewarding for mental health, such as serving as a coping strategy and having psychological and physical functions to improve self-esteem, deal with loneliness, self-comfort, and overall mental well-being [112,118,119]. Sexual intercourse can perhaps help deal with the emotional burden of being a migrant in a host country [27].

1.8 MSM and sexual risk behaviors

The physical, mental, and sexual health of MSM can be influenced by engagement in various sexual risk behaviors, including transactional sex [120]. Sexual risk behaviors, such as a high number of partners, concurrent or sequential number of partners, injection and non-injection drug use, unprotected receptive anal intercourse and other risks, can increase the risk for HIV among MSM [121–127].

Social stigma against same-sex relationships and rigid gender norms are some of the reasons that negatively impact the behavior and health outcomes among MSM [128,129]. Research has shown that individuals who experience stigma related to their sexual orientation or gender identity can be at increased risk for risky behaviors, such as buying sex or engaging in condomless sex, to assert their masculinity or prove their sexual orientation [11,15,130–135]. The literature suggests that MSM reporting engaging in transactional sex can have an increased risk of HIV and other STIs due to inconsistent condom use and lack of negotiating power [83]. A systematic review and meta-analysis found a 12.2% HIV prevalence among MSM who sell sex [134]. According to research, MSM who work in the sex industry are more likely to use drugs, abuse alcohol, use condoms sporadically, experience emotional, physical, and sexual aggression, fail to declare their HIV status to clients and have an STI [16,81,83,88,136]. While some individuals may engage in transactional sex out of financial need or to obtain goods or services, others may do so for reasons such as empowerment, to alleviate the feeling of loneliness, or engage in new experiences [83,84,137].

1.9 Migration and SRH in Sweden

Sweden is a high-income country that has historically accepted migrants, including refugees, asylum seekers, students, unaccompanied children, seasonal workers, and other migrants. According to 2022 statistical data, 19.7% of people in Sweden are foreign-born [138]. Among all residents, 2.5% are 15-24 years old foreign-born [138]. As a consequence of migrants arriving to Sweden predominantly from countries with conflict, including Syria and Afghanistan, since 2015 and more recently from 2022 from the Russian invasion of Ukraine, Sweden has been in a challenging situation to provide health services to these populations. However, Sweden has worked hard to offer dignified circumstances where the migrating population can continue to thrive and preserve good health, including mental health. And this also holds true for all migrants, including young people, arriving to live in Sweden under different conditions.

Sweden has focused on improving and supporting the SRH of young people and people with migration backgrounds through several key strategies, such as the National Strategy for SRHR [139]. Sweden has been a country ranking high (9th) on the European level of lesbian, gay, bisexual, trans, queer and intersex (LGBTQI) human rights, having a liberal view towards different sexual orientations [140]. The right to access healthcare without discrimination based on gender, gender identity, gender expression, age or ethnicity has been part of the Swedish Discrimination Law from 2008 [141]. Those with residence status in Sweden have equal rights as Swedish citizens, while children under 18 can access healthcare free of charge. In Sweden, a person is entitled to an interpreter in healthcare in case they do not speak Swedish. Asylum seekers arriving in Sweden are suggested to undertake a free health assessment, and they receive information about the Swedish health system. Lastly, Sweden has offered programs for newly arrived migrants with a refugee background focusing on job opportunity seeking and establishing themselves, with the opportunity to claim welfare benefits while participating in these activities [142]. Among the topics in this program is health, including mental health, self-care, sexual health, and family and parenting [142].

Sexual risk behaviors researched among migrants in Sweden include but are not limited to, increased condomless sex, using alcohol during the last sexual encounter, or transactional sex that can lead to STIs, including HIV [18,63,143–145]. The research done in Sweden has focused on migrants of different ages, country of birth, and migration status. Research shows that loneliness, perceived stigma, inequalities, and the absence of a social network greatly affected migrants' daily life [106,146]. In addition, migrants may suffer from insecure living conditions, fearing deportation and their residency status, affecting their SRH and mental health [18,60,65,94,144,147]. Their health often comes secondary as a result of these fears and insecurities, but also from language and cultural barriers and challenges with the health system [18,58,60,94,144].

In 2021, the estimated number of people living with HIV in Sweden was approximately 8000 [148]. It is estimated that the highest number of transmissions occurred outside Sweden [149]. Men have been among those with higher rates of HIV infection (69%), and MSM have been at increased risk for adverse SRH outcomes, including HIV [149]. The last years have shown an HIV prevalence of 3-5% among the MSM population in Sweden [150]. The number of people living with HIV/AIDS in Sweden also comprises people with immigrant backgrounds [149]. Among those tested, 20% were positive for chlamydia, and 20% came back positive for gonorrhea [150]. The differences are evident between larger and smaller cities [150]. In Sweden, where the estimated number of MSM is 100,000, it is crucial to address the higher risk for poor SRH outcomes among this population [151].

According to European Men who have Sex with men Internet Survey (EMIS) 2017 report from participants reporting to live in Sweden, 32% of the sample had anal sex without a condom with one or several partners in the last 12 months [150,152]. In addition, 18% reported condomless anal sex in the last 12 months, with 22% not using a condom in the last sexual encounter [150,152].

Researchers and public health officials in Sweden have attempted to gather information on the prevalence and potential causes of transactional sex as a sexual

risk behavior placing an individual at an increased risk for HIV through various studies and surveys [153–156]. Some findings include that almost 10% of men reported ever buying sex, with buying being more frequent abroad (up to 80% of men buying sex abroad)[156]. This finding may explain the infection with HIV from abroad [33,34]. In comparison to heterosexual men, gay and bisexual men have paid for sex more often (10% vs. 15%, respectively), and selling sex is more common among LGBT people [156]. In research by Priebe and Svedin, almost two-thirds of those buying sex are men between 50 and 65 years old, whereas those selling sex are between 18 and 35, with unequal distribution of risk from engaging in transactional sex [157].

1.10 The rationale for the studies

The literature reviewed in the preceding sections highlights that young migrants may be at increased risk of engaging in sexual risk behaviors. Even though research demonstrates the migrants' increased vulnerability concerning sexual risk behaviors, young people as a subpopulation have not been researched in enough detail. Their needs to thrive are not addressed in all policies or initiatives, primarily because of a lack of age-disaggregated data or indicators on youth. Further, the ethical concept behind consenting certain age to be part of a study can complicate their access and the opportunity to learn more about this population, resulting in a lack of data. The scarcity of data is also caused by the difficulty of accessing certain vulnerable migrant groups, including undocumented migrants, asylum seekers, and refugees. Examining the sexual risk behaviors among young migrants living in Sweden is crucial for achieving health equity.

While previous studies in Sweden have looked at the prevalence and risk factors for poor mental health among migrants, there is still a need for research that specifically examines the role of migration-related factors (such as residency status, reasons for migration, and living arrangements) as well as risk behaviors (such as sexual risk behavior) in relation to mental health outcomes [103,106,158]. By filling in this research gap, we can better understand the unique challenges faced by young

migrants in Sweden and develop more effective strategies to support their mental health and well-being.

There is limited information on the prevalence and reasons for engaging in transactional sex in Sweden. Under Swedish law, the purchase of sexual services is prohibited [159]. Because of this legal framework, many individuals who engage in transactional sex may be reluctant to report their experiences, resulting in underreporting this phenomenon. Foreign-born, in that sense, are left behind when it comes to transactional sex data because of the stigma that this behavior generally entails but also because of the complexities that may be related to their lives, such as a challenging economic situation or migration status, which makes it stigmatizing for them to report these activities, including fear of deportation. This can also make it difficult to gather accurate data on the prevalence of transactional sex among foreign-born MSM in Sweden.

This thesis is trying to assess the prevalence of sexual risk behaviors, the sociodemographic factors that can influence the sexual risk behaviors among young foreign-born key populations who may be at higher risk for HIV in Sweden, as well as assess the prevalence of transactional sex, a sexual risk behavior, among MSM reporting to live in Sweden, with a particular focus on foreign-born MSM.

The thesis is compiled from four papers examining data collected from people living in Sweden. The first paper is assessing the prevalence of sexual risk behavior among young migrants in Sweden; the second paper is assessing mental health and the association with sexual risk behaviors among the same population; the third paper is assessing transactional sex as a risk behavior in foreign-born MSM and compares it to Swedish-born MSM, and the fourth builds on the knowledge from the third paper and examines the relationship between HIV status and transactional sex among the same population.

2 Research aims

2.1 Main aim

To assess the prevalence of sexual risk behaviors, the socio-demographic factors that can influence the sexual risk behaviors, among young foreign-born key populations who are at higher risk for HIV in Sweden, as well as to assess the prevalence of transactional sex, as a sexual risk behavior, among MSM living in Sweden, with a particular focus on foreign-born MSM.

2.1.1 Specific aims

1. To assess the prevalence of sexual risk behaviors among young migrants in Sweden (paper I)
2. To assess mental health and its association with sexual risk behaviors among young migrants (paper II)
3. To assess the prevalence of transactional sex (buying and selling) in foreign-born MSM living in Sweden and compare this to Swedish-born MSM (paper III)
4. To assess the relationship between HIV status and transactional sex among MSM in Sweden, comparing foreign-born MSM to Swedish-born MSM (paper IV)

3 Materials and methods

This thesis is built on two main studies with separate cross-sectional surveys that resulted in two papers per study (Table 1).

Table 1. Summary of methods used in the papers

Paper/aim	Design/analysis	Participants	Outcomes
I To assess the prevalence of sexual risk behaviors among young migrants in Sweden	Descriptive study Cross-sectional online survey (December 2018–November 2019) Multivariable Logistic Regression	Eligible participants n=1563 15-25 years old	<u>Sexual risk behavior (in the last year)</u> - Condomless sex - Sex under the influence of drugs with a casual partner - Sex in exchange for gifts/money
II To assess mental health and its association with sexual risk behaviors among young migrants		Eligible participants n=976 15-25 years old	Mental health using the RHS-13 questionnaire
III To assess the prevalence of transactional sex (buying and selling) in foreign-born MSM living in Sweden and compare to Swedish-born MSM	Descriptive study cross-sectional, open-access, self-administered online survey (October 2017–January 2018) Multivariable Logistic Regression	Eligible participants n=4443	<u>Transactional sex</u> - Ever selling sex - Selling sex in the previous five years - Ever buying sex - Buying sex in the previous five years
IV To assess the relationship between HIV status and transactional sex among MSM in Sweden, comparing foreign-born MSM to Swedish-born MSM			Self-reported living with HIV

3.1 Methods

3.1.1 Migrant SRHR study

The study was created at the time when Sweden experienced a high influx of migrants arriving from conflict countries in 2015, with almost 163000 people seeking asylum, nearly a quarter of whom were unaccompanied children [160]. The overall goal was to understand the SRHR needs of foreign-born who were coming in significant numbers and trying to direct at those needs with evidence. The migrant SRHR study aimed to collect data on knowledge, attitudes, and practices related to SRH, norms, and values in SRHR, including questions on mental health and discrimination among foreign-born in Sweden.

The study research questions and tools were developed with the supervisory team of this thesis, researchers involved in the study, and two PhD students whose PhD thesis was part of this study. In the study development process, literature and surveillance data were consulted to understand the target population better and determine the optimal methods for gathering data from the various research participants.

This study included both quantitative and qualitative methods and was aimed at participants older than 15 years old. Data collected from this study were used for papers I and II. Paper I resulted in a published article that explores the sexual risk behaviors and prevalence among young migrants in Sweden. Paper II assessed mental health and the association with sexual risk behaviors in young migrants in Sweden.

3.1.1.1 Survey design and development

For papers I and II, we developed a survey that focused on knowledge, attitudes, and practices among migrants in Sweden, including outcomes, norms, values, and health services needs to address the needs of migrants in Sweden effectively. The questions were numbered and grouped into themes covering sociodemographic data, questions on arrival and living situation in Sweden, mental health and violence,

neighborhood perception, risk behaviors including using alcohol, drugs, and sexual risk behaviors, and gender norms and values. We examined other validated surveys and tools for developing the survey, such as UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction [161]. We also created new questions relevant to the overall aim of the study.

3.1.1.2 Data collection procedures and field testing

The questions from the survey were tested at different study sites with a purposive sample of foreign-born above 15 years old. The study sites were organizations working with foreign-born, including young migrants recently arriving in Sweden. The sites were previously discussed and chosen to capture the target population most efficiently. The migrants were consulted on topics relevant to their peers and which tools would be optimal for them to voice their opinions and concerns. They were asked individual questions from the survey for clarity and whether these questions asked about their needs while modifying the tool accordingly. The questions were revised if they were too sensitive for particular populations.

Data was collected between December 2018-November 2019 in partnership with the World Values Survey and Invandrarindex, an NGO that annually collects various health, demographic and migration-related data from migrants of all ages.

Data was collected at schools offering Swedish for foreigners (Svenska För Invandrare, SFI), and in secondary schools across Sweden. SFI schools are based in different communities in Sweden, offering the opportunity for foreigners to learn Swedish at different levels from the age of 16 onwards. The school classes are provided free of charge and can be attended at different times of the day, including weekends [162]. The rectors and professors of both SFI and secondary schools were consulted about the possible research benefit for the participant and the broader health system in Sweden.

The study population that was included in the survey were various migrant subpopulations, such as international students, workers, and unaccompanied minors, as defined by the IOM definition where the migrant is any person changing their residence and moving to another place, in-country or across the border, for different reasons and times [44]. The eligibility criteria were that the participants were aged 15 years or older, had the ability to complete the survey in one of the offered languages, and had not participated in this survey before.

A link and password to access the survey website were shared with the students who agreed to participate in the survey. The data was gathered through a personal cell phone or a computer and directly uploaded to a server, so no additional input was required. Invandrarindex collects these data using a completely anonymous online survey and produces a regular report with no preceding ethical approval, given the anonymous nature of the data. This means no identifying information (name, address, ID number, etc.) is collected from the participants. Since our questions were included in the complete survey, the overall sample size was almost 6500 individuals across all age groups.

The survey was offered in multiple languages, including Arabic, English, Farsi, Tigrinya, Spanish, Swedish, and Somali. Offering the survey in multiple languages ensured that a diverse group of people could participate, which can be essential for gathering accurate and representative data.

3.1.2 EMIS–2017

Papers III and IV use data from EMIS–2017. Paper III assesses the prevalence of sexual risk behavior transactional sex among foreign-born and Swedish-born MSM in Sweden, resulting in a published paper [163]. Paper IV takes an additional step while examining the prevalence of transactional sex and self-reporting to be living with HIV among the same population as in Paper III. EMIS–2017 is an internet-based, self-completion survey available in multiple languages (about 33 languages). EMIS–2017 methodology and design have been described elsewhere, but in this thesis, the main information about the survey is described [164].

3.1.2.1 Survey rationale

The challenges of gathering robust information on stigmatized minority groups are well-documented [81,84,127,133]. MSM are one such group. The difficulties in estimating their true population size have made it challenging to conduct studies that accurately reflect their needs and behaviors [164]. One of the significant challenges in studying MSM is the stigma regarding same-sex activity persisting in many parts of the world [164]. This can make it difficult to find participants willing to participate in research studies and access the population through traditional sampling methods [164]. The internet has grown to become an important tool for collecting data from considerable samples of MSM, including individuals of different ages and geographies [164]. Using EMIS–2017 was chosen to provide a more accessible and convenient method for MSM to participate in the study, reaching a broader range of participants who may have hesitated to participate in a traditional survey [165]. Most importantly, EMIS–2017 is not survey on a generic health and well-being [166].

EMIS–2017 was a significant study for understanding the sexual health outcomes, behaviors, and health promotion needs of MSM in specific European countries and several countries outside Europe [167]. EMIS–2017 aimed to provide valuable information on STIs, HIV testing, and access to treatment and prevention interventions. Additionally, the survey sought to identify risk and preventive behaviors related to sexual health and provide insight into MSM needs for health promotion and intervention coverage. Main objective was to generate data about the degree and prevalence of HIV transmission risk and preventive behaviors, and intervention needs, that could be helpful to plan and monitor national HIV and STI prevention and care programs [167].

3.1.2.2 EMIS–2017 content

The survey is organized into five groups of questions. The first group, demographics, focuses on gathering descriptive information about the participants that are not intended to be changed [165]. The second group, morbidities, includes

questions about health outcomes that the survey aims to change [165]. The third group, behaviors, includes questions about the actions people take that cause risks or detract from precautions related to the morbidities being studied [165]. The fourth group, needs, includes questions about the opportunities, capabilities, and motivations for risk and precaution behaviors [165]. The fifth and final group, interventions, include questions about actions taken by others that either meet or undermine the needs of the participants [165].

3.1.2.3 Data collection procedures

The data collection period occurred over several months, beginning in October 2017 and concluding at the end of January 2018. This extended period allowed for a more comprehensive data collection and a larger sample size [164]. EMIS–2017 was promoted through various online channels, including website banners and app messages [167]. It was conducted by a network of research institutions, community health organizations, and advocacy groups, including the European AIDS Treatment Group (EATG), Eurasian Coalition on Male Health (ECOM), European Centre for Disease Prevention and Control (ECDC), European Monitoring Centre for Drugs & Drug Addiction (EMCDDA), European Commission (EC DG SANTE) [164,168].

EMIS–2017 included individuals who identified as a man or trans man and were either sexually attracted to men or had sex with men [167]. Before participating in the survey, the respondents had to confirm that they had read and understood the study aim [167]. Additionally, they had to confirm that they were of legal age to consent to a homosexual relationship in the country they live [167]. These criteria were set to ensure that participants comprehend the survey purpose and information and the type of information they will be providing [165]. Additionally, confirming that they are at or over the age of homosexual consent in their country helps to ensure that the survey is only completed by individuals legally able to engage in sexual activity with other consenting adults [167]. These individuals were the ones who qualified for the survey and were included in the data analysis. People who did

not meet the inclusion criteria were still allowed to participate in the survey, but their data was not used [167].

3.2 Measures

3.2.1 Paper I

Dependent variables

Sexual risk behaviors were chosen because of previous research on this topic, elaborated in the Introduction section. The variables were dichotomized for each behavior and structured as follows:

- a. Have you had sex without a condom in the last year? (yes, no, never had sex).
- b. Have you been under the influence of drugs during sex with a casual partner in the last year? (yes, no, never had sex).
- c. Have you had sex in exchange for gifts/money in the last year? (yes, no, never had sex).

A dichotomous variable was created for each variable, coded as 1 if the answer was “yes” and 0 if it was “no”. Respondents to any of the questions above who indicated that they had never had sex were not included in the analysis.

Independent variables

Age was measured discretely in single years, but we calculated the mean for this paper. *Biological sex* was measured as male, or female, or I do not want to answer. For this paper, we did not measure whether their biological sex measures with their gender identity as it was not the purpose. *Education* was measured in years and further categorized into three categories of 4-6 years, 7-9 years, and 10 and higher, corresponding to a Swedish schooling system of low, mid-, and higher education. We included the *number of years living in Sweden*, as well as *religion* (Christianity, Islam, or not religious/other) and the *country of birth*. *Country of birth* was divided as follows: 1) Africa, 2) Americas, 3) Asia, 4) Australia, Other, Stateless, 5) Europe, 6) Syria, 7) Afghanistan, and 8) the Middle East and North Africa (MENA) countries (included in alphabetical order: Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait,

Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Palestine, Tunisia, United Arab Emirates, Yemen). The majority of foreign-born arriving to Sweden at the time of conducting the study were from Syria and Afghanistan, so we observe these two countries separately. We measured three variables about migration: *Main reason for coming to Sweden* (asylum seeker /refugee, work/study, family reunion, other); *Swedish residence permit* (no, yes, already an EU/EEA resident); and *Current living arrangements* (alone, married or cohabiting, other family, friends I knew from earlier, or refugee home) [169].

Missing data

Most observations were missing at random as a result of skip patterns. Because of differences in age or experience, and the design, some questions were not relevant to all participants; therefore, it is expected to assume that they skipped the questions. Demographic variables for paper I were 72% complete, migration variables 58% complete, and religion 16% [169].

3.2.2 Paper II

Dependent variable

The dependent variable in paper II is self-reported *mental health*, measured using the Refugee Health Screener–13 (RHS–13) [170].

The RHS–13 is a reliable and valid screening tool identifying individuals who may require further assessment and treatment for mental health problems [170,171]. The internal validity of the RHS–13 is good, with a Cronbach’s alpha coefficient of 0.95, which indicates that the scale items are strongly related and measure the same underlying construct [170,171]. The instrument has good sensitivity and specificity when compared to other specific mental health diagnostic tools [170]. It has been validated in Sweden and other countries [104,172].

The RHS–13 comprises 13 items that describe signs and symptoms of poor mental health. A Likert scale was used to rate the items, from 0 (not at all) to 4 (extreme), with a total scale score ranging from 0 to 52 [170]. A cut-off score of 11 points or

above was used to define poor mental health, as recommended by the literature [172]. The variable was dichotomized into “good” or “poor” mental health based on the sum score.

Independent variables

Sexual risk behaviors variable as described in the paper I was used [169]. The positive answers to any of the questions mentioned under the variable Sexual risk behaviors (1) had sex without a condom; 2) had sex in exchange for gifts/money; or 3) had sex with a casual partner under the influence of drugs) were analyzed. We chose to combine these answers because of the level of missingness in each variable. *Willingness to take risks* was measured as an individual’s inclination to engage in risk behavior when faced with certain situations. The decision was assessed using a single question, “are you generally a person who is willing to take risks, or do you try to avoid taking risks?” with a 10-point Likert-based response scale used to rate the items, from 0 (not willing to take risks at all) to 10 (very willing to take risks) [173]. Other variables included *age; sex; education; years living in Sweden; religion; country of birth, the main reason to come to Sweden, Swedish residence permit, and current living arrangements.*

Missing data

Missingness patterns in paper II were 12% for demographic variables and 56% for the sexual risk behavior variable. Sensitivity analysis was also performed, but the direction of the association remained very similar. In paper II, multiple imputations analysis was performed on all categorical variables assumed to be missing.

3.2.3 Paper III

Dependent variables

Transactional sex (selling and buying sex) was measured, referring to exchanging money, gifts or favors for sex. Buying and selling sex were further disaggregated into two timeframes: “ever engaging in selling or buying sex” or “selling sex in the previous five years.” We did not measure the previous year’s frequency because of the low response rate on this question. To measure the selling sex variable, we used

the “When was the last time you were paid by a man to have sex with him? By paid, we mean he gave you money, gifts, or favors in return for sex” EMIS–2017 question, and then categorized the variable into those who reported to have ever sold (yes) and those reported they never sold sex (no). The same approach was followed for the variable buying sex, where the question was posed as the last time an individual has paid (gave money, gifts, or favors) to a man to have sex with him [163].

Independent variables

Other variables included in the analysis were demographic variables: *age* was measured in years and then categorized (< 20, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, and ≥ 65), *education* (low-level, mid-level and high-level as this categorization corresponds to the Swedish educational system), *current partnership status* (having a steady partner) further categorized as no and not sure, or yes, I have a steady partner. The economic status was assessed using a question on *living on current income* (living really comfortably, living comfortably, neither comfortable nor struggling, struggling, or really struggling). The *country of birth* was categorized into Swedish-born and foreign-born as a proxy measure for migration to Sweden. We measured the *length of living in Sweden* in years. The *reasons for migration to Sweden* were categorized as refugee/asylum seeker, living more openly as gay/bisexual/trans, or other reasons. Additional variables included were *gender identity*, *sexual orientation*, and *outness*. Sexual risk behavior variables included were the *number of sexual partners in the previous 12 months* (none, one, 2-5 sex partners, 6-10 partners, or more than 10 partners) and *having sex with a woman* (no or yes) [163].

Missing data

Data missingness was highest among education and outness overall, and the reported years lived in Sweden among the foreign-born MSM population.

3.2.4 Paper IV

Dependent variable

The dependent variable was *HIV status*. This variable was measured using a self-reported binary outcome (no, never been diagnosed with HIV, or yes, diagnosed with HIV).

Independent variables

Other variables of interest included were related to sexual risk behaviors. *The number of sex partners in the past 12 months* (including steady male, non-steady male partner, female partner) was included (no sex partners, one sex partner, two to five partners, six to ten partners, or more than ten partners). In addition, we wanted to explore whether the participants were engaged in *sex with a woman in the past 12 months* and have they *used a condom*. The condom variable was modeled after several variables and dichotomized as “using a condom” or “never using a condom.” Further, it was categorized as “using a condom with all sexual partners (both steady and non-steady),” “using a condom only with a steady partner,” “using a condom only with a non-steady partner,” and lastly, “not using a condom ever.” We wanted to explore the pattern of condom usage, as it can be relevant for understanding the pattern of HIV infection. In addition, engaging in sex with female sexual partners was important because participants reported varied sexual orientation or did not report sexual engagement or fantasies about other men, thus engaging in sex with female partners may be as either part of a relationship, or having sex with women and men as part of sex work. Some may experience stigma about their sexual identity and are in long-term (sexual) relationships with women. Lastly, as in paper III, we included the variables on transactional sex, such as *selling sex ever* and *selling sex in the previous 5 years* and *buying sex ever* and *buying sex in the previous 5 years*.

Missing data

In the dataset, demographic variables were 83% complete. There were 9% missing data for education and 3% for outness. In Swedish-born participants, we observed

the same pattern, whereas we observed 83% complete data, 9% missingness for the education variable, and 2% missingness for both length of time living in Sweden and outness variables in the dataset of foreign-born participants.

3.3 Analysis

In paper I, descriptive statistical analysis was performed to identify the distribution and prevalence of all included variables. For sexual risk behaviors, the prevalence in the past 12 months was determined. Pearson chi-square and t-test were used for comparison of sociodemographic characteristics and migration variables among groups. In addition, multivariable logistic regression analysis was performed to model the relationship between independent and dependent variables. The variables for the adjusted models were selected based on bivariate significance and past research, as elaborated in the Introduction. We created different models to estimate the adjusted odds ratios (aOR) and 95% confidence intervals (CI) and the association between various sociodemographic and migration-related characteristics and sexual risk behaviors. A p-value less than 0.05 indicates that the odds ratio for the variable is statistically significant.

Similar to paper I, the data was analyzed with descriptive statistics and Pearson chi-square and t-test comparing the group differences in paper II. Multivariable logistic regression analysis was used to estimate the aOR and 95% CI of poor mental health, measured with RHS-13, and independent variables, with five separate models. This approach was chosen to retain as much of the sample as possible, as some variables had a high level of missingness. As a sensitivity analysis, we conducted multiple imputations by chained equations (MICE) and estimates together with Rubin's rule of all categorical variables assumed to be missing at random [174].

In paper III, the prevalence of ever-selling sex and ever-buying sex was estimated, as well as selling or buying sex in the previous five years. Descriptive and bivariate analyses were performed. The sociodemographic variables in paper III, Table 2, form the rows of the table, and selling sex and buying sex the columns further disaggregated too Swedish-born and foreign-born. The percentages presented are

row percentages, e.g., the percentage of people in each category of people with high-level education who sell or buy sex. Multivariable logistic regression analysis was used for estimation of aOR and 95% CI between the outcome and dependent variables, with models for selling and buying sex (both ever and in previous five years). The included dependent variables were selected based on bivariate significance and past research. We analyzed all participants and then also separately Swedish-born and foreign-born.

In paper IV, the data analysis was similar to in paper III, descriptive, bivariate and multivariate analyses were performed, using percentages, means and standard deviations to describe the data and Pearson chi-square and t-tests to compare the differences between groups. The variables used in the multivariable logistic regression analysis were chosen as relevant to the research question. We calculated the Variance Inflation Factor (VIF) and tolerance factors of independent variables to determine the multicollinearity among the covariates. The tolerance values ranged from 0.58-0.97, with a mean VIF=1.19 for all participants and a mean VIF=1.29 for migration-related variables in the foreign-born participants' sample.

3.4 Ethical considerations

3.4.1 Papers I and II

Papers I and II included human subjects, and therefore ethical permit was obtained from Regional Ethical Board in Stockholm on December 15, 2017, 2017/2030-31. The additional application was submitted to Regional Ethical Board in Stockholm on May 14, 2018, and we received a permit on May 21, 2018, number 2018/1002-32.

Following the ethical principles where the study subject has the right to decide whether to engage in the survey process and safeguard their data, steps for consent approval were taken. The study respects the Declaration of Helsinki and human dignity. Regarding safeguarding ethical principles, the research team members working in the field have already taken competence training in ethical considerations.

The survey was available on a secure online platform. The participants received a password to enter the survey through their cell phones or computers. The participants had to answer whether they consented to the study before proceeding to the questionnaire. They were given time to read the information to provide consent. All questions were clarified at the beginning. After the survey, we reminded the participants that they could contact us if they wished to receive additional details on the survey. Names and e-mail addresses of the principal investigator and the two PhD students were given for this purpose. Throughout the survey, the participants were reminded that their answers were confidential and anonymized and that they could withdraw from the survey at any time. All subjects were assigned a random participant ID number to identify their answer through the analysis. All data was in a secure dataset on an online platform where only authorized study staff and management people with a password could enter and analyze the data. Lastly, the study participants were not identifiable at any stage during the analysis work conducted under the PhD project.

3.4.2 Papers III and IV

Papers III and IV are based on a secondary analysis of anonymous data from EMIS–2017. The multicountry study was conducted in collaboration with several governmental agencies in Europe. Folkhälsomyndigheten (The Swedish Public Health Agency) financed the recruitment of participants in the Nordic countries and coordinated the data collection in Sweden. Folkhälsomyndigheten analyzed the dataset we used in paper III and IV to produce the EMIS–2017 Swedish report [152]. Also, ECDC based in Sweden has, together with the EC and several universities, analyzed and published a European report from EMIS–2017, including data from the Swedish survey participants [168].

The EMIS–2017 followed every step needed to ensure the anonymity of the informants. Participants who agreed to be part of the survey were given the following information about data protection: “What about data protection?” We will not collect the TC/IP address of your device or try to install any cookies on it. We

will not collect any information about you that would allow anybody to identify you. This means you need to complete the survey in one session, and you cannot log out and return later. Participation is voluntary and you can withdraw at any time. Where will the data go? The anonymous data will be shared with EMIS–2017 academic and community collaborators in participating countries as soon as it is ready. Eventually it will be placed in the European Union open data portal for the use of other researchers after a period of embargo” [167]. The data received was anonymized, which no longer, according to GDPR, constitutes personal data. GDPR states, “Personal data that has been rendered anonymous in such a way that the individual is not or no longer identifiable is no longer considered personal data. For data to be truly anonymized, the anonymization must be irreversible” [175].

3.5 My role as a PhD student

As a PhD student involved in the migrant SRHR study, I had various roles throughout the study development and implementation. Before starting my PhD studies, I worked with migration topics and SRHR. This experience helped me to envisage the relevant issues that could be part of the study. During the survey testing, I discussed the questions from the survey with potential respondents individually and in groups to determine whether the questions were understandable and relevant for their peer groups. I would go to different schools in Stockholm to try several questions or the entire survey and discuss the questions with participants afterward. In addition, I was also practicing the time and structure to deliver the information about the study optimally. As I was one of the researchers collecting data on the field, at the beginning of the survey process, I would verbally explain the study’s purpose together with the other researchers in the team that were present at the study site, explain that this is a research study, who the eligible participants were and why they were asked to participate in the study. I would guide them through the steps to fill in the survey, the time needed, and the possibility of asking questions if anything is unclear. I also emphasized that participation in the survey was voluntary and anonymous, they could quit anytime they wanted to, and we could not trace their information back to them. I have further explained that some questions may

be sensitive and require them to reflect before answering. Nothing they write will be taken against them, which is essential to highlight since migration is still a sensitive topic. Some participants may believe they could lose their residency right and be deported if they write something that can be taken against them. If they felt uncomfortable answering those questions, they could refuse to answer them, skip them, ask for clarification, or withdraw from the survey. In addition, my role after data collection was to clean and prepare the data for analysis. Lastly, throughout my PhD studies, I was following the global trends in migration and SRHR, including global health, which enabled me to understand, learn and subsequently implement this learning into my PhD thesis.

In the EMIS–2017, since it was a secondary data analysis, I acquainted myself with the purpose and the design of the survey, both those conducted in 2010 and 2017. I did not participate in the data collection or study design. In close collaboration with the research and supervisory team, I assisted in developing the requests for secondary data.

4 Results

4.1 Papers I and II

Description of the participants

The mean age of the participants was 19.65 years (SD=2.7), with more than half of the participants being men (56%). Almost 42% had mid or higher education. In paper I, we observe about 2.5 years (SD=1.5) of living in Sweden; in paper II, it was almost four years. The majority of the participants belonged to the Islamic religion (61%), and most came from Africa and Syria (22% each) (paper I). Almost two-thirds of the participants came to Sweden as asylum seekers or refugees (61%). Most participants (87%) had a residence permit and reported living with their families (81%).

Sexual risk behaviors (paper I)

The overall prevalence of selected sexual risk behaviors among young migrants was 33% (n=536). The prevalence of those engaging in sexual intercourse without a condom was about 35% (n=614); in those engaging in sex under drug influence (n=707) and those exchanging sex for money or goods (n=709), it was 7% each.

Condomless sex was associated with religion, country born/raised, and reported current living arrangements ($p<0.05$). In sex under the influence of drugs, we observe an association with sex, country born and raised, and residence status ($p<0.05$). Sex in exchange for gifts/money in the previous 12 months was associated with the reasons for coming to Sweden ($p<0.05$) (paper I, Additional file 1, Table 4)[169].

Factors influencing the odds of engaging in sexual risk behavior (paper I)

Increased age (aOR: 1.10 (95% CI: 1.01-1.27, Models 1-5); the increasing number of years of stay in Sweden (aOR: 1.17, 95% CI: 1.00-1.74, Models 1-5); being born in the Americas and Europe; coming to Sweden to live with family increased the odds of engagement in condomless sex in the previous 12 months; reporting belonging

to Islam as religion decreased the odds (aOR: 0.47, 95% CI: 0.22-0.97, Model 5) (paper I, Table 1) [169].

Being born in Europe (aOR: 7.44, 95% CI: 1.46-38.34) or a MENA country (aOR: 5.60, 95% CI: 1.17-23.37); and coming to Sweden to work or study (aOR: 5.00, 95% CI: 1.69-14.75) increased the odds for reporting engagement in sex under drug influence in the previous 12 months. Additionally, younger age decreased the odds of having sex under drug influence over the last 12 months (aOR: 0.83, 95% CI: 0.69-0.98) (paper I, Table 2) [169].

Increased years of living in Sweden (aOR: 1.63, 95% CI: 1.05-2.51); coming to Sweden to work or study (aOR: 4.62, 95% CI: 1.47-14.53) or to live with family in Sweden (aOR: 4.14, 95% CI: 1.03-16.51) compared to those who came for other reasons increased the odds for engaging in sex for money or gifts in the past 12 months (paper I, Table 3) [169].

Mental health and sexual risk behaviors (paper II)

The overall reported prevalence of poor mental health among young migrants was 59% (55% male and 45% female participants). Among those reporting to have had sex, about a third reported engagement in sexual risk behavior in the previous 12 months. The mean value of willingness to engage in risk behaviors among those with poor mental health was 4.5, SD=2.8. Almost 40% had poor mental health in those who engaged in sexual risk behavior (paper II).

Education, years living in Sweden, religion, country born or raised, reasons for coming to Sweden, current living arrangements, and sexual risk behavior were significantly associated with poor mental health ($p < 0.05$) (paper II, Table 1).

Factors influencing the odds of poor mental health and engaging in sexual risk behavior (paper II)

Those living five years or longer in Sweden had increased odds of reporting poor mental health compared to those living in Sweden for less than one year. Participants who reported engaging in any of the sexual risk behaviors assessed were more likely

to report poor mental health (aOR: 1.99, 95% CI: 1.20-3.29, Model 2). Willingness to take risks, being female (compared to being male) and living four years in Sweden compared to those living in Sweden for less than a year, increased the odds of poor mental health. Those who lived alone (aOR: 1.89, 95% CI: 1.04-3.42, Model 4) or with friends known from earlier (aOR: 2.93, 95% CI: 1.30-6.61, Model 4) had increased odds for poor mental health compared to those who lived with other family members. Also, being female and increased years of living in Sweden increased the odds of poor mental health (Model 4). Engaging in sexual risk behavior (aOR: 2.39, 95% CI: 1.09-5.22, Model 5) increased the odds of poor mental health (paper II, Table 2).

Being born in Asia, Europe or Africa decreased the odds for poor mental health, in comparison to being born in Syria. This association remained in Model 2, in which longer education (10 or more years) was also found to decrease the odds of poor mental health compared to ≤ 3 years of education. Country or region of origin remained associated but only for those born in Europe or Africa, compared to Syria. In Model 4, only those born in Africa showed decreased odds of poor mental health compared to those from Syria. Coming to Sweden to live with family decreased the odds of poor mental health compared to coming as an asylum seeker or a refugee. In Model 5, which included all variables, this association did not remain significant, nor did the association with country/region. The only factor that decreased the odds of poor mental health was having 10 or more years of education compared to low education. Poor mental health was not associated with age, religion, and residence status in any of the models (paper II, Table 2).

4.2 Papers III and IV

Description of the participants

The study population in this survey consisted of 4443 MSM participants reporting to live in Sweden, with 43% above 50 years old. Almost half of the participants (47%) reported completed upper secondary education, and the majority (85%) were Swedish-born. The majority identified as men (97%), and about two-thirds (63%) as

gay or homosexual. Almost half (45%) of participants reported a high level of outness, and 56% reported not having a partner currently. Nearly a third responded to living comfortably with their current income. Most reported not having sex with a woman during the previous 12 months (80%). Almost all (98%) had never used injectable drugs. About half of the participants reported always using a condom during sexual intercourse (47%) (paper III, Table 1) [163].

Among Swedish-born MSM participants, 45% were 50 years old and above, with 51% having completed upper secondary education, sharing similarities with all MSM sample. Among the foreign-born MSM (n=656), 30% were above the age of 50. About two-thirds were highly educated (66%) and 69% identified as gay or homosexual, and 98% as men. About 33% lived comfortably on their current income. About 60% reported being born in Europe (northwestern Europe reported as the most common), 16% in Asia, and 10% in South America. The mean number of years reported to live in Sweden was 22 (SD = 16), and more than half of respondents reported they had arrived in Sweden for other reasons than to live as being gay/homosexual (74%) (paper III, Table 2) [163].

Transactional sex (paper III)

Selling sex – 13.2% of all MSM participants reported ever selling sex, and 5.9% reported they had sold sex during the previous five years. Amongst Swedish-born MSM, 12.7% reported ever selling sex, and 5.4% reported having sold sex in the past five years. Among foreign-born MSM participants, 16% reported ever selling sex, and 8.4% reported selling sex in the previous five years (paper III, Table 1 and 2)[163].

Among all MSM engaging in ever-selling sex, we observe an association with age, education, country of birth, sexual orientation, outness, having a current partner, the number of sex partners in the previous 12 months, living on current income, and injecting drug use ($p < 0.05$). Among Swedish-born MSM participants reporting selling sex, we observe a similar association trend as in all MSM participants, with the addition of current gender identity and sex with a woman over the last 12 months

($p < 0.05$). In selling sex among foreign-born MSM participants, we observe an association with age and the number of sex partners during the previous year, as well as injecting drug use ($p < 0.05$) (paper III, Table 1 and 2) [163].

Buying sex – 10.8% of all MSM participants reported ever buying sex, while 6.7% reported buying sex during the past five years. In Swedish-born MSM, 10.7% reported ever buying sex, and 6.6% buying sex in the previous five years. For foreign-born MSM, 11.6% reported ever buying sex, and 6.8% buying sex in the previous five years (paper III, Table 1 and 2) [163].

Among all MSM, age, education, current gender identity, number of sexual partners in the previous 12 months, sexual orientation, sex with women in the previous 12 months, outness, and injecting drug use were associated with buying sex ($p < 0.05$). Among foreign-born MSM, only age was associated with ever buying sex compared to Swedish-born MSM, where we observe a similar association as in all MSM participants except education ($p < 0.05$) (paper III, Table 1 and 2) [163].

Factors influencing the odds of engaging in transactional sex (paper III)

Ever selling sex – In almost all age categories, compared to those over 65, we observe increased odds of ever selling sex, from under 20 to 35–39 years old. The odds of ever selling sex were increased among those who were foreign-born compared to be Swedish-born, as well as in those reporting to be struggling and really struggling compared to living very well, and those reporting having sex with a woman in the past 12 months compared to those reporting that they did not (paper III, Table 3) [163].

Factors decreasing the odds of ever-selling sex in all MSM participants: Decreased odds of ever-selling sex were among those who reported that only a few or no one knew about their attraction to men compared to those reporting that all or nearly all individuals knew about it (outness). Among those reported being between 55 and 59 years old, we observe decreased odds of ever selling sex compared to those above 65 years old (paper III, Table 3) [163].

The factors increasing and decreasing the odds of ever-selling sex followed the association observed in all MSM sample, both in Swedish- and foreign-born MSM participants. Having sex with a woman in the past 12 months increased the odds compared to those that did not have sex with a woman. In Swedish-born MSM, it was also younger age (younger than 20 and up to 29) compared to those over 65 years old. No factors decreased the odds in foreign-born MSM (paper III, Table 3) [163].

Selling sex in the previous five years – Among all MSM participants, almost all younger age groups (until the age of 39) showed increased odds in comparison to older participants (over 65 years old) (paper III, Table 3) [163].

The factors that decreased the odds of selling sex in the previous five years among all MSM participants: among those who reported that only a few people or none know about their attraction to men compared to those with a high level of outness [163].

Among the Swedish-born participants, in younger than 20 to 39 years old (compared to those above 65 years) and struggling to live on their current income (compared to living really comfortably) increased the odds of reporting selling sex in the previous five years, in addition to not using a term for sexual orientation (compared to “gay/homosexual” reference category) and reporting sex with a female partner in the past year (compared to those who reported they did not have sex with a woman in the past year). We observe decreased odds as those in all MSM sample (outness and education). In foreign-born MSM, only in those who were younger than 20 years, who struggled to live on their current income compared to those who lived comfortably, had sex with a woman during the previous year, we observe increased odds of selling sex in the past five years. The high level of outness was also increasing the odds compared to those with high level of outness (paper III, Table 3) [163].

Ever buying sex – In all MSM participants, those with first-stage tertiary education are more likely to engage in buying sex than those with low educational levels.

Increased odds of ever buying sex were among those were single compared to those having a partner (paper III, Table 4) [163].

Factors decreasing the odds of buying sex ever: nearly all age groups, except for those between the ages of 60 and 64, had decreased odds of buying sex ever in comparison to the age of 65. The aOR ranged from 0.05 (95% CI: 0.02-0.14) for those between the ages of 20 and 24 to 0.64 (95% CI: 0.43-0.94) for those between the ages of 55 and 59. Those who reported being bisexual were less likely to buy sex than those who identified as gay or homosexual. Also, those who reported no one knew about their attraction to men had decreased odds of ever buying sex than those who reported all or almost all knew about it (paper III, Table 4) [163].

We observe among Swedish-born MSM younger age (20-59) (compared to older participants), low outness (compared to high levels), and reporting to be bisexual as sexual orientation (compared to gay/homosexual) decreased odds of buying sex ever among MSM born in Sweden, including among those that reported did not have a current partner, we observe increased odds (aOR: 1.36, 95% CI: 1.05-1.75). None of the analyzed variables were associated with the odds among foreign-born MSM, except for those in the 25–29 age group (compared to older than 65) and the years lived in Sweden (paper III, Table 4) [163].

Among all MSM, those who report being single were more likely to buy sex in the previous five years than those with a partner. Those with third-level education also had increased odds of buying sex in the past five years compared to those with first-level education. Moreover, in practically all age groups below 40, the odds of buying sex were decreased when compared to those over 65 years old, with aORs 0.10 (95% CI: 0.04-0.25) for those in the 25–29-year-old range to 0.47 (95% CI: 0.27–0.82) for those in the 35–39-year-old range. Living comfortably and neither comfortably nor struggling decreased the odds of buying sex during the past five years versus those who lived truly comfortably on their current income (paper III, Table 4).

Increased odds of buying sex during the past five years in Swedish-born MSM were comparable to those in all MSM participants (being single) and decreased odds for

buying sex in the past five years (age and income). Those reporting low outness were less likely to report buying sex in the previous five years than those with higher levels of outness. Among foreign-born MSM, the reported years of stay in Sweden decreased the odds of buying sex during the past five years (paper III, Table 4) [163].

Living with HIV (paper IV)

The prevalence of self-reported living with HIV among all participants was 5.4%. The self-reported prevalence among Swedish-born MSM (n=3775) was 4.8%, and in foreign-born MSM participants (n=656), it was 8.8%.

Participants living with HIV

The majority of individuals reporting living with HIV were Swedish-born (76%), and around 54% of participants reporting living with HIV (n=237) were above 50 years old. Nearly all participants (99%) identified as men, and most identified as gay or homosexual (84%). Almost half (47%) of those reporting living with HIV were highly educated. More than half (56%) reported high outness and being without a partner, making up the majority (57%). A third (34%) reported they had more than ten partners in the past 12 months, and 35% used condoms with a steady partner. Almost half (42%) reported living comfortably on their current income, and 94% have never injected drugs (paper IV, Table 1).

Among all participants, age, birth country, gender identity, sexual orientation, number of partners, sex with a woman, outness, condom use, living off current income, use of injectable drugs, selling and buying sex (ever and in the past five years) were associated to self-reported living with HIV. In Swedish-born MSM living with HIV (n=180/3775, self-reported), we observe an association with age, sexual orientation, and gender identity, outness, number of sexual partners in the last year, sex with a woman and condom use in the previous year, living on current income, selling sex ever, selling and buying sex in the last five years. In foreign-born MSM, living with HIV (n=57/656) was associated with sexual orientation, sex with a woman in the past 12 months, condom use in the past 12 months, living on current

income, injecting drug use, selling sex ever and in the past five years, and buying sex ever and in the past five years (paper IV, Table 1 and 2).

Participants not living with HIV

Most were Swedish-born (86%) and aged 50 and above (42%). Almost all participants in this group identified as men (97%), and the majority had a mid-level education (47%) (paper IV, Table 1).

Other characteristics of this group generally followed the same pattern as those living with HIV. However, a third of the participants in this group reported having 2-5 partners in the past 12 months (33%), and 21% reported having had sex with women during the past year. Nearly half of the participants in this group reported always using a condom (48%) (paper IV, Table 1).

HIV and transactional sex (paper IV)

Among those that were reporting selling sex ever, 11.4% reported living with HIV. Of those reporting selling sex in the past five years, 8.1% reported living with HIV. Of those reporting ever buying sex, 10.3% were living with HIV, and 11.9% who reported buying sex in the previous five years reported living with HIV (paper IV, Table 1).

Among Swedish-born MSM who have ever sold sex, 9.7% reported living with HIV; among those who sold sex in the previous five years, 5.4% reported living with HIV; among those who have ever bought sex, 9.3% reported living with HIV; and among those who have bought sex in the previous five years, 10.9% reported living with HIV (paper IV, Table 2).

Among foreign-born MSM, living with HIV was reported among 19% of those reporting to sell sex ever, 18.5% in those selling sex in the previous five years, 15.8% in those reporting to buy sex ever, and 17.6% in those buying sex in the past five years (paper IV, Table 2).

Factors influencing the odds of living with HIV (paper IV)

In all MSM participants, factors increasing the odds of living with HIV include reporting selling sex within the previous five years. Amongst those reporting buying sex in the previous five years, we observe increased odds of living with HIV. Compared to Swedish-born, foreign-born had increased odds of living with HIV. Those struggling, compared to those living really comfortably with their current income, had increased odds of living with HIV (paper IV, Table 3).

Compared to those aged 65 and older, almost all age categories up to 34 years (excluding those younger than 20) had decreased odds of living with HIV. Decreased odds of reporting living with HIV were among those reporting that only a few or no one knew about their attraction to men (outness) compared to those with reported higher levels of outness. In comparison to those who never used a condom in the previous 12 months, those who had only one partner over the last 12 months, two to five partners, always used a condom in the previous 12 months, and only used a condom with a non-steady partner, had decreased odds of living with HIV.

Among Swedish-born participants, reporting selling sex within the previous five years increased the odds. Also, those comfortably living and those struggling on their current income had increased odds of reporting living with HIV than those who live really comfortably on their current income (paper IV, Table 3).

Among Swedish-born MSM participants, being 25-29 years old compared to being 65 years old and older decreased the odds of reporting living with HIV. Factors decreasing the odds were lower reported degree of outness (aOR: 0.40, 95% CI: 0.19-0.83) where few or no one knows about their attraction to men (compared to high levels), having one partner in the previous 12 months (compared to reporting no sex partners), always using a condom and those who used condom only with a non-steady partner in the past 12 months compared to those who never used a condom (paper IV, Table 3).

Selling sex in the last five years increased the odds of reporting living with HIV among foreign-born MSM participants. Compared to those 65 and older, those aged

20 to 29 had decreased odds of living with HIV. Decreased odds of reporting living with HIV were among those with first-stage tertiary education than for lower-level education and living comfortably. Using a condom consistently decreased the odds of reporting living with HIV compared to never using a condom and the length of time spent living in Sweden (paper IV, Table 3).

5 Discussion

This thesis has attempted to assess the prevalence of sexual risk behaviors among young foreign-born key populations living in Sweden, including condomless sex, sex under the influence of drugs, and sex in exchange for money or gifts in the previous 12 months. According to the findings, one in three young migrants reported engaging in sexual risk behavior, and those who reported engaging in sexual risk behaviors also had an increased risk for poor mental health. Different sociodemographic factors and migration-related circumstances affected the odds of engagement in sexual risk behavior and poor mental health outcomes.

Furthermore, the thesis aimed to assess the prevalence of transactional sex, as a sexual risk behavior, in foreign-born MSM living in Sweden and compare this to Swedish-born MSM. The overall prevalence and factors of MSM engagement in transactional sex differ between Swedish-born MSM and foreign-born MSM.

In the following, these findings are discussed in-depth.

5.1 Prevalence and associated factors for sexual risk behavior among young migrants in Sweden

This thesis aimed toward age-specific migrants in Sweden and measured sexual risk behaviors using three different behaviors within a 12-month timeframe; thus, comparing the findings with other studies that use different timeframes and definitions may be difficult [176,177].

In paper I, we found a 33% prevalence of sexual risk behavior (condomless sex, sex under drug influence, and sex in exchange for money or gifts) during the previous 12 months among young migrants living in Sweden. Observing those who reported specific sexual risk behaviors described above, almost a third of the sample reported condomless sex. A study conducted among Swedish youth aged 16-29, known as UngKAB15 (Young people's Knowledge, Attitudes and Behavior), found that almost 25% used condoms entirely during their last intercourse [178]. In addition, a study from Sweden which included young people between 18-30 years

old, found that nearly 76% reported not using a condom during last sexual intercourse, including a 59% prevalence of condomless sex with a casual partner [27]. The same study reported significantly increased odds of condomless sex among those 25-30 years old compared to younger participants, which aligns with our findings that belonging to the older age group increased the odds of condomless sex [27]. Older participants could potentially be married and thus engage in condomless sex as part of a marriage or be in a monogamous relationship, where this behavior is more common. They may use another form of contraception, such as hormonal or diaphragms. In addition, as age increases, the possibility of having more sexual partners increases, together with the chance to have condomless sex.

Increased odds of engaging in condomless sex were observed among those who reported coming to live with a family compared to those reporting arriving as asylum seekers/refugees. Other studies had different findings: when children live with parents, parental support is usually a key factor for improved health since the parents are those closely engaged in the child's learning of health and health outcomes, including behaviors that can affect health [176]. A study in Ethiopia showed that adolescents aged 15-19 who do not have social support had about five times higher odds of engaging in sexual risk behavior compared to peers with social support [179]. However, we may also want to acknowledge the possible inconsistency in parental engagement due to other factors that may influence their lives living as a migrant in Sweden. This would give them less focus on family dynamics [180]. We also did not explore the young migrants' household composition as these may be young migrants arriving with siblings, one parent, or with their children. Lastly, we may consider these young people are sexually exploring, including engaging in sexual risk behaviors.

Compared to coming to Sweden from Syria, we observe increased odds of engaging in condomless sex among those reporting coming from Europe or the Americas. This finding may be due to different attitudes towards sex and sexuality among those arriving from the American continent and Europe than those reporting to come from Syria, as reported in similar research [27,181]. In addition, increased

odds of engaging in sex under drug influence were among those reporting coming from Europe or a MENA country compared to those reporting arriving from Syria and those coming to Sweden to work or study compared to those reporting arriving as asylum seekers/refugees. Although there are no similar studies on the topic of the influence of drugs and sexual risk behavior comparing Europe, MENA countries, and Syria, studies have shown that those arriving from non-conflict countries could be seasonal workers, students, or coming to work/study, therefore may not share the same burden and migrant experience and share a different risk for using drugs [27,181]. Those arriving to work/study in another place may engage in sex under the influence of drugs or alcohol as trying a new experience in a new surrounding [27,181].

Decreased odds of engaging in sex under the influence of drugs were among younger migrants compared to older – one of the reasons to engage in this behavior would be the reduced agency among younger participants and the peer pressure. In addition, an older participant may be more cautious about engaging in this behavior.

Increased odds for engaging in sex for gifts and money in the past 12 months were the years reported to live in Sweden. This finding may be due to acculturation stress, where the challenges of finding employment, disappointment, and financial instability, can make the young migrants susceptible to engaging in this sexual risk behavior. Those reporting living with family members had increased odds of exchanging sex for gifts/money. As mentioned, we did not explore the household composition; some young people may arrive with their children or siblings and need to supplement their income to survive. Selling sex does not necessarily occur due to financial scarcity; research from Sweden on young people found that transactional sex happened through friends, and they also frequently received alcohol and cigarettes in exchange for sexual favors [8].

Those who reported coming to Sweden to work/study had increased odds of engaging in transactional sex compared to coming as an asylum seeker/refugee. We observe a challenge in elaborating on the findings. The paper does not explore the

causes of transactional sex. It may be difficult to conclude whether this is transactional sex due to economic struggle, where migrants can be adversely affected, or some other factor is the cause. In addition, it does not have to mean that this is commercial sex – the participants may engage in sex for gifts as a part of cultural exchange or sensation-seeking [82]. In addition, we did not explore the frequency or temporality of engaging in transactional sex beside the reported behavior in the previous year. We did not assess where did the transactional sex took place. The participants may travel elsewhere and engage in transactional sex where the place and practice of sexual intercourse are experienced as an adventure [9,25,85,182]. A study on migrants residing in two European cities reports that about half of those who have traveled abroad have had a partner in the country of migration and abroad [25]. Lastly, as suggested in a global review on the prevalence, correlates, context, and youth involvement in transactional sex, studies differ in time event reference period, type of gift, and the direction of selling versus buying; thus, it is important to observe the cause, frequency, and temporality in future studies [85].

5.2 Prevalence and associated factors for poor mental health, including sexual risk behaviors, among young migrants living in Sweden

In paper II, there was an observed overall 59% of poor mental health prevalence among young migrants aged 15-25 living in Sweden. Studies show that prevalence and risk factors may vary between migrant groups [74,99,105,183–185]. A study by Andersson et al. among undocumented adult migrants found that 68% were suffering from anxiety, 71% from depression, and 58% from PTSD [186]. A systematic review and a meta-analysis on depression among international migrants reported a 15.6% prevalence [187]. According to studies done in Sweden, such as by Hollander et al. on a cohort of almost 1.5 million people, refugees had higher exposure to a traumatic experience; however, they did not have a higher risk of suicide compared to other types of migrants, possibly due to resilience and being part of a group of strong survival beliefs [188]. Other reasons for poor mental health

include educational challenges, adaptation to a new setting, family pressure, language barriers, and financial difficulties [189].

In paper II, we observe that compared to other global regions and countries of arrival, those who reported coming from Syria had increased odds of poor mental health. Traumatic experiences in a war-torn country can increase the odds of poor mental health [99,105]. As mentioned in a review on the mental health of immigrants to Sweden, the prevalence of anxiety and PTSD was higher in individuals arriving from countries with conflict than in the Swedish-born population [190]. In addition, a qualitative study on Syrian refugees settling in Norway also described mental stress over their asylum application, understanding the new culture, language barriers, and challenges of exclusion from the labor market and loss of social status [191]. Another study on post-migration stress and mental health among 1215 Syrian refugees resettled in Sweden found that anxiety, depression, and PTSD prevalence ranged up to 40%, with depression being the most common [158]. In findings from the Stockholm Public Health Cohort from 2002 and 2006, among young migrants 18-29 years old, it was found that migrating from a country outside of Europe can cause poor mental health, especially among young women [80].

In the findings from paper II, we observe that females had increased odds of poor mental health compared to males. Nearly half of almost 90 million asylum seekers, refugees, and internally displaced persons are women, who are more vulnerable before, during, and post-migration [192]. Previous studies have found no gender difference between undocumented adult migrants in Sweden regarding psychiatric disorders prevalence; in contrast, a systematic review on the long-term mental health of war refugees found that women have a greater risk for anxiety but not PTSD [94,99]. Furthermore, Dykxhoorn et al. explored the intersection of gender and having social support (family members) and found that female migrants living alone have increased odds of developing psychosis than those coming with a family; however, in males, it was somewhat the contrary – coming with a family had increased odds for psychosis than those without family networks in the host country [193]. This finding may be explained by females' preference for the family as a source

of social support and buffering social isolation, especially when females are also expected to succeed as migrants, providing for their families due to changing gender norms [193].

Those young migrants who reported living alone compared to reporting to live with a family had increased odds of poor mental health. There are several studies describing possible explanations for this finding. Based on a systematic review of public health consequences of social isolation and loneliness, both can lead to poor mental health [194,195]. A lack of social support can contribute to depression and anxiety, according to a study on war refugees living in Sweden [158]. Separation from the family and worry about them can contribute to poor mental health [61]. However, as described in the previous paragraph, gender differences in social support and social roles may exist while viewing family networks as a source of social support during migration and mental health, differentiating mental health outcomes in men and women [99,193]. The differing findings may be attributable to differences between study populations, time since resettlement, and postmigration conditions [158].

The number of years lived in Sweden increased the odds of poor mental health among young migrants. This finding could be due to the post-migration economic situation, particularly with documented inequities between migrants and host populations, such as unequal employment opportunities, housing, and healthcare access [99,187,196]. Over time, poor social integration and disappointment in the host country's prospects may trigger poor mental health [103]. Other research suggests resilience as a possible factor in managing their life in the host country, which diminishes over time [103].

Among those who reported engaging in sexual risk behaviors and willingness to take risks, we observe increased odds of poor mental health. A study from Sweden among young individuals aged 18-30 shows an increase in sexual risk behaviors among those with poor mental health, including condomless sex in the last sexual intercourse [27]. According to studies on the complex relationship between

willingness to take risks and mental health, poor mental health can influence behavior, emotions and expectations bounded by context [197]. In addition, the context can influence engagement in sexual risk behaviors, resulting in poor mental health. A research study on migrants in China found that family separation, and lack of social support, may lead to migration stress and sexual risk behaviors as a way to deal with the stress [112]. Young migrants may suffer from loneliness, which increases the feeling of indifference, and may engage in sexual intercourse without thinking about the risk because of the indifference to protect their health [119]. This study and others support our finding that mental health and sexual risk behavior can possibly be interdependent, but more research is needed [27,115–117].

In some research, we find a supportive finding to our result that higher education decreases the odds of poor mental health compared to lower education, explained by opportunities for employment due to higher educational status and the knowledge on how to use healthcare services that increases with the level of education [103]. However, other research on mental health inequalities performed in Sweden also suggests that poor mental health could influence education attainment resulting in low educational levels leading to an unmet need for health care and increased risk of poor mental health [198].

5.3 Prevalence and associated factors for transactional sex and living with HIV

A modified socioecological model was applied to discuss the findings of this thesis related to papers III and IV [2]. This model is focused on drivers of HIV, recommending that besides individual factors, there are other factors (community, networks, regulations, policies, etc.) that impact the potential for the individual to live with HIV [2].

Individual drivers

Individual drivers are related to biological or behavioral characteristics that can put the individual at a higher risk.

Sexual risk behavior

The prevalence of transactional sex observed in our research is consistent with other studies from similar settings. According to research in industrialized countries, the reported prevalence is 4.5-7% in the last year among those selling sex and 6-17% among those buying sex [81]. According to a study on the prevalence of transactional sex among young MSM from the US who engage in sexual intercourse with casual and regular partners, 40% reported lifetime engagement in transactional sex [120]. Another Canadian study on gay, bisexual, and other MSM reported a 22% prevalence of transactional sex [199]. In the overall EMIS–2017 sample (n~128000), 9% reported engaging in buying sex, and 5% reported selling sex at least once in the previous year [168]. Other examples include almost 37% of transactional sex engagement ever, and in an Australian study among gay and bisexual men, the prevalence was 16.7% for selling ever and 25% for buying ever [84,137]. The difference in prevalence between the literature and the findings has to be observed with different factors. One such factor is the prevalence measurement, and another is laws that may influence engagement in transactional sex [84].

Reporting selling sex among all MSM represented an increased risk for reporting to live with HIV. According to other authors, HIV prevalence among MSM samples ranges from 12% to 41% [84]. This finding can also be explained by an increased risk for condomless sex, often offered as a monetary incentive by buyers and increases the risk for HIV [12]. According to research on male street workers and internet escorts, with almost 31% HIV prevalence, they report varying rates of condom use, condomless sex, and low HIV disclosure rates, some of the recognized risks for HIV transmission [83]. Other research on MSM and transactional sex found that among those living with HIV, there are increased odds of reporting engagement in transactional sex which can be a double risk. According to the literature, MSM who sell sex are disproportionately affected by HIV, with a 20 times increase in HIV infection prevalence rate than the general male population [81]. Research suggests that MSM who frequently sold sex had more than twice as many increased odds of living with HIV [81].

Age

Selling sex ever and in the past five years was associated with age; increased odds for selling sex were among those 20-39 years old (including younger than 20 years old) compared to 65 years old. Nearly all age groups, except for those between the ages of 60 and 64, were less likely to buy sex ever when compared to those over the age of 65. Prestage et al. found that selling sex steadily declined with age, while a reverse trend was observed with buying [137]. Youth may be a valuable commodity in selling sex which may be reflected in the reverse direction of the selling and buying sex practice [137].

The trend of being younger increased the odds of selling sex compared to older, and older age increased the odds of buying sex compared to younger participants may speak about the power hierarchies between these two groups, where selling may occur among those who are young and economically disadvantaged and buying among those who are older, better economically situated and more educated. According to a study on age discordance, such sexual relationships may enhance HIV acquisition among the younger MSM [13]. Due to possible decreased control in sexual decision-making in sexual intercourse with an older partner, younger MSM may experience high vulnerability due to lower economic power [18,84,137,200]. This vulnerability could be reflected in negotiating safe sex practices and increasing their risk for HIV. However, engaging in selling sex can be to explore sexual identity, where an older partner can serve as a partner guiding them through this phase [201]. We could not examine whether those buying are clients of those selling in our sample; however, age and socioeconomic differences among those engaging in transactional sex require more research [12]. Compared to those aged 65 and older, almost all age categories up to 34 years (excluding those younger than 20) had decreased odds of living with HIV. Those who are older possibly had more lifetime partners, increasing their risk for HIV compared to younger MSM [12,202]. Engaging in sexual intercourse should employ all means of protection of the individual to minimize the risk of that sexual activity.

Sexual orientation

Among those who do not define their sexual orientation, we observe increased odds of selling sex in the previous five years compared to those who identify as gay or homosexual. One of the reasons for this finding may be because the description and categories offered do not match their self-identification and relate to their experiences [131]. Sexual orientation may become complex in countries with a strong sexual orientation stigma [133,203]. Research has shown that in different societies, the insertive male partner may not identify as a sexual minority identity [129]. In addition, some migrants are experiencing varied sexual encounters with men, including selling sex, which does not mean they do not define as heterosexual [52]. Research on MSM from the US has shown that those who identify as heterosexual may have been pressured to identify as such due to their culture, but they engage in sexual intercourse with both sexes [135]. As a result, those who declare as heterosexual, as complying with the normative of the broader context, may still be involved in same-sex practices; however, they also may maintain the masculine identity in that sexual intercourse [15]. One of the reasons for these results is that sexual orientation may not be as essential to disclose for many since that is a part of their lives and intimacy. Also, adapting to the new sociocultural norms of sexual and gender categories in a host country can be challenging for sexual minorities who are migrants and take time [53]. Understanding the importance of how sexual orientation can be interpreted can be very valuable for creating programs, including understanding the nuances and diversity [131].

Network

Network factors are relevant for reaching and recruiting members of MSM [11]. They offer a greater understanding of routes of HIV transmission and individual characteristics that can benefit HIV treatment and prevention programs [11]. But network dynamics are also central in driving risk. HIV can be transmitted in networks at high speed, depending on the network type; HIV can be transmitted in networks at high speed if the members of the network also have an increased risk; if people in the network have a low risk for HIV, including high prevention

and treatment strategies, the risk can be low, even independent of condom use [121].

Current partner

The type and number of sexual partners can influence the risk for HIV. In our research, those reporting not having a current partner were more likely to engage in buying sex than those reporting having a partner. This finding can be explained by the fact those who buy sex and do not have a partner could be looking for sexual sensation and experience and engage in buying sex. Another explanation could be that those who are buying sex have a difficult time forming a relationship, they maybe want sex without commitment, and they engage in buying sex as a romantic escape. According to research on MSM with regular and casual partners, those romantically involved also had decreased odds of engaging in transactional sex [120]. However, we did not explore the type of relationship among those who reported not being single or the reasons for buying sex. That could be a potential avenue for further research.

Number of partners and condom use

A factor in the broader environment that can influence the individual's HIV status is the number of partners, including condom use trends with the type of partner. This thesis found that reporting having one partner in the past 12 months decreased the odds of HIV. The concurrency or sequential partnership and having a high-risk sexual partner, together with engaging in buying sex with non-regular partners or partners with unknown HIV status, increase the risk of HIV. Research has shown that those who engaged in transactional sex, including having multiple sexual partners, had a high risk of violence [204].

Another finding was that reporting using a condom consistently (both steady and non-steady partners) reduced the odds of reporting living with HIV compared to never using a condom. This finding has been supported and proven in many HIV prevention programs that condom is a preferred and safe choice against HIV

infection, especially in those with many partners and concurrent or sequential partners. Condom use can differ according to the partner type. According to research on Peruvian MSM, MSM report condomless insertive sex with female partners rather than male partners and engage in condomless sexual intercourse with steady partners [205]. In addition, deliberate avoidance of condoms during anal sex or “barebacking” in HIV-risk contexts has been a concerning behavior [121,126,127]. A Swedish study on barebacking found that barebackers are involved in other sexual risk behaviors, including rimming and group sex, and may use the internet for sexual networking [127]. However, those engaging in condomless sex may still be very well informed about the risks of condomless sex. For example, those engaging in unprotected sex may report more frequent HIV testing, disclose their HIV status to the most recent sexual partner, and use other techniques, such as strategic positioning during sexual intercourse [127]. The results from the SIALON–II study among European MSM show that unknown HIV status contributed to HIV exposure [206]. Thus, using a condom during anal intercourse is essential, especially with non-steady partners, including testing and HIV status disclosure [206]. In conclusion, the number of partners can be a variable related to other sexual risk behavior (e.g., condomless sex) and should be explored as a risk factor for HIV.

Sex with a woman

According to our analysis, reporting having sex with a woman in the past 12 months increased the odds of selling sex (ever and five years) comparing to not having sex with a woman. According to other research on MSM engaging in transactional sex, those reporting to have a partner of both sexes were also more likely to report engagement in transactional sex as part of convenience. Some non-exclusive straight identities reported that even though they have a female partner, they engaged in having sex with a man as an adventure, including their female partner in intercourse. Furthermore, foreign-born MSM reporting having sex with a woman the previous year were more likely to sell sex in the past five years. It may be connected to engagement in sex for favors or goods with a man while having a woman as a steady

partner [14]. Thus, this may suggest that those who have sex with both men and women could also sell sex as part of sex work. MSM may hide their sexual identity and have a steady relationship with women, where females are their primary partners [205]. Thus, it is important to create prevention program messaging to address those who do not necessarily recognize themselves in the ads targeting gay men [127].

Community

A community can have a strong influence on sexual risk behavior and drivers of HIV. Communities can be perceived as more hostile or supportive based on language and cultural differences, religious beliefs, or ethnic composition. Communities' disapproval of different gender and social identities may lower the levels of outness and increase the social isolation in sexual minorities [107,207]. The social capital that refers to social inclusion, participation and support may be lacking in some communities, adding to poor health and well-being [207].

Outness

MSM reporting low levels of outness had decreased odds of selling sex compared to those with high levels of outness. Also, the odds of living with HIV were decreased for those reporting that only a few or no one knew about their attraction to men (outness) than those who said that all or almost all individuals knew about it. Outness has been treated in the literature as a disclosure gradient; however, a person may not have self-labeled yet decided what and whether they will disclose that to others, especially in young and formative years [208]. Most sexual minorities disclose their sexual orientation to just a few significant people [129]. Stigmatizing environments can inhibit the level of outness among sexual minorities. Sweden ranks as one of the liberal countries regarding homophobia and discrimination against sexual minorities [140]. However, living in such a society does not preclude that stigma against sexual minorities is present, including internalized homonegativity [209]. Arriving in a host country where one can openly be a sexual minority does not mean one is prepared to do so. Previous traumatic experiences of being a sexual minority in a country where one is physically and psychologically abused can be a significant burden [53].

Some are used to hiding their identities for so long that coming out can have psychological consequences and make them additionally vulnerable [53]. In addition, some migrants can continue to hide their identity because they fear violence, especially if they live with members of their ethnic community or, in collective housing, with other members that stigmatize sexual minorities [210].

The reason for low outness and decreased odds for selling sex and living with HIV could be that those not openly declaring their attraction to men may have decreased opportunity to engage in sexual intercourse, be part of the gay scene, and have decreased risk for engaging in transactional sex overall [133,211]. According to research, those with low outness may also experience homophobia and have a lower probability of adopting risk behaviors [133]. On the other hand, research shows that for many sexual minority men, the minority stress contributes to identity concealment and is increased with sexual risk behaviors [135,212].

However, in foreign-born MSM reporting higher outness levels, we observe increased odds of selling sex. Foreign-born MSM residing in countries with a low stigma against MSM may practice a higher level of outness and openness for engaging in different sexual experiences, including sexual risk behavior [133,213]. Thus, selling sex among foreign-born MSM may also occur for sexual exploration and sensation-seeking. In addition, foreign-born MSM living longer in Sweden had decreased odds of buying sex. Therefore, foreign-born MSM may be selling sex as part of a relationship where receiving gifts is part of courtship and sexual exploring. Research on minority stress among Latino MSM found that those with sexual minority identities can access social support more readily from similar sexual identity others [214]. In conclusion, there is a possible association between outness, sexual risk behavior, and HIV risk [135]. Lower outness may decrease the odds of living with HIV; however, those with low outness may be “hard to reach” with HIV prevention and testing programs occurring in the gay community and engaging in obscured sexual risk behavior, thus increasing their long-term HIV risk. Higher outness among foreign-born MSM may also be beneficial regarding access to

programs aiming towards HIV prevention and testing and decreasing their risk for HIV [133,213].

Country of birth

The self-reported prevalence of HIV was lower among Swedish-born MSM (4.8%) than foreign-born MSM participants (8.8%). According to previous literature, MSM face multiple stigmas for being foreign-born, a sexual minority, and living with HIV, which puts them at higher risk of accessing healthcare services and treatment [12]. In addition, due to different factors, such as stigma, foreign-born MSM may be in a precarious financial situation and conceal their HIV status [215]. Even though the prevalence of transactional sex (buying and selling sex) is somewhat similar among Swedish-born and foreign-born MS, transactional sex is more common among foreign-born MSM. This has also been reported in research among foreign-born MSM in the UK, where 15.4% sold sex during the past year. Living in Sweden as MSM certainly has advantages because of the positive view on sexual minorities. However, foreign-born can be a subject of discrimination that can reflect on their socioeconomic status, including social devaluation [132]. Arriving as a migrant can mean being culturally, racially, and ethnically different. It also suggests that one must establish themselves – socially and economically – which may lead to risk behaviors and poor health outcomes such as poor mental health or making them vulnerable to HIV. In addition, adapting to a different culture may cause stress which may induce engagement in sexual risk behaviors to cope with feelings and find pleasure [216].

Although Sweden has made a significant effort to include migrants in the health system, there are barriers and challenges described in the literature [67,100,144,186]. Some factors from other research include proximity of services, discriminatory treatment, cultural competence, health insurance, ability to pay, and interpreter availability [217]. However, the reported number of years living in Sweden has decreased the odds of engagement in transactional sex which could be explained by

the possibility that foreign-born MSM have a stable relationship and a steady partner after several years [218].

Economic situation

Those reported as really struggling with their current income had increased odds of living with HIV and increased odds of selling sex compared to those living really comfortably with current income. Research has focused on understanding how the economic situation and financial security contribute to higher HIV risk [134,219,220]. According to research from the USA on transactional sex among MSM, transactional sex is one of the survival strategies in young MSM occurring in poor contexts [120]. The older or homeless MSM reported selling and buying sex, describing their socioeconomic situation as disadvantageous [84,120]. In addition, other studies from the US on MSM and sexual risk have confirmed that those who sell sex usually have economic challenges [12]. According to research on MSM in Latin America, unemployment among MSM was associated with increased odds of transactional sex [134]. Foreign-born MSM were more likely to sell sex in the past five years if they also reported struggling with their income, similar to findings among young MSM in a US-based study where those engaging in any transactional sex were most likely unemployed or underemployed emphasizing that educational attainments or employment might be critical factors related to engagement in this behavior [120]. Programs aiming towards job creation may be very beneficial to alleviate the involvement in transactional sex.

Education

Increased odds for buying sex (ever and in the past five years) were among those reporting to have first-stage tertiary education compared to those with lower education [163]. According to previous research, those who buy sex generally have a university education [81]. In general, buying sex is possible in cases of disposable income [130]. The odds of living with HIV were decreased for first-stage tertiary education than for low-level education. Those who are more educated are among those usually earning more and have a higher financial and social standing,

consequently being able to buy sex. Other research on transactional sex reports that education is a prerequisite for formal employment, and lower educational status is usually related to financial insecurity; therefore, these individuals may sell sex as an income supplement [221]. On other findings from this thesis, where struggling to live on current income was related to increased odds of selling sex, we may believe that education offers an additional dimension to understanding the dynamics between buying sex [221].

Laws and policies

Different regulations can positively or harmfully affect sexual minorities or migrants and their risk for sexual risk behavior. A critical discourse analysis on migrants in Swedish SRHR-related policies found that migrants are mentioned under different terminology and categorized according to their legal status, gender, age, and years of living in Sweden [222]. The terminology is asylum seekers, foreign-born, undocumented, newcomers, or newly arrived migrants, among others [222]. SRHR are an essential part of human wellbeing, related to physical and mental health fulfillment, as mentioned in the International Covenant on Economic, Social and Cultural Rights [223]. Sweden is a signatory of the Covenant; therefore, it should comply with its obligations. The Covenant emphasizes different vulnerable groups, also reflected in Swedish policies where specific subgroups, such as women, young people, and underaged and unaccompanied minors, have been highlighted [222]. Sweden is also a signatory to all major human rights treaties, such as the 1951 Convention on Status of Refugees (ratified in 1954) and the 1954 Convention on Status of Stateless Persons (ratified in 1965) [224].

All individuals have the right to SRH, including the freedom to make their own choices about their health [223]. Sweden has adopted several international documents related to health overall and SRHR specifically, such as the 1994 International Conference on Population and Development (ICPD) Programme of Action, the 1995 Fourth World Conference on Women, and the Beijing Platform of Action [225]. Sweden has adopted the Agenda 2030 and Sustainable Development Goals (SDGs), including relating the different aspects of SRHR to the various SDGs

outcomes and their targets [226]. SDG 3 (Ensuring healthy lives and promote wellbeing for all at all ages), SDG 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), and SDG 5 (Achieve gender equality and empower all women and girls) closely link to SRHR [226]. The aim to achieve these goals has been set, among others, in the Swedish national strategy on SRHR [139]. The Swedish national strategy on SRHR also refers to “equal rights and opportunities regardless of sexual orientation, gender identity or expression” [139]. The strategy looks at SRHR from a life-course perspective, also emphasizing the needs of those who may be left behind, such as people with experience of migration, sexual minorities, young people and young adults, among others [139]. Currently, the strategy is under revision and should be finalized in 2023. In addition, Sweden has had a national strategy against HIV/AIDS and other STIs since 2006 and an updated strategy since 2017 [227]. The overarching goal is to decrease the transmission of HIV and STIs and minimize the harmful consequences of these infections for the individual and society. Within the strategy, there are different target groups, such as MSM, people arriving from high-endemic countries, unaccompanied children and young people, and people who engage in prostitution (engaging in selling sex) [227].

In Sweden, buying sex is a criminal activity [159]. Those who buy sex may not disclose practice, which puts them at increased risk for HIV because they cannot be reached with HIV prevention programs. This also means that transactional sex may occur abroad where the practice is not criminalized. This challenge has been recognized and is part of efforts under the national strategy against HIV/AIDS and other STIs [227].

Stigma can occur through laws, policies, norms, and practices, otherwise known as structural stigma [73]. Research has shown that MSM living in European countries with more favorable policies towards sexual minorities have lower predictive probabilities for HIV, even with other HIV factors [209]. These policies can benefit overall health, such as mental health, HIV prevention and access to health services. Policies that support sexual minorities and are more protective can significantly

reduce engagement in sexual risk behaviors and HIV risk [209]. In Sweden, the laws and the general population's attitudes against sexual minorities are very similar. Both support the approach that people should have the right and opportunity to live their lives as a sexual minority.

5.4 Methodological considerations

This section describes some of the limitations of the methods and analysis, including ways to mitigate those limitations that could affect the findings. All findings were based on cross-sectional surveys that collect data at a given point in time, and it is sometimes difficult to establish a causal association. Additional limitations are described in papers I-IV.

Papers I and II

Procedural bias – The survey covered many themes beneficial for further research. Due to time limits, it may not have been possible to answer all questions or to reflect and provide an accurate answer. Some participants cannot speak any of the languages offered and thus responded to the survey in Swedish. Due to a possible lack of understanding of the questions in a language other than their mother tongue and the time to reflect and answer, some participants could have given misleading information. This could pose a weakness for the study outcomes. The survey was tested extensively to minimize this bias; however, offering it in even more languages could have had its benefits.

Selection bias – For papers I and II, SFI and high schools were chosen because a significant number of people who have recently migrated to Sweden, especially those that need to attend school, could be found there. However, there is a number of those that did not participate in the survey because of limited access to these schools (for example, if we were allowed to collect data in the morning or afternoon school hours when, the data may be representative of those who may attend the classes in the evenings, after working hours, or students who are disabled and participate at classes only online, etc.). The behaviors among these participants may differ, so the interpretation of the findings may not be representative of the whole population

under study. In addition, to attend Swedish language school lectures, one needs to have the right to reside in Sweden. Since some are asylum seekers and undocumented immigrants without a residence to stay in Sweden (do not have a decision on residence) and therefore cannot access these lectures, the sample is biased. In conclusion, the findings cannot be extrapolated to migrants living in Sweden.

Participation bias – The piloting was done with students who belong to higher levels of studying Swedish as a second language. Despite the efforts to include those who were illiterate or barely literate, this population was not included in the sample. As observed, other ways of assessing the risk behavior among this population could be employed, such as qualitative studies or shorter questionnaires.

Social desirability bias – It is possible that the participants underreported or overreported certain behaviors. This can occur due to stigmatization of engaging in such behaviors where the answers on risk behaviors would be underreported. Some of the questions could be overreported if the respondent believes that they prove sexual experience.

Recall bias – The survey asked questions where the participants they need to recall past behaviors. To minimize this bias, the questions were asked about sexual behavior within a specific timeframe (12 months), so the participants could focus on the behavior at this time.

Observation bias – Even though the information was given anonymously and on a personal electronic device, the presence of the research team members could have resulted in “better than average” responses and not an accurate answer. However, given the time taken to fill in the survey, the observation bias probably was reduced since the respondent would become more focused on answering the survey and neglect the fact that the research team is present.

RHS–13 tool – There is an overall acknowledgment that RHS–13 may not be the optimal tool to measure mental health among our participants, where not all belong to asylum seekers or refugees – the primary focus group for which this tool is

beneficial. However, when conceptualizing the study, there was a large influx of migrants arriving from countries with conflict, indicating that those people could be present in the sampling venues. Thus, to capture the mental health of that population, the research team agreed that RHS-13 is a valuable tool for that purpose. The limitations of RHS-13 and measurements of mental health among this population are as follows – those aged 15 have different mental health than those who are 25 and may need differentiated tools that could measure their mental health based on their cognitive development due to their age difference [228]. In addition, their life situation may be very different – 15 years old are probably not married and may not have children; thus, their concerns will likely differ compared to 25 years old, and this tool may not be able to capture that, including possible differences between sexes [228]. A qualitative study may have been a better approach combined with RHS-13 or another tool. RHS-13 had good validity, and since the purpose of the study was not to diagnose but to get an overview of poor mental health prevalence, this was believed to be a tool that could serve the purpose [171]. However, there is a broad acknowledgment that many other tools could have been used, with their benefits and challenges. Perhaps an interview-administered mental health assessment or an implicit capture of different measurements related to mental health and sexual risk behaviors could be performed.

Papers III and IV

Selection bias – The online banner survey most likely recruited participants who were knowledgeable about technology and thus represented a convenience sample. The survey did not assess the reasons for migration, nor did our analysis. Some foreign-born MSM may not have been involved because of advertisements on Swedish websites. In addition, those without internet access, not integrated into the community, and unaware of these sites may not have been represented. Lastly, most participants (88%) from Sweden were reached via the Nordic online community Quiser, mainly targeting MSM and other HBTQ people looking for social and sexual contacts. Thus, MSM who do not use these online communities and apps or

prefer other ways and venues when meeting MSM for social or sexual contact may be underrepresented in our study sample [152].

Participation bias – Despite the large sample size and recruitment of participants with different backgrounds and across diverse settings, some individuals may choose not to participate because of sexual identity concealment [229–231]. In addition, as previous research has shown, individuals use internet sites for sexual networking and are thus at an increased risk for sexual risk behaviors. Thus, the sexually active participants may be overrepresented, as well as those who identify as gay. Men on these sites may not represent all MSM in Sweden, including sexual activity and age.

Recall bias – There is a possibility that participants did not correctly remember the behaviors they were asked to report. The questions are constructed so the participant has a specific timeframe; however, those may not be appropriate, and the answer could be questioned.

Misclassification bias – The definition of transactional sex is broad and can reflect a high variability in engagement causes. There is a difference in temporality and frequency of the activity, meaning there could have been one or several time moments where it was not possible to assess the variance in causes to engage in transactional sex (love, relationship, or money) in time as well as the frequency of engagement in time. This can cause false conclusions that inflate the engagement in selling or buying sex. The temporality, cause, frequency, and type of partners could better generalize the results. Thus, we cannot generalize the findings without considering the broader context of engagement. Also, if the participants chose a European country as their residence, they were still included in the survey even if they lived elsewhere.

Social desirability bias – Transactional sex could be interpreted as a stigmatizing behavior that could lead to underreporting of the behavior and false results, including in relation to the outcome (HIV). This bias is also applicable to those who misreported their HIV status and engagement in transactional sex, leading to findings that are not accurate.

Confounding bias – Many variables and factors can result in different outcomes once measured. The EMIS–2017 is a quality survey trying to assess many factors, but there are undoubtedly many more that the survey did not measure. The research team did a secondary data analysis; therefore, influencing the survey content was almost impossible; however, there is a broader acknowledgment that the survey was beneficial in capturing a significant number of people and their characteristics.

6 Conclusions

One of the primary conclusions in this thesis is that one in three young migrants reported engagement in sexual risk behavior, with condomless sex being the most commonly reported.

About two-thirds of young migrants had an increased risk for poor mental health, and sexual risk behavior was recognized as one of the factors to increase the risk. Being female was found to be associated with poor mental health. Coming to live with family decreased the odds of poor mental health while living alone increased the odds.

In comparison to their Swedish-born peers, foreign-born MSM have a higher prevalence of engaging in transactional sex.

The self-reported HIV prevalence was higher among foreign-born than Swedish-born MSM. Reporting selling sex was associated with increased odds of reporting to live with HIV. Always using a condom and being younger decreased the odds of reporting to live with HIV among all MSM.

7 Points of perspective

This thesis points to several implications and recommendations for future research and policy work to minimize sexual risk behaviors and enhance mental health among young migrants in order to improve long-term health benefits. These recommendations can be challenging because they require normative, institutional, and social change. They demand political will and economic support.

Implications for policy and practice

- Improving and optimizing policies, laws and strategies focused on SRHR that recognize young migrants as beneficiaries, but also social support programs, economic opportunities, and mechanisms that can minimize sexual risk behaviors among this population.
- Provide support for initiatives focusing on promoting safer sexual behaviors aimed at young migrants and key populations, especially those coming from countries affected by conflict.
- Programs seeking to decrease sexual risk behaviors among young migrants must include a component to inform, detect and manage transactional sex exposure. Efforts must be made to address structural inequities and vulnerability among young migrant MSM, such as equitably extending economic opportunities or social support.
- Investment in programs in all sectors focusing on practicing safe sex and using appropriate protection to prevent transmitting STIs should be continuously implemented.
- Improve longitudinal mental health screening programs for young migrants. Programs for mental health should be designed not just for newly arrived migrants but also for those living in Sweden for several years, especially if they live alone.

Implications for future research

- Temporality and causality of the sexual risk behavior engagement were not observed in this thesis, hence researching the behavior patterns within a timeframe in further research could be relevant.
- Support research that would involve diverse types of migrants, including asylum seekers, undocumented migrants, and migrants with lower literacy levels, to understand better their behavior and mental health needs and potential risks for poor health outcomes.

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